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Advancing inclusive education for students with special educational needs: rethinking policy and practice

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Advancing inclusive education for students with special educational needs: rethinking policy and practice

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Editorial: Advancing inclusive education for students with special educational needs: rethinking policy and practice

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Editorial on the Research Topic
Advancing inclusive education for students with special educational needs: rethinking policy and practice

This Research Topic offers a timely reflection on inclusive education for students with special educational needs (SEN), commemorating the 30th anniversary of the Salamanca Declaration [United Nations Educational, Scientific and Cultural Organization (UNECSO), 1994]. While the Declaration catalyzed a global commitment to inclusive, equitable education, progress toward its realization remains uneven, with disparate policies and practices evident throughout the world. The 10 studies in this Research Topic, though diverse in their aims, methods, and findings, share a common purpose: critically examining persistent challenges while exploring innovative pathways to improving inclusive schooling for this student group across varied national and educational contexts.

The first article by Liu and Potmesil sets the scene with a review of research on inclusive education for students with SEN using CiteSpace. The review provides a broad, data-driven overview of how the field has evolved over the past decade, identifying major trends, gaps, and future directions. The analysis indicates a primary research focus on education, psychology, and child development while advocating for greater interdisciplinarity. The need for future comparative and cross-national studies to enhance inclusive practices are highlighted.

The next three articles illustrate the critical need to rethink policy and governance in educating students with SEN within inclusive settings. Cumming et al. examine the contentious debate in Australia regarding the role of special schools vs. full inclusion, a discussion reignited by the divided recommendations of the 2023 Royal Commission. Key issues considered are international agreements, stakeholder perspectives, and the practical challenges of implementing full inclusion in mainstream schools. Rather than framing schooling as a binary choice between special vs. mainstream settings, the authors advocate for strengthening existing processes and practices at system, school, teacher, and family levels to ensure the most supportive educational environment is selected based on individual student need.

Expanding on the theme of inclusive policymaking, Norwich and Webster present a pilot Citizens' Panel in England that applied deliberative democratic methods to generate policy ideas for more inclusive schooling. The project has two aims: (a) enhancing the participation of young people with special educational needs and disabilities (SEN/D) in policymaking, and (b) developing practical policy recommendations, primarily focused on broad school improvements with integrated SEN/D considerations. This community-based initiative highlights the potential of deliberative approaches to create more inclusive and representative education policies.

Beamish et al. shift the focus to the Asia-Pacific in their comparative study of seven jurisdictions, revealing shared challenges to progressing inclusive education in mainstream schools. Their findings identify inconsistent policy guidelines, weak implementation plans, and the pressing need for stronger government and institutional commitment to bridge the gap between policy and practice. Recommendations include locally driven research to inform effective inclusion strategies and a coordinated approach involving action at multiple levels of governance.

Another set of articles examine the pivotal role of schools and teachers in implementing inclusive education. D'Angelo and Singal explore teachers' perceptions and practices regarding inclusive education for students with diverse learning needs in the Dominican Republic. Their findings highlight how teachers' views of their students shape inclusive practices in classrooms. The importance of equipping teachers with adequate training, pedagogical skills, and a supportive school culture are emphasized.

Extending the discussion to out-of-school settings, Boström and Elvstrand investigate the extent to which Swedish School-Age Educare Centers (SAEC) support students with SEN. Their study reveals differing perceptions among various professional groups, particularly principals, regarding students who need special support and additional adaptations. Findings also disclosed a scarcity of specific programs for these students, suggesting the need for increased resources, stronger reform prioritization in SAEC, and targeted staff training.

A broader institutional response to inclusion is considered by Gómez-Domínguez et al. who analyze how schools adapted—or failed to adapt—to the needs of students with SEN during the COVID-19 pandemic. Their bibliometric study highlights key challenges, including limited personalized support and resource accessibility, while also identifying effective strategies such as dialogic literary gatherings (DLGs) and school-family collaboration. The authors argue that the pandemic exacerbated educational inequalities and placed additional emotional burdens on families. They call for proactive policies and greater emphasis on psychological wellbeing in education to foster more inclusive and resilient school systems.

A final set of articles showcase frameworks and resources aimed at better supporting neurodiverse students. Le Cunff et al. propose a preliminary framework for managing cognitive load in online education for neurodivergent students. This framework emphasizes flexible content formats, reduced environmental distractions, appropriately paced information delivery, clear instructions, accessible support services, and participatory research. A PESTEL analysis points to external factors affecting the framework's implementation, including resource disparities and policy support. By comparison, Abd El-Sattar et al. explore the potential of serious games as a participatory research tool for children with autism. Drawing on the authors' prior work, a new theory and framework for game-based skill development to enhance engagement and learning outcomes is detailed. Ethical considerations and copyright aspects are discussed alongside supplementary online materials.

Expanding the discussion beyond learning interventions, Johnston et al. address the broader issue of school absences among autistic students, proposing a structured, neuro-affirming resource to foster inclusion. Developed collaboratively with stakeholders and rooted in neurodiversity perspectives, the freely available resource moves away from deficit- and reward-based models. It includes key messages, case studies, and a planning framework promoting inclusive practices, parental partnerships, environmental adaptations, and predictable school experiences.

Collectively, the studies presented here highlight both the barriers and opportunities for fostering more inclusive learning environments, offering insights from across the United Kingdom, Europe, Middle East, and the Asia-Pacific. While some articles critically examine existing policies and institutional responses to educating students with SEN, others propose innovative frameworks and pedagogical strategies that can drive meaningful change in practice. Together, they emphasize the importance of multi-stakeholder collaboration, evidence-informed policymaking, teacher training and support, and inclusive school cultures that value all learners. Future challenges lie not only in developing robust policies and frameworks but in ensuring their effective implementation—one that is responsive to students, teachers, and families. By continuing to rethink policy and practice in light of emerging research and evolving societal needs, we can move closer to truly inclusive education systems for all students.

Author contributions

SH: Conceptualization, Writing – original draft. WB: Conceptualization, Writing – original draft. DC: Writing – review & editing.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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A brief neuro-affirming resource to support school absences for autistic learners: development and program description

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Background: Education should be inclusive, nurturing each individual's potential, talents, and creativity. However, criticisms have emerged regarding support for autistic learners, particularly in addressing disproportionately high absence levels within this group. The demand for accessible, person-centered, neuro-affirming approaches is evident. This paper provides a program description of a structured absence support framework, developed and implemented during and following the Covid-19 pandemic. We detail creation, content, and implementation.

Methods: We collaborated with stakeholders, reviewed literature and drew on existing theoretical frameworks to understand absence in autistic learners, and produced draft guidance detailing practical approaches and strategies for supporting their return to school. The final resource was disseminated nationally and made freely available online with a supporting program of work around inclusive practices.

Results: The resource is rooted in neuro-affirming perspectives, rejecting reward-based systems and deficit models of autism. It includes key messages, case studies and a planning framework. It aims to cultivate inclusive practices with an autism-informed lens. The principles promoted include recognizing the child's 24-hour presentation, parental partnership, prioritizing environmental modifications, and providing predictable, desirable and meaningful experiences at school. Feedback to date has been positive in terms of feasibility, face validity, and utility.

Conclusion: This novel, freely available resource provides a concise, practical framework for addressing absence in autistic learners by cultivating a more inclusive, equitable, and supportive educational system in which autistic individuals can thrive.

KEYWORDS

neuro-affirming, autism, education, pedagogy and practice, school inclusion, anxiety related absence, education resources, education research articles

1 Introduction

While the global prevalence of autism in school-age children is estimated at around 1–2% (Elsabbagh et al., 2012), some recent studies indicate higher prevalence, with the United States Center for Disease Control estimating that in 2020, one in 36 children aged 8 years (approximately 4% of boys and 1% of girls) was autistic (Maenner et al., 2020). In Scotland in

2022, the prevalence of needs related to autism was 2.6% in primary schools, and 16.22% of all pupils were neurodivergent (Maciver et al., 2023). The wider literature indicates that neurodivergent children spend less time at school than their peers (Munkhaugen et al., 2017; McClemont et al., 2021; John et al., 2022) with a high prevalence of school attendance issues particularly evident among autistic learners (Munkhaugen et al., 2017; Maynard et al., 2018; Adams et al., 2019; Totsika et al., 2020; John et al., 2022). Absence has further been put in the spotlight by the international literature on experiences of staying home and then returning to school following the Covid-19 pandemic (Spain et al., 2021; Kreysa et al., 2022; Meral, 2022). The consequences of this experience on the emotional wellbeing and attendance of neurodivergent children are still being felt today, necessitating action and coordinated responses by governments, schools and teachers (Genova et al., 2021).

Absences for autistic learners are influenced by interconnected factors, including bullying, social support, and mental health (Adams et al., 2019; Sobba, 2019; McClemont et al., 2021; Adams, 2022). Sensory sensitivities, as well as the individual's levels of self-esteem, can introduce further complexity (Maynard et al., 2018). Conventional approaches to absence, for example those based on rewards, have often fallen short in achieving desired outcomes (Londono Tobon et al., 2018; Maynard et al., 2018). The lack of practical resources around support for autistic children, as well as professionals' understanding of autism itself are key barriers (Melin et al., 2022). Professionals and stakeholders are calling for evidence-informed strategies (Preece and Howley, 2018; Melin et al., 2022). Autistic people stress the significance of solutions that resonate with their experiences, advocating for non-judgmental and neuro-affirming approaches (Dallman et al., 2022; Rutherford and Johnston, 2023).

Informed by the lived experiences of neurodivergent individuals, the neurodiversity paradigm has prompted a profound reassessment of historical research and support structures, challenging prevailing consensus and motivating the development of neuro-affirming practices in schools and other settings (Arnold, 2017; Fletcher-Watson and Happé, 2019; Dallman et al., 2022). Central to this ongoing transformation is a departure from traditional disorder-centric perspectives (Rutherford and Johnston, 2023). This viewpoint recognizes that adverse outcomes arise from person-environment interactions, rather than being inherent to individuals (Dallman et al., 2022). Neuro-affirming practice aims to foster acceptance and self-comprehension, as well as amplifying the voices, experiences, and needs of neurodivergent individuals (Roche et al., 2021; Wood et al., 2022). While the transition to neuro-affirming practices is gaining momentum, there is little comprehensive and accessible guidance on supporting autistic individuals who experience dysregulation or anxiety in school, and there remains a need to reassess the ways in which pedagogy and school environments are conceptualized and understood through a neuro-affirming lens (Cherewick and Matergia, 2023).

The complexity and high frequency of school absence among autistic children motivates the need for solutions. Comprehensive resources addressing school absence in autistic young people are crucial to tackle this complex issue. This paper outlines efforts to address anxiety related absences in autistic learners through the development of the "Anxiety Related Absence (ARA) resource." Developed by the National Autism Implementation Team (NAIT) in Scotland, the resource provides a practical and accessible guide for staff working in and with schools, complemented by a dissemination and training program. This paper discusses the resource's development, content, key messages, and implementation to date.

1.1 National Autism Implementation Team

The National Autism Implementation Team (NAIT) leads an initiative that aims to bridge the evidence and policy-to-practice gap and facilitate lifespan whole systems change in neurodevelopmental practices (Scottish Government, 2011, 2018; Rutherford et al., 2021; Maciver et al., 2022, 2023; Curnow et al., 2023a,b; Rutherford et al., 2023; Rutherford and Johnston, 2023). The team is composed of neurodivergent and neurotypical individuals from a range of professional backgrounds including Education, Speech and Language Therapy, Occupational Therapy, Psychiatry and research. The full NAIT program aims to drive improvement and innovation in professional practice to create a neurodevelopmentally informed workforce through various mechanisms focussing on health and education provision for autistic and other neurodivergent individuals.

1.2 Language statement

In the context of addressing absence, traditional terms like "truancy," "school refusal," or "school avoidance" are stigmatizing and child or family blaming. After discussion with stakeholders, a more suitable term emerged: "Anxiety Related Absence" or "ARA." Our guidance recommends using this language to describe absences among autistic learners.

2 The Scottish context

Scotland's educational ethos prioritizes inclusivity, with a presumption of inclusive mainstream schooling for most learners (Scottish Government, 2019). This means that many classroom educators support learners, with "Support for Learning" teachers providing additional guidance as required. However, schools have considerable leeway in determining their own pathways and procedures for issues including additional support needs and absence. Although policy outlines the need for multidisciplinary and multiagency teams, the health and education systems in Scotland operate autonomously, differing in funding, staff, and practices, and concerns persist regarding the onus on educators to provide support for children with additional support needs (Ballantyne et al., 2022). Criticisms have been directed at the assessment process and allocation of resources and have identified a need for change in practitioner mindsets to better use resources allocated (Scottish Government, 2020). Concerns exist that the increased incidence of absence in Scottish schools is evolving into a crisis (Connolly et al., 2023) with an attendance rate of 90.2% in 2022/23 marking a deterioration of 2.8% since 2018/19 and 1.8% since 2020/21, the most significant single-year drop in attendance since the Scottish Government started collecting this data in 2010 (Scottish Government, 2023). Additional discussions with school leaders and educators in Scotland uncover a related trend: a notable surge in consistently low attendance among autistic learners

(Connolly et al., 2023), with Scottish Government data indicating an attendance rate of 91.6% for autistic pupils in 2022 compared with 94.1% in the wider population (Scottish Government, 2022). Feedback and data from a national parent survey (Children in Scotland, Scottish Autism and the National Autistic Society, 2018) affirm that a majority requiring absence support have autism diagnoses or related needs. The Covid-19 pandemic has exacerbated this, as home learning provides a less demanding, more regulated environment. Prolonged absences diminish tolerance for school challenges, eroding established support strategies.

3 Key programmatic elements

3.1 Development of the ARA resource

During the Covid-19 pandemic, the NAIT team engaged with stakeholders locally and nationally who were familiar with ARA experiences. The aim of this engagement was to identify the nature of the issues surrounding ARA experience for autistic children and young people and identify potential solutions. This involved:

1 Rapid review of scientific literature, policy, theoretical frameworks and approaches to support.
2 Professionals' feedback—synthesis of existing knowledge through leveraging our clinical and educational networks to understand current practice and solicit perspectives from parents and children and young individuals. The NAIT team also drew on their own experience of working with families from years in practice as education and health professionals.
3 Stakeholder feedback: Virtual meetings conducted with parent volunteers to facilitate the collection of feedback from their children.

3.2 Wider NAIT program and pre-existing models used to support the development of the resource

The full NAIT program of work represents a complex intervention with several interacting parts including work over health, education and community settings (Maciver et al., 2022). Developments in inclusive practice in education are a major focus, with several linked and interconnecting strands. This multifaceted approach aimed to embed inclusivity principles into the daily educational experiences of children and young people with the goal not only of addressing specific needs related to ARA but also to foster a more inclusive educational landscape overall. Two NAIT initiatives are particularly pertinent, as they form a core aspect of the context in which the ARA resourced was implemented, as briefly described here.

First, the ARA resource draws and builds on the CIRCLE resource, an evidence-informed resource for education and health professionals to support universal inclusive practice within schools (Maciver et al., 2020, 2021). CIRCLE aims to equip professionals with the guidance to assess and create inclusive environments and provides an introduction to a range of supports and strategies to support inclusion (Maciver et al., 2020, 2021). The central concept underpinning these efforts is the notion of "universal" supports, which embodies an inclusive classroom approach designed to meet the needs of all learners. This focus on good inclusive practice emphasizes the importance of proactively making adjustments before or alongside "specialist" interventions. The CIRCLE resource provides a framework promoting an "environment first" approach, as well as the idea that inclusion is a responsibility shared by all staff. The ideas that underpin effective supports and inclusion of autistic children specifically are highly consistent with the principles of inclusive schooling generally (Roberts and Webster, 2022) hence the application of the CIRCLE framework is supportive of practices around ARA. By incorporating CIRCLE ideas, educators can establish a foundation of universal inclusive practice (Maciver et al., 2020, 2021). NAIT supported national implementation of CIRCLE, providing a "train the trainer" package of videos and online materials to integrate the CIRCLE framework in schools. Additionally, online professional learning modules, created collaboratively with a government agency, were accessible to all teachers in Scotland, focusing on CIRCLE usage.

Second, the ARA resource approach is supported by and incorporates ideas from the SCERTS Framework, an evidence-informed assessment and planning approach for children and young people (Yi et al., 2022). The SCERTS Framework operates as a solution to address factors impacting ARA by concentrating on three aspects as described by Prizant et al. (2006). First, "Social Communication" entails comprehending the "How and Why" of individual communication. Next, "Emotional Regulation" involves identifying strategies for "self-regulation" to achieve calmness and happiness, and "mutual regulation" to assist others or to be assisted by others. Finally, "Transactional Supports" encompass "interpersonal support"—adaptations made by those around the individual, and "learning supports"—including visual aids, curriculum adjustments, and adaptations to physical learning resources for enhanced accessibility and success. The ARA resource equips practitioners to address key aspects of autistic experience by organizing ideas around SCERTS concepts, including an understanding of social communication, emotional regulation, and transactional supports (Prizant et al., 2006). NAIT supports the national implementation of SCERTS, including conducting training programs, in collaboration with SCERTS authors. This includes three-day training sessions, an online repository of SCERTS implementation guidance, and regional networks to provide guidance to professionals. SCERTS is a more specialist and complex framework so has lesser reach than universal application, but within some areas of Scotland it is becoming a more common model.

3.3 Program description

The 34-page ARA resource provides a short, practical and freely available guide for managing absences among autistic learners (see Supplementary material). The resource offers a structured approach, starting with the implementation of universal inclusive practice and highlighting key messages for supporting autistic children and young

people. Case studies provide examples of the concepts discussed. Reflective practice is encouraged, and the resource extends its guidance to support within home and school environments, and for emerging and existing ARA situations. The resource includes references and recommended reading materials. The key ideas and key messages which are presented in the resource are discussed below. The planning framework is also presented. See Figure 1 for a diagram representing key ideas.

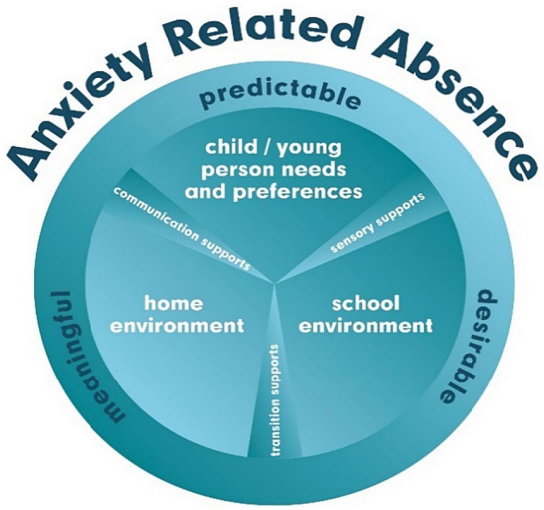

FIGURE 1
ARA resource. An overview of the key concepts underpinning the resource, focusing on communication, sensory and transactional supports and the provision of predictable, desirable and meaningful environments across home and school to meet the child or young person's needs and preferences.

3.4 Key concepts underpinning the ARA resource

Table 1 provides an overview of the key concepts underpinning the resource. Central themes include the "24-hour child," an approach that extends beyond school; effective communication and collaboration with families; and a focus on low cost and practical support strategies. The resource promotes an "environment-first" perspective, emphasizing modifications in social and physical environments of school and home with a focus on predictability, desirability, and meaningfulness aligned with the child's interests and needs. The "environment first" principle further posits the primacy of adaptations to the learning environment over skills or "behaviors." An autism-informed lens provides understanding of social complexities and coping mechanisms like masking. Importantly, the resource promotes positive educational experiences by eschewing external reward systems, seeking to enhance intrinsic motivation and self-driven engagement. Support strategies cover communication, sensory, and transition aspects.

TABLE 1 Key concepts underpinning the ARA resource.

Key idea	Description
24-hour child	Discrepancies between how a child presents at home and school are common and are often indicative of a problem building up. This resource recognizes that support at home must coincide with adjustments in the social and physical environment of school to maximize success. A comprehensive approach bridges these settings, acknowledging that changes implemented in one setting can impact on a child's presentation and experience in both
Parents as partners	Collaboration with parents is key to fostering a nurturing environment, characterized by a "no-blame" culture and openness to listen, believe, and respond compassionately. The resource emphasizes clear, planned communication between home and school, practical support for home routines, and acknowledgment of impacts on parents and the family. Addressing the impact of relationships on problem-solving related to attendance issues, including separation anxiety, is integral to this approach
No rewards	The resource encourages reasonable adjustments to create predictable, desirable and meaningful educational experiences without relying on external reward systems, aiming to increase intrinsic motivation and self-driven engagement. Rewarding or praising children for tolerating the intolerable risks the child learning to mask rather than experiencing the school setting as a safe place to be their authentic self
Environment first	The resource prioritizes modification to the physical and social environment within the school setting, emphasizing collaboration among stakeholders. In many cases it is the adults and environments that must change to ensure the child's potential for successful participation and well-being
Predictable, meaningful, desirable	The resource highlights three fundamental components crucial for a successful school experience: predictability, meaningfulness, and desirability. The stability and consistency of people and routines, the meaningfulness and personal relevance of educational activities, as well as the enjoyment and feelings of accomplishment or satisfaction derived from school engagement, collectively bolster learner engagement and alleviate anxiety
An autism lens	This idea focuses on understanding autistic children, including individual communication and sensory preferences, thinking styles, coping mechanisms like masking, exploring the concept of double empathy, navigating the complexities of social dynamics within school, and recognizing the cumulative impact of stress
Communication, sensory, and transition supports	Supports are directed at three areas: communication, sensory, and transitions. These supports aim to foster positive participation in school, motivation to attend, a sense of being a valued member of the school and feeling heard and believed. The availability of multifaceted support helps with emotional regulation and confidence

TABLE 2 Key messages for practitioners.

Principle	Description
Ensure adjustments are anticipatory	Ensuring "anticipatory" rather than reactive reasonable adjustments. An anticipatory approach involves understanding recent experiences, strengths, needs, and preferences, and preparing well ahead of any change or transition
Listen to parents	Listening to and believing parents adds key insights into family dynamics and preferences. Understanding approaches and experiences at home provides useful information, and staff should seek to understand and respond to parents' concerns
Provide predictability	Predictability helps to reduce anxiety. Disrupted expectations increase anxiety. People, places and experiences should be made as predictable as possible. By understanding current concerns and creating the right social and physical environment, school will feel more predictable
Use visual supports	An individual visual timetable fosters predictability and engagement, aiding in managing transitions and events. It supports understanding, communication, social interaction, transitions, routines, motivation, and participation, while reducing anxiety and apprehension. Length and format depend on needs and developmental stage
Provide a safe space	A safe space offers a retreat for overwhelmed children, aiding in regulation. It should be individual, accessible, and readily available for independent use. Multiple unique safe spaces might be needed to cater for various needs and settings
Plan for movement breaks	Planned movement breaks, individual or group-based, aid transitions, prevent distress, enhance focus, learning, emotional regulation, and reduce overwhelm. Tailored to preferences, these activities can be predictable, desirable and meaningful
Seek to understand distress	Staff should reframe "behavior" as actions and responses arising from distress or dysregulation, adopting a non-judgmental perspective. To understand a child's actions and responses, staff should seek reasons, identify possible triggers, avoid post-analysis with the child, and proactively prevent recurrence. Masking and double empathy are key concepts to consider
Two key adults	Autistic children and young people and caregivers may struggle with knowing who to contact. Each learner should have two consistent key adults, ideally one from the Senior Leadership Team, as contacts. Children need to know how to access them for support during school. Both key adults should be involved in communication and planning, particularly during transitions

3.5 Key messages for practitioners

Table 2 shows "key messages" for practitioners. The key messages are designed to promote realistic, appropriate and effective strategies to facilitate the establishment of an environment tailored to the specific needs of autistic children or young people, and to be high level and straightforward. Most involve shifts in teacher or other adult mindset, with minimal additional costs, meaning they are largely cost-neutral, an additional benefit for schools and practitioners. An anticipatory approach is advocated, predicated upon a comprehensive understanding of individual experiences, strengths, needs, and preferences. These key messages promote the importance of proactive planning and adjustments. They emphasize the value of engaging with parents to understand family dynamics and home life. Creating a predictable environment and curriculum are recommended, incorporating movement breaks into daily routines, the use of visual supports and provision of safe spaces. Practitioners are encouraged to shift their focus from labeling the child or young person as displaying "challenging behavior" to adopting a more compassionate perspective. Specifically, they are urged to reframe "challenging behavior" as a manifestation of distress which indicates a requirement for the adults around the child or young person to make adjustments and adaptations. This approach promotes a non-judgmental stance, fostering a proactive understanding of issues like autistic masking. Lastly, assigning two consistent key adults for each learner ensures clear communication and support during school activities and transitions.

3.6 ARA planning framework

Resolving anxiety related absence can take time (Maynard et al., 2018; Melin et al., 2022) and it is important that planning is individualized, consistent, organized and anticipatory. The ARA planning framework ensures a holistic and collaborative effort to enhance the school attendance experience for autistic children and young people, acknowledging the unique challenges they may face. A systematic process comprising several steps is recommended, with collaborative planning involving a team approach between practitioners, parents, and health professionals. Practitioners initiate the process through an assessment process and addressing the questions about the barriers to attendance present for a specific learner. The questions address developmental expectations, routine, predictability, independence support, environmental factors, desirability of activities, consistency of experiences in school, what success might look like for that learner, effective adaptations in place, involvement of various individuals, sensory preferences, parent views, and home-school communication. These inquiries aim to ensure a comprehensive understanding of the child and family's experiences and promote a tailored, supportive approach. The planning cycle promotes reflective discussions, and setting realistic targets that prioritize adaptations to natural environments. Consistent communication, a staged intervention involving collaboration, and a cautious approach to traditional "therapeutic" methods (such as counseling or cognitive behavioral approaches) are also recommended.

3.7 Implementation methods

The implementation methods are detailed below.

1 Initial guidance was sent out via email to professional networks in 2020 as part of a suite of resources targeted to return to school following the COVID 19 pandemic (see Supplementary material).

2 The resource was widely disseminated nationwide, made freely available online on the NAIT website, and supported by national virtual presentations and webinars. Invitations to the webinars were shared through professional distribution lists. The first of these presentations was delivered in 2020 through the Scottish Government Online Scottish Strategy for Autism Conference for which the Scottish Government requested pre-recorded themed submissions. A "Return to school" webinar was held in 2020 which focused on wider supports for learners to return to school, including support for those who may be experiencing anxiety (Rutherford and Johnston, 2020). A further national webinar was held in 2022, which offered insights into autism including its nature and assessment, as well as supports for absence (Rutherford and Johnston, 2022). Importantly, this webinar also provided information for leaders planning a strategic approach to attendance. The webinar recording was uploaded to a YouTube platform for teachers in Scotland and also the NAIT website, with an email to all delegates sharing a link to the resource and to a recording of the webinar.
3 Following the webinar in 2022, cascading through professional networks was facilitated by providing information and training resources to webinar delegates, with an invitation to share this with relevant and interested colleagues.
4 Links to the relevant information and guidance was also shared with national organizations, and uploaded to websites including those which teachers access and those which parents and carers might access.

3.8 Post-implementation evaluation of the ARA resource

Feedback was gathered during the webinar held in 2022, using an online tool. Delegates were also asked to complete a post-webinar evaluation which was shared via a QR code during the webinar and sent out again to all delegates. As well as this opportunity to evaluate the resource, feedback was also sought through professional networks and expert practitioners in 2022. A summary of feedback was collated by the NAIT team, with next steps identified. Engagement with professional leads in local areas is underway to provide a long-term evaluation including an ongoing survey of professionals who have accessed the resource. Feedback could be used to develop an updated version which will be disseminated in future.

3.9 Feedback from users

The resource has garnered considerable interest and positive feedback, with 537 practitioners from 30 local authorities (geographic areas) attending the 2022 webinar, and 211 practitioners providing feedback after the event. The substantial turnout for the webinar affirms the resource's face validity and its ability to engage staff. In reviewing feedback, attendees praised its balanced approach, advice, and informative content, noting that the recommendations were feasible and practical. An impactful aspect of the resource was noted as its ability to raise awareness and enhance understanding of autism. Feedback prompted the identification of "next steps." Practitioners firstly expressed commitment to actively listen to autistic children and young people's experiences. There was a recognized need to shift from surface-level to comprehensive autism-informed assessment. Practitioners discussed the importance of consistently promoting autism-informed thinking among staff, expressed a strong desire to discontinue ineffective practices, eliminate stigmatizing language like "school refusers," and adopt "environment first" methods. Intentions were outlined to phase out reward-based approaches. Feedback stressed the fundamental importance of reflecting on current approaches and engaging in collaborative discussions with stakeholders. The necessity of listening to parents was emphasized, with a call to cease dismissing their perspectives, observations, and concerns, and avoid assumptions about uniformly shared goals among children, families, and schools. Practitioners highlighted the need to strengthen connections between home and school, recognizing the vital role of a supportive home-school partnership in providing comprehensive and effective support.

4 Discussion

The NAIT ARA resource offers a concise, practical, and freely available framework for addressing absence in autistic children and young people. Given the persistent attendance challenges among autistic learners, practical resources are essential to empower staff working in and with schools. Developed through stakeholder consultation and implemented nationally during the COVID-19 pandemic, the resource signifies a shift toward supporting neurodivergent learners and fostering neuro-affirming mindsets. A key contribution is its capacity to cultivate inclusive thinking among school staff, aiming for more predictable, desirable and meaningful educational experiences. The resource prioritizes anticipatory support and autism-informed strategies over "behavioral" approaches, encouraging a focused understanding of anxiety causes. Proactively addressing attendance barriers for neurodivergent learners is crucial for creating an environment where they not only cope but thrive.

School communities and stakeholders are grappling with a lack of comprehensive neuro-affirming guidance, evidence-informed practices, and frameworks (Sobba, 2019; Anderson, 2020). In previous research, reasonable adjustments and the cultivation of peer connections have been shown to play a substantial role in creating an environment in which autistic learners can engage and thrive (Melin et al., 2022). Early detection and anticipatory support are also pivotal in averting chronic absences (Bonell et al., 2019; John et al., 2022). Some prevention and early intervention programs have focussed on school climate for reducing adolescent mental health problems (Bonell et al., 2019; John et al., 2022). Interventions might also focus on psychological support, for example anxiety (Delli et al., 2018) and school-based mental health (Greig et al., 2019; Punukollu et al., 2020). However generic strategies to improve attendance miss the key aspect of autistic learners needing to endure an environment they may find intolerable (Tomlinson et al., 2020). This also poses a substantial risk of encouraging masking and making the child feel that their authentic self or identity is not valid (Beardon, 2019). The ARA resource diverges from traditional methods by eschewing reward-based approaches by acknowledging that non-attendance among autistic learners often arises from factors beyond their control (Tomlinson et al., 2020; Totsika et al., 2020). Importantly, it does not advocate addressing anxiety related absence through alternative educational pathways like forest schools or homeschooling.

A notable innovation of the ARA program is its "environment-first" perspective, drawing on key concepts from the neurodiversity paradigm (Fletcher-Watson and Happé, 2019; Pellicano and den Houting, 2022), the social model of disability (Shakespeare, 2006) and the frameworks of CIRCLE (Maciver et al., 2021) and SCERTS (Yi et al., 2022). Protective environmental factors assume a key role in cultivating a supportive ecosystem for autistic learners (Hatton, 2018; Adams, 2022), extending beyond the school setting to encompass the child's 24-hour life. The program aims to create a non-judgmental school environment, fostering understanding and support for children, young people and families. This perspective shifts the responsibility for change from the child to those in their environment. Meaningful change here arises from collective efforts. Instead of engaging in counseling or problem-solving with the child or young person, the ARA resource places the onus on adults to observe, reflect, and act. The program places significant emphasis on the notion that "the young person will do something… when the adults do something," recognizing that action of adults is pivotal for achieving positive outcomes.

A key idea of the resource is that different reasons for absence exist, and that insights into possible mediating pathways, supports, and necessary actions stem from teachers' models of why the absence is occurring (Klein et al., 2022). The ARA resource therefore places emphasis on understandings of why absence might be happening. Changing mindsets is key. Poor attendance labeled as truancy, for example, has negative connotations with teachers, who report irritation and frustration toward truant learners (Wilson et al., 2008). As a result, teachers are less willing to support (Klein et al., 2022). On the other hand, in the context of autism, when teachers possess a comprehensive understanding of autism and the reasons for absence, they are more inclined to help (Petersson-Bloom et al., 2023). An empathetic understanding of autistic individuals in a neurotypical world, as well as the extreme difficulties of some environments for autistic people, is essential for fostering appropriate actions. Autism-specific knowledge equips educators with the insights needed to create inclusive and accommodating environments. They can make adjustments that cater for sensory sensitivities and unique cognitive styles and foster an environment where support is effective in promoting the academic and personal growth of autistic learners (Petersson-Bloom et al., 2023). The goal is to make school a predictable, appealing, and meaningful choice for autistic learners and their families, ensuring that they select it as their primary option.

Future development, implementation, and dissemination will face barriers and facilitators. Barriers include general issues with attitudes to inclusion (Krischler and Pit-Ten Cate, 2019) as well as the theoretical and practical knowledge that school staff have about autism and related differences (Vincent and Ralston, 2020; Melin et al., 2022). Overcoming deficit-oriented mindsets and historical views of autism is crucial. Regarding facilitators, increasing awareness of autism and an emphasis on inclusivity and neurodiversity both within Scottish education and more widely in society are supportive, as is a desire for improved collaboration among health and education stakeholders. Positive feedback to date serves as a strong foundation for the use of this resource. Future research should focus on outcomes for schools and children and young people. The development of case studies of use in schools would offer in-depth examinations of real-world applications, contributing to the growing body of evidence on best practices for supporting neurodivergent learners.

Cross-cultural applicability of the ARA should be carefully considered given the context in which it was implemented. The NAIT program is grounded in the Scottish context. As a complex intervention building on an interacting network of pre-existing inclusive education strategies and ideas, the ARA approach and resources may require adaptation if applied in different contexts. However, the key underlying principles, mechanisms and potential outcomes proposed are relevant across many different contexts. Given the established association between anxiety and school absence internationally, as well as the pressing need to facilitate neuro-affirming practices in schools, it is likely that that the underpinning ideas and principles have wide applicability. Exploration of the transferability of the resource to different contexts may be valuable for those working to improve attendance for autistic students.

5 Methodological constraints

As the resource has been distributed widely online, it is not possible to obtain records to establish how many practitioners have subsequently accessed it. The resource has high levels of face validity; however, longer-term evaluation remains necessary. There is limited evaluation data from children, young people and families, and further evidence is required to assess how well practitioners can implement the recommendations and the resulting outcomes, both in preventing absence and ensuring return to school. This will inform further refinements and adjustments to the resource.

6 Conclusion

The NAIT ARA resource provides supports for practitioners. Our knowledge and application of the neurodiversity paradigm continues to evolve, and future review of the materials should reflect the most recent evidence about neuro-affirming practice creating a foundation for autistic individuals to engage academically and thrive.

Data availability statement

The original contributions presented in the study are included in the article/Supplementary material, further inquiries can be directed to the corresponding authors.

Author contributions

LJ: Conceptualization, Data curation, Formal analysis, Methodology, Project administration, Software, Supervision, Validation, Writing – original draft, Writing – review & editing. DM: Data curation, Formal analysis, Software, Supervision, Validation, Writing – original draft, Writing – review & editing. MR: Conceptualization, Data curation, Formal analysis, Methodology, Project administration, Software, Supervision, Validation, Writing – original draft, Writing – review & editing. AG: Validation, Writing – original draft, Writing – review & editing. EC: Data curation, Formal analysis, Validation, Writing – original draft, Writing – review & editing. IU: Validation, Writing – original draft, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

The Supplementary material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/feduc.2024.1358354/full#supplementary-material

SUPPLEMENTARY DATA SHEET 1
Anxiety Related Absence: A guide for Practice.

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Inclusive education in the Dominican Republic: teachers' perceptions of and practices towards students with diverse learning needs

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Introduction: Students with diverse learning needs, particularly those with disabilities or identified as overaged, face significant challenges within the Dominican Republic's education system. Despite efforts by the Ministry of Education to promote inclusion, these learners often have limited access to quality pedagogical support. This is further confounded by the fact that there is a paucity of research examining how teachers perceive and interact with these learners.

Methods: This ethnographic study draws on diverse methods, including observations and interviews, to investigate teachers' perceptions of inclusion in two public schools and how these perceptions shaped their pedagogical practices.

Results: The authors illuminate how teachers' perceptions of their students, their schools, and their classroom environments influence their commitment to facilitating student learning, irrespective of student age or ability.

Discussion: The findings contribute valuable insights to inform strategies for enhancing inclusive education in the Dominican Republic. Recommendations for policy and teacher training are provided, and the importance of conducting research with teachers is explained.

KEYWORDS

inclusive education, Latin America and the Caribbean, teachers' perceptions, pedagogy, ethnography, disability, Dominican Republic

Highlights

- This ethnographic study draws on diverse methods, including formal and informal observations and interviews with teachers, to explore their perceptions and practices related to inclusive education.
- Teachers often described overage students through a deficit lens, in terms of their misbehaviour or disinterest in school. Students with disabilities were nearly invisible in the study, due to a lack of data or health assessments, and teachers described these students as needing "special" external support.
- Teachers' perceptions shape their practice, often resorting only to classroom management strategies, or shifting responsibility to external actors.
- These perceptions change, however, as teachers get to know their students and their home lives. They develop a deeper understanding of students' cultural, psychosocial, or cognitive needs, and seem to become more empathetic towards students.
- These findings point to the importance of building school-community partnerships and ensuring teachers work together with families and other child protection institutes.
- Teachers also need to be supported with training, pedagogical skills, and a conducive classroom and school environment that supports inclusion for all students.

1 Introduction

The inclusion of all young people, regardless of their abilities, is a fundamental aspect of Sustainable Development Goal (SDG) 4: the provision of inclusive and equitable quality education for all (United Nations, 2015). While SDG4 has been seen as a major commitment of governments in the Global South, there has been varying levels of progress in terms of national policy design and implementation. This article focuses on the Dominican Republic, a country which – prior to the COVID-19 pandemic – had some of the highest rates of economic productivity in the region of Latin America and the Caribbean, yet low levels of learning and high levels of educational inequality across groups of students (World Bank, 2016). Over the past thirty years, the Dominican Republic Ministry of Education (MINERD), government bodies, and civil society organizations have demonstrated a growing commitment to universal access to education and increased attention to educational quality (Hamm-Rodríguez and Veras Diaz, 2021).

Yet access to education and quality learning still remains a privilege reserved for few students, and inequities based on gender, socio-economic level, and disability, hamper progress towards SDG4. Even before the COVID-19 pandemic, just over 1 in 5 students (21 percent) in the Dominican Republic finished lower-secondary level having met minimum proficiency level in reading, with girls (26 percent) more likely to do so than boys (16 percent); and fewer than 1 in 10 students (9 percent) achieved a minimum proficiency level in mathematics by the end of lower secondary level (with similar rates across sexes) (UNESCO-UIS, 2018). The Dominican Republic performs poorly on international and regional comparative exams (UNESCO, 2013; OECD, 2016, 2019). Further, low retention and completion rates for students point to significant inequalities within the education system. Although net enrolment rates at the primary level have increased from 84 percent in 1999 to 93 percent in 2018 (UNESCO-UIS, 2022), these figures drop dramatically at the secondary level. At the secondary level, 17% of youth ages 14–17 years old are out of school, and amongst the poorest quintile, 30% of school-age adolescents are not enrolled (FHI360, 2018). Boys are also more likely to be out of school or repeat grades (FHI360, 2018). Other students who are more at risk of dropping out or repeating grades include students from rural communities or households of lower socioeconomic levels, and children with disabilities (UNICEF, 2021; UNESCO-UIS, 2022).

This paper focuses on the experiences of students with disabilities and overage students who have repeated grades. It targets the fifth and sixth-grade levels, or last two years of primary school, which at the time of data collection formed a transition period in which Dominican students commonly dropped out of the school system (MINERD, 2016). In particular, this article aims to understand teachers' perceptions and practices in relation to these two groups of students who remain at the margins of the Dominican education system. We use the term "students with diverse learning needs" to refer to overaged students, students with disabilities, or students with special educational needs, in line with the terminology used in the official documents.

1.1 *Sobreedad* students and children with disabilities

In the Dominican Republic (DR), a student is considered overage (*sobreedad*) when they are at least two years older than the required age for their grade [National Education Council (NEC), 2001]. During the 2017-2018 school year, the rate of *sobreedad* in Dominican public schools was 7.5 percent at the primary level and 12 percent at the secondary level (MINERD, 2019). This means more than one in ten secondary-age students were not studying at a grade level appropriate for their age even before COVID-19. National statistics suggest that the *sobreedad* experience is shaped by socio-economic level, household location and gender. There are twice as many overage boys as there are girls at both the primary and secondary levels (MINERD, 2019). Further, students from poor or rural households are some of the most at risk of repeating grades. They more commonly perform poorly on national exams (MINERD, 2019), and students who fail their exams may be immediately held back, increasing their risk of being overage (World Bank, 2019). Overage students are also more likely to drop out of school, and this risk magnifies as their age difference with their peers increases (Fiszbein et al., 2015; World Bank, 2019).

Students with disabilities comprise another vulnerable group. A UNICEF (2017) report found that more than one in five children (21 percent) aged 6–11 years with disabilities do not attend school. Further, approximately 70 percent of those who drop out report doing so because of their disability (ONE, UNICEF, and O&MED, 2019). On average, just 68 percent of students with disabilities complete primary education, compared to 83 percent of their peers without disabilities (Disability Data Portal, 2022). Young people with disabilities are also less likely to develop critical skills needed for success in school and society. Nearly half of children (ages 6–11) with disabilities in the country do not know how to read or write; and 35 percent of adolescents (12-17-year-olds) with disabilities have not acquired basic literacy skills (UNICEF, 2017). The literacy rate for persons 15-years and older is 90 percent for those without disabilities and less than 78 percent for those with disabilities (UNESCO-UIS, 2018). Students with disabilities who do not develop basic skills necessary to succeed in school, are more likely to drop out of school prematurely (ONE, UNICEF, and O&MED, 2019). Additional challenges include inaccessible school infrastructure, or the lack of trained teachers, as well as negative attitudes, stigma and discrimination (ONE, UNICEF, and O&MED, 2019; Rouhani et al., 2023).

2 Inclusive educational policy in the DR

International mandates and policy proclamations have sparked changes at the national level in the Dominican Republic. Starting in the mid-1900s, educational policy was primarily grounded in the medical model of disability and students with disabilities were often segregated in special schools. Schools were built for students with visual impairments (1957), motor impairments (1963) and auditory impairments (1969) (DEE-MINERD, 2017). Other students with diverse learning needs were allowed to attend mainstream schools but were taught separately in "pedagogical recovery classrooms." Students were assigned these classrooms without carrying out psycho-pedagogical evaluations, without specialized trained personnel, and above all, in an approach that stigmatized them through a process of labelling (DEE-MINERD, 2017). In 1998, Departmental Order 07-98 eliminated the use of pedagogical recovery classrooms and mandated schools to evaluate all students so that they could later be reintegrated into their corresponding grades, based on their age level. The new legislation also established Special Education centres for students with

TABLE 1 Laws and policies addressing education of children with diverse learning needs.

Name of law or policy	Year	Description
General education act	1997	Regulates Dominican education system; promotes equal learning opportunities and equitable delivery of educational services
Departmental order 07	1998	Established accelerated learning for *sobreedad* students; eliminated pedagogical recovery classrooms to attend to learning diversity
Departmental order 18	2001	Authorized the reorganization of special education centres for learners with disabilities and diverse educational needs
Departmental order 05	2002	Changed the National School of the Blind to Resource Centres for children and adolescents with visual disabilities
Departmental order 24	2003	Established national guidelines for inclusive education
Code 136–03 protection of children and adolescents	2003	Guarantees the right to education for all learners, free of any type of discrimination
Ten-year education plan	2008–2018	Contains ten key policies to impulse transformation of the education system and to make it more "accessible, inclusive, democratic, and efficient" (MINERD, 2016: p.35).
Departmental order 03	2008	Replaced Departmental Order 24; supports mainstream schools in responding to learning diversity through inclusive education; mandates all learners with SEN to attend mainstream schools from early childhood, regardless of whether they have disability
General act on disability	2013	Mandates early and basic education as compulsory for learners with disabilities, in mainstream schools; decrees special education centres will receive students whose disabilities prevent them from attending mainstream schools
Competency-based curriculum	2016	Promotes skills-based approach to teaching-learning; emphasises inclusion and equity; presents Special Education as subsystem
Strategic plan 2017–2020	2017–2020	Guarantees "an inclusive, equitable, and quality education for all" (National Education Council and MINERD, 2018: p. 22), especially for vulnerable learners and through the National Plan for the Reduction of *Sobreedad*.
Department order No. 04	2018	Students in mainstream schools to receive psychoeducational support from staff in Special Education Centres or CADs

Sources: adapted from UNESCO (n.d.) and DEE-MINERD (2017).

multiple disabilities or developmental delays requiring accommodations across curricular subjects.

As part of its commitment to fulfil the right to inclusive education enshrined in the 1997 General Education Act, the Dominican government passed numerous laws and policies that directly impact the education of persons with diverse learning needs, including those with disabilities and overaged students (see Table 1). In 2003, the Dominican Republic Ministry of Education launched its first inclusive education policy, which built off the ratification of the 1994 World Conference on Special Needs Education in Salamanca, the 2000 World Education Forum's Dakar framework, *Education for All,* the Universal Declaration of Human Rights, and the Convention of the Rights of the Child. In 2001 the National Plan for the Reduction of *Sobreedad* (referring to "overage" students) was launched; and in 2004, the Programme for Strengthening Attention to Diversity and Expanding Special Education Services (PADEE for its name in Spanish) started with the support of the Spanish government. The programme employed three strategic lines of action: institutional strengthening, Special Education Centres, and Resource Centres for Attention to Diversity (CAD) (PADEE, OCI, and CAD, 2008, cited in DEE-MINERD, 2017). The establishment of CADs aimed to promote whole-school improvement processes and the development of inclusive education through teacher and administrator training, and guidance to families for those students with diverse learning needs in mainstream schools (Pérez Jiménez, 2008). This marked an important milestone in inclusive educational policy in the Dominican Republic, as it shifted the political agenda from supporting students with "special education needs" to supporting all students, in all their diversity (DEE-MINERD, 2017).

The 2008 Departmental Order No. 03 defines inclusive education as it is known in the country today, as "achieving full participation and learning for all children, whatever their social, cultural and individual status, through education that responds to all students' diverse educational needs" (Education Secretary of State, 2008: p.4). It also describes "special educational needs" (SEN) as "the support and resources to be provided to certain children and young people who, for various reasons – which may be personal, social, economic, cultural, academic, among others – face barriers to their learning process and participation in school" (*ibid*: p.5). This renewed inclusive education policy placed responsibility on the school, and school community – including teachers, school leaders, parents, and families – to support students with diverse learning needs. Article 2 indicated a shift from segregation in special schools, to the full inclusion of all students in mainstream schools, while Article 3 clarified that only students with "profound and multiple disabilities" were to attend Special Education Centres.

As indicated in Table 1, various other developments have taken place at the policy level. In recent past, Strategic Plan 2017–2020, known as the "Educational Revolution" (*Revolución Educativa*) was launched to "guarantee an inclusive, equitable, and quality education for all" (National Education Council and MINERD, 2018: p.22), especially for vulnerable students. Within this strategy, the government plans to improve primary school completion rates and reduce dropout, repetition, and *sobreedad* rates, including by expanding the National Plan for the Reduction of *Sobreedad.* Despite these policy efforts, data regarding school access, dropout rates, and the academic achievement of young people with disabilities and diverse learning needs in the Dominican Republic indicate few advancements towards inclusive

education over the years (Jovine, 2017; ONE, UNICEF, and O&MED, 2019). It is within this context that this research was conducted.

3 From policy to practice: research on implementing inclusive education

While there is limited research on the practice of inclusive education in the Dominican Republic, that which does exist points to several key challenges hindering policy implementation. Barriers to addressing equity and inclusion include the historically low investment in education (albeit an upward trend over the years) (Jovine, 2017), unequal distribution of resources across geographies, socio-economic levels, and ethno-racial divides (Hamm-Rodríguez and Veras Diaz, 2021), and limited teacher education and training that focuses on inclusion of the most marginalized (Jovine, 2017). To meet the SDGs in the Dominican Republic, Jovine (2017) highlights a particular need to strengthen institutional capacity, increase the hiring of qualified personnel, especially teachers, and increase budgetary resources targeted at initiatives for vulnerable students.

At the school and classroom levels, challenges are revealed in teaching and learning environments that are inconducive to teaching for diversity, as well as discriminatory attitudes of teachers and other education personnel. Velásquez (2020), for example, argues that the high pupil-to-teacher ratio is a particular barrier for supporting students from lower socio-economic levels, who are more likely to repeat grades, and who receive limited support from parents or caregivers at home, and thus require more tailored support and individualized attention from the teacher. Teachers also lack training on how to effectively detect the socio-economic factors shaping students' learning processes, and to develop more appropriate pedagogical strategies to address their needs, including through the provision of psychosocial support or didactic materials (*ibid*). In addition, school leaders must be supported, as they play an important role in providing pedagogical support to teachers, building connections between schools and families, managing resources and finances, and detecting students at risk of repeating grades or dropping out (*ibid*). Challenges for students with disabilities in particular include stigma and discrimination which lead to them being excluded from schools, inaccessible infrastructure of school buildings, and the limited number of trained teachers, including in sign language or the use of Braille (Noboa, 2015). Discriminatory attitudes of teachers and other education personnel also lead to the exclusion of students of Haitian descent (Bartlett et al., 2011; Bartlett, 2012; Jayaram, 2013; D'Angelo, 2021), and dark-skinned boys experience verbal or physical abuse (Bartlett, 2012), and at times are denied access to school altogether (Giliberti, 2013a,b,c,d). Indeed, recent media articles point to racist practices, whereby Afro-Dominican girls or boys have been denied access to school for wearing their hair naturally in an afro-style (Vargas, 2015; Hoy, 2019). Yet there is a laguna of recent evidence in relation to teachers' perceptions and classroom practices in relation to student diversity.

4 Research approach

This article draws on ethnographic research conducted in two public schools on the north coast of the Dominican Republic. It focuses specifically on fifth and sixth grade teachers' perceptions in relation to inclusion and student diversity, how these perceptions shape their classroom practices, and the factors in their surrounding environment which either enable or inhibit their ability to provide quality teaching for all students, with a particular focus on those children who are identified as having a disability or being overage (*sobreedad*).

4.1 School setting and participants

The two schools, which we refer to as Taino and Larimar Schools were selected through a purposive sampling strategy: both had been identified as "good" schools by community members including parents, families, teachers and other educational practitioners of local non-governmental organizations. Approximately 20 individuals from each of the surrounding communities were approached to understand their views on "good" schools in the vicinity. These people often described "good" schools in relation to student behavior or classroom environments. While many of these individuals also initially identified private schools or religiously backed institutes as "good," consensus was built to identify a public, government-funded school that would help provide insights for a larger sample of schools, and ultimately generate evidence to inform public policy. A decision to focus on "good schools" was important given that we wanted to select information-rich cases. Rather than reproducing a deficit-driven discourse in understanding teachers and teaching practices (Cooper and McIntyre, 1996) in the Dominican Republic, we also wanted to identify strengths in the system and build on these.

Both schools are located on the north coast in what is considered "urban tourist" zones with a two-hour drive separating them. The schools included students from preschool to eighth grade. According to data from the administration offices, Taíno School had 484 students and Larimar School had 755 students, both the largest in their districts.

The first author contacted the school leaders to discuss the focus of research and seek permission. Once this had been granted, the school leaders recommended two teachers, one from each of the fifth and sixth grade levels, who they believed modelled effective pedagogical practices. Grades 5 and 6 were chosen because they constitute the last two grades of primary school, with significant dropout rates during this transition to secondary school (MINERD, 2016). Permission was sought from each teacher to ensure that they were willing to participate. The four teacher participants who were selected varied significantly in age and teaching experience, as indicated in Table 2.

Given the focus of the research was on teaching and learning practices, all students in grades 5 and 6 of the participating teachers were also included in various activities. Consent from both students and their parents were obtained. A total of 170 students (87 girls, 83 boys) participated in the formal research. Students were between the ages of 9 and 15 years; the most common age and the average age were both approximately 11 years. The initial two weeks of fieldwork were purely devoted to "hanging around" in the school (Delamont, 2016), to develop rapport with the teacher and student participants.

4.2 Methods

As an ethnographic study, this research draws on diverse methods, including prolonged participant observation, formal classroom

TABLE 2 Description of four teacher participants.

School	Taíno School		Larimar School	
Teacher pseudonym	Samuel	Miguel	Gloria	Fernanda
Gender	M	M	F	F
Age	28	27	37	43
Teaching experience	4	6	12	21

Teachers' teaching experience is calculated based on when the research was conducted (2018–2019), i.e., Taíno School teachers in their fourth year of teaching experience had just begun their fourth year, as fieldwork occurred at the beginning of the academic school year (September–November). Fieldwork in Larimar School was conducted from January–April. All names are pseudonyms to protect the anonymity of participants.

observations, interviews and focus groups with teachers, students, and other education personnel, field notes, as well as visual data, including photographs of textbooks and the school and classroom environment (Delamont, 2016). Data collection took place over three months consecutively in each school, where the first author spent time actively participating in activities of the fifth and sixth grade classrooms. She also attended staff meetings, spent time with students during recess and lunch, and lived within walking distance from each of the schools. Observations and reflections were noted in a research journal, pictures of the school and other artefacts were also gathered for analysis.

More systematic data was gathered using weekly classroom observations and follow-up semi-structured interviews with teachers. Teacher interviews used "stimulated recall" to access teachers' sense-making processes (Calderhead, 1981). This implied the use of open-ended questions, such as "why" to probe teacher reflection and garner an understanding of how teachers made on-the-spot decisions during any given lesson. Ten formal interviews were conducted with each of the participating teachers, eight of which were stimulated recall interviews that followed classroom observations. An initial and final interview with teachers was also conducted to discuss more of teachers' general experiences and reflections based on their pre-service training, years of classroom experience, or to gather feedback on the research design. As data from these interviews reveal, the regular pattern of multiple classroom observations and post-observation interviews became important opportunities for teacher reflection, and in some cases catalysts for change. With student participants, semi-structured interviews, focus groups, and arts-based and participatory research methods were used to gather data on their experiences at school and at home or in the wider community. Ethics approval for all data collection was granted by the University of Cambridge's Faculty of Education, in alignment with the British Educational Research Association's (BERA) Revised Ethical Guidelines for Educational Research. Given the focus of this paper, we centre teachers' voices and practices in the findings, and indicate the chronological trajectory of teachers' perceptions by indicating the interview (#1–10) from which the data emerged.

4.3 Data analysis

Data was analysed in an ongoing, collaborative, and iterative process. All interviews were transcribed and analysed in Spanish. A constant comparative approach was used to ensure data saturation was achieved both across teacher participants within the same school and across the two schools (Glaser and Strauss, 1967; Corbin and Strauss, 2008, cited in Postholm, 2019). A final list of seven inductive and deductive codes were used (each with between three and four subcodes) to illustrate teachers' beliefs or perceptions of: (1) themself; (2) their students, (3) the curriculum and curricular subjects; (4) teaching and learning; (5) classroom management; (6) classroom-and school-level factors shaping teaching and learning; and (7) factors external to school shaping teaching and learning. The findings below emerge from the cross-cutting themes in the teacher data.

5 Findings

The first two subsections below explore teachers' perceptions of overaged (*sobreedad*) students, and their role in supporting these students. The next two subsections explore teachers' perceptions of students with disabilities and their roles in supporting these students. Differences and similarities between teacher participants and across schools are also highlighted throughout.

5.1 Teachers' perceptions of overaged students

Teachers commonly described *overaged* students in relation to their behavior in the classroom or their disposition towards learning. They often described *sobreedad* students' unwillingness to pay attention, their disinterest in class, or their lack of work ethic. As Samuel from Taíno School said:

> 'They [overage students] have repeated fourth grade and they are not at the same level [as their peers] because they already have other interests. Most students are younger, and [overage students] are older and a lot of the time they are not interested in the lesson because it's outside their normality.' (#1)

In seven of his ten interviews, Samuel mentioned how overage students did not have an "attitude" that was conducive of learning – or that they lacked "interest" in school.

Similarly, Fernanda, in Larimar School, noted the challenge of "working with a lot of kids with different ages," since "age differences make them have different interests, so they focus on different things" (#1). She described two of her overage students in relation to their lack of "responsibility" (#3), and later noted that "sometimes the oldest are the most problematic" (#8). These two teachers seem to associate *sobreedad* students with a behavior that disrupted learning, suggesting that their inability to learn or transition successfully throughout school is rooted in their disengagement or inadequate effort in the classroom.

In one interview, Fernanda elaborates upon this and makes specific connections to the overage student's homelife: "A student who is 17 years old and still in the sixth grade must have had a lot of setbacks, and sure something is going on at home as well" (#1). In this instance, Fernanda draws connections between the observed behavior of overaged students and the potential causes of those actions.

Gloria did this even more frequently. She described one of her overage students, Fredderick, a 13-year-old in her fifth-grade class, as "almost always distracted." But she also turned to his homelife and his

personal experiences to understand what could be causing his actions. With Fredderick, for example, she discerned that his father was abusing illegal substances and being physically abusive to Fredderick at home – and that this had contributed to Fredderick's disengagement or low learning levels.

Miguel in Taíno School spoke of several of his overage students in a similar way. In the context of Marcel, an overage student in the sixth grade, he stated: "Marcel is an overage student who comes from a home where he hears bad words all the time. He knows his dad only by video calls, he's never met him in person. So that hurts him inside" (#2). Miguel associated *sobreedad* with bad behavior, and in this instant – like Fernanda – perceived the bad behavior to be a product of adversity at the household or family level. In these moments, these teachers cultivated empathy towards their overage children and tried to look towards the root causes of their behavior.

Samuel, however, only came to this realization eight weeks into the study. When asked to comment on a student, he rarely referred to their home life, family, or experiences outside of the classroom. However, in his final interview, Samuel was asked to comment on the research process and the three months of reflective discussions. In response, he said, "I see myself as more tolerant" (#10). When probed to explain, he told the story of a 12-year-old overage student in the fifth grade, whose father had recently passed away, and who had been separated from his siblings. Upon learning this of his student, and the "certain difficulties" that the child had experienced, Samuel explained that he could now "cope" better with the behavioral challenges the student presented in the classroom. By learning about the lived experiences and realities that children endured at home, Samuel also became more compassionate about the indiscipline observed in the classroom, rather than blaming the students' learning difficulties on "disinterest." Importantly, in his final interview, Samuel also described the importance of the weekly conversations, the opportunities to discuss with someone who had observed his classroom, and the fact that he often continued reflecting on what we discussed beyond our time together.

5.2 Teachers' perceptions of their roles in relation to overaged students

Teachers had distinct perceptions of their roles in relation to overaged students. On the one hand, Samuel described his role in relation to Taíno School's "Support Spaces" (*Espacios de Apoyo*). In Taíno School, Support Spaces were provided for students in the first and second cycles of primary (Grades 1–3 and Grades 4–6, respectively). This meant that fifth and sixth graders who were identified as having diverse learning needs were pulled out of the mainstream classroom at least once a week to work with a support teacher either one-on-one or in small group settings. This allowed for more individualised attention tailored to the cognitive and behavioral needs of these students. Samuel often described his role in relation to the Support Spaces: "There's also a *sobreedad* program which works to level out a student to his age group. Here in school a woman works to help them acquire the competencies that should be developed at their grade level." (#7).

He described these support spaces as "fruitful." Despite the Support Spaces teacher not having qualifications in special education or remedial learning, this learning environment had many advantages. Students were provided individualised attention or small group instruction. They were also provided opportunities to use didactic materials that were not available in the mainstream classrooms. In these settings, students who were normally observed distracted or unengaged during a lesson in the mainstream classroom were seen working actively and collaboratively with their peers and support teacher. They had access to a variety of books, magnet letters, or recycled bottle caps with syllables written in permanent markers.

But the availability of these segregated support spaces seemed to absolve Samuel of responsibility for these students, shifting it to the support teacher. When asked how he could support overage students in the classroom, Samuel said it would be "impossible" to differentiate instruction and provide them an activity that was at the adequate learning level for them (#10). In three of the eight classroom interviews, he described his teaching style as "democratic" because he taught all his students equally – rarely making modifications or providing individual support. Instead, Samuel's role in the classroom was one of a disciplinary nature: "Being more careful with them in everything is the first thing [I do]. Being more attentive to make sure they work, to make sure they do not leave the classroom, and all that" (#1).

Fernanda from Larimar School spoke of her overage students similarly. When speaking of Kurry, a *sobreedad* student three years older than most of his peers in the sixth grade, she described him as "distracted" and referred to the need "to be on top of him, almost always controlling him" (#3). A similar situation occurred with Goku. Goku was a 15-year-old in the sixth grade who often had to skip school to sell street food to support his family. Fernanda spoke to his aunt and insisted she allow him to attend school and finish. However, in school, Goku was often found wandering the halls, or in the classroom disengaged or even sleeping at his desk.

Fernanda and Samuel explain their roles in supporting overage students in relation to classroom management. They describe the need to keep overage students inside the classroom or "control" their behavior, but rarely described how to adapt their teaching strategies to support their learning.

These perceptions contrast significantly with those of Miguel and Gloria, who both describe their roles as teachers, parents, and even psychologists. During a classroom observation, Gloria was seen visiting students at their desks during a writing assignment. When asked to explain this in the follow-up interview, she noted how it was important to scaffold student thinking so that they could "*arrancar*" (get started) on their assignment. Gloria also described how she used positive reinforcement with her overage students to motivate them and integrate them into the lesson: "A high five for them is motivating. "Oh, they praised me for something. I did something right." It makes them feel happy" (#3). Miguel spoke similarly of how he changed his ways with his *sobreedad* student, Marcel:

> 'In the lesson plans there is a part that says, "Attention to Diversity." That's where I include Marcel because Marcel is a *sobreedad* student… I [also] work as if I were a psychologist… what I do with Marcel is joke around with him and I treat him at the same time as if I were his dad. So, when I tell Marcel, "Hey friend, you are my brother, pound it, high five. Hey everyone, give Marcel a round of applause," he feels like he has all of the attention, and that generates happiness and that makes him want to participate.'

Both Miguel and Gloria looked for ways to motivate their *sobreedad* students – not just to control them and avoid negative behavior, but to integrate them into the classroom in a positive or constructive manner. Miguel and Gloria were also observed using various pedagogical strategies to scaffold student learning, such as repeating questions, using multimodal explanations (e.g., with images and drawings) or providing additional time to complete an exercise. Gloria also accessed books from the Larimar School library to provide struggling readers with texts appropriate for their skill level. She was observed providing one-on-one support to students during lunch or recess, and often paired overage students with their younger but more advanced peers who could support them without making fun of them. These teachers had a repertoire of strategies to adapt their teaching and integrate overage students into the learning process.

Samuel, on the other hand, described the concept of "Attention to Diversity" in relation to his different classrooms rather than individual students. He explained that he adapted his teaching in a "group way," so he altered how he taught his lesson in class 5A and class 5B, rather than for any individual student (#7). He also explained how he tailored plans for subsequent classes based on how the day's lesson went. For example, when he saw a "weakness" in the group's understanding of adverbs, he planned to create a conceptual map to guide them in the next lesson (#2). While important to inclusion, these actions portray a collective notion of inclusion rather than one that respects and upholds the diverse learning needs of all individual students. Importantly, Samuel also explicitly acknowledged that he had challenges with classroom management, and felt his pre-service training did not prepare him to effectively respond to student misbehavior (#1). However, these perceptions – in the initial stages of data collection – differ significantly from his perceptions in the final interview, in which he clearly articulated his more "tolerant" approach (#10).

5.3 Teachers' perceptions of students with disabilities

Both Taíno and Larimar School completed an administrative data form from the Ministry of Education, listing certain demographic statistics, including the number of classrooms, staff, students in general, foreigners, and students with disabilities. In both schools, each section of the form was complete except for the number of students with disabilities, which was left empty. This lack of recognition of disabilities was evident throughout the data collection process, from teachers not using the word *disability*, to their accepted inability to identify or engage with children with disabilities who might be attending their classes. Gloria touched on this in an interview, describing the absence of identification and referral processes at Larimar School:

> 'I have not been given any diagnosis. For me to say there are any [students with disabilities], I would have to have, in my hand, a diagnostic of some kind… But I have yet to receive anything about any of these children.' (#7)

She went on to explain that only one parent had informed her of her child, Amelia's needs, but even this had not been with the support of an expert or specialist.

Similarly, Samuel from Taíno School noted the absence of information on students with learning disabilities: "There are some [students] that do not develop the required skills or knowledge and sometimes many of us [teachers] do not understand why. But it's because we do not know if they have dyslexia, we do not know if they have dyscalculia" (#5). For students who potentially have significant behavioral challenges, Samuel later made a similar comment: "You cannot tell if a student really has a discipline issue or if they have special needs. It's important that you know how to identify them with the help of counsellors, psychologists, and all that" (#9). With a lack of information, teachers were left on their own to identify students with disabilities and try to discern their learning needs.

When teachers perceived their students to have disabilities, they tended to refer to them as "special" students. In Taíno School, Miguel described Cristal, a girl perceived to have intellectual disabilities as a "special girl" with a "special" case. In Larimar School, Gloria spoke similarly of Ángel and Jesús, two students she suspected to have psychosocial disabilities: "Ángel and Jesús are two very special cases, even though I do not have a document that tells me that they are seeing a psychologist, or some sort of help [or] therapy, so that they can learn better" (#2). In the case of Jesús, she suspected a prognosis: "I've also seen that psychologically he has some small developmental delays in terms of knowing what is write and what is wrong" (#2). In the case of Ángel, she described how he lived with his mother, who was suspected of participating in illicit activities, including drug consumption and sex tourism in the local community: "He sees that unbalanced life that his mom has, and these are all factors that make Ángel develop differently than other children. Since the life he is living is different" (#5). In the context of these two students with unknown developmental disabilities, Gloria associated potentially adverse childhood experiences that may have influenced their circumstances and ultimately their behavior.

Teachers associated students with disabilities with "special needs" and/or the need for "specialized" help or "special" services, including through psychologists, therapist, or trained "special education" teachers. For example, Miguel and Gloria mentioned CONANI, the Dominican Republic Children and Adolescence National Council, a decentralised organisation dedicated to protecting the rights of young people. One teacher participant, Samuel, described how students with disabilities have certain limitations compared to their peers. He noted that only special education teachers can support these students in overcoming those limitations: "it's about the student's ability level. A student [with dyslexia or dyscalculia] cannot give any more than that because their cognitive capacity does not allow it" (#5).

5.4 Teachers' perceptions of their roles in relation to students with disabilities

Teachers' perceptions of their roles in supporting their students with disabilities were shaped by the policy and school environment, and their limited training in disability inclusive pedagogies. On the one hand, all teachers described challenges in relation to the lack of data on children's learning needs, and pressures to teach the curriculum in a timely manner to perform for district level "*tecnicos*" or supervisors who would observe their lessons. They described how their heterogeneous classes made it difficult to ensure all students developed the skills and knowledge the CBC required. Students lacked

basic foundational skills in maths and literacy, thus making the "learning indicators" of the CBC unrealistic, "in the air," and not grounded in reality (Samuel). An interview with a government official also confirmed that the national curriculum and assessment system were not designed to accommodate students with disabilities or diverse learning needs.

At the school level, the availability of Support Spaces again played a role in shaping Taíno School teachers' perceptions. Miguel and Samuel both described how students with diverse learning needs were supposed to be pulled out of the classroom to receive support from the specialist teacher in a "special" environment. Samuel, for example, described how students with dyslexia and dyscalculia require trained specialists to support their learning needs.

> '[Dyslexia and dyscalculia] are learning difficulties that I as a teacher cannot help them with. Because these are disabilities that unfortunately there are few solutions for… because the people who tend to that part are specialists in that field of cognition.' (#5)

He went on to describe his role as a primary subject area teacher, without the "special education" qualifications or skills to support students with disabilities: "We are primary school teachers, or subject area teachers. That part [working with students with disabilities] is a different cognitive area; it's special education" (#5). Thus "special education" was regarded as something separate, and Samuel viewed himself as ill-equipped and/or unprepared to support students with disabilities. Instead, he absolved the responsibility to external "experts." Miguel similarly explained this in the case of Cristal, the same girl who was suspected to have a form of an intellectual disability:

> 'In Cristal's case, she's a special girl. Because her case is *special,* I do not often call attention to her. The only thing that I tell her is "sit up straight for me, pay attention to the class." But few times I do this, because well, they treat her. You have to treat her apart. That's why there is a teacher who sometimes takes her out of the class and treats her apart. Because she is a girl who, because she has special needs, one must treat her in a *special* way.' (#2)

In this interview, Miguel explicitly describes a disciplinary role – one strictly based on classroom management, to ensure Cristal is sitting up straight and paying attention, but with no reference to the types of pedagogical practices needed to support her learning. Rather, he explains that academic support should come from elsewhere, as Alicia must be treated "apart" from her peers.

Like Miguel, Fernanda in Larimar School, when asked to comment on a sixth-grade boy perceived as having intellectual disabilities, described her role as behavioral in nature. "Sometimes when I see he's a little quite or distracted, I ask him a question to see how he's doing" (#3). But Fernanda also went one step further. In a subsequent interview, she described how she tried to support this student's literacy skills by engaging other stakeholders, including his family and a classroom volunteer:

> 'There are letters that he does not know. And I've spoken to his father, he says that he's following up on this at home, but I do not feel it… I also told a woman to help me. She would come last year with me, and she would take three students out into the hall and help me in that way. But it seems that she has another job this year and cannot come help me.' (#5)

In the absence of formal Support Spaces in Larimar School, Fernanda describes how she made her own spaces to support students with diverse learning needs. In doing so, like Samuel, she shifts the responsibility of inclusive education from herself to external support structures, including other (volunteer) teachers or the student's parents.

The perceptions of these three teacher participants contrast significantly with those of the fourth teacher, Gloria. When Gloria spoke of Ángel and Jesús, two students believed to have psychosocial disabilities, she noted the need for trained specialists, but she also held herself accountable for the students while in her classroom:

> 'I try to speak to them the most peacefully that I can. It's the only way that I have as a teacher because that part has to do with a psychologist. They must be treated apart by a psychologist, but I apply what I can. I do not know about psychology, but I try and read every now and then how certain behaviours are treated, how to manage them. Because we are in this. And we must get through it. With those kids you must find a way of helping them. We know that we have little support. But with the support that we have, we must help these kids.' (#2)

Despite the lack of support in her work environment, Gloria assumes responsibility and seeks out information that will better prepare her to tend to the diverse learning needs of her students, including those suspected to have disabilities. She was observed providing positive reinforcement and individual support to these students in the classroom, speaking to them calmly, teaching them breathing exercises, cultivating empathy and patience amongst their peers, and playing meditation videos for the whole class to practice developing social–emotional skills together.

6 Discussion

This ethnographic study has provided important insights to further our understanding of inclusive education in the Dominican Republic. Though not comparative by design, this research points to how the unique material, social, institutional, and political contexts of each school shape teachers' perceptions and practices (Vavrus and Bartlett, 2012), particularly in relation to overage students and students with disabilities. Though some school-level factors (e.g., the availability of Support Spaces) also shaped teachers' perceptions, teacher participants within schools had unique and influential attitudes, skills, and knowledge.

First, the findings of this study resonate with international literature that points to how teachers' perceptions shape their practice (De and Malik, 2021), and how these perceptions are often framed within a deficit lens (Valencia, 1997). Valencia (2010) describes deficit thinking as when teachers blame students' failure to learn on their own "internal deficits or deficiencies" which may be cognitive, behavioral or motivational (p. 6–7). Indeed, some teachers in this study described overage students in relation to their indiscipline or lack of interest in their studies. Samuel, for example, used the word "attitude" several times, to explain how overage students did not have a scholarly disposition, and Fernanda described them as having other

"interests", which were not seen as conducive to school learning. Furthermore, research focusing on children with disabilities in other parts of the global South also highlights similar trends wherein teachers tend to frame children with disabilities in highly deficit terms, sometimes even questioning whether learning was the main purpose of their classroom participation (Singal, 2019; Taneja-Johansson et al., 2023). In our research, not only did teachers tend to describe students with disabilities in deficit terms, but they were also invisible in the classroom. Without any information on their functional or health needs, and how to best support them, teachers perceived these students as "special" requiring "specialist support." When teachers believed students were unable to learn in the mainstream classroom, they resorted to relying solely on classroom management strategies or turning to external support for help. The significant lack of support available to these mainstream teachers was clearly evident.

However, as this study has also shown, teachers' perceptions are not rigid. Rather, when provided with more information about their students and opportunities for reflection on their practices, these perceptions undergo change (Fullan, 2006). As teachers learned about individual students' home lives, families, or community contexts, during the course of ongoing reflective interactions, they began to develop a more holistic understanding of children. For example, instead of teachers describing overage students' individual behavior or personality, they expressed an understanding of how external factors, such as intrafamilial relationships, experiences with adverse childhood experiences, poverty, substance abuse, violence, and other related issues, influence the child's ability to engage in teaching and learning activities and/or develop important skills. What became evident during the research process was that as teachers became more sensitive to the personal biographies of the children, their perceptions and practices began to show a shift as they made more efforts to tend to individual needs. This is perhaps best evidenced by the story of Samuel, who described himself as more "tolerant" in the final (10th) week of classroom observations and interviews. Teachers who began to reflect on the important impact of a student's home life and family made intentional efforts to engage family members and strengthen home-school relationships to support student learning. For example, Gloria in particular took extra time to provide individualized support to students, differentiating instruction by using books or literacy materials that were more aligned with their reading level, pairing them with more advanced peers, or providing positive reinforcement in the classroom to encourage their learning.

Over two decades of research on culturally relevant teaching suggests effective teachers try to know students beyond the confines of classrooms (Gay, 2010). Whether a health assessment for students with disabilities or an understanding of the adverse childhood experiences faced by overage students, as teachers develop a deeper understanding of the root causes of student disengagement, they seem to become more willing or motivated to adapt their practice and tend to students' diverse learning needs. Inclusive teachers thus believe in the educability of their students and are motivated to learn more about their students' cultures, home and community environments, and how these factors shape the very nature of learning (Ladson-Billings, 1995). Inclusive schools encourage information sharing around children. They foster an understanding of the whole child, the myriad factors shaping learning, and the psychological, behavioral, and cognitive effects of poverty and adverse childhood experiences (Blodgett and Lanigan, 2018).

Thus, school and community partnerships are critical to inclusion. In the context of the DR this means meaningfully engaging parents and families, as well as other important actors within a child's support network, such as CONANI and the MINERD's Resource Centres for Attention to Diversity (CAD). Indeed, this study has shown that for inclusive education to become a reality, teachers need to be supported. Firstly, teachers need to understand and have support in assessing the individual needs of students in their classroom. This could range from a simple understanding and appreciation of differences in student learning styles, to a more rigorous approach to the identification of needs for students with more profound disabilities. This information needs to extend beyond simple diagnostic labels to an understanding on how to shape effective teaching and learning interactions in the classroom.

Teacher training that equips teachers with practical and a wide range of pedagogical strategies, the provision of accessible and adapted resources for students with different abilities, and a conducive school environment, are among the factors that shape effective student participation in the classroom (Noboa, 2015; Velásquez, 2020). At the school level, this study has shown that where Support Spaces do exist, where teachers have access to classroom assistants or remedial support teachers, there is a need to clearly identify each actor's roles and responsibilities and strengthen coordination and accountability mechanisms to ensure all students receive adequate support. At the policy level, this study also revealed several challenges, including the limited space or opportunity for teachers to adapt curriculum and assessment strategies for students with diverse learning needs.

7 Conclusion

This study has provided valuable insights into how teachers perceive and attend to students with diverse learning needs in the Dominican Republic, thus contributing to our understanding of inclusive education. Nevertheless, as an exploration of four Dominican teachers' perceptions and practices within the context of two primary schools, one limitation of this study is the small sample size. A larger sample could add breadth to the knowledge constructed surrounding Dominican teachers' perceptions of inclusion, and how they support students with disabilities, special education needs, or those who are overaged. As evident in the findings, differences exist across schools, so amplifying the sample could also strengthen the claims made herein.

Still, our findings echo prior research in the DR, which indicates a need for inclusive teacher education and training and more teacher research to better understand the country's progress toward SDG4 (Jovine, 2017). While the Dominican government has demonstrated a commitment to improving the quality of teaching and learning processes and fostering safe and inclusive schools, especially for the most vulnerable students, efforts have been highly centralized and resources have not been distributed equitably across socio-economic levels, geographies, or ethnic-racial divides (Hamm-Rodríguez and Veras Diaz, 2021). In our study, even the two participating schools – a two-hour car ride apart – had unequal access to resources, such as equipped libraries or Support Spaces to provide remedial support to primary-age students. More research is needed to understand how teachers in Dominican public schools can be equipped with the skills,

knowledge, and confidence to adequately address learning diversity in the classroom, and to support the particular cognitive and psychosocial needs of overage students and students with disabilities.

Further, this study demonstrates the importance of providing structured spaces for teacher reflection. As teachers analyze their practice, they learn how to construct new understandings and question entrenched beliefs or attitudes towards their pedagogy or student learning (Schön, 1983; Annig, 1988). This was especially evident through the experience of Samuel, whose perceptions of overaged students changed over the course of the three months that he participated in this study. Therefore, this study has shown that research on teachers' perceptions and practices can reveal important insights to inform future scholarship and policymaking, ultimately to ensure all young people in the Dominican Republic have access to an inclusive, equitable, and quality education.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation, until December 31, 2024. After this, in line with the ethics approval, all raw data will be destroyed.

Ethics statement

The studies involving humans were approved by Faculty of Education, University of Cambridge, Ethics Review Board. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

SD'A: Investigation, Methodology, Writing – original draft, Writing – review & editing, Data curation, Formal analysis. NS: Investigation, Methodology, Writing – original draft, Writing – review & editing, Conceptualization, Supervision.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Moving inclusion forward for students with special educational needs in the Asia-Pacific region

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This paper draws on a comparative study of seven jurisdictions in the Asia-Pacific region to examine current challenges to progressing inclusive education for students with special educational needs (SEN) in mainstream schools. The study used a qualitative approach to collect data from each jurisdiction through a purposive sampling of knowledgeable, university-associated informants. Content analysis was used to identify and quantify specific challenges reported in the data. Subsequently, these items were coded as themes to form a matrix of challenges within and across jurisdictions. Findings revealed that challenges were broadly consistent with recent global trends and shared many commonalities, despite occurring in diverse societal, political and education systems. These challenges are: lack of adequate initial teacher education and ongoing professional development for practicing teachers; lack of resources and support to meet the needs of students with SEN; inconsistent policy guidelines and implementation action plans; restricted stakeholder engagement and collaboration across all levels of education; and limited local inclusion research to inform practice in schools. The findings underscore the need for government and institutional commitment and oversight to bridge the policy-to-practice gap, and an urgent need for local research to identify and disseminate successful approaches for including students with SEN throughout the region.

KEYWORDS

Asia-Pacific, barriers, disability, inclusive education, special educational needs

Introduction

Over the past three decades, United Nations (UN) declarations and conventions have set the agenda for advancing policies and practices around the movement toward inclusion, with inclusive schooling now being regarded as a global norm throughout education systems (Powell et al., 2016). However, an agreed model for inclusion is still contested in educational discourse, and this is affecting the inclusion agenda. The discourse reflects different conceptualizations of inclusion and the driving force behind the ideal. For example, Opertti et al. (2014) adopted a socio-political perspective to document the genealogy of inclusion, highlighting influences that have provided conditions for inclusive education. They identified: (a) the significance that human rights discourses have played, commencing with the UN General Assembly (1948); (b) the emphasis on disability (United Nations Educational, Scientific and Cultural Organization, 1990) and special educational needs (United Nations Educational, Scientific and Cultural Organization, 1994); (c) the promotion of education for all via the targeting of marginalized groups and individuals (United Nations Educational, Scientific and Cultural Organization, 2000); and (d) the transformation of educational systems through policy guidelines (United Nations Educational, Scientific and Cultural Organization, 2005, 2009).

During the same period, Göransson and Nilholm (2014) reviewed the research literature to distill four contrasting definitions of inclusive education that appeared to impact the scope and implementation of reforms and accompanying practices. They proposed that the four definitions have a hierarchical relationship, with each level of definition building on the previous one. Definitions encompass: (a) inclusion defined as the placement of students with disabilities and SEN in mainstream classrooms; (b) inclusion defined as meeting the social and academic needs of students with disabilities and SEN; (c) inclusion defined as meeting the social and academic needs of all students; and (d) inclusion defined as the creation of communities within and across schools and classrooms.

These conceptual and analytical mappings suggest that the move toward inclusive education has been evolutionary rather than revolutionary, reflected by the iterative shifts in inclusion discourses, policies, and practices. Consequently, many education systems globally have found the translation of fundamental concepts and principles into national policy and enactment to be a convoluted and problematic process (Karim and Hue, 2022). This paper reports on the challenges faced across seven jurisdictions throughout the Asia-Pacific region in implementing inclusion in their national contexts and the subsequent recommendations made for improving the quality of education for students with SEN in mainstream schools. The data examined are derived from detailed information provided within case studies for seven jurisdictions in the Springer publication *Inclusion for Students with Special Educational Needs across the Asia Pacific* (Beamish and Yuen, 2022). These case studies relate to five Asian settings (Hong Kong SAR, Macao SAR, Japan, Singapore, and South Korea) and two Anglo-Pacific settings (British Columbia and Australia).

All jurisdictions studied have developed economies and social policies to support effective student access to compulsory education (early childhood through to tertiary level) and sufficient staffing and resourcing of learning environments (OECD., 2022). Except for British Columbia where all students are educated in mainstream schools, the six other jurisdictions still have dual education systems that cater for students with SEN in both mainstream and special schools. However, inclusive education reform described in all jurisdictions reflected the recent UN definition stating:

> Inclusion involves a process of systemic reform embodying changes and modifications in content, teaching methods, approaches, structures and strategies in education to overcome barriers with a vision serving to provide all students of the relevant age range with an equitable and participatory learning experience and environment that best corresponds to their requirements and preferences (UN Committee on the Rights of Persons with Disabilities, 2016).

At this point in time, these jurisdictions can be seen to represent various points on a continuum for advancing inclusive education as influenced by varying political priorities, cultural distinctiveness, historical and geographic circumstances, systemic configurations, and pedagogical traditions. This diversity across Asia-Pacific contexts therefore provides a useful sample for examining implementation barriers to, and recommendations for, progressing inclusive education. The selected jurisdictions were chosen due to their unique and contrasting approaches to inclusive education, which offer valuable insights into how different systems address common challenges.

Hong Kong SAR and Macao SAR, as Special Administrative Regions of China, provide perspectives on how inclusive education policies are implemented within unique administrative and cultural contexts influenced by both Western and Chinese educational philosophies. Japan and South Korea, with their highly developed educational systems, offer insights into how countries with rigorous academic standards are advancing inclusive education within their mainstream schools. Singapore represents a city-state with a strong emphasis on educational excellence and innovation, providing a model for rapid implementation of inclusive policies. British Columbia and Australia, as Anglo-Pacific settings, offer a comparative perspective from Western educational systems that have long histories of inclusive education reform.

The findings derived from these jurisdictions should have implications for improving inclusive practice for students with SEN in other Asia-Pacific contexts. Additionally, the findings derived from this region may have translatability to a wide range of contexts globally. Despite contextual differences, comparative research across countries has the potential to inform inclusive education reforms in countries beyond those in which the original research has been undertaken (Sahli Lozano et al., 2021).

Students with SEN are a diverse group of learners, with definitions of the term varying not only over time, but from country to country (Ainscow and Haile-Giorgis, 1998; Ruijs and Peetsma, 2009) and often within countries (Mitchell, 2015). Drawing on OECD reports, Brussino (2020) provided an operational definition of SEN encompassing three main categories: learning disabilities, physical impairments, and mental disorders. This definition does not include the categories of gifted or disadvantage (as related to socio-economic, cultural, and/or linguistic factors). Student groups covered by SEN provisions in all jurisdictions considered in this paper were identified according to Brussino's definition. For specific details of student groups identified as SEN within each jurisdiction, see Hay et al. (under review).[1]

Informing literature

The Salamanca Statement (United Nations Educational, Scientific and Cultural Organization, 1994) initiated the global movement toward inclusive education; and at the turn of the millennium, UNESCO's Principal Regional Office for Asia and the Pacific (PROAP) recognized the need to prioritize education of students with SEN throughout the region. To achieve this outcome, PROAP funded 3 week-long workshops at Bangkok (Thailand), Beijing (China), and Ahmedabad (India), in addition to providing USD $9,000 for participating countries to generate action plans (Mitchell, 2003). Following these workshops, Mitchell synthesized proceedings into reports and then into a chapter titled, *Challenges and Successes in Implementing Inclusive Education*. This publication documented major issues concerning inclusive schooling as "… the

1 Hay, S., Beamish, W., and Yuen, M. (under review). Policy perspectives from Asia-Pacific region on inclusion of students with special educational needs.

participants noted that barriers had to be identified and strategies developed to overcome them" (Mitchell, 2003, p. 243). The barriers put forward were identified as occurring at three levels: society, education system, and school.

At the societal level, participants acknowledged that the community, including parents, lacked an understanding of students with SEN and their potential for learning. The issue of parent advocacy was also raised, together with the need for media to play a more prominent role in influencing community attitudes toward this student group. At the system level, participants recognized that legislation was focused on general education and needed to be supplemented by clear policy guidelines on inclusive education. They also acknowledged that inclusive education implementation required targeted funding. Moreover, the pivotal roles played by non-government organizations, educational administrators, and researchers were emphasized. Furthermore, the need for appropriate pre-service and ongoing in-service teacher training was stressed. At school level, participants appreciated that teachers lacked the knowledge, skills, and confidence to educate and include students with SEN in their classrooms, thereby making school-based professional development in inclusive education essential. As principals and other senior teachers make critical decisions regarding school organization and distribution of resources, complementary training for leadership teams was recommended. Importantly, participants also noted that teachers needed to act as appropriate role models of acceptance of students with SEN, in order to shape peer group attitudes and acceptance.

The inventory of major barriers has been expanded, particularly over the past decade as inclusive schooling has progressed throughout the Asia-Pacific. For example, Dua and Dua (2017) listed challenges and barriers across seven categories that have continued to thwart inclusive education efforts in India. The categories and subcategories were: (a) retaining use of the label "special educational needs," (b) attitudinal constraints (social exclusion and discrimination, peer pressure, attitude of regular teachers), (c) school factors (admission criteria, communication problem, building and infrastructure, materials and technology, class size), (d) curriculum, (e) untrained teachers, (f) organization of education system, and (g) resource limitations. This listing, according to Mitchell's (2003) three-level classification system, identifies barriers predominately clustered around the school and classroom.

School-based barriers to inclusive education were also documented by Uttayotha and Scheef (2021). These barriers were: (a) lack of school staffing, (b) a dearth of qualified special educators, (c) the inability of general education teachers to modify curriculum content due to time or lack of knowledge, (d) large class sizes, (e) limited awareness of the effective use of assistive technologies, (f) low levels of government funding, (g) screening and assessment practices, (h) poorly developed individualized education plans, (i) lack of collaboration, both within the school and between the school and other entities, and (j) a general lack of training across all levels of school-based staff.

In contrast to the focus on the challenges identified in the studies noted above, Hosshan et al. (2020) conducted a scoping review of factors facilitating inclusive schooling within the Southeast Asian region. For the purpose of this paper and its focus, findings are only reported in relation to the inputs and processes categories. Critical inputs were identified as: (a) policy, (b) staff professional development and teacher education, (c) resources and finance, (d) leadership, and (e) curriculum. Except for the notable inclusion of policy, the remaining inputs had parallels with respect to the barriers identified above. Effective processes were identified to be: (a) school climate, (b) school practices, (c) classroom practices, (d) collaboration and shared responsibility, (e) support for individuals, and (f) roles of special schools. Taken together, these findings overlap and extend the school-based inventories above.

The informing literature presented above on challenges highlights the intricate interplay between factors at both school and system levels that hinder the effective implementation of inclusive education. While most challenges are pinpointed to occur at the school level, it's crucial not to disregard the systemic responsibilities associated with policy formulation, resource allocation, and teacher professional development. These systemic factors significantly influence the extent to which schools can successfully embrace and enact inclusion, particularly for students with SEN. Therefore, a comprehensive understanding of barriers to inclusion necessitates a holistic examination that encompasses both school-level challenges and systemic dynamics.

The current analysis

In this paper, the analysis of barriers (hereafter referred to as challenges) is drawn from case studies describing developments occurring in seven jurisdictions. Jurisdictions responded to a data-gathering brief that sought information on policies, practices, and challenges related to the inclusion of students with SEN in each context. The brief specifically requested information to address the following question: *What are the current challenges and concerns regarding the implementation of inclusion in schools within your local context?* This paper reports only on information provided by small groups of university-associated participants within each jurisdiction in relation to this question.

Method

Settings and participants

The data-collection brief was intentionally sent to high profile researchers who had networked previously with the first author of this paper. These researchers were based at universities in a mix of Eastern and Western jurisdictions which were characterized not only by substantial cultural and ethnic diversity but also strong economic, technological, and educational development. Consequently, these characteristics served as selection criteria: (a) cultural and ethnic diversity as an influence on inclusive policies and practices; (b) economic and technological development as an influence on resource availability for inclusive education; and (c) education system structure as an influence on the implementation of inclusive education in schools. As indicated previously, the jurisdictions represented in this study were Singapore, Hong Kong SAR, Macao SAR, South Korea, Japan, British Columbia, and Australia. Collectively, these seven jurisdictions exemplified a range of political, cultural, and educational environments, making the

research findings applicable and informative for the Asia-Pacific region and a global audience.

Participants in this study ($n = 26$) were informants who collaboratively co-authored the seven case studies considered in this paper. They were either based at or affiliated with a university located in each jurisdiction. Those based in universities held doctoral-level qualifications, while affiliated participants were at least masters-level qualified. The majority of university-based participants were actively engaged in both teaching and researching within the area of inclusive education policy and/or practice, with many demonstrating additional interests in special needs education. Notably, the vast majority of lead case-study authors had established national and international research profiles concerning inclusive education. As a collective, these participants formed an expert group, who were approached in recognition of their capacity to offer informed perspectives and commentary on the implementation of inclusive education within their specific jurisdictions. They were regarded, therefore, as knowledgeable, outside informants (Chen et al., 1993) who could provide meaningful insights enabling a macro-comparative overview and synthesis of the challenges related to implementing inclusive education across seven Asia-Pacific jurisdictions. These expert participants therefore comprised a purposive sample (Cohen et al., 2018).

Data gathering procedure and analysis

Data gathering involved collating responses to a brief covering seven key areas, one of which specifically focused on implementation challenges relating to including students with SEN. This brief drew on content from briefs previously used for other Springer books published within the Center for the Advancement of Inclusive and Special Education (CAISE) series. Additionally, the brief was informed by numerous overlapping literature reviews related to (a) inclusive education policy and practice, and (b) students with special educational needs (SEN). The brief from which this paper is drawn has been attached as an Appendix.

Textual data on challenges for each jurisdiction were analyzed using content analysis, a systematic qualitative method commonly adopted within the social sciences (Creswell and Poth, 2018). This method was considered appropriate because it takes into account context when sorting textual data according to relational categories to identify similarities, differences, and patterns within the text (Schreier, 2012). The first two authors of this paper followed a seven-step procedure adapted from Elo and Kyngäs (2008) and Schreier (2012) to identify and quantify specific challenges within and across jurisdictions. Reliability of the analysis was obtained through a structured process of double-coding and consensus (see Steps 4 and 5).

1. Data familiarization: all collected textual data were read multiple times by the authors to become thoroughly familiar with the content and context.
2. Initial coding: the authors independently coded the data, identifying initial themes and patterns related to the challenges in implementing inclusive education.
3. Development of a Coding Framework: Through discussion, a coding framework was developed based on the initial codes. This framework included major categories that emerged from the data.
4. Double-coding: both authors then applied the agreed-upon coding framework to the entire dataset, coding the text independently to ensure consistency and reliability.
5. Consensus meetings: two meetings were held to compare the coded data, discuss discrepancies, and reach a consensus on the coding categories. Any disagreements were resolved through discussion.
6. Interpretation and aggregation: coding was refined through interpretation and aggregation into challenge categories identified in the literature.
7. Cross-jurisdictional comparison: finally, the identified challenges were quantified and compared across the different jurisdictions to highlight similarities, differences, and unique occurrences.

Limitations of method

The reporting of challenges from the seven jurisdictions varied, with most presenting information in a discrete section, whereas others threaded similar information throughout their reports. In the latter case, the specific challenges had to be carefully separated from the surrounding text and interpreted by the first two authors. Given the potential impact of this reporting difference on the trustworthiness of the data, the authors discussed in detail the extracted challenges to arrive at a consensus on the meaning of each extract according to theme. Nevertheless, these circumstances may have inadvertently introduced some bias into the data analysis procedure. Moreover, variability occurred in the amount of detail relating to challenges in the reports. Furthermore, the reports were informed by what the small group of university-associated participants perceived as important challenges in their specific jurisdiction. As a consequence, reported perceptions may have been restricted by participants' beliefs, experiences, and commitment to inclusive education policy and practice for students with SEN. Taken together, these three aspects (trustworthiness of identification, amount of detail, and participant perceptions) may be viewed as limitations of method which potentially have influenced the subsequent findings discussed below.

Findings and discussion

Findings, together with discussion, are presented in relation to the research question, *What are the current challenges and concerns regarding the implementation of inclusion in schools within your local context?* Our analysis delineated five categories of challenges reported by university informants across multiple jurisdictions, with no unique challenges being identified outside these five categories. Table 1 shows challenges in each category across jurisdictions. In the ensuing synthesis, categories of challenges are introduced in descending frequency of occurrence, serving as a rough gauge of their relative prevalence across the

seven jurisdictions in our Asia-Pacific sample. Consequently, the reporting sequence is as follows: inadequate teacher education and training; limited local research to inform practice in schools; policy formulation and implementation issues; under-resourcing of mainstream schools; and restricted stakeholder engagement. For each category, reported manifestations of challenges within a jurisdiction are detailed, common trends across jurisdictions identified, and connections to relevant literature established. In addition, a summative commentary is provided.

Inadequate teacher education and training

The most pervasive obstacle to inclusive education cited by university informants across all jurisdictions was the lack of adequate initial teacher education (ITE) and ongoing professional training for practicing teachers. This finding is not surprising as only graduates from ITE programs in New Zealand are equipped with the values, knowledge, and competencies for implementing inclusive education in the classroom (Morton et al., 2021). ITE practice in New Zealand, therefore, are in accordance with recent policy advice from the UNESCO Office, Bangkok and Regional Bureau for Education in Asia and the Pacific to governments, which pointed to the need for inclusive education to be embedded in pre- and in-service teacher education and "tackle the sensitive issue of well-established teacher education institutions teaching out-of-date approaches and with little experience in inclusive education" (Kaplan and Lewis, 2019, p. 5).

In contrast, ITE in many other jurisdictions were reported to feature stand-alone units on inclusive practice and/or offer dedicated studies in special needs education. Moreover, informants from several jurisdictions stressed the need for deeper teacher training, particularly in the areas of curriculum differentiation and behavioral support. The 2021 OECD report not only underscored the need to strengthen teachers' ability to modify the curriculum for students with SEN but also acknowledged the negative impact on teacher wellbeing associated with the requirement to continually adjust the curriculum for this student group. Traditional teaching approaches in many jurisdictions have typically not demanded such adaptability in content and methods, with teachers primarily providing instruction to an entire class in a relatively formal manner (see for example, Kim, 2018).

Additionally, many jurisdictions were reported to offer postgraduate programs in special education rather than inclusive education. This approach continues in "exacerbating specialisms" (Hunt, 2020, p. 40) at the expense of promoting collaborative practice, problem-solving and knowledge sharing among teachers. Interestingly, the need for leadership training as recommended by Mitchell (2003) and Hunt (2020) was not mentioned in any reporting. These insights suggest that is time for governments, education systems, and tertiary institutions to take collective responsibility and work together to ensure that all teachers and school leaders are equipped to support all learners.

Limited local research to inform inclusive practice in schools

Overall, our analysis revealed limited local inclusion research in five of the seven jurisdictions, with British Columbia and Hong Kong being the exceptions. In the other jurisdictions, some potential areas of investigation were suggested to address the existing gap between research and practice. Case studies from Australia, Japan, Singapore, and South Korea emphasized the pressing requirement to pinpoint specific obstacles to the inclusion of students with SEN in their respective school contexts. In Singapore and South Korea, the need for local research to enhance the understanding of local conditions that best facilitate inclusion was proposed. Further, various strategies were suggested to advance the inclusion research agenda in several jurisdictions. Enhancing collaborations between schools and local universities were proposed for Australia and Macao, while the broader use of participatory action research involving stakeholders was advocated for Singapore. Additionally, school-based action research with the direct engagement of students was strongly advanced in the case of Japan.

The adoption of one or more of these strategies has the potential to narrow the local research-to-practice gap within jurisdictions. Although research into inclusive schooling includes case studies employing collaborative action research approaches to enhance inclusive practices in schools around the globe (e.g., Ainscow et al., 2004; Deppeler, 2013; Moliner et al., 2021), no mention of limited local research hindering inclusive practice can be located in the literature. Rather, emphasis has been placed on conducting local collaborative research to establish practices for inclusion that have contextual relevance (see Forlin, 2013; Messiou, 2017). Importantly, Hummel (2018) has highlighted how inclusive practices should be constructed through research being undertaken at local sites with local stakeholders. She contends that such an approach allows for the incorporation of socio-cultural, political, and institutional dimensions crucial for the effective implementation of inclusive education within specific contexts. Consequently, the adoption of locally derived research by schools should lead to the enactment of sustainable, contextually sensitive practices compared to drawing upon more generalized recommendations from other regional or national contexts.

Policy formulation and implementation issues

Challenges relating to policy formulation and implementation were reported with respect to four jurisdictions and concerned (a) system-level policies, (b) a school-level policy; and (c) an existing policy discrepancy. In relation to system-level policy formulation, inconsistent government policies were identified as a significant obstacle to inclusive education reforms in Australia, due to each state and territory (rather than the federal government) being responsible for educational administration and service delivery. Based on these circumstances, Anderson and Boyle (2019) have pressed for "a nationally accepted understanding of inclusive education, and the development of an Australian Framework

TABLE 1 Overview of challenges by categories across jurisdictions.

Jurisdictions	Inadequate teacher education & training	Limited local research to inform practice	Policy formulation and implementation issues	Under-resourcing of mainstream schools	Restricted stakeholder engagement
Australia	✓	✓	✓	✓	
British Columbia	✓			✓	
Hong Kong SAR China	✓				
Japan	✓	✓			✓
Macao SAR China	✓	✓	✓	✓	✓
Singapore	✓	✓	✓		
South Korea	✓	✓	✓		✓

Data are based on information provided in case-study chapters.

for Action" (p. 806). In contrast, concern about national-level policies being formulated for implementation without sufficient attention to practical action plans for infrastructure reform were expressed in regard to South Korea. Moreover, in this country, the ongoing national 5-year plan to enhance segregated education in special schools and classes was recognized as being at odds with the philosophy of inclusive education. In terms of school-level policy, the need for a whole-school approach to be officially endorsed by the Macao government was called for. Internationally, this comprehensive approach is increasingly acknowledged as a way to build inclusive schools and classrooms through systematically changing school culture, programs, and pedagogy (see Chan and Yuen, 2015; Kenny et al., 2023). Lastly, an existing policy discrepancy was highlighted between the UN's rights-based approach to inclusive education and the advancement of inclusive schooling in Singapore. The discrepancy is associated with incorporation of the inclusive schooling agenda within the government's broader socio-cultural aspiration to foster an inclusive society. These insights remind us that the interpretation of policies is not an easy matter as it requires an understanding of historical, cultural, and contextual influences as well as national priorities (Lim et al., 2019).

Under-resourcing of mainstream schools

The challenge of adequately resourcing schools was highlighted in the case of three jurisdictions. This issue seems to have reached a critical point in British Columbia where diminishing government funding has led to a reduction in classroom teachers and specialist teachers, increased numbers of students with SEN, and rising student waiting lists at schools. By comparison, concerns were raised about the inequitable distribution of resources among schools in Macao, whereas lack of systemic support for teachers was seen as a resourcing issue in Australia. The lack of funding and personnel issues aligns with findings from the 2021 OECD report, suggesting that teachers worldwide are urging their governments to acknowledge the importance of prioritizing expenditure for students with SEN. As highlighted in the literature for almost a decade (e.g., Ebersold and Meijer, 2016; Dua and Dua, 2017; Hosshan et al., 2020; Uttayotha and Scheef, 2021), school resourcing is a fundamental issue for the successful implementation of inclusive education.

Restricted stakeholder engagement

In three jurisdictions, the current level of engagement from stakeholders at the systemic, community, and school levels was reported as posing primary barriers to implementing inclusive education practices. For instance, the need for policymakers and school administrators to share both vision and responsibility for inclusion was urged in South Korea whereas cooperation and collaboration between teaching professionals and associated organizations were encouraged for Japan. On the other hand, the need for all parties involved in the educational process to be accountable for the execution of inclusion was called for in Macao as was a stronger parental say in how inclusion is enacted at the school level. Viewpoints about shared visions, responsibilities, accountability, and cooperation among stakeholders continue to be strongly recommended in the literature (for example, see Johnstone, 2011; Hosshan et al., 2020; Uttayotha and Scheef, 2021; Subban et al., 2023). Yet, Karim and Hue (2022) contend that this expectation is unrealistic considering the differences in socio-economic, cultural, and political factors in action within and across countries.

Summary

The inclusion of students with SEN has remained challenging for many education systems and schools globally (Forlin and Lian, 2008; OECD., 2021; Karim and Hue, 2022). Our analysis of reported data across seven jurisdictions distilled five challenges as having significant implications for effectively including students with SEN in mainstream schools: (1) inadequate teacher education and training; (2) limited local research to inform practice in schools; (3) policy formulation and implementation issues; (4) under-resourcing of mainstream schools; and (5) restricted stakeholder engagement. Overall, these findings provide valuable insight into how barriers to inclusive education are interconnected within different jurisdictions. Moreover, despite the presence of diverse

historical, political, systemic, and socio-cultural factors at play, a similar pattern of challenges was evident across jurisdictions.

Except for the challenge related to limited local research, the four remaining challenges are well-documented, with an abundance of previous studies emphasizing their significance within and across countries. Challenges identified across our seven jurisdictions, therefore, appear to be broadly consistent with global trends. Undoubtedly, inadequate teacher education and training is the most prominent challenge emphasized in the international literature. Moreover, this challenge has long been recognized as fundamental to thwarting inclusive education efforts in the Asia-Pacific region (Mitchell, 2003; Forlin and Lian, 2008; Dua and Dua, 2017; Hosshan et al., 2020; Uttayotha and Scheef, 2021). Yet, inadequate teacher education and training emerged as a universal obstacle to achieving inclusive education for students with SEN in each of our jurisdictions. As such, this finding confirms that the current strong press by UNESCO to improve inclusive teacher education, internationally (Hunt, 2020) and regionally (Kaplan and Lewis, 2019), is both needed and necessary.

Recommendations

Table 2 presents five recommendations aimed at addressing the identified challenges and reducing their impact on inclusive education reform initiatives for students with SEN. These recommendations also offer a strategic guide for developing a viable approach to advancing inclusive education within Asian-Pacific contexts. The aspiration signaled here is that countries might integrate these recommendations into their national policy frameworks and action plans to improve inclusive schooling for this specific group of students.

The five recommendations collectively form a comprehensive strategy for improving inclusive education that is characterized by reform efforts that are vertically and horizontally integrated. Vertically, the strategy calls for action at multiple levels of governance and administration. At the government level, targeted funding for schools supporting students with SEN and the development of robust rights-based policies and action plans to bridge the policy-to-practice gap are essential. The strategy also calls for governments to ensure that initial teacher education programs at universities equip classroom teachers with a broad foundation of evidence-based inclusive practices and approaches. It is equally important that governments establish an independent authority to monitor university programs together with related professional development in-service activities provided by relevant organizations.

Horizontally, the strategy emphasizes the need for broad stakeholder engagement and a greater sharing of responsibility for the enactment of inclusive education at the school level. Local initiatives should involve not only school staff and parents, but also where possible, students with SEN, their peers, and external support service personnel. This collaborative approach extends to the research agenda, where partnerships between researchers and local education staff is recommended to establish a needs-based research agenda. Further, successful approaches for including and educating students with SEN should be widely disseminated across schools, locally and regionally.

TABLE 2 Recommendations to address identified challenges.

Recommendations
Improving teacher preparation and training
(a) That initial teacher education programs commit to producing "work-ready" graduates with the essential attitude, knowledge and competencies for including and teaching students with special needs. This requires training institutions to have teachers and tutors who are themselves suitably experienced in inclusive pedagogy to deliver these courses. The relevant authority in each country should monitor initial teacher education programs for effective inclusive education content (b) That education systems afford a minimum specified amount of ongoing professional development for classroom teachers and specialist teachers to promote their understanding, efficacy, and practice in including and teaching students with SEN. Additionally, teacher registration bodies (or equivalent) in each country should monitor this ongoing professional development for their teaching workforce
Extending the inclusion research agenda
That a partnership be established between researchers and staff in local education systems and schools to establish a needs-based research agenda and enlist broad stakeholder input when undertaking agreed-upon studies. It is also essential that a mechanism be put in place that will enable details of positive approaches found to work well in some schools are disseminated to all other local schools
Redressing the policy gap
That governments develop robust rights-based policies and action plans focused on equity principles that enable students with SEN to achieve their potential in the mainstream. Additionally, governments should then authorize an independent body to monitor the implementation of these policies at the school level, to prevent policy slippage over time
Increasing targeted funding
That governments and education systems prioritize funding to mainstream schools that are supporting students with SEN and monitor the impact on student outcomes and teaching quality
Expanding stakeholder engagement
That education systems support schools in implementing effective processes for enlisting and maintaining the engagement of all stakeholders (teachers, parents, students, peers, and external support service personnel) and encouraging their input into the inclusive education model for students with SEN

In essence, this strategy recognizes the importance of both top-down and bottom-up approaches in promoting inclusive education for this specific group of students. It underscores the need for government and institutional commitment and oversight, while also acknowledging the pivotal role that teacher educators, researchers, and school-level stakeholders play in implementing and refining inclusive practice. This dual and integrated focus ensures that the strategy is both comprehensive and responsive to the specific needs of students with SEN and their situated contexts.

Conclusion

The analysis of challenges and concerns presented in this paper outlines issues that warrant immediate consideration to enact effective inclusive education for students with SEN across the Asia-Pacific region. The most pervasive and universal obstacle identified across all jurisdictions was the deficiency in both initial and continuing teacher education and professional growth. Further substantial roadblocks include policy complexities, a scarcity of

localized research to guide school practices, insufficient funding, and restricted stakeholder participation, in response to these challenges, we have proposed five recommendations which have been organized into an all-encompassing strategy that integrates reforms at diverse levels of governance and administration and promotes collaboration amongst various stakeholders. This strategy calls for greater government commitment and oversight, an explicit focus on enhancing teacher knowledge and practice, the need for broad stakeholder engagement and shared responsibility for inclusive schooling, and productive research partnerships at the local level. We are confident that through the implementation of these initiatives, countries in the Asia-Pacific region can make effective strides toward the realization of sustainable inclusive schooling for this group of students.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Author contributions

WB: Conceptualization, Formal analysis, Methodology, Writing – original draft, Writing – review & editing. SH: Conceptualization, Formal analysis, Methodology, Writing – original draft, Writing – review & editing. MY: Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

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Appendix

Guide for case studies.

Case studies should be written to cover the following seven key areas.

1. Context: Begin by providing basic information about your jurisdiction: population and demographics; mainstream education systems (government and non-government schools); where students with special needs or disabilities traditionally received their education are where they are placed now; any relevant cultural influences that affect education and inclusion.
2. Legislation, policies, and guiding documents related to inclusion.
3. Brief review of any inclusion research undertaken in your country/state.
4. Teacher preparation and ongoing professional development (initial teacher education programs; in-service and further development opportunities).
5. How inclusion is implemented in schools. Mention any relevant structures and arrangements together with the working relationship between regular and special education teachers. Describe any valued practices (whole school and classroom) that have evolved; if possible, provide a case study illustrating good inclusive practice in action.
6. Remaining challenges and concerns regarding inclusion.
7. Conclusion: This final section could provide key recommendations for advancing inclusion in your country/state, and indicate issues still needing research.

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Enhancing public dialogue about inclusion in school education: a citizens' panel pilot

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Introduction: This paper reports on a small-scale Citizens' Panel pilot project using deliberative democratic methods to produce policy ideas about inclusion in school education of young people with special educational needs and disabilities (SEN/D) in England. The project had two aims: (i) to obtain information about modifying a Citizens' Panel process to enhance the effective participation of young people with SEN/D; and (ii) to generate more nuanced, grounded and integrated policy ideas about inclusion than can be found in recent English school education policy.

Methods: The Citizens' Panel was a two phase deliberative process. Phase 1 involved working with six young people with SEN/D and their parents/carers to shape the Citizens' Panel agenda, and to obtain information about how they could participate and communicate their perspectives during the events. Phase 2 involved the delivery of the Citizens' Panel itself, which comprised 28 people: the six young people from phase 1, plus four young people without SEN/D, 13 parents/carers, and five education professionals.

Results: The process evaluation revealed the need for and impact of meticulous planning using a differentiated and strengths-based approach to design. While participants reported that taking part in the Citizens' Panel was overall, a positive and worthwhile experience, the differentiated approach involved trade-offs that affected the experiences of some participants without SEN/D, though not detrimentally. The panel produced distinctive ideas about more inclusive schools, where almost all of the themes were about general school changes for everyone. Most general themes involved some specific SEN/D aspects, with only one theme being SEN/D specific. This paper illustrates how these ideas are more *nuanced*, grounded and integrated than those in current national policy.

Discussion: This paper provides evidence of how deliberative approaches can be used within and between schools, groups of schools (e.g., multi academy trusts), local networks (including local authorities), as well as at the national level. Lessons drawn show how deliberative methods used by advocacy groups, protest movements and non-governmental organisations in support of more transformational change can be developed in ways that enable young people with SEN/D to participate and have their voices heard.

KEYWORDS

inclusive schools, special educational needs, disability, deliberative democracy, public dialogue

Introduction

This paper reports on a deliberative public dialogue project undertaken in England, over 2022/23, concerning the inclusion of children and young people with special educational needs (SEN) and disabilities in schools. The project was one of nine pilots, funded by the UK Research and Innovation[1] and managed by the Royal Society of Arts, Manufactures and Commerce[2], as part of the 'Rethinking Public Dialogue' programme[3]. The programme involved developing and testing novel approaches and innovations for public dialogue.

The project reported here is believed to be the first to use a deliberative democratic approach, that involves public dialogue, on improving the English school education system. The project not only addressed valuable policy questions about how the English school education system could be designed to be more inclusive for pupils with special educational needs (SEN) and disabilities (SEN/D). Consistent with the aims of the 'Rethinking Public Dialogue' programme, it also piloted approaches to including young people with SEN/D in the policymaking/decision-influencing process, in the format of a Citizens' Panel.

The project was timely, as it took place during the period when the government had published a new improvement plan for SEN/D policy and practice in England (DfE, 2023), which was itself a response to its own 2022 SEN/D Green Paper (DfE, 2022a; DfE, 2022b). Findings from the project could therefore be compared with contemporary national policies. In addition, the project intended to add value to the planning and delivery of Citizens' Panels and other deliberative public dialogue approaches, by providing fresh insight into the effective and efficient ways that young people with SEN/D can fully participate in them.

The project, therefore, had two main aims: (i) to obtain information about modifying a Citizens' Panel process to enhance the effective participation of young people with SEN/D; and (ii) to generate, via the modified Citizens' Panel process, more nuanced, grounded and integrated policy ideas about inclusion than can be found in recent English school education policy.

The idea for the project emerged from the work of the SEN Policy Research Forum (SENPRF)[4], an influential multi-disciplinary and stakeholder national network, which has run public policy dialogue in the form of participative policy seminars in the SEN/D and inclusive education field for 30 years. The authors and project leads are members of the SENPRF's strategic lead group, and one has written previously about the potential of deliberative democratic approaches for policymaking, as a way of addressing democratic deficits in education policymaking, especially in relation to pupils with SEN/D (Norwich, 2019).

This paper continues by outlining three concepts and principles central to the project, before provides the rationale and context to the Citizens' Panel pilot. Next, we detail the methods, sample and procedures relating to the two strands of the project, which address the two aims stated above. We then move to the project findings, which are again presented in two parts: first, the outcomes from the Citizens' Panel; and second, the findings from the parallel process evaluation. Finally, we discuss the strengths, limitation and implications of the findings in terms of school SEN/D policy and how future public dialogue processes involving young people with additional needs might be enhanced and advanced.

Key concepts

Central to this project are three concepts and principles, each of which have a background of thinking and practice. These are: inclusion and inclusive education; deliberative democracy; and learners' voice.

Inclusive education

Despite being contested and difficult to define (UNESCO, 2020), inclusion in education, or Inclusive education, is widely recognised as a cherished value. It has been argued that inclusion is both a process and a state of affairs. As a process, it embraces and forms a sense of belonging based on beliefs that each individual has value and is to be respected. As a state of affairs, it involves several dimensions, such as physical placement, academic and social participation, and achievement in a common curriculum. Its complexity derives from this multi-dimensionality (Qvortrup and Qvortrup, 2018). Furthermore, inclusion in education goes beyond disability to encompass other vulnerable or marginalised pupils, and indeed, applies to all pupils (Ainscow, 2020).

One way of examining this complexity is to consider two influential and divergent perspectives on inclusive education. The first, associated with Warnock (2005), positions inclusive education as being about everyone learning what is personally relevant, wherever this takes place. This perspective focusses on the learner engagement aspect of inclusion (Cooper and Jacobs, 2011), and has two implications: (i) it can be used to justify some separate provision settings; and (ii) it overlooks the social significance of any separation. It is a perspective, especially as advocated by Warnock (2005), associated with a strong focus on an academic cognitive curriculum.

The second perspective is associated with the Inclusion Index (Booth and Ainscow, 2011). It assumes that the onus is on mainstream or general schools to accommodate the diversity of pupils to participate academically and socially 'under the same roof'. This perspective focusses on learning together, and raises questions about: (i) how much diversity can be accommodated at general school and classroom levels; (ii) the extent to which some internal school separation for those with SEN/D is justifiable.

The difference between these two perspectives is captured by the difference between a focus on learning what is personally relevant (Warnock, 2005), and a focus on increased participation in the culture, community and curricula of the one's local school (Inclusion Index; Booth and Ainscow, 2011). The latter does not connect to a personal curriculum relevance, while the former does not address questions about shared and common curricula. A coherent perspective on

1 UKRI: UK public body that provides investment and support for researchers and businesses. https://www.ukri.org/who-we-are/about-uk-research-and-innovation/https://www.ukri.org/who-we-are/about-uk-research-and-innovation/

2 RSA: Charity with Royal Charter to encourage the arts, manufactures and commerce; where world-leading ideas are turned into world-changing actions. https://www.thersa.org

3 UKRI-RSA Rethinking public dialogue programme: https://www.thersa.org/rethinking-public-dialogue

4 SEN Policy Research Forum: https://senpolicyresearchforum.co.uk

inclusion has to address deep questions about what to learn, with whom and where.

Norwich (2024) suggests that there is tendency to prevarication (avoiding saying what you really mean) about full inclusion, which is also found in Article 24 of the UN Convention of the Rights of People with Disabilities (UNCRPD: UN, 2006; UNCRPD, 2016; UNESCO, 2020) and the Salamanca Statement (UNESCO, 1994). For example, the Salamanca Statement refers to 'all children learning together, *wherever possible*, regardless of any difficulties or difference they have', which implies a potential limitation to togetherness.

Inclusion has often been defined as the opposite of exclusion and segregation, with separate settings, such as special classes and special schools, and the language of SEN, deficits and difficulties seen as excluding or stigmatising. So, inclusion as a cherished value, can come to be treated as the opposed to, and so split off from, anything that can be distinguished from it, such as special educational needs. Cigman (2007) has called this style of thinking, *universal inclusion*, in which the purity of inclusion is protected from anything 'special' or 'separate'. She proposes a *moderate inclusion*, open to the potential benefits of practices labelled 'special' and 'separate'. In a similar way, Norwich (2024) recognises that inclusive education calls for some ideological impurity, where the purposes of education involve settling for a balance between different values, of which inclusion is one. This calls for a more nuanced perspective, where inclusive education can involve some specialised adaptations.

It is notable that in his recognition of the importance and challenges associated with inclusion in education, Ainscow (2020) claims that moving in a more inclusive direction requires seeking to involve all stakeholders at every level in the policy process. Everybody's experience and expertise needs to be involved, he argues, to build a consensus about inclusive values in school communities. This can be seen as an implicit call for a more democratic approach to policymaking, an approach which Norwich (2019) has advocated in arguing for a more deliberative approach to making policies that drive schools to be more inclusive for children and young people with SEN/D.

Deliberative democracy

The growing dissatisfaction with democracy in the UK and elsewhere has led to increased interest in more deliberative approaches to policymaking and politics (Taylor, 2019). Liberal democracies involve the election of representatives, with citizens having a limited involvement in discussion, debate and decision-making, sometimes called a 'democratic deficit' (Marquand, 1979). Deliberation is the careful thought and discussion of various aspects of a topic or issue. When linked to democracy, it brings together three criteria: inclusivity, deliberation and citizenship.

Deliberative democracy covers a range of approaches that bring together a representative group of citizens and experts from diverse backgrounds in order to exchange perspectives on a complex issue. Opportunity for inclusive democratic deliberation, it is claimed, can educate citizens, stimulate awareness of complex issues, and produce enlightened bottom-up and legitimate policy ideas (Bächtiger et al., 2018). Deliberative democracy is an umbrella term covering different models of public deliberations, often called 'mini-publics'; for example, Citizens' Assemblies and Citizens' Panels.

Research shows that these approaches can enhance empathy and solidarity between generations and different social groups, and decrease the risk of polarisation (Bulling et al., 2013). However, these approaches have also been criticised for reproducing prevailing imbalances of power and wealth (Azmanova, 2010), which threaten the inclusion of those at risk of being marginalised in these mini-publics. These groups include young people, disabled people, and ethnic minorities. In addition to ensuring the proportional representation of minorities in public deliberations, organisers can use *enclave deliberation* in order to prepare these groups before they enter the wider process (Karpowitz et al., 2009). Enclave deliberation has been advocated for young people in various forms (Bulling et al., 2013), and is relevant to the pilot Citizens' Panel reported in this paper.

There are criticisms of deliberative democratic approaches that are important to consider. One criticism concerns whether mini-publics can achieve consensus through deliberation. This is partly about power imbalances between participants, but also linked to the participants' emotions and how the mini-publics connect to existing institutions. The agonistic view of democracy (Machin, 2023) raises questions about whether deliberation can represent the 'public voice', suggesting that it is instead a setting where social conflict can be enacted (Azmanova, 2010). However, as Taylor (2019) claims, even if consensus is not achieved, deliberative democracy can help people develop a respectful understanding of their differences in an agreeable way.

Another critique from Hammond (2020) sees deliberation as having links to the policy process in an advisory role, on one hand, and to protest movements through critical disruptive deliberation, on the other. Though her analysis relates to climate change and radical environmental movements, it has relevance to deliberative approaches in other policy areas. Viewed as a system-supporting role, deliberation is framed as supplementary, decision-oriented, and top-down, influenced, perhaps owned, by authorities. As a system-disruptor, deliberation is seen as being open-ended, discussion-oriented, and bottom-up, initiated and owned by movements.

An alternative criticism is that deliberative democracy is unrealistic, as government is complex and people lack the interest to participate and the abilities to contribute (Posner, 2003). Posner argues for a kind of marketplace democracy, where voters, as consumers, have sovereignty and express their political preferences for different parties and their policies. Talisse (2005) has questioned this 'realist' model, drawing on Dewey's ideas of democracy as collective problem-solving, at both the state and other levels of society, being experimental and on-going. Deliberative democracy can in this model co-exist with representative democracy (Fishkin, 2018). Talisse (2005) contended that research shows citizens are capable of reasoned discussion of important issues, and that opinions and voting match their level of being informed (Bächtiger et al., 2018).

Learner voice in school education

Though we have found no literature on the inclusion of school-aged children and young people in democratic deliberation activities, there is much international research and development work on learner voice. Much of this is influenced by the UN Convention on the Rights of the Child (CRC; UN, 1989), with Article 12 declaring a child's right to express their views on matters that affect them (when 'capable of forming' their own views) and that 'due weight' be given to these views according to the age and maturity of the child.

There is a tradition of individual and group interviews of children and young people about their lives, including their school

experiences (e.g., Lewis et al., 2006; Messiou and Hope, 2015) consistent with the UNCRC. There is also participative action research, such as Byers et al.'s (2008) project to promote the emotional well-being of young people with learning difficulties in inclusive English secondary schools and colleges. Learners and staff in nine varied mainstream secondary settings worked together to develop improved policies, practices and responses initiated by the young people themselves. Several of this project's main conclusions and their implications are relevant to this paper. First, young people with learning difficulties have new, different and important ideas that can contribute to school/college improvement. Secondly, school/college leaders could do more to enable young people, including those with learning difficulties, to communicate their ideas and have an active role in the democratic processes in school/college. Thirdly, leaders could also ensure that young people enjoy a sense of safety and security throughout the school/college day, including during non-teaching times. This means creating, maintaining and staffing safe places, support or activities for young people to use when needed.

The European Agency for Special Needs and Inclusive Education (EASNIE) has organised four hearings to listen to the voices of young people, and to empower them by promoting their involvement in inclusive education policy debates. The hearings took place across Europe between 2003 and 2015, with over 300 young people (15–28 years old with an without a SEN/disability) from member countries, including the UK (Mangiaracina et al., 2021). Themes arising from these hearings covered the principles of inclusive education (e.g., rights to non-discrimination and respect), and its implementation, which was summarised in terms of slogans, such as: 'everything about us, with us', 'barrier-free schools', 'breaking down stereotypes', and 'becoming a full citizen' (Mangiaracina et al., 2021). Following Talisse (2005), the EASNIE researchers show how learner voices can be included in inclusive education policy debates, be key agents in this and other decision-making processes. However, there was not enough detail in the European Agency's reports about how communication mode was adapted to the needs of some participants.

Rationale and context

The review above shows the connection between the principles and practices of inclusive education, deliberative democracy and learner voice. It also reveals gaps in current thinking and practice. There is contention and uncertainty about inclusion as a value, few examples of involving all stakeholders in inclusive policymaking, and weak connections between education policymaking and deliberative democracy.

Reviews of school education in the UK, for example, use stakeholder consultations. Some rely fully or predominantly on learner perspectives, for example, the 'Big Ask' survey administered by the Children Commissioner's Office for England (2021). Others mostly involve experts, but not citizens in their deliberative processes (e.g., Times Education Commission, 2022). A key aim of the pilot study reported in this paper was, therefore, to obtain knowledge about how to design and modify a deliberative public dialogue process to enhance the effective participation of young people with SEN/D.

Public deliberative dialogue is often designed to be inclusive of people with disabilities, in terms of physical accessibility to spaces and providing materials in a range of different formats (Involve, 2023). It is not typical for them to be designed with the specific needs that people with SEN/D can have with communication and engagement. This pilot used the principle of enclave deliberation to plan and deliver a dedicated preparatory phase involving young people with SEN/D, before the deliberative public dialogue with a wider group of stakeholders. The young people with SEN/D who took part in the project were consulted on how to make the mini-public events as inclusive, as engaging, and as productive as possible. This required working with the project team to learn how the dialogue process needed to be modified or augmented in order for them to contribute to the discussion and deliberations, and prepare for the experience of taking part in a public dialogue.

The original intention was to pilot a Citizens' Assembly (about 50 participants), but as this was beyond the project's resources, a smaller Citizens' Panel (about 30 participants) was used. These group sizes reflect current UK deliberative democratic practices. The advantage of this smaller group was that the social, emotional and cognitive demands on young people with SEN/D could be planned for more sensitively. The project ran over the 2023/23 academic year, involving participants drawn from the city of Portsmouth and the surrounding county of Hampshire.

To reiterate, the pilot had two objectives: (i) to obtain information about how to modify a Citizens' Panel process to enhance the effective participation of young people with SEN/D; and (ii) to generate, via the modified Citizens' Panel process, more nuanced, grounded and integrated policy ideas about inclusion in school education than current policy.

Methods, sample and procedures (1): the citizens' panel

The Citizens' Panel was set up to address the question: "How do we make schools more inclusive for children and young people with SEN/D?" (In public dialogue parlance, this is the 'calling question'). The framing of the question gave primacy to provision for, and the lived experiences of, children and young people with SEN/D. It provided a lens for exploring how inclusion could be made integral to the general purposes and objectives of schooling.

In the following section, we provide details on the methods, sample and procedures relating to the process evaluation, but first, we describe, in chronological order, the methods, sample and procedures relating to the Citizens' Panel. The delivery of the Citizens' Panel was led by the organisation Involve[5] which carried the ethical responsibility for the Citizen Panel. However, the project leads ensured that good practice procedures and data processing and protection procedures were consistent with ethical and data handling research practices.

In summary, this was a two phase deliberative process. Phase 1 involved shaping the Citizens' Panel agenda and obtaining information about how the young people with SEN/D could participate and

5 Involve is a leading public participation charity in the UK that develops and supports new ways to involve people in decisions that affect their lives: http://involve.org.uk/

communicate their perspectives during the events. This phase involved only the young people with SEN/D and their parents/carers. Phase 2 was the delivery of the Citizens' Panel itself, which involved all participants taking part in two events, one online and one in-person. Below we set out in detail what these phases involved, but begin by describing the process of participant recruitment and selection.

Recruiting participants

The Sortition Foundation was commissioned to support the recruitment through representative sampling to select participants. Recruitment was more challenging compared to most public dialogues, as it involved mediation by third party actors. The project team asked contacts in the education department of the unitary (Portsmouth) and county (Hampshire) authorities to email headteachers with a request to forward an online expression of interest form and information sheet to pupils' parents/carers and school staff. The team also contacted a number of local SEN/D-related advocacy groups and associations to share the expression of interest with their members, clients and contacts.

The people targeted for participation in this project (parents/carers and practitioners) was, therefore, heavily dependent on whether headteachers, third sector leads and administrators noticed and forwarded the expression of interest email. This is at variance to the standard way of recruiting participants for public dialogue, which involves targeting households and individuals directly by email and/or post. This systematic approach makes it possible to collect data on how many prospective participants received and responded to the invitation to participate. The drawback of the recruitment process deployed in this pilot project meant that the project team were unable to track responses to the expression of interest, and so cannot know whether there were systematic differences between those who did and not choose to respond. The interviews with some of the participants conducted for the process evaluation, however, confirmed that most of them were made aware of the Citizens' Panel via school and/or local authority communications.

A total of 76 expressions of interest were received: 54 from parents/carers (34 had a child with SEN/D; 20 had a child without SEN/D) and 22 from education professionals. The response rate was low, given that the sign-up information was potentially available to families and staff in over 700 schools. The reliance on third parties to share information and the fact that recruitment took place during the weeks leading up to the school Christmas holidays – an especially busy period in schools – are factors in the low response rate.

Selecting participants for the citizens' panel

The Citizens' Panel was to be made up of 30 people:

- 8 young people (aged 12–16) with SEN/D
- 4 young people (aged 12–16) without SEN/D
- 8 parents/carers of the young people with SEN/D
- 4 parents/carers of the young people without SEN/D
- 6 education professionals (i.e., teachers, school leaders).

Given the project's focus on inclusion, young people with SEN/D were over-represented in the Panel's composition, despite making up around 17 per cent of the pupil population in England.

Prior to selection, the young people were stratified according to criteria collected as part of the written expression of interest. This was to ensure proportional representation of young people across key characteristics, according to national statistical data in 2022. These were: gender; ethnicity; and eligibility for free school meals (FSM). Additional criteria were applied for the young people with SEN/D. These were: type of school attended (e.g., mainstream or special); the level of SEN/D[6]; and type of SEN/D[7].

It was not possible to represent the full range of SEN/D on the Citizens' Panel. Some types were not represented among the expression of interest responses. These were: moderate learning difficulties; severe learning difficulties; profound and multiple learning difficulties; and sensory impairment. Also, no expressions of interest were received from parents/carers of young people who attended a non-mainstream setting (e.g., a special school or alternative provision). The reasons for this were unclear, but are likely to mirror those for the low expression of interest response rate. A description of the 12 young people who were selected for the Citizens' Panel can be seen in Table 1.

Expressions of interest were received from education professionals in a variety of roles and settings. These people were also stratified before selection, according to their role (e.g., classroom teacher; school leader; SEN/D specialist) and the setting in which they worked (e.g., primary or secondary; mainstream or special school). Only four respondents (18%) identified themselves as either a class teacher or a senior leader. The limited number of places for practitioners overall meant that it was not possible to represent the full range of roles and settings on the Citizens' Panel. Of the six education professionals who were selected to take part, three worked in schools, two people who worked for a third sector organisation, and a trainee educational psychologist. All of these participants were female.

An additional condition of participant selection was put in place to mitigate the outside chance of a young person and a teacher (or other professional) from the same school being chosen for the Citizens' Panel. This was important, as it could have inhibited young people from talking about their school experience in the presence of someone who worked at their school. Postcode data collected as part of the expression of interest were used to avoid this situation.

In the weeks prior to the first Citizens' Panel event, seven participants withdrew from the project. Given the late stage at which this occurred, the project team took a necessarily pragmatic approach to identifying and replacing participants. Two young people with SEN/D (both of whom attended a unit attached to mainstream school), and their parents/carers, withdrew in the week leading up to

6 There are two levels of need in the English system. The majority of children and young people with SEN/D are on SEN Support, and around a fifth of those with the most complex SEN/D have an Education, Health and Care Plan (EHCP).

7 Parents/carers of young people with SEN/D were asked to identify up to four types of need from the following: autistic spectrum disorder; speech, language and communications need; social, emotional and mental health; moderate learning difficulty; specific learning difficulty; severe learning difficulty; profound and multiple learning difficulties; physical disability; hearing impairment; visual impairment; multi-sensory impairment; other difficulty/disability. These terms are used by the Department for Education, and reflect medical diagnostic categories. The authors recognise that many/most autistic people prefer neurodivergence-affirming language (i.e., 'autistic person' rather than 'person with autism').

TABLE 1 Characteristics of the young people selected for the Citizens' Panel.

Sex	Type of SEN/D	Level of SEN/D	School attended	Ethnicity	FSM eligible
Female	SEMH; PD; Other	SEN/D support	Mainstream	White British/Irish	No
Female	ASD; SEMH; SPLD	EHCP	Mainstream	White British/Irish	Yes
Female	ASD; SEMH; Other	Not recorded	Mainstream	White British/Irish	No
Male	ASD; SLCN; SPLD	EHCP	Mainstream	Black/African/Caribbean/Black British	No
Male	ASD; SLCN; MSI	EHCP	Mainstream	White British/Irish	Yes
Male	Other	SEN/D support	Mainstream	White British/Irish	No
*Male	PD	EHCP	Unit attached to mainstream school	White British/Irish	No
*Male	ASD; SLCN; SPLD	EHCP	Unit attached to mainstream school	White British/Irish	Yes
Female	N/A	N/A	Mainstream	White British/Irish	No
Female	N/A	N/A	Mainstream	Black/African/Caribbean/Black British	No
Male	N/A	N/A	Mainstream	White British/Irish	No
†Male	N/A	N/A	Mainstream	White Other	Yes

*Withdrew and did not take part in the Citizens' Panel. †Withdrew and replaced at short notice by sibling of one of the young people with SEN/D. ASD, autistic spectrum disorder; MSI, multi-sensory impairment; PD, physical disability; SEMH, social, emotional and mental health; SLCN, speech, language and communications need; SPLD, specific learning difficulty; Other, other difficulty/disability.

the first preparatory event. In one case, this was due to other commitments, while in the other, the parent explained that their child felt anxious about taking part in an unfamiliar process with strangers.

Replacements were recruited, including two parents/carers of children with SEN/D (SLCN &MSI; ASD, SEMH & moderate learning difficulties) who had indicated that they would be willing to take part without their child. However, two places could not be filled. The final Citizens' Panel, therefore, comprised 28 participants:

- 6 young people with SEN/D
- 4 young people without SEN/D
- 13 parents/carers (11 females; 2 males)
- 5 education professionals.

All participants attended both Citizens' Panel events, with the exception of one young person without SEN/D who only attended the second in-person event.

Onboarding participants

The onboarding phase involved providing participants with information, where all participants receive the same information in the same way. All participants received information outlining the purpose and agenda for the Citizens' Panel events, including logistical details (venue, times, etc.). However, there was additional on-boarding for the young people with SEN/D and their parents/carers. It was more detailed, incremental, informal, personalised and also highly responsive. There was a member of the team with extensive professional experience of working with young people with SEN/D who.

scheduled introductory video calls to meet with and get to know these participants. Onboarding incorporated ongoing communications by text, which meant that parents / carers of the young people with SEN/D could ask and receive answers to questions about the Citizens' Panel. The process of onboarding the young people with SEN/D had a dual function in terms of enabling the team to begin building a picture of their capabilities and preferences. This information was critical to informing the strengths-based approach to designing the events and activities.

Phase 1: preliminary sessions to inform design

The key purpose of the preliminary sessions was to elicit more information on how to design an inclusive Citizens' Panel and to maximise the participation of young people with SEN/D, in line with our strengths-based approach. Both sessions lasted 3 h and were hosted via Zoom on two Saturday mornings, 2 weeks apart, before the first Citizens' Panel event. Only the young people with SEN/D and their parents/carers (who provided support where required) took part.

The sessions had a deliberately friendly and informal feel in order to maximise accessibility and reduce anxiety, and to build trust and confidence. The session activities were designed to test the accessibility principles that were designed to give the young people a taster experience of the first Citizens' Panel session. The young people with SEN/D practised using an online voting app (Menti) to anonymously respond to questions, and listen to and critique a short presentation from an expert.

The first session consisted of: providing an orientation to the project, and the Citizens' Panel process (covering key concepts, etc); collecting information about how the young people with SEN/D can fully participate in Citizens' Panel activities; and refining the calling question about school inclusion. The second session involved: walking through the draft Citizens' Panel agenda; gathering their experiences of and views about school and topics to cover regarding school inclusion; obtaining detailed information about how the day and the environment should be structured and adapted to the needs and requirements of the young people with SEN/D; and agreeing some 'golden rules' for participation.

Phase 2: the citizens' panel on school inclusion

Though the project proposal envisaged four Citizens' Panel sessions, the available budget allowed for only two events. The first event was held online to reduce hosting costs (venue hire, etc), and the second was held in-person. Having one event to bring everybody

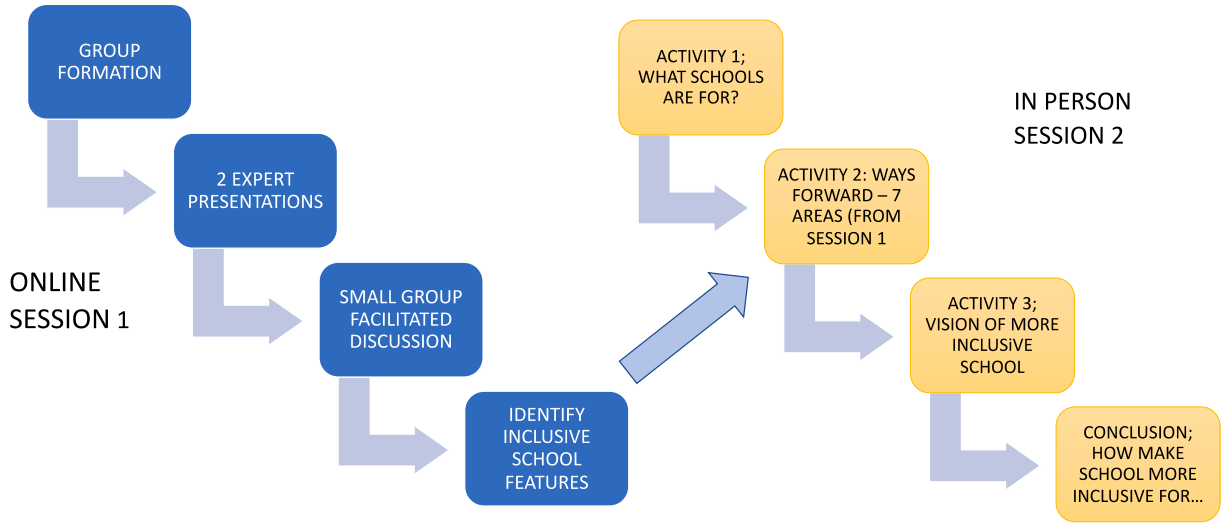

FIGURE 1
Citizens' panel phase 2.

together in one place was considered important to bring the agenda to an active conclusion.

The purpose of the first event was to contextualise the calling question, to understand the problem, to hear from experts and discuss ideas with them in small, facilitated groups, and to set out the scope of work that the panellists had been invited to undertake. The second session focused on working towards and making decisions about producing practical recommendations, and imagining and presenting a vision for more inclusive schools (see Figure 1).

The first event was held via Zoom on a Saturday, and lasted 4.5 h. The objective was to create the psychologically safe conditions needed to run a good public dialogue. Participants were arranged into small, carefully chosen groups of five or six participants, with particular attention to the needs and wishes of young people with SEN/D. In separate breakout spaces, the groups took part in an informal ice-breaker activity and facilitated discussions in which they shared their experiences of school and their thoughts about education and inclusion. Two external experts gave short presentations: an academic presented research findings about future thinking about inclusive schools; and an ex-head teacher, adviser and author talked about provision for learners with severe and complex learning difficulties. This was followed by another round of small group discussion, with the experts joining the groups in their breakout spaces to respond to questions. The event concluded with some brief activity in response to the calling question.

Two weeks later, the second Citizens' Panel event took place. This was an in-person event, held over 1 day (a Saturday) at a hotel in central Portsmouth. The day was structured around three activities, which were, once again, conducted in small, carefully chosen groups of five or six participants, and facilitated by a member of the project delivery team. The first activity was a broad-based discussion about the purposes of a school (see Figure 1). In order to stimulate discussion, participants were provided with some possible purposes, which were based on a mix of contemporary ideas from a review of relevant literature about what schools are for. These were:

- To learn skills and knowledge to live a good life
- To get good exam results; to get a good job
- To learn how to get on with, understand and respect others
- To improve understanding and relationships between diverse people
- To become a confident and independent person
- To help learners become more creative.

In the second activity, participants considered what an inclusive school would be like, and what trade-offs and compromises would be involved in creating it. The group were given prompt cards and asked to discuss several particular dimensions of an inclusive school, which were generated from an analysis of the discussions in the first event. These were:

- How we do things: what pupils wear; how pupils are grouped; where pupils sit
- Learning: the curriculum; what everyone learns, and why
- Relationships and communication: between parents/carers, community and pupils
- Teaching and support: adapting to pupils' different needs; attitudes; special skills
- School environment: design of the site/buildings; moving around the school site
- Bullying, rules and behaviour: dealing with bullying; following rules; rule flexibility
- Outside relationships: the school as part of the community; support from parents/carers; learning from other schools.

The final activity of the day involved building on and prioritising the ideas about the purpose of a school from Activity 1, and the compromises identified from Activity 2, in order to create and capture the Panel's vision of the inclusive school.

Collecting and analysing the panel outputs

The three activities were completed in facilitated groups, and records of the groups' responses and perspectives were captured in the moment on flipchart sheets. There were 39 sheets transcribed overall, which were then analysed thematically using Nvivo software. The text from each of the activities were analysed separately in an inductive style and informed by Braun and Clarke's (2006) methodological approach.

Methods, sample and procedures (2): the process evaluation

The process evaluation described and assessed the effectiveness of the planning, design and delivery of a public dialogue event involving young people with SEN/D. This process evaluation was informed by a theory of change model (details in Norwich et al., 2023), which had been required as part of funding proposal. It involved an exploratory style of qualitative evaluation of context, process and outcome factors (Foster, 2024). The main purpose was to provide information on how and in what ways approaches to participation in deliberative dialogue activities can be adapted and expanded to effectively include people with SEN/D and maximise their contribution to the process. The process evaluation component of the project obtained full ethical approval via the University of Portsmouth's research ethics procedure.

The main source of data informing the evaluation was obtained via semi-structured interviews, and supplemented with data obtained via observations, post-event feedback forms, documentation (e.g., detailed minutes of meetings involving the project team; agendas and materials generated for/during the Citizens' Panel events) and researchers' overall impressions obtained from a deep immersion in the project, from start to finish.

At the second Citizens' Panel event, the project delivery team explained the purpose and process of the project evaluation, and invited participants to take part in a voluntary interview to share their insights on the experience of the Citizens' Panel. Interviews were conducted in the 3 weeks following the second event, and took place via Zoom. Interviews lasted approximately 30 min. A transcript of each interview was generated using Zoom's transcription function. These were then coded and analysed, and where necessary, checked against an audio recording of the interview.

The interview schedule was designed to walk interviewees through the key phases of the project chronologically, with questions and prompts eliciting their views about what worked well, what did not, and what improvements could be made for a future Citizens' Panel. There was a specific emphasis on the role, effectiveness and impact of the accessibility principles; that is, the design, provisions and adjustments put in place to maximise the inclusion, engagement and participation of young people with SEN/D. Interviewees were also invited to sum up their view on the extent to which the pilot achieved its principal purpose: testing innovative ways for young people with SEN/D to be fully included and participate in public dialogue.

Interviews were conducted with 19 people involved in the project, either as a member of the Citizens' Panel or a member of the project delivery team. Table 2 shows the breakdown of interviewees by group.

TABLE 2 Citizens' panel participants interviewed for the process evaluation.

Young people with SEN/D	1
Young people without SEN/D	1
Parents/carers of children with SEN/D	4
Parents/carers of children without SEN/D	4
Education professionals	4
Members of the project delivery team	5
Total participants	19

A note on the presentation of findings

In the following sections, we first summarise the findings from the analysis of transcribed data collected during the Citizens' Panel events, and then the findings from the analysis of data collected for the process evaluation. The summaries of findings presented in this paper are necessarily brief. A more expansive exposition of the findings from this project can be found in the full project report (Norwich et al., 2023).

Findings (1): the Citizens' Panel

Our summary of findings from the Citizens' Panel is organised in terms of the three activities completed in the second, in-person event (see Figure 1).

Activity 1: what school is for?

The first activity asked participants to address the question: 'what is school for?' Eleven themes emerged from the analysis of data, covering broadly the same areas as the stimulus list of purposes (see methods section). The most referenced themes were about learning personal and life skills, personal relationships and broadening perspectives compared to the other presented ones. It was clear from the thematic analysis that the emphasis of the Citizens' Panel was more on personal and social skills than on knowledge skills and examination results. Society-focussed purposes were also recognised; both social and economic purposes. But the Panel's social integration sub-theme did not quite capture the presented purpose of improving understanding and relationships between diverse people, which might have been expected given the focus of this Citizens' Panel.

Activity 2: ways forward

The second activity concerned identifying ways of addressing the challenges associated with making schools more inclusive. The starting points for this activity originated from an exercise in the first Citizens' Panel event held online, and were re-presented to the participants to stimulate the group discussions. The analysis of the data from this activity was organised under seven themes [see details about topics covered, themes and sub-themes and wording used in Norwich et al., 2023].

School environment

Participants emphasised the improvement of current spaces and the provision of quiet dignified spaces. Linked to this was the suggestion to ensure spaces are less busy and easier to move through, which in turn was connected to views about school size and pupil

numbers. Quiet dignified spaces reflects the recognition of the need for separate spaces for some, but used in positive and supportive ways (not stigmatising and punitive). Sub-themes concerning changes to canteens, the learning equipment provided, and the use and design of technology additionally indicate how participants saw the physical design of a school as important for inclusion.

Learning and curriculum

Challenges relating to learning and curriculum were referenced with less frequency compared with other themes. Consistent with the picture that emerged through Activity 1, participants emphasised personal relevance and needs, personal, social and life skills, and personal choice as prominent ways forward. There were a few references to traditional ideas about knowledge and understanding. Assessment was also framed as personally relevant and continuous, with national testing seen to take time away from other activities. There was one reference to a SEN/D aspect in the form of adding learning about disabilities to the curriculum. And despite being one of the discussion prompts, there were no references to sharing a common curriculum.

Teaching and support

Participants identified another SEN/D aspect – understanding needs and having relevant information about needs – as important under this theme. They drew distinctions between this happening proactively and pre-emptively, rather than late and reactively. Also, they recognised the pressures facing teachers in achieving this, in terms of being short of time and training. Teachers were not cast as uncaring. Participants mentioned teachers having their training needs met and the importance of job satisfaction, wellbeing and working in satisfactory and flexible conditions.

How we do things

The most prevalent sub-theme to emerge in this area concerned the use of, and alternatives to, ability setting. Participants said ability setting was 'not working', stigmatising and was associated with poorer quality learning opportunities. Flexible grouping was suggested as an alternative, allowing pupils with SEN to choose the level of their own learning and to avoid them 'standing out'. There was a recognition that learning can have progressive levels, with the implications that stigmatisation needs to be prevented and managed by trying some alternative arrangements.

Outside relationships

The only sub-theme that emerged in relation to outside relationship was about how a school connects with its local community. This was expressed in various ways, including acting as a community centre and provider.

Relationships and communications

Several sub-themes were identified in this area, though none had a high frequency of reference. The centrality of relationships between learners, teachers and parents was seen as important, and were characterised by notion of listening to others and disagreeing respectfully. There was a particular emphasis on school-parent relationships, and the overarching need to prioritise relationships in the development of more inclusive schools.

Rules, bullying and behavior

This final area generated sub-themes concerning pupils having more independence and more agency. Specific examples were given in relation to options for uniform, and doing certain things without permission. In terms of behavior, suggestions were put forward regarding co-producing behaviour management and the use of conflict management and restorative approaches.

Activity 3: visioning

The third and final activity of the Citizens' Panel was an exercise in visioning and identifying the elements of an authentically inclusive school. The themes that emerged in this activity, summarised in Figure 2, overlapped those from Activity 2. Four themes spoke to making general improvements that would benefit all pupils: promoting positive well-being; curriculum coverage (i.e., what is taught and learned); behaviour policy and bullying; and community relations and activities.

Several themes were also of general relevance to school improvement, but also relate to feature of specialist SEN/D. These overlapping aspects were staff training (participants called for all staff to be trained in SEN/D and neurodiversity); learners' participation and contribution to how elements of school and school life are managed and implemented (e.g., around curriculum adaptation); the use of a communication system (e.g., Makaton); and the physical environment and accessibility. Only one theme referred directly to specialist provision for those with SEN/D, and encompassed specialist staff, specialist spaces, and the identification of needs.

Findings (2): the process evaluation

The presentation of the key findings from the process evaluation of the Citizens' Panel is arranged in terms of three themes, and illustrated with indicative comments from the interviews.

A positive and worthwhile experience

The first theme summarises participants' views of the overall experience of taking part in the Citizens' Panel, and the extent to which the project was successful in achieving its principal aim of meaningfully including young people with SEN/D in a public dialogue.

The broad consensus across participants and the delivery team was that the Citizens' Panel was successful in achieving its aim of meaningfully including young people with SEN/D in a deliberative public dialogue. Comments from participants described it being a positive and worthwhile experience.

> *"We've really enjoyed the whole process, and it's nice to have a voice,"*
>
> Parent/carer of young person with SEN/D.

The Citizens' Panel format provided a safe space for respectful and constructive dialogue, in which participants 'feel safe to say what I was thinking' and to 'agree to disagree' with one another. Framing the process as constructive and respectful, which included outlining the golden rules at the start, was key to creating the optimal conditions for civil and productive discussion, and helping everyone to, as one participant put it, 'feel emotionally safe to contribute honestly'.

HIGH-LEVEL THEMES	GENERAL LOWER-LEVEL THEMES	SEN/D SPECIFIC ASPECTS IN LOWER-LEVEL THEMES	
Promote positive wellbeing	Enjoyment & happiness; school community, relationships		General improvements for all
What learn: curriculum	More informed choice, changes to current curriculum		
Behaviour policy	bullying		
Community relations and activities	Community relations, community activities		
Teachers	Training, number and kinds, pay and conditions	training: all staff trained in SEND and neurodiversity	General improvements for all Some aspects specific to SEN/D
Provision	Resources	resources: resources labelled but available to all	
Manage school	Student participation, adaptable, policy implementation	time to build relationships, adapt curriculum, recognise needs	
Teaching		use communication system, e.g. PECS, social stories	
Environment	School size, learning class environment, toilet, places to go	easy accessibility, ramps, lifts.	
Specialist provision		Specialist staff, specialist spaces, Inter-school links; need identification	Specific to SEN/D

FIGURE 2
Themes emerging from activity 3: visioning an inclusive school.

Panellists valued the opportunity to talk with, listen to and learn from people that they encountered infrequently in their everyday lives, reporting that it helped them develop empathy and obtain new insights.

> *"We had very different opinions on various different things, and could see where the other person was coming from and had more of an understanding… I think that is great on a community level."*
>
> Parent/carer of young person with SEN/D.

In several cases, it transpired that some of the young people attended the same school. The parents/carers of children without SEN/D reported how their children had, as a result of this project, begun to view their peers with SEN/D in a new and positive light.

> *"One of the [young people with SEN/D] on our table goes to [young person without SEN/D's] school. [They] never recognised [them]. I think [the Citizens' Panel] has opened [my child's] eyes to just how other children cope in that school environment."*
>
> Parent/carer of young person without SEN/D.

Attention to detail and a differentiated approach

The second theme concerns the essential need to differentiate the processes and approaches to public dialogue in non-standard ways, so that young people with SEN/D were demonstrably and qualitatively included.

Creating a safe and comfortable environment in which people who are new to one another can engage in constructive discussion is an essential part of any public dialogue. In this project, the effort to create such conditions flowed immediately from the recruitment phase. A clear and early success was the differentiated onboarding process. Parents/carers of the young people with SEN/D commented on the thoroughness and value of the individualised approach to onboarding, which was central to building trust and confidence.

Having a single point of contact was highlighted as not only highly practical, given the busyness of their lives, but helpful in terms of personalising and making personable both the project and the unfamiliar process of a public dialogue.

> *"The communication from [member of project delivery team] was great, and they were really lovely, really friendly, really accommodating throughout. [They were] very careful to make sure that [young person] was happy and comfortable, and everything worked for them."*
>
> Parent/carer of young person with SEN/D.

A key feature of the detailed planning and delivery of the Citizens' Panel was the differentiated and strengths-based approach to design. The emphasis was on enhancing, and not unsettling or limiting, the participation and contribution of the young people with SEN/D, based on what they said would work best for them.

The phrase 'little things matter a lot' summed up the way in which the project team paid particular attention to identifying and

addressing housekeeping issues in the onboarding and preliminary design phases. This included: providing detailed information about car parking facilities at/near the venue, as finding accessible parking is a frequent challenge for SEN/D families; giving young people with SEN/D early sight of the lunchtime menu and having some choice about options, as for some of them, certain tastes and textures could be problematic; and providing a nearby quiet space for young people with SEN/D to retreat at any point during the day.

> *"I think the principle of doing the preliminary sessions was great, and just worked so well. No way could we have just gone into a Citizens panel without that groundwork being laid."*
>
> Member of project delivery team.

Participants remarked that the meticulousness of the planning and preparation was important to the project's overall success, though there was the odd unforeseeable hitch. For example, the sweets supplied by the venue did not, as the ingredients cards showed, include any halal/vegetarian/vegan options. While these incidents did not threaten the project, they drew attention to how organising a public dialogue on the topic of inclusion resulted in inclusion becoming a lens through which its organisation and operationalisation can be assessed. Any element that is *not* inclusive could, therefore, undermine the participant experience in ways that are less obvious, or have less serious consequences, in most other public dialogues.

Trade-offs

The third theme addresses the trade-offs involved in designing and delivering a public dialogue attuned to the needs of young people with SEN/D, and the effect of this on other participants.

The differentiated approach described above, plus the need to manage and mitigate issues that might negatively affect the participation and engagement of the young people with SEN/D, involved making the kind of trade-offs. These trade-offs, less evident in typical public dialogue events, can affect the experience of other participants. Two ways in which this was most noticeable in this project was in the pace of the day and the composition of groups.

While most participants reported that the pace of the Citizens' Panel events acceptable, some participants with and without SEN/D found it a little slow and the event overall too long, particularly the session delivered online. One potential reason for this was the number and frequency of scheduled breaks, which were added to the agenda to manage screentime and concentration. Views on the pace of the in-person event, meanwhile, were roundly positive.

In a typical deliberative dialogue, participants' thinking is challenged by frequent exposure to a range of different views and backgrounds, in order to inform and enrich the overall debate. For some young people with SEN/D, the combination of the social anxiety produced from engaging with new people in fairly rapid succession and the cognitive fatigue exerted by the challenging of preconceptions, can be overwhelming. However, mixing up discussion groups in this project was deliberately avoided, as the young people with SEN/D expressed an early preference for working with the same small group (which included their parent/carer) throughout the Citizens' Panel. This would give them the comfort and confidence they said they needed in order to actively participate. However, providing consistency and familiarity for this group had the effect of limiting opportunities for others.

While there was a general appreciation of why the groups were largely fixed, some adult participants said that they would have liked more variation in the groupings.

> *"You could argue whether it would have been more beneficial to mix the groups up so that you have different opinions meeting different opinions, instead of just bumping up against the same opinion. It's a tough one, because you could argue that the familiarity of being with the people you were with before is good because you relax and you get a bit more confident."*
>
> Parent/carer of young person with SEN/D.

Interestingly, the education practitioners interviewed for the evaluation had reservations about mixing the groups, but for a different reason. They were concerned that they might have been viewed by parents/carers as representatives of, for example, the local authority. They wanted to avoid finding themselves in the unwelcome position of having to justify policies, processes or decisions outside their sphere of influence.

> *"We're not the lawmakers. We're not the system. We're just working the other side of it. So, yeah, I think that definitely people need to be kept apart."*
>
> Education professional.

This reticence to engage in the disruptive process of public dialogue perhaps suggests that more could have been done to prepare the education professionals for their role in a public dialogue, as citizens and as informed professionals.

Discussion

This project, funded as part of a programme of work to rethink public dialogue, had two objectives: (i) to obtain information about how to modify a Citizens' Panel process to enhance the effective participation of young people with SEN/D; and (ii) to generate, via the modified Citizens' Panel process, more nuanced, grounded and integrated policy ideas about inclusion in school education than current policy. In this section, we summarise and discuss the main findings in terms of these aims, and in relation to the literature on deliberative democracy and inclusive education. In particular, we relate the ideas for more inclusive schools to the development and direction of current SEN/D policy in England. We also consider the project's limitations.

Objective 1: enhancing the participation of young people with SEN/D in public dialogue

A key finding from the process evaluation was the need for and impact of meticulous planning and preparation, which incorporated a differentiated and strengths-based approach to Citizens' Panel

design. The accessibility and engagement needs of the young people with SEN/D, and their comfort and safety, were given the highest priority in order to make the Citizens' Panel as inclusive as possible. The evaluation illustrates how the differentiation of the project into two phases, with phase 1 consistent with the principle of *enclave deliberation* for the young people with SEN/D (Karpowitz et al., 2009; Bulling et al., 2013), before they engaged in the wider Citizens' Panel public deliberation (phase 2), worked well. In addition, paying attention to seemingly 'little things' relating to housekeeping, was also seen as important in the project's overall success.

The flipside of the differentiated approach, however, was that it led to trade-offs, which affected the experience of other participants, though not detrimentally. Two ways in which this was most noticeable was in terms of the pace of the day (slow for some) and the composition of groups, which were more static than is typically the case in public dialogue.

There was a broad view among those involved in the project that the Citizens' Panel was successful in achieving the aim of meaningfully including young people with SEN/D in a deliberative public dialogue. Participants described taking part as a positive and worthwhile experience, and valued the opportunity to interact with people constructively and empathically in ways consistent with the deliberative literature (Bulling et al., 2013; Bächtiger et al., 2018). In line with Talisse (2005)'s position, and contrary to Posner's (2003), the Citizens' Panel demonstrated that citizens, including young people with and without SEN/D are capable of reasoned discussion on important educational matters.

Limitations and learning

This project contributes to learning about both the potential of inclusive methods and procedures in deliberative dialogue involving young people with and without SEN/D. However, there were some limitations worth enumerating before we provide some general advice on how future mini-publics involving young people with SEN/D might proceed.

The central limitations experienced in this project concerned the constraints of funding and timeframe (11 months). The decision, for example, to conduct events online was driven by the cost of hosting in-person events (venue hire, etc.). While this did not have a critical impact on the project outcomes, it did affect to some degree how some members of the Panel participated, notably the young people with SEN/D. More on this can be found in the project report (Norwich et al., 2023).

Another potential limitation is that the composition of the Citizens' Panel was diverse, rather than representative. This arose from the challenges experienced with the recruitment process, as described above. A more representative group of participants would probably have been achieved in a longer timeframe. Relatedly, there was no representation on the Citizens' Panel of young people with severe and complex learning and other difficulties (e.g., intellectual disabilities), and so this remains a gap in understanding. Silvers and Francis (2009) have addressed the issue of including people with cognitive disabilities by recommending a practice of assistive thinking and 'prosthetic practices' mediated by trusted others. Further research in this area might explore developments of *enclave deliberation* for including young people with significant SEN/D.

We note too that the participation in the project was, from the outset, much more likely to appeal to parents/carers and education professionals with a favourable view of inclusion, rather than people with objections, doubts or no view at all. Further public dialogue projects on SEN/D and inclusion May consider selection criteria based on opinion, as well as key demographics and characteristics.

So, on the basis of this project, we conclude that enhancing the effective participation of young people with SEN/D Citizens' Panels and other mini-publics have several prerequisites. First, ensuring adequate time, especially for the early recruitment and preparatory phases, including any enclave deliberation. Secondly, carefully designing appropriate recruitment strategies. Thirdly, working directly with young people with SEN/D and their families. Fourthly, mindful deployment of a person-centred and strengths-based approach to planning and delivery. Fourthly, mindfulness about the potential need for and impact of trade-offs on the experience of all participants, and wherever possible, minimising their effect. Finally, it is worth noting that neither the authors/project leads were experts in public dialogue, and so the skills and experience of people specialising in public dialogue is another valuable ingredient in delivering a successful project.

Objective 2: more nuanced, grounded and integrated policy ideas about inclusion

The thematic analyses of the qualitative data collected during the Citizens' Panel deliberations illustrated the participants' perspectives in broad terms. A sense of the general direction of participants' positions could be seen in the comparison between the themes from Activity 1 (what school is for) and Activity 3 (visioning a more inclusive school). This indicated that perspectives on more inclusive schools involved the interplay between means and ends, and not just idealised purposes.

The key finding on improving school inclusion was that almost all of the themes were about general school changes, with promoting well-being, changes to the school environment and its management the most frequently referenced. However, most of the general changes also involved some specific SEN/D aspects, including SEN/D training for staff. Only one theme was explicitly SEN/D specific. The summary of themes in Figure 2 (above) can, therefore, be seen as a continuum of SEN/D elements in the various dimensions of the vision of a more inclusive school.

This way of thinking about disability inclusive schools reflects developed ideas about the purposes of more inclusive schooling, and how these purposes can be realised for all, with the assumption of benefits for those with SEN/D too. This integration of SEN/D into the inclusive school dimensions differs from some contemporary ideas about inclusion. The concept of a SEN/D continuum is different from the historic, but still influential continuum of provision model (Rix et al., 2013). This describes a placement continuum in which a pupil with SEN/D is placed at various degrees of separation from and time away from general mainstream classes. It is also different from the Inclusion Index ideas about inclusive schooling (Booth and Ainscow, 2011), discussed above, which are about increasing participation of all in the school culture, curriculum and policies. The Inclusion Index model has no place for the kind of SEN/D labelled element or dimension evident in the Citizens' Panel themes. In this respect, these themes reflect what Cigman (2007) called moderate inclusion, which assumes any separation, differentiation or specialisation is stigmatising and devaluing.

In identifying specialist elements in most general provision dimensions and some specialist provision, the ideas generated through the Citizens' Panel also recognise that specialist elements need to be presented in sensitive and dignified ways, that labels be used in neutral ways and separate settings in inclusive schools can be open to all. While there were a few references to a positive role for specialist SEN/D special schools in the Citizens' Panel transcripts, this important topic was not examined further in deliberations. This might have been due to time limitations and/or it being overlooked by those facilitating group discussions.

One further limitation concerning the analysis of data collected during the Citizens' Panel was that it was based on notes made on flipchart paper, captured in-the-moment during small group discussions. It is possible that some important aspects of these deliberations, such as points of agreement and dispute, conclusions and decisions, are missing, and therefore, not reflected in the analysis. However, the notes that were captured were coherent and consistent across the groups and the discussion activities, suggesting that the reader can have confidence that the analysis presented is a reliable reflection of the discussions that took place.

In terms of the second project objective, the expectation was that the Citizens' Panel would generate more *nuanced, grounded and integrated* policy ideas about inclusion. So, to what extent, do the ideas that emerged connect with the policy directions and proposals regarding SEN/D in England?

Since 2011, government policy about inclusion for SEN/D has been based on an assumed 'bias to inclusion' (DfE, 2011), as a counter to the previous Labour government's adoption of inclusive-oriented policies. Despite some legislative change to the SEN/D framework in 2014/15, there were increasing pressures to review policy and practice, with calls for school policy to recognise and implement 'the principle of inclusion and right to mainstream schooling' (House of Commons, 2019).

Inclusion is now recognised in recent plans for SEN/D in England in terms of a more inclusive society (DfE, 2023), but there is no reference to nor definition of inclusive schools (SENPRF, 2023). Moreover, the broad ambitions of these latest reforms – designing a national set of standards for the SEN/D and alternative provision system; improving early identification of needs and intervention; and clarifying the types of support that should be ordinarily available in mainstream settings – were originally published separately from a wider and more expansive set of proposals to reform the schools system (DfE, 2022a).

This approach by policymakers contrasts with the more *integrated* ideas from the Citizens' Panel, which connect improvements in the general school system with those in the specialist system. The Citizens' Panel's perspectives were arguably more *grounded*, as they involved the experiences of a group of local stakeholders, learning, reflecting and deliberating about inclusion. Their ideas could also be judged as more *nuanced*, as most of them involved making changes that would benefit *all* learners, not just those with SEN/D, while also offering dignified and inclusive specialist provision.

Conclusion

This paper provides evidence that a small-scale Citizens' Panel, using deliberative public dialogue methods, can produce elaborate policy ideas about inclusion in school education, involving the constituency most affected by such policy. These ways of thinking about more inclusive schools might reflect the 2 phase participatory approach used in this pilot project. Further analysis of the content of these ideas is discussed in another paper to be published. However, the scale and approach used in this project suggests that there might be scope for deliberative approaches to be used within and between schools, groups of schools (e.g., multi academy trusts), local networks (including local authorities), as well as at the national level. These applications would align more with what Hammond (2020) calls the system-supporting uses of deliberative methods, to reinforce and improve the current system of education at the organisational, regional and national levels. In contrast, deliberative methods can also be used by advocacy groups, protest movements and non-governmental organisations campaigning for transformational change, with what Hammond calls the system-disrupting uses of deliberative methods. The proposal for education policymaking to be informed by deliberative democratic methods beyond electoral cycles and outside direct government influence is aligned with this version of deliberative methods (Norwich, 2019). In both uses of deliberative methods, the preparation of young people with and without SEN/D to participate in wider public deliberative dialogue, as evidenced in this project, also connects with the movement for schools to actively prepare all children and young people to participate in democratic processes, as a basic aspect of democratic citizenship (Gutmann, 1999).

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving humans were approved by Ethics committee, University of Portsmouth. The studies were conducted in accordance with the local legislation and institutional requirements. Written informed consent for participation in this study was provided by the participants' legal guardians/next of kin.

Author contributions

BN: Writing – original draft, Writing – review & editing. RW: Writing – original draft, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Australia at an educational crossroads: special schools and inclusive education

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The ongoing debate surrounding special schools and inclusive education in Australia has come to the forefront since the recommendations of the 2023 Royal Commission into Violence, Abuse, Neglect and Exploitation of People with Disability, where the Commissioners were split on the implementation of full educational inclusion and the elimination of special schools. The authors discuss the controversy surrounding segregated special education classes and schools, particularly considering the push for full inclusion. The concept of inclusion is examined through a brief review of national and international policies and academic and popular literature, including how the inclusion continuum is conceptualized by policymakers, academics, and families. Stakeholder perspectives on the complexities and challenges of implementing full inclusion in mainstream school settings offer differing experiences and opinions on what is possible. Lastly, by examining the nuances of the special school controversy, the authors provide recommendations on how best to meet the educational needs of all students, across the spectrum of abilities.

KEYWORDS

special education, special schools, Australian education, inclusive education, disability

1 Introduction

The goal of inclusive education is to provide equal opportunities for all students to learn together in mainstream classrooms, in an environment that accommodates and supports the diverse learning needs of all students (Ainscow et al., 2019). According to *General Comment No4 on Article 24 of the United Nations Convention on the Rights of Persons with Disabilities Committee on the Rights of Persons with Disabilities* (CRPD Committee, 2016), inclusive education is recognized as a human right and special schools are defined as forms of segregation and "an inclusive approach involves strengthening the capacity of an education system to reach out to all learners." (GC4, p.4). Australia, as a signatory of the CRPD, has the obligation to move towards a unified inclusive education system meeting the needs of all students.

Still, an argument can be made that special schools are a valuable component of an inclusive education model that have the capacity to reach out to some of the most vulnerable learners that require the highest level of support and are therefore part of this system. For instance, some students with severe disability or complex learning needs may require specialized instruction and support that may be challenging to provide in a mainstream classroom setting (Duncan et al., 2020). Special schools can offer tailored programs with specially trained educators and staff to address these individual and complex needs. These programs include a range of

therapeutic services, such as speech therapy, occupational therapy, and physical therapy, in a more concentrated and coordinated manner than could be offered in a mainstream school (Lindsay and Edwards, 2013). In addition, providing parents with the choice between mainstream and special education settings acknowledges the diversity of student needs and preferences. Although there Mann et al. (2015) reported that some Australian parents of students with disability experience restrictions on exercising their right to choose a school for their child and therefore their choice of special schools does not necessarily reflect their preferences, there is also evidence that others choose special schools based on their attitude toward inclusive education and evaluation of what is best for their child's development and well-being (Paseka and Schwab, 2019).

When considering inclusive education in Australia, recognizing the unique cultural, geographical, and socioeconomic factors that influence the education landscape is crucial. For example, Australia has vast and diverse geographic regions, and some remote or rural areas may face challenges in providing inclusive education in mainstream settings due to limited resources and access to specialized support. Special schools in these areas can cater to the unique needs of students with disability who might otherwise experience acutely limited support (Cumming et al., 2023). Any discussion about the role of special schools in the Australian context should involve collaboration with Indigenous communities, educators, policymakers, and stakeholders to ensure that inclusive education practices are culturally responsive and meet the diverse needs of all students.

Within this complex content, the 2023 into Violence, Abuse, Neglect and Exploitation of People with Disability issued its final report offering 15 overall educational recommendations with little dissent among the six members of the commission, until the final two recommendations where a split decision regarding the option of special schools (SS) for persons with disability (Royal Commission into Violence, Abuse, Neglect, and Exploitation of People with Disability, 2023). The impetus for this paper was born out of this contentious outcome—the phasing out or the continued availability of these highly specialized schools. This debate is not new within the special education and inclusive education communities, still, the Commission's report raises the profile of the debate in Australia, as it raises issues around the successes and challenges of implementing fully inclusive education in mainstream education settings. This paper seeks to understand specialized schools within a dynamic, complex, and nuanced inclusive education network including education policies, documents, and guidance provided by international, federal, state, and local stakeholders; research-based practices; pragmatic considerations; and the long-standing *de facto* school choice operating in Australia. To achieve those goals, we frame the problem by introducing the findings of the Disability Royal Commission and the resulting public opinion, describe the current Australian special and inclusive education policy and context, and examine international policy regarding inclusive education. We then discuss the inclusive education/special schools debate and close with recommendations for future practice and policy.

2 Recommendations of the Royal Commission regarding special schools

In 2019, The Disability Royal Commission was established to investigate violence, neglect, abuse, and exploitation of people with disability. The Royal Commission also scrutinized the best way to promote a more inclusive society that supports people with disability to be independent. Regarding education, the Royal Commission agreed that significant changes in supports and adjustments for students with special education needs in Australian schools were needed and the status quo should not be maintained. Across 15 overarching recommendations, strategies were proposed to address low expectations, lack of understanding about disability and related behaviors, bullying, limited participation in school communities, and the inclusion of First Nation and culturally diverse students.

Early in the report, the commission defined segregation as:

> …the circumstances where people with disability live, learn, work or socialise in environments designed specifically for people with disability and are separate from people without disability. Segregation occurs when people with disability are separated and excluded from the places where the community live, work, socialise or learn, because of the person's disability (p. 7)

However, the Commission made the distinction that,

> Segregation does not occur in spaces where people with disability choose to come together, share culture and values, seek support for their individual needs, or are encouraged and supported to engage with the broader community. These are the same choices available to people without disability (p. 7).

Participation in SS can be interpreted through both definitions and illustrates the nuanced complexity of this debate.

Recommendations 7.14 and 7.15 openly evidenced the divergence of the commissioners' opinions on fully inclusive education and illustrated the tensions that lie in the larger disability community and its stakeholders. Recommendation 7.14 outlined the differences, with Commissioners Bennett, Galbally, and McEwin urged for the eventual elimination of specialized schools, citing that nearly 30% of students with disability are educated in specialized or segregated settings and the figure is growing. Instead, they proposed that no students shall be enrolled in a specialized setting by 2051. Recommendation 15, set out by The Chair (Sackville) and Commissioners Mason and Ryan, delineated "an alternative approach," whereby a greater intentional collaboration between mainstream and non-mainstream schools be sought when feasible and appropriate and students be encouraged to move between the two types of schools, recognizing the role each type of school can play in providing educational supports for students with disabilities (Royal Commission into Violence, Abuse, Neglect, and Exploitation of People with Disability, 2023). Under the direction of the Minister for Social Services, a federal task force will study all recommendations and solicit further submissions with work ending mid-2025.

3 Reactions to Royal Commission's findings and recommendations

Directly following the Royal Commission's report, the Australian media was rife with items showcasing the importance of special schools to students with disability and their families. The Age had a collection of letters from parents and teachers supporting the retention

of special schools, using the justifications that: the infrastructure in public schools is not able to provide specialized supports such as very small class sizes, medical care for students who require tube feeding, catheters, oxygen, physical therapists and other specialized stuff; and teachers do not have the training or capacity to provide support for students with high support needs while teaching the rest of the class. Parents were the most vocal group about keeping special schools (Campanella, 2023; Loney, 2023), expressing fears that mainstream schools would not be able to meet their children's needs. Additional stories featured parents who would be happy to endorse, if special schools were left alone. For example, Ed Croft from Western Australia, the father of a son with intellectual disability, autism, and behavioral issues, felt the choice should be available to access the education which was the best fit for their child. Croft is also a teacher and characterized complete inclusive education as "pie in the sky stuff" (Loney, 2023).

Adversely, some interviewees, including people with disability, parents, and politicians (Loney, 2023; Quail, 2023) felt the Commission's decision to "phase out" special schools over the next 28 years was too lengthy a period and only served to perpetuate segregation for another generation of school children with disability. Most did acknowledge that a major overhaul to mainstream education would be necessary to make it happen, with some even calling full inclusion an unlikely "pipe dream" due to the expense and capacity issues.

One solution to the debate mentioned in the letters section of *the Age* (2023, October 3) was to keep special schools but co-locate them with mainstream schools, so that students in special schools could participate in activities with neurotypical peers. While this is regarded as another category of segregation, it may be a preliminary solution while changes are made to the current education system. Capacity is another issue for scrutiny, as the current teacher corps (and shortage) could not maintain the proposed seismic change of full inclusion.

4 Australian context

4.1 Students with disability in Australia

Based on the Australian constitution, states and territories are responsible for the education of the school aged children within in their jurisdiction, including students with disability (Savage, 2020). In 2023, there were 4,086,999 students enrolled in Australian schools with nearly 1 million students (24.2%) with a disability receiving a type of adjustment. The four main recognized categories of disability include: (a) cognitive, (b) physical, (c) sensory/speech disability, and (d) social–emotional, with four levels of adjustments available: (a) support with Quality Differentiated Teaching Practices (QDTP), (b) supplementary, (c) substantial, and (e) extensive (Nationally Consistent Collection of Data on School Students with Disability, 2019). Descriptors of each of these levels of adjustment can be found at https://www.nccd.edu.au/sites/default/files/h5p/content/167/docs/endorsed_levels_of_adjustment.pdf (Nationally Consistent Collection of Data on School Students with Disability, 2019). Across categories of disability, 7.3% of students received adjustment with support with QDTP, 10.4% with supplementary adjustments, 4.3% with substantial supports, and 2.2% with extensive supports. Nine out of 10 students with a disability attended a mainstream school (Australian Bureau of Statistics (ABS), 2023) and over half of students received adaptions or supports. The disability which most impacts a student's educational adjustments is used for reporting purposes and the loading used for funding purposes, which consigns the possibility for underreporting across categories (Australian Curriculum, Assessment and Reporting Authority (ACARA), 2023). Even though federal and state policies exist to support students, they remain porous as the mechanism for ensuring policies is deficient, leaving one-third of students with disabilities reported needing additional support currently offered and some families seeking alternative educational settings (Australian Bureau of Statistics (ABS), 2023).

4.2 Specialized schools

Specialized schools are possible based on Section 6 of the Australian Education Act (AEA; 2013). The AEA defines a special school as a school that: (a) is, or is likely to be, recognized by the State or Territory Minister for the school as a special school; and (b) provides education under special programs, or special activities, designed specifically for students with disabilities. Specialized schools in Australia vary in foci and types of supports provided. The MySchool website includes 421 special schools (SS) and 96 special assistance schools (SAS) Australia-wide (Australian Curriculum, Assessment and Reporting Authority (ACARA), 2023). These types of school cater to 12% (or 45,000) of all students with a disability in Australia. Special schools typically focus in specific disabilities, such as autism or vision/hearing impairments, however some enroll students based on the level of support they require to be successful educationally. While some SS teach the same curriculum as their mainstream counterparts, others are focused on a life skills curriculum, which provides options for students with disability who cannot access the regular course outcomes, particularly students with an intellectual disability.

Special schools only enroll those students with disability, while special assistance schools (SAS) have a wider brief under the AEA. Further, SAS schools can also include students with disability in addition to the difficulties outlined under the AEA, which defines a special assistance school as a school that: (a) is, or is likely to be, recognized by the State or Territory Minister for the school as a special assistance school; and (b) primarily caters for students with social, emotional or behavioral difficulties.... (Australian Education Act 2013 Sect. 6).

Special assistance schools materialized from a need to support students who were disengaged and disenfranchised in their mainstream schools. Typically small, with less than 150 students, SAS meet the same learning outcomes as students in mainstream schools but in a specialized manner. For example, instead of sitting year 12 exams, students produce a portfolio of their work. Individualized wraparound services, such as counsellors, social workers, and art and music specialists are also provided (Chernaya Pexels, 2023; Gately, 2023; Henebery, 2023). Student enrolment in SAS has steadily been increasing from 3,353 in 2014 to 13,100 students in 2022, which maybe a reflection of mainstream classrooms' inability to meet student need but are ineligible based on SS enrolment guidelines.

Government schools represented the largest number of special schools ($n = 355$; 67.6%) with 170 (33.2%) non-government schools. Queensland and Tasmania have a greater number of non-government special schools, while the remaining states either reflect the overall national percentage or rely more heavily on the government to provide

specialized schooling, particularly in VIC, WA, ACT, and NT. The average enrolment is 109 students, ranging from 12 to 1,026 and (Australian Curriculum, Assessment and Reporting Authority (ACARA), 2023), which reflect the complex student needs, geographical challenges, and jurisdictional capacity to support students with disability.

For example, the school with the largest enrolment is a non-government SAS and does not charge tuition. The SAS "caters specifically for children and young people who have disengaged from mainstream education and are not participating in vocational and education and training or employment" (Independent Schools Queensland, 2021, para. 1). However, specialized schools with such large enrolments are unique. The school with the lowest enrolment opened in 2021 and caters for 12 students aged 5–18 with high needs autism (ASD 3). It is an independent school located in Victoria and is fee charging (up to $16,000 per year) (Lyrebird College, 2023).

Using the MySchool data for 2023, Figure 1 provides a visual representation of SS geolocation within Australia. The clustering of SS near capital cities and metropolitan areas is not surprising, still SS can be found in the most remote areas of the country.

4.3 Mainstream schools

The ability of mainstream schools to meet the needs of students with disability, underscored in the Royal Commission's report, is illustrated by some students with autism (Roberts and Webster, 2020). The rapid increase of students with disability enrolled in mainstream schools over the last 20 years resulted in a lack of capacity of school leaders and staff to create autism friendly cultures and implement evidence-based practices. Despite extensive research in autism, stakeholders feel that these students' needs are still not adequately met within mainstream schools, and there is a need for a proactive and responsive approach to support them effectively. Many school staff lack the knowledge and expertise to support students in their learning, address social and emotional needs, and schools do not always have the capacity to translate research and knowledge into practice (Saggers et al., 2019).

5 Inclusive education policy infrastructure

The Royal Commission's Recommendations for Education are bound in international agreements, federal and state education policies and guidelines, and the implementation at the individual teacher level. This policy milieu also sits alongside (and in competition with) other reform agendas (e.g., literacy, STEM, mathematics, and student well-being).

5.1 International agreements

Contemporary policy structures date back to 1990 with *United Nations Convention on the Rights of the Child (CRC)*. The CRC articulated the rights and needs of children detailed in universal terms, including educational needs and that children should not encounter discrimination based on a disability (UNICEF UK, 1989; Fass, 2011). In 2008, the *United Nations Convention on the Rights of*

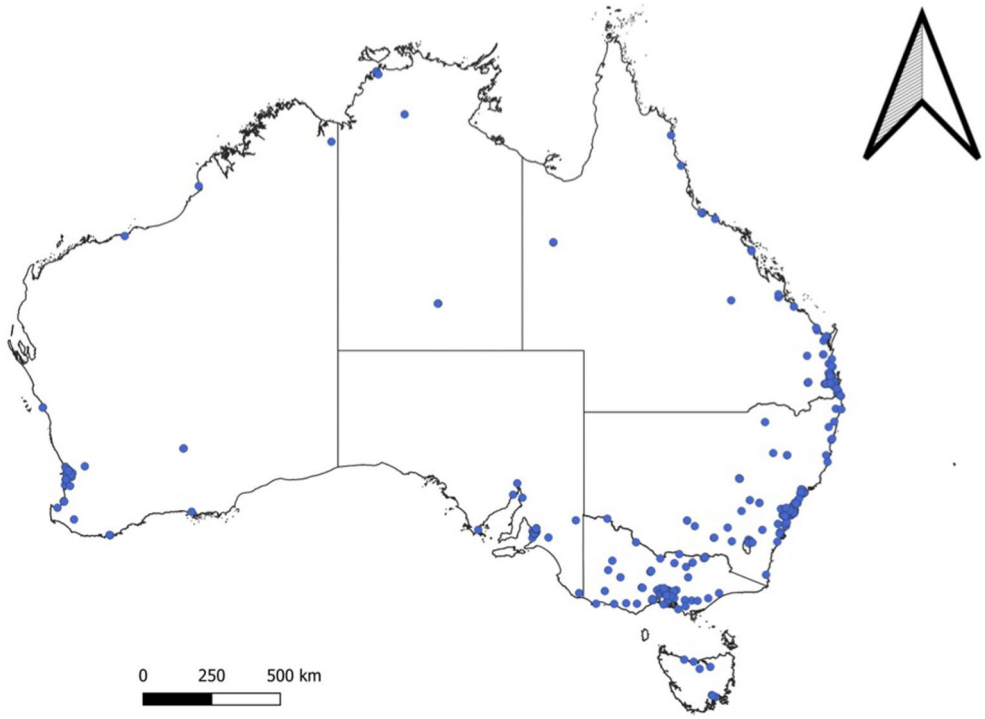

FIGURE 1
Geolocation of Australian specialized schools.

Persons with Disabilities (CRPD) recognized inclusive education as an international human right for person with disabilities, which Australia is a signee [see Lassig et al. (2022) for a review of Australian states and territories alignment with CRPD]. In 2016, additional language provided in Article 24 articulated the parameters of inclusive education including the role of parents stating, "education is the right of the individual learner, and not, in the case of children, the right of a parent or caregiver. Parental responsibilities in this regard are subordinate to the rights of the child" (CRPD Committee, 2016, para. 10). Article 24 also included the concept of 'reasonable accommodation" to address the individual's needs.

5.2 Australian federal and state legislation and guidance

Although Australian states and territories are responsible for educational provisions, federal entities, such as the Australian Government Department of Education Skills and Employment, construct educational policies and distribute funding to aid students with disabilities (Chambers and Forlin, 2021; Lassig et al., 2022). The federal government has also provided legislative measures to protect Australians with disabilities, including The Disability Discrimination Act 1992 (DDA)[1] and the Australian Government (2005), which was created to offer greater guidance as to the education and training obligations in the DDA.

Additional declarations/agreements have been issued in support of the education of all Australian children. Ministerial Council on Education, Employment, Training and Youth Affairs (2008) and more recently, The *Alice Springs (Mparntwe) Education Declaration*, further recognized that "Australian Governments commit to ensuring the education community works to provide equality of opportunity and educational outcomes for all students at risk of educational disadvantage" (2019, p. 17). In 2013, the *Nationally Consistent Collection of Data on Schools Students with Disability* (NCCD) was instituted to systematically collect data from schools across Australia to determine eligibility for funding for educational support. Additional federal reforms included the *National Disability Strategy* and the *National Disability Insurance Scheme (NDIS),* strengthening the ways in which persons with disability are supported. For schools and teachers, these policies are intended to provide pathways for reasonable adjustments and access to the curriculum through the equity of opportunity and through the application of differentiated instruction pitched at the, "right measure of individual support and educational intervention provided" (p. 10). The DDA and DSE largely provide the legislative framework for each state and territory, underscoring their approach for supporting students with disability.

In agreement with federal laws, states and territories provide education approaches and funding based on the contextual needs of students with disabilities. For example, SS in New South Wales, are Schools for Specific Purposes (SSPs), which "provide specialist and intensive support in a dedicated setting for students with moderate to high learning and support needs" (para. 1). Additional setting designations are provided for students with moderate intellectual ability, severe intellectual disability, and significant physical disability or significant health conditions requiring additional supports from health professionals and exist in primary or secondary schools. Other settings also provide for students with behavioral disorders, conduct disorders, and emotional disturbance (Department of Education, 2023).

The right to an equitable public education and educational support services in Australia are outlined and highlighted in several national and international policies. Carrington et al. (2024) conducted a policy review informed by the UNESCO guide for policy analysis and based on the social model of disability and CRPD definition of inclusive education and determined that policies should have a consistent definition of inclusive education and require and support all schools to be inclusive schools. Adversely, the results of a literature review conducted by Lindsay and Edwards (2013) suggested that educational policies should not be about choosing one system over the other but rather about finding ways to optimize both systems to serve today's diverse student populations effectively.

5.3 Initial teacher education

Strong Beginnings: Report of the Teacher Education Expert Panel, a review of existing teacher education programs in Australia, consultations with stakeholders, and the synthesis of evidence-based practices in education, both in Australia and internationally focused on strengthening initial teacher education programs and improving the quality of practical teaching experience in Australia (Teacher Education Expert Panel, 2023). While the report does not directly address the issue of or recommend the elimination of special schools, the importance of preparing beginning teachers to address the diverse and complex needs of students in modern inclusive classrooms. The report underscored evidence-based practices and the understanding and valuing perspectives of diverse groups, which supports the foundations of specialized education for marginalized students, including those in special schools.

6 The special school controversy

A nearly 20-year on-going debate persists, particularly since the publication of the CRPD in 2006, over the appropriateness of segregated special education classes and schools for students with varying degrees and types of disability. Those who argue for a fully inclusive education system often cite the benefits of inclusive education for all students (Boyle and Anderson, 2020; de Bruin, 2022; Krämer et al., 2021), which provides a more equitable learning environment, promotes social integration, and better prepares students (both with and without disability) for their diverse post-school life. Additionally, these academics argue that inclusive education can lead to better outcomes for students with disability, as they have access to the same curriculum and resources as their peers and can develop important social and academic skills, resulting in an inclusive education reform movement. Additionally, the findings of a study by Dell'Anna et al. (2020) were moderately in favor of inclusion for students with moderate, severe and complex disabilities in the areas of improved behavior, academic achievement and adaptive skills. They also found that although inclusive settings offer more access to instructional time and peer interaction, students experienced marginalization during class activities and social isolation within the peer group.

1 https://www.legislation.gov.au/Details/C2021C00134

Education reform movements often look outwards for solutions to perceived and real problems (Ruby and Li, 2020). Policy borrowing without consideration of contextual similarities and differences often leads to failed or partially implemented initiatives or painful rollouts that are mostly felt by school personnel and students. While Nordic countries (e.g., Denmark, Sweden, Norway, and Finland) are identified as flag bearers of the practice, inclusive education is aligns with their egalitarian societies and approaches to education. Still, Nordic researchers report greater understanding of inclusive special education is needed (Keles et al., 2024). Keles et al. (2024) conducted a scoping study on inclusive education and found most studies were qualitative, from Sweden, and actual inclusive practices were underrepresented in the literature. Keles et al. (2024) further found inclusive education was not well-defined or understood as a practice. While sentiment for the inclusive education may be high, the appetite for a total implementation without macro and micro- considerations, including competing policies and procedures (i.e., priority, funding), contradictory research evidence, level of student support needed, teacher capacity, school resources, etc. reflects the ongoing misalignment between policy and practice (and ideological differences) (Ferri, 2017; Savage and O'Connor, 2019).

A recent meta-analysis found that inclusive settings were more beneficial for students with general learning disabilities than segregated settings (Krämer et al., 2021). The meta-analysis included 40 studies from Austria, Canada, Denmark, Finland, Germany, Israel, Poland, Slovenia, Switzerland, and the United States. The researchers found a small to medium positive affect on cognitive outcomes for students with general learning disability (GLD) attending school in mainstream settings and no effect on psychosocial outcomes.

Studies such as the one by Krämer et al. (2021) are often referenced as evidence to support inclusive education. Under greater scrutiny, there are several points to consider. First, when interpreting the significance of this study is the inclusion criterion of studies that included students with GLD, which were defined in a few ways, including having an IQ between 60 and 90 and having difficulty in more than one class. The authors intentionally excluded students with emotional and behavioral (EBD) and more severe disability, as earlier studies suggested that students with both of those conditions exhibited poorer academic and social outcomes in inclusive settings than in segregated settings. Krämer et al. also mentioned that the inclusion of students with EBD has been known to have negative effects on typically developing students in mainstream settings.

Second, the authors acknowledged that although students with GLD may benefit academically from receiving their education in mainstream settings, there are potential disadvantages, such as higher expectations not in alignment with students' performance levels could cause frustration and demotivation. The typically larger class sizes of mainstream classes may limit the amount of individual support a teacher can provide to students and cause students with disability to become overwhelmed (Krämer et al., 2021).

6.1 Philosophical disagreements

Overall, support for inclusive education is wide-ranging, but this sentiment is in opposition to several contradictory realities, including school choice, which remains a central and founding tenant to the Australian school system based on the historical way in which schooling (and school funding) matured in Australia. Australia's three schooling sectors—government, Catholic, and independent systems—operate parallel to each other and all receive federal funding (Barcan, 1980; Australian Department of Education, 2023). The distribution of federal funding also includes supplementary apportionments for students with disability that are available to all school sectors. A fourth "sector," which evidences the fastest growth in Australia, is home education or homeschooling, which includes families and their children with disability. Australian parents (and those globally) cite traditional schools' failure to meet their child's needs (Forlin and Chambers, 2023; Jolly, 2022).

Special schools are considered a school choice, however, whether parents are presented with an informed and genuine choice continues to be debated (i.e., special school versus mainstream school) (Mann et al., 2015). Iacono et al. (2019) noted, "The issue is whether these alternatives provide families with true choice, or the only option if their children's needs are not accommodated in mainstream schools" (p. 265).

Gatekeeping as described by Poed et al. (2022), noted that teachers and allied professionals' suggestions to parents that "segregated" environments were the best option for their child were in violation of Article 24 and contradictory to research evidence. While gatekeeping does occur, what is a reasonable accommodation (as noted in Article 24) remains contested, due to complexity and nuance around the decision-making process for individual students. One-third of special schools are already provided by the non-government sector (Australian Curriculum, Assessment and Reporting Authority (ACARA), 2023), while some are non-fee-paying schools—others operate as fee paying even after the disability subsidies are applied. Home education, which grew exponentially after COVID, remains a realistic alternative for parents dissatisfied with inclusive education, as some parents found that their child with disability ended up thriving in a home environment (Heyworth et al., 2021).

Those who argue for keeping special schools and classes as options on the inclusive education continuum point to the need for specialized support and resources for some students with disability. Further complicating special education services in Australia is the move away from a medical model of special education to a social model. Rather than providing a targeted intervention as in the medical model, the social model posits acknowledging and withdrawing barriers that make life more difficult for those persons with disability (de Bruin, 2022). While those who argue for special schools also believe that mainstream classes are appropriate and desired for most students with disability, they assert that some specialized settings are necessary to provide a safe and supportive environment. In these settings, students have access to individualized attention and support from teachers and staff who have specialized training. Additionally, special schools can provide a sense of community and belonging for students with disability to connect with peers who share similar experiences and challenges (Duncan et al., 2020).

Some of the most vocal proponents of special education and the place of special schools in the continuum of inclusive education are Hornby and Kauffman (2023). The overarching myth (and the focus of their paper) was that only full inclusion can bring true social justice and effective education for students with disabilities. The second myth Hornby and Kauffman debunk is that full inclusion is the accepted standard of education internationally. Rather, these researchers suggest that the intent of the *Salamanca Statement* (United Nations

Educational, Scientific and Cultural Organization (UNESCO), 1994) is that most children with disability be included in education systems, but a minority would still need to be educated in special schools or classes within mainstream schools.

Extensive evidence supporting inclusion as more effective than special education is disputed, even in countries, such as Canada and Italy, which implement full inclusion. Imray and Colley (2017) argue the lack of published studies evaluating full inclusion effectiveness but also news stories calling for a review of full inclusion policies.

Ainscow et al. (2019), outspoken inclusionists, recently acknowledged the challenges involved in fully implementing inclusive education, including the complexity of transformations required to close the discourse between inclusive educational research and practice. While they argue that inclusive education can be achieved if mainstream schools become capable of educating all children in their local communities, they also concede that there are many barriers to this actually happening. This suggests special schools should remain on the continuum of educational supports to provide a more focused and tailored approaches to meeting the diverse needs of students with disability.

6.2 Australian literature supporting full inclusion

The Australian literature largely supports the full inclusion model as a fundamental right for all students with disability and makes the argument that anything short of full inclusion is unacceptable, as it violates the rights of students with disabilities. Boyle and Anderson (2020) contended that segregated education in Australia is perpetuated by the current educational climate, which is influenced by contextual challenges in the educational landscape, such as governance issues, educational reform agendas, standardized tests, and school ranking systems. Additionally, they claimed that education in Australia is influenced by neoliberal principles, hindering the progress of inclusive education, and argued that only inclusive education can provide quality education for all students and contribute to the achievement of educational, social, and economic equity, aligned with the principles outlined in the *Alice Springs (Mparntwe) Education Declaration*.

de Bruin (2022) agreed with Boyle and Anderson (2020), maintaining that inclusive education was an effective model for all students and rooted in human rights principles and research findings. Another of deBruin's arguments focused on *The Universal Declaration of Human Rights* (United Nations, 1948), which declared education to be a right of all children without exception, laying the foundation for inclusive education. Additionally, a series of treaties and guidance documents from the United Nations have articulated a clear preference for young people with disability to be educated in the general education system. She also claimed that Australia can achieve full inclusion by overcoming historical influences to achieve genuine systemic reform towards inclusive education. Like Boyle and Anderson, deBruin postulated that factors such as attitudinal barriers and the lack of teacher preparation for diverse student cohorts were some of the main barriers to ending educational segregation.

Cologon (2022) blamed the continued presence of special schools on a lack of agreement on the definition of inclusion, with many misinterpreting the term as conditional. This was related to the common mindset that educators must make special affordances to support students with disability instead of the ideal of school systems recognizing neurodiversity as a human condition and being set up to meet the needs of all students. Cologon gathered family stories to provide insights into the experiences of children with disability and discovered that when systems view inclusion as assimilation, it led to families always having to fight the perception that inclusion is a privilege, not a right. She also claimed that rather than preventing bullying, special settings such as special education classrooms or schools increased bullying, due to the segregation of those settings.

To combat the argument that inclusive mainstream settings are less beneficial for students with severe disabilities/complex support needs, Cologon (2022) cited research findings that demonstrated positive outcomes for this population when educated in inclusive environments, including benefits in academic development, communication, and behavioral and social development. Inclusive education also had benefits in maintaining and generalizing learning and had been shown to also benefit students without disability by creating diverse learning environments that foster empathy, understanding, and respect for individual differences.

A national survey conducted in Australia found over 70% of families reported experiencing gatekeeping or restrictive practices, which were widespread across all levels and types of schools and for all types of disability (Poed et al., 2022). Gatekeeping included leaders of a mainstream school suggesting that a student may do better in a special school. Restrictive practices included partial attendance strategies, physical, chemical, and mechanical restraint, and seclusion and have been known to cause psychological trauma, student injury, staff absenteeism, and even student death (Poed et al., 2022). The article highlighted that these practices are in breach of Australia's obligations as a signatory to the UN Convention on the Rights of Persons with Disabilities.

According to inclusion advocates, the current education system in Australia fails to provide equal opportunities for students from disadvantaged backgrounds, leading to increased segregation and disparities in educational outcomes (Anderson and Boyle, 2019). The responsibility for inclusive education is left to individual states and territories, resulting in inconsistencies and the absence of a national consensus on how to best support students with disabilities. Additionally, the lack of standardized assessment criteria made it challenging to measure the success of inclusive education initiatives in Australia. Five years ago, Anderson and Boyle (2019) called for a national approach to inclusive education in Australia, emphasizing the need for systemic changes to create a more equitable and inclusive education system for all students. They also called for Australia to recommit to the principles of the Salamanca Statement and work towards establishing a nationally accepted understanding of inclusive education. Similarly, Poed et al. (2022) called for targeted interventions and policy changes to address gatekeeping and restrictive practices to ensure that Australian students with disability have the equal access to education in inclusive, safe, and effective learning environments, in alignment with the CRPD.

6.3 Australian literature supporting special schools as part of inclusive education

Several Australian scholars, such as Duncan et al. (2020) opposed the full inclusion stance. Their scoping review of the effectiveness of the Disability Discrimination Act (1992) and the Australian

Government (2005) in eliminating discrimination against students with disability in Australia found that special schools have a place in the context of inclusive education in Australia. The results of the review suggested that special schools can offer tailored programs with specially trained educators and staff to address the individual needs of students with disability whose needs are simply not being met in inclusive mainstream classrooms. They also highlighted the challenges faced by remote or rural schools in providing inclusive education in mainstream settings, due to limited resources and access to specialized support by trained educational professionals.

While proponents of a solely mainstream education model argued that the model was crucial to meeting the social needs of students with disability, Heyworth et al. (2021) highlighted the importance of flexibility and autonomy for autistic children in educational settings. They pointed out that although interactions with peers can enhance motivation and improve academic outcomes, during lockdown many students with autism flourished, despite a lack of support for friendships. This was attributed to the close relationships that students had with their parents and contradicted the argument that only mainstream schooling can provide students with peer social support. Connected, trusting relationships can be formed in a variety of ways and in a variety of settings.

Lindsay and Edwards (2013) found that although inclusive education was associated with positive outcomes for students with disability, there were many challenges when it comes to implementing it. Teachers needed appropriate training and access to adequate resources. A shift in societal attitudes towards disability also needed to shift. Without these necessities in place, special schools were necessary to provide the specialized supports required by students with disability to be successful academically and behaviorally. These missing links were often felt by parents and the students themselves, which was evident in the popular literature immediately following the outcome of the Royal Commission.

6.4 International literature

When compared to the Australian literature, the international literature is more supportive of including SS in the inclusion continuum. While Kauffman et al. (2022a) advocate for inclusion in public education for most students with disabilities, they embrace the current shift towards focusing on the quality of instruction, individuals' needs, and learning outcomes rather than just being present in the classroom, or what they term "bodily inclusion." They criticize the notion that general education teachers can adequately deliver special education to students with disabilities in large and diverse classrooms, noting special education should not be considered less specialized to the extent that it can be effectively provided by generalist teachers. The authors stress the complexity of teaching diverse groups of students and the need for specialized skills in addressing the educational needs of students with disabilities.

Kauffman et al. (2022b) cautioned against the idea of full inclusion without special education, stating that it may detach from reality and reason, advocating for a balanced approach guided by science and rationality. They urge educators to uphold enlightened definitions of science, reason, truth, justice, and democracy, emphasizing the benefits of science and rationality for the effective teaching of students with disability. The importance of teacher and parent perceptions and preferences cannot be overstated in the inclusion conversation. Studies show mixed teacher attitudes towards inclusion (Savolainen et al., 2022), with factors like the nature of disabilities, experience with inclusive education, and cultural variables influencing teachers' perspectives.

Kauffman et al. (2022a) argue that parents of students with disabilities have played a crucial role in establishing policies, facilities, and services to ensure appropriate education for their children. Their advocacy and individual needs should be honored with a range of placements available for them to choose from, rather than enforcing full inclusion in mainstream classrooms. Kauffman et al. (2019) discussed why some students with severe disabilities are not placed in general education classrooms. They emphasized that the curriculum and intensity of instructional interventions needed for students with severe disabilities differ significantly from those in general education and argued that some students require specialized instruction focusing on fundamental skills like functional communication, self-care, and mobility, which may not align with the general education curriculum. While acknowledging that some students with severe disabilities can learn advanced content consistent with the general education curriculum, they highlighted the importance of individualized education that aligns with the student's unique needs and goals for the future. Overall, Kauffman et al. (2019) suggested that effective instruction for students with severe disabilities may often require specialized settings with specially trained teachers who can deliver intensive instruction. They also addressed the importance of considering context, the law, and scientific evidence in making placement decisions for students with severe disabilities, advocating for individualized approaches rather than a universal mandate for inclusion in general education classrooms.

Much of the international literature recognizes the continued relevance of special schools (Kauffman et al., 2022a, 2022b; Lindsay and Edwards, 2013). While inclusive education is often portrayed as the ideal, special schools play a crucial role in the current educational landscape. They offer a specialized environment where students with disability can receive individualized supports in educational programs tailored to their needs (Lindsay and Edwards, 2013).

7 Implications for future practice and policy

The recommendations provided in the text aim to address the challenges and gaps identified in achieving non-discrimination for students with disability in Australian primary and secondary education. Rather than propose a system of schooling (Recommendation 7.14) that will never eventuate due to an absence of consensus (philosophical and empirical) around the approach, federal and state/territory education funding lacking in priority, and pragmatic considerations (e.g., initial teacher education, teacher shortages), why not address and strengthen processes and practices that already exist? The following recommendations are organized by system, school, teacher, and family levels.

7.1 System-level recommendations

System-level administrators should ensure that the policies and practices within educational institutions are in alignment with the

Disability Discrimination Act 1992 and the Australian Government (2005) and the United Nations Convention on the Rights of Persons with Disabilities (Poed et al., 2022). This ensures that the legal requirements for non-discrimination are integrated into the daily operations of schools. Poed et al. (2022) also highlighted the importance of ensuring that all students, regardless of their needs, have access to high-quality education that meets their individual requirements. This makes a case for the existence of special schools, giving students and families a choice, thereby fostering self-determination.

Greater empirical evidence is required to inform decisions regarding policy, processes, and guidance. For example, data reporting could be improved. Currently, the lack of disaggregated NCCD data for tiered assignments across the four disability categories in primary and secondary mainstream and specialized schools is a barrier to understanding the impact of this support. Additionally, no data are kept regarding the longitudinal outcomes for students with disability in either specialized school or mainstream school setting. This could be a rich data source to understanding how these different settings impact students over time.

7.2 School-level recommendations

Primary and secondary school principals should undergo mandatory professional learning sessions to enhance their understanding of and ability to meet the obligations of education providers under the Act and the Standards. This training equips principals with the knowledge and skills necessary to ensure compliance within their schools (Duncan et al., 2020; Roberts and Webster, 2020). School leaders should also ensure that the Act and the Standards have easily accessible supporting documents and training resources available for use in schools. This accessibility facilitates understanding and implementation of the legal framework by educators and staff (Duncan et al., 2020).

A whole-school approach that adopts a multi-tiered system of support model that includes family involvement, environmental modifications, staff awareness, and individual supports is recommended (Kauffman, 2021; Roberts and Webster, 2020). Such an approach can help in creating a more inclusive environment by offering a range of supports within general education that cater to students' diverse needs, potentially reducing the need for separate special education placements. Schools should adopt a holistic approach, as providing various levels of support tailored to the diverse needs present in today's classrooms, along with external collaboration from specialists, support staff, allied health professionals, and external agencies, is essential in a proactive and responsive manner to support not only the students but also educators and families effectively.

7.3 Teacher-level recommendations

Initial teacher training programs should include comprehensive instruction on the application of the Act and the Standards within the classroom context. This training ensures that teachers are well-prepared to support students with disability and implement necessary accommodations.

Ongoing teacher registration processes should include evidence of teachers' capacity in understanding and applying the Act and the Standards. This requirement ensures that teachers maintain their knowledge and skills in supporting students with disability effectively. Caution must be used when considering a single special education teaching endorsement for all levels of instruction and all types of disability, as we must question the adequacy of generic teaching skills for meeting the diverse needs of students with disability (Duncan et al., 2020).

7.4 Family-level recommendations

National free-of-charge standardized online learning modules should be made available to parents of students with disability. These modules should comprehensively explain the rights of students with disability in schools and assist parents in navigating the legal requirements associated with non-discrimination. This empowers parents to advocate for their children and understand their educational rights. Information regarding the different types of schools available should be provided to students and their families so that they can weigh their options and make informed decision about where the student with disability should receive their education. The student voice in decision making and all supports provided is critical. This will help to foster a sense of self advocacy and self-determination.

These recommendations emphasize the importance of aligning policies and practices, providing necessary training and resources, and ensuring that all stakeholders involved in the education of students with disability are well-informed and equipped to support inclusive and non-discriminatory practices in schools.

8 Conclusion

Many of the authors cited in this manuscript who favored full inclusion, cited policy particularly the UN Rights of the Child, as evidence for inclusive education. Policy is often based on a philosophical or ideological position, rather than research. Additionally, those who work in the educational research focused on students with special needs often take the role of researcher/advocate (Hopkins et al., 2022; Stephenson and Ganguly, 2021). Maintaining objectivity and limiting bias is paramount in communicating results (even those not aligned with our ideological or epistemological stance) when conveying evidence-based practices to pre-and in-service teachers and administrators. As Kauffman et al. (2022b) advised science should guide the work, not ideological debates or personal experiences.

We could not locate any empirical studies that provided evidence to support the idea of full inclusion in mainstream classes for all students. It is notable that articles on full inclusion of students with severe/profound disabilities are largely philosophical and qualitative (with small sample sizes). None recommend any concrete practical strategies for implementation. This highlights the oversimplification of inclusive education, rather than the recognition of the complexities and demanding nature of teaching diverse student populations with individual needs and the preferences/perspectives of teachers, parents, and the students themselves.

The review of popular literature undertaken here clearly shows that many students and their families benefit greatly from special classes and schools and show a clear preference for those settings. While full inclusion is the ideal that we should all strive for, we must not mandate such an arrangement at the detriment to our most vulnerable students. Historically, the fight for free and appropriate education for all students, including those with disability has been long and contentious. By eliminating some of the most specialized supports, special education would regress by decades. We would like to suggest that the conceptualization of inclusive education include special classes and schools, as well as other settings that provide individualized specialized supports for students with disability.

Inclusive education remains a point of controversy even within the Royal Commission committee. This schism reflects a narrow and exclusive view of inclusive education that is outdated and built on a foundation that has cherry-picked findings or drawn from societies which are quite dissimilar to Australia's (e.g., Finland). Incongruously, this vision does not support all learners found in contemporary classrooms, particularly classrooms where students representing wide-ranging and complex learning needs. Specialized schools have become an expectation of parents, particularly for those families who have found little educational relief for their children in mainstream schools.

We propose that inclusive education as discussed by the Royal Commission and its allies is a relic of the past and that educational systems includes specialized schools, mainstream schools, and even by extension schools devoted to the development of special talents such as the arts, sports, and academics. School systems require a litheness and flexibility to account for wide-ranging student learning profiles, including varied programming and services to reflect learning trajectories which are often not linear or progress at the same rate.

The distinctiveness of the Australian schooling (which is often its Achilles heel) are the three school sectors working in parallel. Independent (and to a lesser extent Catholic schools) have the ability to market themselves as filling the breach left by government schools' perceived or actual failings. Independent schools enrollment has grown 14% in the past 5 years, while enrollments in the government schools evidence little growth (Australian Bureau of Statistics (ABS), 2023). Parents who have the means will seek out schools who can address their child's needs, exacerbating issues of equity already evident in Australian schools and society.

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How did educational institutions respond to students with special needs during COVID-19: considerations for policy?

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This bibliometric study analyzes the scientific production on the educational response of institutions to families with children with special educational needs (SEN) during the COVID-19 pandemic. The research identifies emerging trends and distinctive characteristics, providing a foundation for improving strategies in schools. The analysis reveals an increase in publications from 2020 to 2023, peaking at 24 articles in 2022. A total of 246 researchers participated, with Castro-Kemp S and McIntyre LL standing out for their productivity and citations. Institutions such as UCL and the University of Oregon led in publications, while the University of California, Santa Barbara, topped the citations. In terms of scientific production, the United States had the most articles, followed by the United Kingdom and Spain. However, the United Kingdom led in global citations, indicating a high level of interest in the topic. The main journals in this field include Frontiers in Education and Education Science. Twelve collaboration networks among authors were identified, with a primary network of seven closely collaborating researchers. The pandemic exacerbated pre-existing difficulties in the education of children with SEN, increasing stress and emotional burden on parents. The transition to home education and the lack of adapted resources presented significant challenges. However, some strategies, such as dialogic literary gatherings and collaboration between schools and families, proved effective in mitigating negative impacts. The study underscores the need for inclusive public policies that address disparities in educational support and prioritize the psychological well-being of children with SEN. It recommends a proactive and equitable approach in school psychology training and educational practice. In conclusion, this analysis provides a solid foundation for future research and improvements in schools, promoting an inclusive and resilient educational environment.

KEYWORDS

COVID-19, pandemic, families, disability, inclusive education, bibliometrics

1 Introduction

The COVID-19 pandemic has had an unprecedented impact on multiple sectors worldwide, with the education sector being one of the most severely affected (Martínez and Bañón, 2020). Government measures to contain its impact, such as closing playgrounds, public parks and schools were crucial in mitigating the spread of the virus (Kim and Asbury, 2020;

Viner et al., 2020). This closure had significant consequences that affected teachers, students and families.

The COVID-19 pandemic therefore marked a turning point in education, as distance learning became essential (Canning and Robinson, 2021). This new situation brought major challenges, particularly for those with special educational needs (Armitage and Nellums, 2020). The change that took place had a significant impact on all levels of education, from primary to higher education, but was particularly challenging for these students and their families (Hodges et al., 2020). Disrupted routines, difficulty adapting to uncertainty, and physical and environmental restrictions significantly affected the physical and mental health of children with SEN (Brooks et al., 2020).

Meanwhile, the need to organize schooling at home left parents feeling overwhelmed by the workload and experience of using an online platform (O'Connor et al., 2021). These families also experienced considerable pressure to support their children's learning (Canning and Robinson, 2021). This was in addition to a perception of unfairness, as they often did not receive institutional support, and the efforts they made to enable their children to follow lessons like their classmates received no recognition (Castro-Kemp and Mahmud, 2021).

Educational inclusion, which seeks to ensure equitable access to education for all students regardless of their individual differences, was subjected to an unprecedented test during the pandemic in this respect (UNESCO, 2020). While technology greatly facilitated the continuation of learning, it also exacerbated pre-existing inequalities, as students who did not have access to adequate technological resources or who lacked additional support when adapting to new teaching formats were left behind (Brown, 2020).

In this context, careful consideration of how the measures taken in response to the pandemic affected the participation, learning, and well-being of students with special educational needs is essential. The scientific evidence points to a number of specific challenges faced by these students during distance education, including a lack of personalized support, limited social interaction, and difficulty in accessing educational materials tailored to their needs (Kartsoni et al., 2023).

Meanwhile, emerging opportunities for improving educational inclusion in a digital environment have also been identified. The use of technological tools to personalize learning can give students with special educational needs the opportunity to progress at their own pace, and access educational resources designed to meet their specific needs (Kalyani, 2024). Cooperation between educators, families and health professionals has also been critical in identifying and addressing the barriers faced by these students in the online environment (Porter et al., 2021).

However, it is important to acknowledge that the transition to online education has not been equally successful for all students with SEN. Those with sensory, cognitive or motor disabilities may find it more difficult to participate in online educational activities, and may require additional tailoring to ensure that they are fully included (Castro-Kemp and Mahmud, 2021). Adopting a learner-centered approach focused on their individual needs when designing and delivering online educational programmes is therefore critical.

In this new scenario, it has become necessary to find educational alternatives that provide continuity in teaching and learning. This has led to a shift towards successful educational actions, including dialogic learning (Ruiz-Eugenio et al., 2020).

The lockdown also had a major psychological impact, creating emotions including fear, anxiety, boredom and frustration among both children and their families (Chafouleas and Iovino, 2021; Soriano-Ferrer et al., 2021). These difficulties can lead to health problems such as cardiovascular disorders and weight gain and are risk factors for mental health and cognitive development issues in the future (Averett, 2021). This impact is even more pronounced among vulnerable students with physical, mental or developmental disorders, and with family-related challenges (Greenway and Eaton-Thomas, 2020; O'Connor Bones et al., 2022). A lack of interaction with peers, financial problems and a lack of personal space in the home can have adverse effects on health (Corral and Fernández, 2021). Despite these challenges, changes in the educational environment have led to the discovery of transformative practices that involve the family and teachers and are supported by institutions and administrations (Cabero, 2020; Carrascal et al., 2020; Sanz and López-Luján, 2022). These practices include dialogic gatherings. Although these gatherings were face-to-face before the lockdown, they were adapted to an online format during the pandemic and provided an important means of social contact during the period of isolation. This had a positive and significant impact on reading, especially among children with SEN, as well as on their instrumental knowledge, vocabulary acquisition, thinking development and oral expression (Gómez-Domínguez et al., 2022). Sharing concerns, feelings and routines with friends and teachers improved communication during the lockdown (Tremmel et al., 2020). Being close to their parents also helped these students to feel more comfortable and supported, which improved their participation, as well as strengthening family ties and facilitating in-depth conversations on various topics (Greenway and Eaton-Thomas, 2020; Ruiz-Eugenio et al., 2020). Implementing these successful practices will not only benefit the well-being of children, but will also improve their family life (Asto et al., 2022; Otero-Mayer et al., 2021; Ruiz-Eugenio et al., 2020).

In short, the COVID-19 pandemic posed significant challenges for educational inclusion, but it also provided a unique opportunity to reflect on how we educate our students, and especially those with special educational needs, and how this affects their families.

The research undertaken in this study seeks to answer the question: What is the current academic production and interest among the global scientific community regarding the satisfaction of families of children with special educational needs in terms of the school system's response during the COVID-19 pandemic? Publications indexed in the Web of Science Core Collection were analysed using a bibliometric approach in order to address this question. Investigating the perception of families of children with special educational needs of the response of education during the pandemic is crucial in order to identify possible supports and consequently improve quality and inclusion in education.

By addressing the gaps in access to education and leveraging the opportunities provided by technology, we can work towards a future in which all students have the opportunity to learn, grow and reach their full potential, regardless of their individual differences.

In the context of research on the response that schools provided for students with SEN and therefore to their families during the COVID-19 pandemic, it is important to consider the relevance of conducting a comprehensive bibliometric analysis. Bibliometric analyses, including bibliometric mapping and thematic analyses, can provide a comprehensive overview of the academic literature related

to this topic. These methods enable the identification of trends, emerging areas of research, and connections between different disciplines and methodological approaches (Glänzel and Schubert, 2005). Furthermore, by displaying the network of collaborations between authors, institutions and countries, they identify key actors in the field of inclusive education during the pandemic. This approach not only helps to understand the current state of the research but may also guide future research and educational policies in the most appropriate direction for addressing the challenges faced by students with special educational needs and their families in times of crisis.

In addition, conducting a bibliometric analysis can provide valuable information on developments in research on the perception of families of children with SEN and the response provided by education during the COVID-19 pandemic, thereby identifying areas requiring further attention and development. It may also enable the identification of gaps in the literature, and underrepresented areas that need further exploration. This is crucial for informing researchers, educators and policymakers about research priorities and the most effective interventions for promoting inclusive and equitable education in emergency situations like the one experienced, and to address the needs of families with children with SEN.

2 Materials and method

2.1 Data collection

This study, based on descriptive bibliometrics, analyses the scientific production related to the satisfaction of families with children with special educational needs with the educational response from schools during the pandemic. To that end, a search was performed in the Main Collection of Web of Science (WoS). The chosen database is a dependable source that encompasses major bibliometric indicators and a wide array of specialized indexes organized by subject or content indexing (Pranckutė, 2021). Utilizing a bibliometric approach for analysis aids in structuring the information, selecting the most pertinent items, and creating categories to evaluate the information both quantitatively and qualitatively (Gallegos et al., 2014).

The data was collected in January 2024 and covered the previous 5 years (since the onset of the COVID-19 pandemic). In order to meet the objective, the quality indicators established by the PRISMA 2020 approach were followed in order to obtain relevant and systematized information on the field of study (Page et al., 2021).

To that end, an advanced search was performed by subject, using the title, abstract and keywords of the articles. The search string used in the subject field was as follows:

> *("Famil*") (All Fields) and ("Intellectual* Disabilit*") or (disabilit*) or (special* need*) or ("Intellectual* Disabilit*" children*) (All Fields) and ("School") (All Fields) and (pandemic OR COVID 19 OR COVID-19 OR Coronavirus OR "Health Crisis" OR "sanitary crisis" OR "healthcare crisis" OR "health emergency" OR "SARS-CoV-2") (All Fields).*

A total of 316 articles were obtained. Some were subsequently eliminated due to overlap ($n = 4$) and based on automation tools such as open access and/or different databases ($n = 15$), leaving a total of 297 articles to which the various inclusion and exclusion criteria were applied. The criteria for inclusion were as follows: (1) literature reviews and empirical studies (qualitative and quantitative); (2) scientific journal articles; (3) published in any language in the last 5 years; (4) in the main collection of Web of Science and (5) families with children with special educational needs, assessing their satisfaction with the educational system's response during COVID-19. A total of 145 articles were selected.

After reviewing the content of these articles, the following exclusion criteria were subsequently applied: (1) not formal education; (2) inconsistency or inaccuracy in the study, with the categories excluded: Rehabilitation or Psychiatry or Pediatric or Public Environmental Occupational Health. This led to the exclusion of 73 articles, and consequently to the selection of a total of 72 articles (Figure 1).

2.2 Bibliometric analysis

This study used three different statistical programs to analyse the scientific production and its impact on the field of study. The programs used and the analyses carried out with each one are listed below:

> HistCite software (version 2010.12.6; HistCite Software LLC, New York, NY, U.S.A.) (Padrón and Pirela, 2017).

HistCite was used to calculate a variety of essential bibliometric indices, covering article counts by year, author, country, institution and journal. In addition to providing a clear presentation of the information, this software provides quality indicators, such as the total global citation score (TGCS) and the total local citation score (TLCS). The TGCS shows the total number of citations received by the articles analysed, while the TLCS shows the number of citations received in the Web of Science (WoS) database, for only the articles selected in the analysis. HistCite not only provides bibliometric indices and quality scores. It also provides a historical analysis of citations, displays citation networks, identifies collaboration patterns and can be customized. These additional features make it a comprehensive and versatile tool for bibliometric analysis (Wulff-Barreiro, 2007). HistCite is also known in the academic community for its robustness and reliability, and has established itself as a leading tool for bibliometric research.

> VOSviewer software (van Eck and Waltman, 2017):

VOSviewer is a versatile tool for bibliographic and thematic linkage analysis. Its ability to examine the interconnection between articles and display bibliometric networks makes it a valuable resource for researchers. It is able to produce clusters, thereby highlighting similarities between articles based on the number of references they have in common. In addition to being useful in systematic literature reviews, VOSviewer is not affected by when the analysis is performed, thereby ensuring consistent results regardless of time. Its user-friendly interface and ability to dynamically explore and examine data make it an attractive option for researchers working in a variety of fields (Viner et al., 2020). It is important to note that VOSviewer is renowned for its ability to reveal patterns and trends in the scientific literature, making it a valuable tool for evidence-based decision-making.

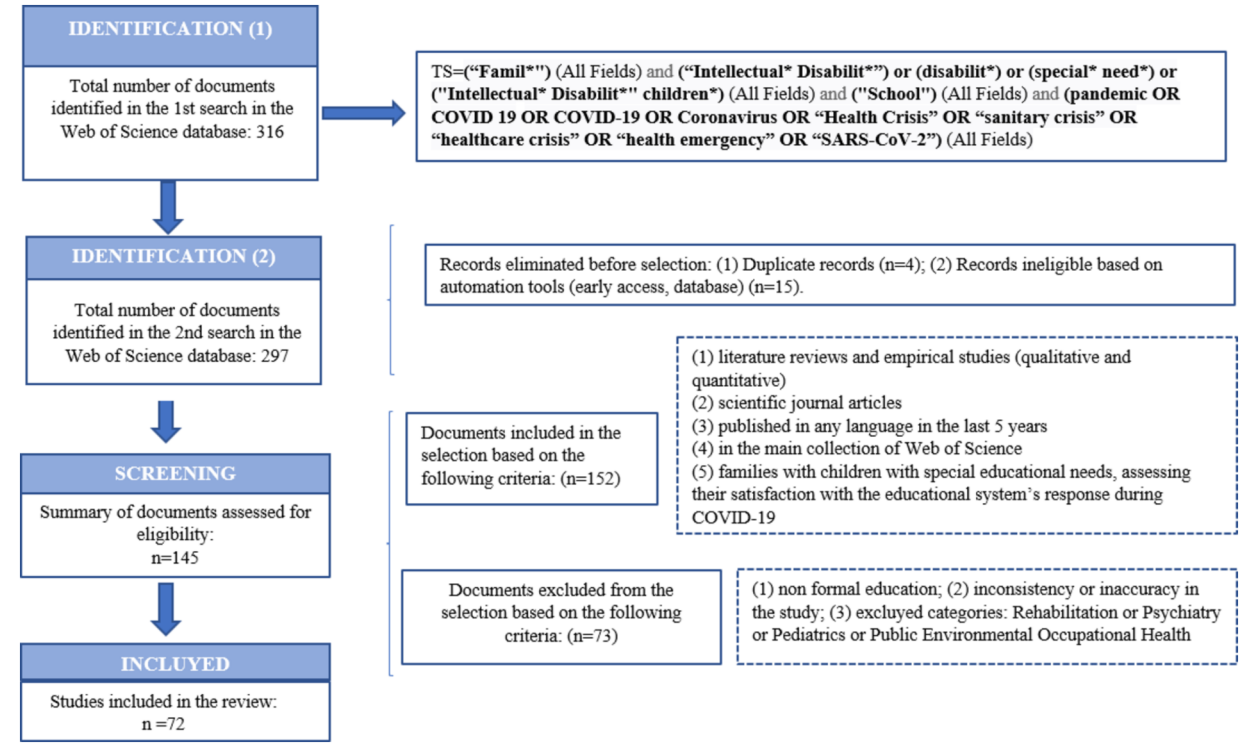

FIGURE 1
PRISMA flowchart detailing the steps in source identification and selection. Adapted from Thananusak (2019) and Page et al. (2021).

R bibliometric software (Aria and Cuccurullo, 2017; Derviş, 2019).

The bibliometric analysis was carried out using the bibliometric package within the R programming environment. This software provided the ability to examine aspects such as co-authorships, collaborations between countries, and the most common keywords in the articles analysed. It also permitted a thematic analysis in order to identify both emerging topics and those that are neglected in the field of study. One of the distinctive advantages of the R software and its bibliometric package is its flexibility when generating a wide range of graphs, such as networks, three-dimensional graphs, word clouds, thematic maps, histograms, strategic diagrams, evolution maps and world maps. These graphs provide a clear and effective visual representation of the results provided by the bibliometric analysis (Moral-Muñoz et al., 2020). It is important to note that R and its bibliometric package have been used increasingly by researchers due to its ability to perform comprehensive analyses and generate dynamic displays that provide a better understanding of the structure and dynamics of scientific literature.

3 Results

After all the documents were reviewed, the search in the WoS database retrieved a total of 72 articles published in 47 journals by 246 authors. The mean number of citations per document was 7.2. A total of 123 keywords and 266 author's keywords were found. Finally, the number of authors per paper is around 4, with an international collaboration rate of 11.1%. This information can be seen in Table 1.

3.1 Basic indicators

This first section of the results presents the main indicators, with details of the papers and citations per year, the number of papers and citations per author, institution and country. The journals that published at least one article, the number of publications, citations and the impact factor are also listed. Finally, the authors' keywords are presented according to the year of publication.

3.1.1 Years

The number of published articles is 72, and they were published between 2020 and 2023. The publications per year range from 8 to 24, with a mean of 18 and a standard deviation of 7 ($n = 72$; range = 8–24; mean = 18; SD = 7). The first article was published in 2020, with six publications ($n = 6$). In the next 2 years, the number of publications increased until 2022, when it peaked ($n = 24$), followed by a decline ($n = 19$). The annual growth rate percentage is positive and is 33.4%, as shown in Figure 2.

3.1.2 Authors

246 researchers published at least one article on the topic of satisfaction with educational inclusion among families of students with disabilities during the pandemic. The number of publications

TABLE 1 Main information.

Main information about the data	
Timespan	2020:2023
Sources (Journals, Books, etc.)	47
Documents	72
Annual Growth Rate %	33,4
Document Average Age	2,25
Average citations per doc	7,2
References	2,886
Document contents	
Keywords Plus (ID)	123
Author's Keywords (DE)	266
Authors	
Authors	246
Authors of single-authored docs	6
Authors collaboration	
Single-authored docs	6
Co-Authors per doc	3,6
International co-authorships %	11,1
Document types	
Article	72

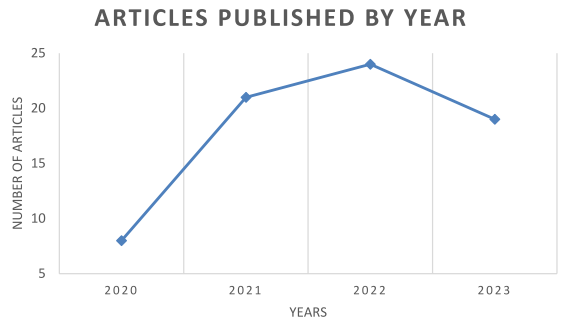

FIGURE 2
Articles published by year.

ranged from one to three, with a mean of 1.13 and a standard deviation of 0.42 (range = 1–3; mean = 1.075; SD = 0.3). The researchers with the most publications on this subject were Castro-Kemp S and McIntyre LL, with three papers each, as shown in Table 2.

Lambert R and Schuck RK also had the most overall citations with 46, followed by Benigno V, Giusto M, Parmigiani D, Silvaggio C, and Sperandio S with 43, as shown in Table 3.

These authors work in different research fields. The most common is "Education Educational Research" with 34 authors each, followed by "Special Education," with 13 authors and "Educational Psychology" with 12 authors.

3.1.3 Institutions

The number of institutions with publications is 141. The number of publications ranges from one to 4, with a mean of 1.13 and a

TABLE 2 Authors with the highest number Recs (≥ 2 Recs).

Author	Recs	TGCS
Castro-Kemp S	3	24
McIntyre LL	3	8
Allard A	2	3
Bates J	2	18
Finlay J	2	18
Gray KM	2	3
Hastings RP	2	3
Heyne D	2	3
Kouroupa A	2	3
Mahmud A	2	19
Melvin GA	2	3
Safer-Lichtenstein J	2	7
Totsika V	2	3

Recs-number of articles; TGCS- Total Global Citation Score.

TABLE 3 Authors with the highest number of TGCS (≥ 43 TGCS).

Author	Recs	TGCS
Lambert R	1	46
Schuck RK	1	46
Benigno V	1	43
Giusto M	1	43
Parmigiani D	1	43
Silvaggio C	1	43
Sperandio S	1	43

Recs-number of articles; TGCS- Total Global Citation Score.

standard deviation of 0.46 (range = 1–4; mean = 1.13; SD = 0.46). One of them has four articles, three of them have three, and the rest have one article. As shown in Figure 3, if three publications are taken as the cut-off point (≥3), UCL, the University of Oregon, the University of Roehampton and the University of Valencia are the universities with the most papers published, with three or more papers each.

However, there are a total of 1,178 global citations, ranging from 0 to 371, with a mean of 8 and a standard deviation of 10 (range = 0–46; mean = 8; SD = 10), with 31 citations as the cut-off point (≥ 31) and the University of California, Santa Barbara has the most global citations, with a total of 46, followed by CNR University of Genoa, the University of Edinburgh, the University of Wales Trinity St David and the University of Valencia, as shown in Figure 4.

3.1.4 Countries

Researchers from 25 countries have published at least one article on this Research Topic. The total number of articles is 72. The number of publications ranges from one to 24, with a mean of 3.5 and a standard deviation of 5.75 ($N = 72$; range = 1–24; mean = 3.5; SD = 5.75). If four articles (≥4) is taken as the cut-off point, the country with the most publications is the USA ($n = 24$), followed by

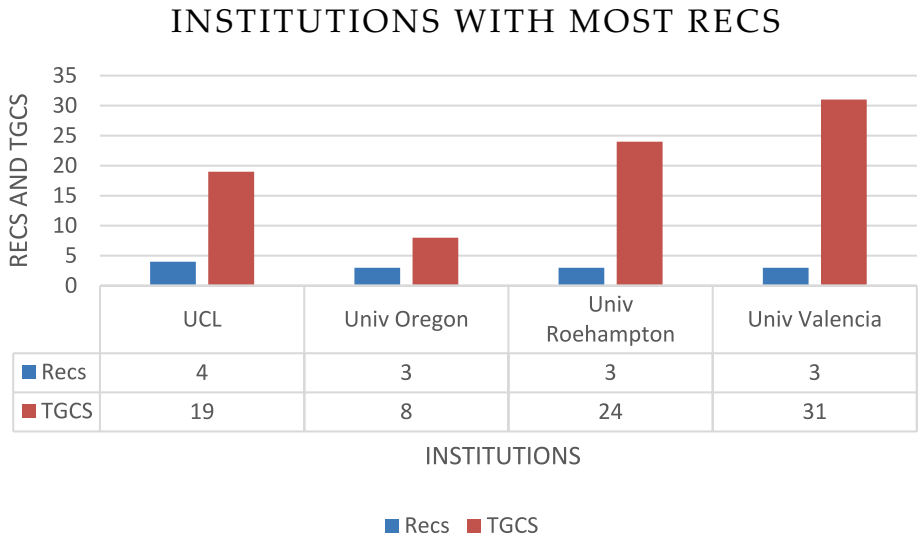

FIGURE 3
Number of publications by institutions (≥ 3 Recs). Recs-number of articles; TGCS- Total Global Citation Score.

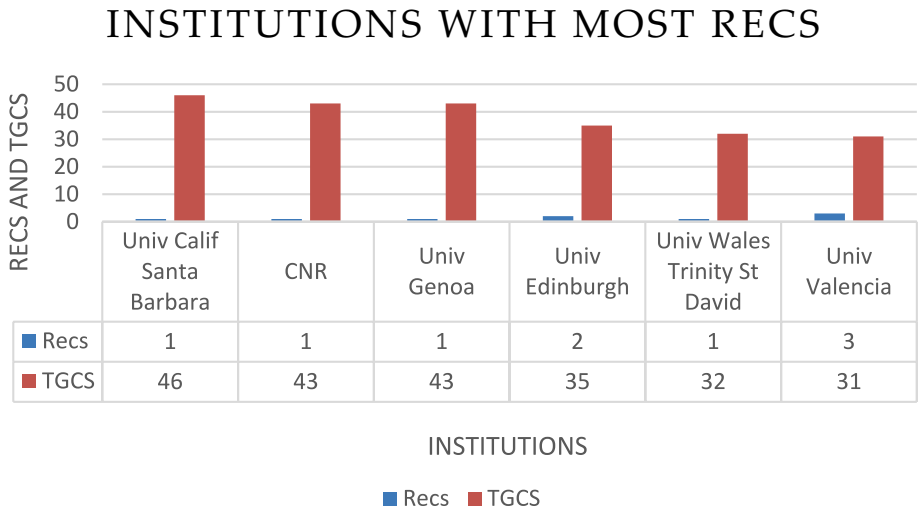

FIGURE 4
Number of TGCS by institution (≥ 31 TGCS). Recs-number of articles; TGCS-Global Citation Score.

the United Kingdom ($n = 20$), Spain ($n = 9$), Australia ($n = 4$) and Germany ($n = 4$). This can be seen in Figure 5.

The number of citations ranged from 0 to 204, with a mean of 25 and a standard deviation of 53 (range = 0–204; mean = 25; SD = 53). The countries that have the most citations in the WoS as a whole, with a cut-off point of more than 20, are as follows: United Kingdom ($n = 204$), USA ($n = 184$), Italy ($n = 60$), Spain ($n = 42$), Iran ($n = 20$) and Zambia ($n = 20$) (see Figure 6).

3.1.5 Journals

A total of 47 journals have published at least one article on this topic. Taking the cut-off point as three or more publications ($n \geq 3$), we obtain the following information (Table 4). The journals with the most articles published are Frontiers in Education ($n = 8$), Education Sciences ($n = 4$), European Journal of Special Needs Education ($n = 4$), Frontiers in Psychology ($n = 4$), British Journal of Special Education ($n = 3$), Psychology In The Schools ($n = 3$), and School Psychology Review ($n = 3$).

The journals with the most total global citations, ordered from highest to lowest, with a cut-off of TGCS = 34, are European Journal of Special Needs Education ($n = 72$), Education Sciences ($n = 46$), Technology Pedagogy And Education ($n = 43$), Frontiers In Education ($n = 41$), Frontiers In Psychology ($n = 38$), British Journal Of Special Education ($n = 35$), School Psychology Review ($n = 34$), as shown in Table 5.

3.2 Co-citation analysis

This section contains an analysis of the co-citations. The co-authorship network will be presented, followed by cross-country

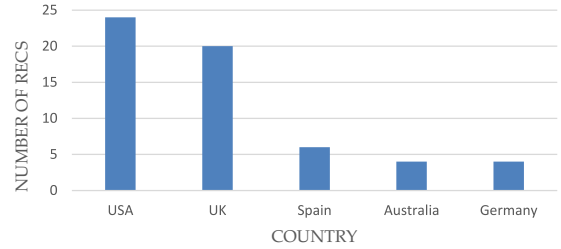

FIGURE 5
Comparison of countries with the most publications (≥ 4 Recs).

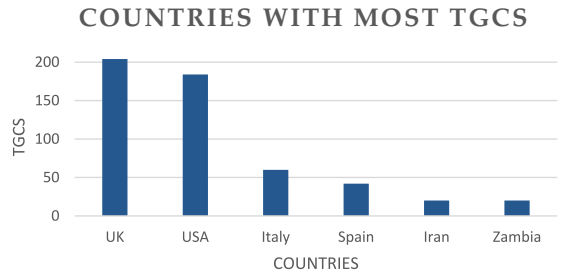

FIGURE 6
Countries with the most publications (≥ 20 TGCS).

collaboration networks and finally, keyword networks will be shown. These results have been displayed and presented in the maps presented below.

Relationships and collaborations between authors are analysed in the co-authorship map, and the links and patterns of co-authorship identified. This shows the research communities and the links between authors in the field of study.

The collaboration networks between countries are then presented, showing international collaborations and the links between different countries. This provides an understanding of the global dynamics of research and transnational collaborations on the topic studied.

Finally, keyword networks are shown, with an analysis of the relationships and connections between the terms used in the publications. This helps to identify the main topics and areas of focus within the field of study.

3.2.1 Co-authorship

For the 246 authors, only collaborations between authors who have written one or more articles are presented. The 12 co-authorship networks involving 34 researchers who have published a joint article on this topic are presented. There is one network of seven collaborators, two networks of four collaborators, one network of three collaborators, and eight networks of two collaborators. Figure 7 shows the various collaborative networks.

This analysis provides valuable information on collaboration and interaction between researchers in the field of study. These findings suggest the existence of consolidated research groups, and the existence of closer collaborations between some authors in particular.

TABLE 4 Journals by the number of publications and impact factor (JCR) (≥3 Recs).

Journal	Recs	IF
Frontiers in Education	8	2.3
Education Sciences	4	3.0
European Journal of Special Needs Education	4	1.93
Frontiers in Psychology	4	4.23
British Journal of Special Education	3	1.24
Psychology in the Schools	3	1,92
School Psychology Review	3	2.136

Recs-number of articles; IF-impact factor.

TABLE 5 Journals by the number of citations received (TGCS) (≥34 TGCS).

Journal	TGCS
European Journal of Special Needs Education	72
Education Sciences	46
Technology Pedagogy and Education	43
Frontiers in Education	41
Frontiers in Psychology	38
British Journal of Special Education	35
School Psychology Review	34

TGCS-Global Citation Score.

3.2.2 Collaborations between countries

Figure 8 shows that Spain, the USA, United Kingdom and Australia are the most collaborative countries in terms of cross-country collaborations.

3.3 Thematic analysis

Finally, this third section presents the results of the thematic analysis. First, we show the bibliographic coupling analyses by documents and words, and second, a strategic diagram of the various themes. All these results are presented on maps.

3.3.1 Bibliographic coupling by document and keyword

The bibliographic coupling for documents established a cut-off point of at least 11 citations per document (≥11). Only those connected were subsequently selected, leaving the final analysis with 16 documents distributed in four clusters (one color per cluster). The size of the letter is proportional to the number of citations and the frequency of connections between them. These clusters are shown in Figure 9. A thematic review of each cluster with the number of papers, citations and most prominent authors is provided below.

We present below a thematic review of each cluster, together with the number of papers, citations and the most important authors.

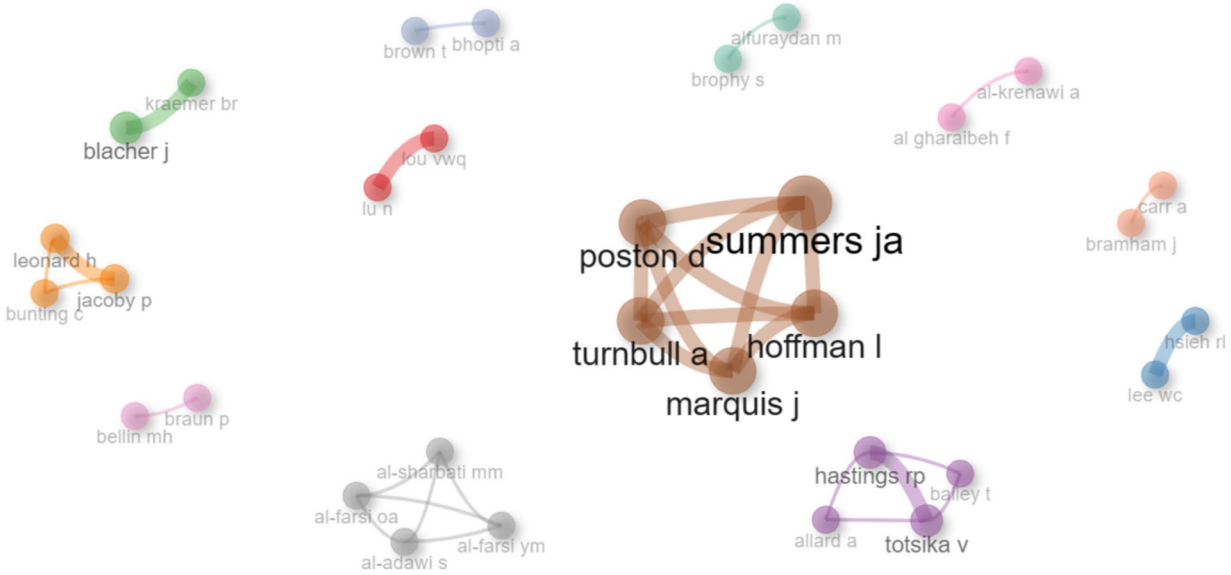

FIGURE 7
Co-authorship networks (≥1 collaboration).

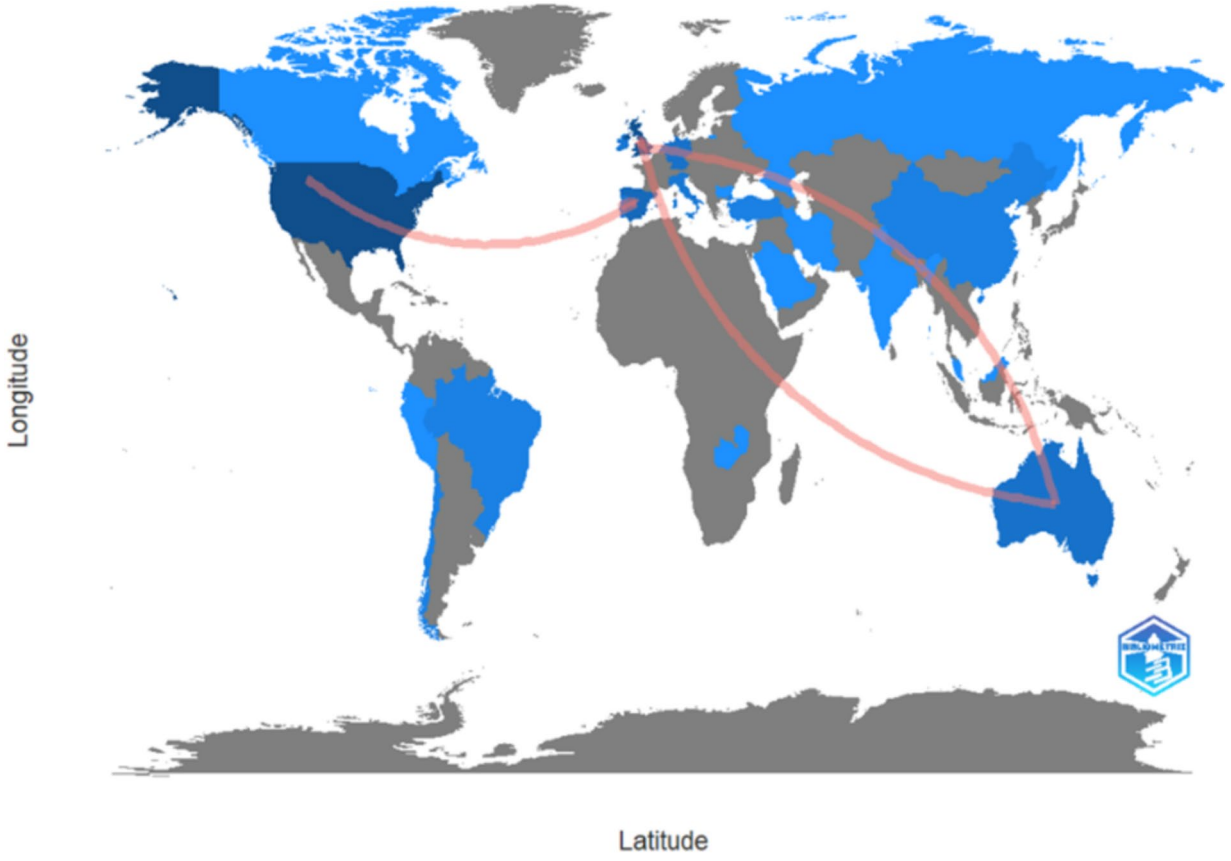

FIGURE 8
Country collaboration networks (≥1 collaboration).

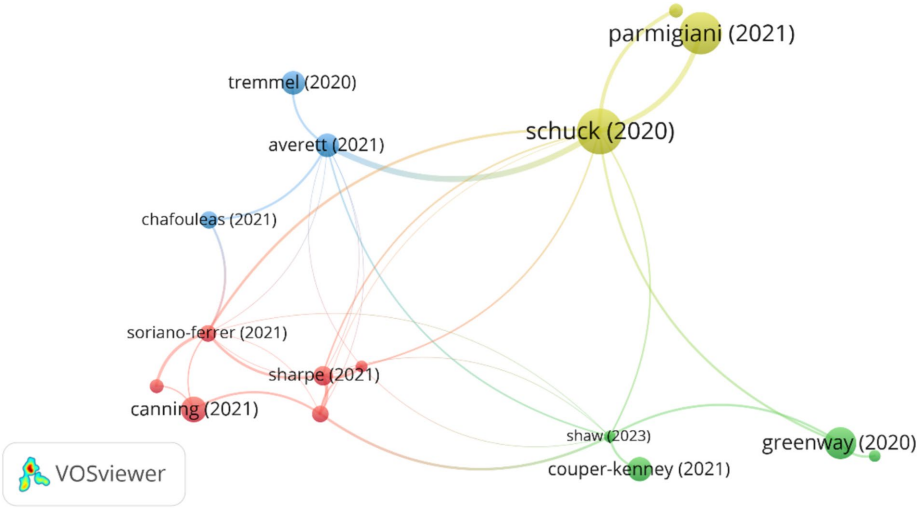

FIGURE 9
Bibliographic coupling analysis for documents (≥11 citations of publications).

Cluster 1 (106 citations, 6 papers) looks at the pandemic's effect on the mental health of children with SEN and their families and the need for community support at times when schools are closed.

This cluster consists of six articles (Canning and Robinson, 2021; Castro-Kemp and Mahmud, 2021; O'Connor Bones et al., 2022; Ruiz-Eugenio et al., 2020; Sharpe et al., 2021; Soriano-Ferrer et al., 2021). It received a total of 106 citations.

The most cited article is by Canning and Robinson (2021), with a total of 26 citations. It addresses the challenges faced by children with special educational needs and their families, and particularly those on the autism spectrum, as a result of the disruption of their routines and online education. The parents were overwhelmed by having to organize schooling at home without sufficient institutional support. The lack of equity and recognition also created an additional emotional burden, with parents requiring extra time and effort to adapt the educational material to their children's needs.

The second article is by Sharpe et al. (2021) with 20 citations. It argues that vulnerable paediatric populations, such as those with developmental disabilities, needed greater support during the pandemic because of their physical and mental multimorbidity. The research highlights the negative impacts of the lockdown on their lives, and the need for community-based strategies to unlock access to mental health and educational services.

The third article is by Castro-Kemp and Mahmud (2021), with 17 citations. It focuses on the impact that the lockdown had on English children with SEN needs and disabilities, as well as their families. The authors note that parents from disadvantaged areas suffered more in terms of mental health due to school closures and the return to school. Caring for children with disabilities during the lockdown increased parents' levels of depression, anxiety, and stress. On the other hand, returning to school was considered positive for the children's mental and physical health, and socialization and established school routines were considered important.

The fourth article, by Soriano-Ferrer et al. (2021) with 17 citations, notes that children with dyslexia experienced higher levels of depression and anxiety during the lockdown, as well as emotional symptoms, hyperactivity and behavioral problems. The parents of children also reported increased stress during this period. Difficulties in establishing study routines and a lack of support from teachers were common concerns. The study notes the need for additional support during crises such as the COVID-19 pandemic.

The fifth article, with 14 citations, is by Ruiz-Eugenio et al. (2020). The authors look at how the pandemic and lockdown led to new forms of education, especially for vulnerable children. Dialogic literary gatherings (DLGs) proved to be successful, even in an online format, improving reading performance and strengthening family ties, and improving the mental health of children and parents during the pandemic. The paper suggests that it should be adopted as public policy in educational institutions in order to benefit children and families.

In the last article, O'Connor Bones et al. (2022), with a total of 12 citations, consider how school closures due to COVID-19 led parents, and especially parents of children with special educational needs (SEN), to adopt educational roles. This change had a particular impact on those whose children attended special schools, as they lost access to therapies and support in the classroom. The lack of a school routine had a negative effect on students' emotional and social well-being, creating anxiety and frustration. Parents faced practical and emotional challenges in balancing caring for their children with SEN, their work, and educational demands. Cooperation between parents and teachers was crucial, and the commitment of school staff was essential.

Cluster 2 (81 citations, 4 papers) focuses on the challenges faced by children with SEN and their families in the wake of the pandemic, such as the transition to home-based learning, the lack of tailored resources, and inequality in access to them.

This cluster consists of four articles (Couper-Kenney and Riddell, 2021; Greenway and Eaton-Thomas, 2020; Lazarus et al., 2022; Shaw and Shaw, 2023). It received a total of 106 citations.

The most cited article is by Greenway and Eaton-Thomas (2020), with 32 citations. It examines the challenges faced by parents of children with SEN during the period of schooling at home brought about by the pandemic. It highlights inequalities in children's learning and development, as well as concerns about a lack of routine and structure. It also discusses the need for more tailored resources,

structured "catch-up" programmes, and alternative educational approaches to support these children's diverse needs during schooling at home, and the transition back to school.

The article by Couper-Kenney and Riddell (2021), with 25 citations, assesses the extent to which the rights of children and especially those with SEN were prioritized during the COVID-19 crisis. In particular, it emphasizes the lack of initial attention to these rights due to the abrupt withdrawal of education and care services. It also notes the unequal access to technology and the lack of support and resources which had a negative impact on the educational progress and well-being of children with SEN.

The third article, by Lazarus et al. (2022), which received 12 citations, addresses the importance of promoting a model that addresses disparities in care, especially for children in groups with support needs. This proactive approach prioritizes psychological well-being, equality of care and access for all children, in order to address addressing the young people's psychological needs. The article also discusses implications for school psychology training, public policy and educational practice.

In the fourth article, Shaw and Shaw (2023) with 12 citations present the challenges faced by parents of children with SEN while the schools were closed. The authors identify three main themes: the infrastructures, the impact on parents and the impact on the child. They propose recommendations for schools, such as working with parents to ensure greater equality and inclusion in the provision of education.

Cluster 3 (66 citations, 3 papers) looks at the need to adapt services, especially in remote learning, and to support vulnerable groups such as students with disabilities during the pandemic.

The cluster consists of 3 articles (Averett, 2021; Tremmel et al., 2020; Chafouleas and Iovino, 2021) and received a total of 66 citations. In the first article, Averett (2021) addresses the challenges faced by parents of children with disabilities during remote learning, and highlights the lack of appropriate and adapted services. The article highlights the vulnerability of these children during the pandemic, and the importance of understanding their experiences and providing ongoing support. It also calls for a more inclusive approach and greater support in the education of these children.

In the second article, Tremmel et al. (2020) argue that the transition to distance education during the COVID-19 pandemic significantly affected special education in rural areas. It highlights the challenges and opportunities and emphasizes the importance of tailoring teaching to these students' individual needs, and especially those with individualized education programmes.

Finally, Chafouleas and Iovino (2021) examine the impact of the pandemic on family caregivers of children, highlighting the differences in psychological burden and distress between those with and without developmental disabilities. Caregivers of children with developmental disabilities experienced higher levels of psychological distress, reduced self-care, and difficulty performing activities. These findings highlight the importance of addressing this group's specific needs during the pandemic and underscore the need for targeted support strategies for family caregivers of children with developmental disabilities in order to mitigate the impact on their emotional well-being.

Cluster 4 (103 citations, 3 papers) focuses on the importance of communicating with families and adapting educational strategies to ensure the inclusion and success of students with SEN during the pandemic.

It consists of 3 articles (Schuck and Lambert, 2020; Parmigiani et al., 2021; Crane et al., 2021). The article with the most citations was by Schuck and Lambert (2020) with 46 citations. In this article, the authors explore the problems encountered by special education teachers during the transition to remote teaching during the pandemic. The process was carried out in three stages: establishing contact with families, prioritizing social–emotional support, and transitioning to more structured academic activities. Teachers faced difficulties such as students having unequal resources, and the need to adapt teaching strategies to the home environment. Despite the challenges, it emphasizes the importance of communication with parents and the need for cooperation and support for teachers in order to address the changes involved in distance learning.

The second article, by Parmigiani et al. (2021), with 43 citations, describes the integration of students with SEN into regular, classes and the problems encountered during school closures. Teachers had to organize inclusive online activities in order to deal with this situation. The effectiveness of this "e-inclusion" depended on several factors, including technology, relationships with families, collaboration from teachers, and online teaching strategies. Teachers adapted both synchronous and asynchronous personalized activities to encourage students to participate, preferably in small groups or individually.

Finally, Crane et al. (2021) discuss the impact of the pandemic on special schools in England, and especially those dealing with children with autism. The article highlights the challenges these schools experienced. The exacerbated educational inequalities during this period and the lack of attention from the government to their specific needs were particularly salient issues. However, other aspects included the creative solutions that these schools implemented, such as holistic approaches to support and effective communication with families. The authors call for special schools to be given priority, specific guidance provided, and the adoption of a comprehensive approach to addressing the needs of children with SEN.

A bibliographic coupling for co-word networks was then performed, and a group of six clusters of different colors is shown in Figure 10. The size of the letter is proportional to the frequency of occurrence of the keyword and the number of connections between them in both cases. The most common keywords used in the publications studied total 367. If the cut-off point is set at a frequency of five or more ($\geq$5), there are 22.

The first group is composed of 6 keywords, with "students" and "education" as the core terms. It also includes related and connected concepts such as "distance learning," "pandemic," "family" and "school."

The second group consists of a network composed of 4 words with "COVID-19" as the central point and "children," "impact" and "autism" as the most important connected concepts.

The third network is composed of 4 interconnected keywords, which are: "adolescents," "COVID-19 pandemic," "inclusive education" and "remote learning."

The fourth cluster contains three keywords among which "special education" as the core term, followed by "teachers" and "intellectual disability."

The last groups of words are composed of two terms each - one with "parents" and "mental health" and the other with "families" and "disabilities."

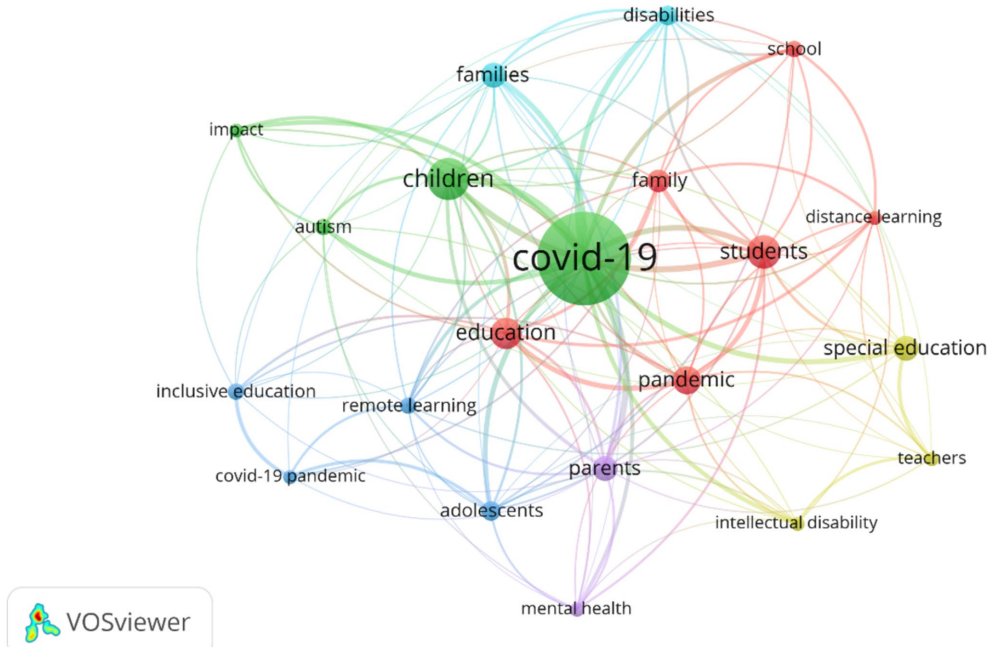

FIGURE 10
Bibliographic coupling analysis for co-word networks (≥5 co-word networks).

3.3.2 Strategic thematic analysis

The study was based on an analysis performed using the R bibliometric software package, which is renowned for its efficiency in the evaluation and display of this type of data. This software provides statistical tools and algorithms for identifying relevant patterns and trends in the academic literature. Its most important features include the ability to generate strategic diagrams, which provide a clear visual representation of the thematic structure of the research field. These diagrams, divided into quadrants, enabled the issues to be classified according to their relevance and degree of development, providing a more accurate interpretation of the data.

Figure 11 summarizes the issues addressed in this study. The size of the spheres in the diagram is directly related to the frequency of occurrence of the keywords. The areas of the diagram are divided into quadrants to facilitate understanding: the top right quadrant presents the main or driving topics; the top left quadrant presents highly specialized or niche topics; the bottom right quadrant presents fundamental or basic topics; and the bottom left quadrant presents emerging and disappearing topics. This visual presentation provides a clear understanding of the distribution and relative importance of the various topics identified in the bibliometric analysis. Likewise, the proximity to the horizontal axis measures the importance or relevance of a topic within the field of study, and the proximity to the vertical axis measures the density or internal development of a topic.

For all these reasons, the topics "Children, Students, Families" and "Behavior Problems, Intellectual Disability, Social Support" are shown in the top right quadrant in the strategy map shown in Figure 11, indicating that they are well developed and crucial areas for current research. The topic "Adolescents, COVID-19, Disorders" is also in the right quadrant, showing its relevance and development in the context of the recent pandemic. In the bottom right quadrant, the themes "Education, Impact, Mental-Health" are presented as fundamental, but require further internal development. The topics in the bottom left quadrant, such as "Validation" and "Health," are identified as emerging or declining, suggesting that they are areas that could benefit from additional research to determine their relevance in the future. Interestingly, no topics were identified in the top left quadrant, suggesting the absence of highly specialized research areas in the field studied. These findings provide a clear picture of the most developed and fundamental areas, as well as emerging issues, showing opportunities for future research in the field.

4 Discussion

This article presents a comprehensive bibliometric study examining the scientific output related to the educational response offered by institutions to families with children with intellectual disabilities during the COVID-19 pandemic. The analysis helps identify emerging trends and distinctive characteristics of research in this field, providing a solid foundation for implementing improvement strategies in schools, benefiting both students and their families.

One of the most notable findings is the increase in publications in 2022, particularly around the topic of the pandemic's impact on children with special educational needs (SEN). This increase reflects the urgency and relevance of addressing the consequences of the health crisis for vulnerable populations. According to Canning and Robinson (2021), the pandemic exacerbated pre-existing inequalities in education and support systems, leading to an increase in research focused on the most affected groups, such as children with SEN and their families. Researchers have prioritized this topic due to the need

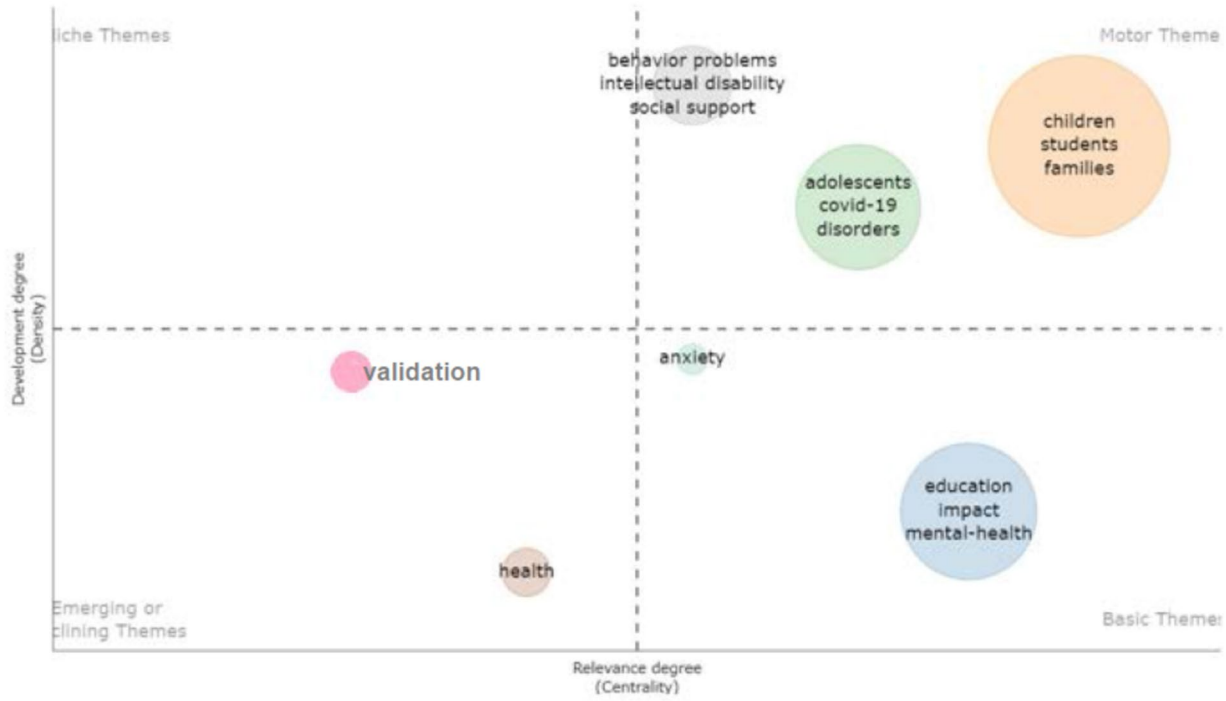

FIGURE 11
Strategic diagram of family satisfaction with educational inclusion.

to highlight the challenges faced by both children and their caregivers, especially during school closures and the transition to remote learning (Canning and Robinson, 2021; Sharpe et al., 2021; Castro-Kemp and Mahmud, 2021).

The lack of adapted resources, social isolation, and the additional emotional burden experienced by families spurred greater academic output, focusing not only on documenting the challenges but also on offering solutions and policy recommendations to mitigate long-term effects. Sharpe et al. (2021) emphasize the need for community support for these families, while Castro-Kemp and Mahmud (2021) noted that parents of children with SEN, particularly in disadvantaged areas, experienced high levels of depression, anxiety, and stress during the lockdown.

The return to classrooms and the need to implement educational recovery strategies and psychosocial support have also fueled the academic debate on the importance of strengthening community support networks and inclusive practices, especially during times of crisis (Sharpe et al., 2021; O'Connor Bones et al., 2022). Ruiz-Eugenio et al. (2020) suggest that the adoption of practices such as dialogic literary gatherings (DLG) could benefit children's reading performance and strengthen family bonds, even in times of crisis.

The thematic analysis of the most cited articles confirms that the pandemic exacerbated pre-existing difficulties in the education of children with SEN, significantly impacting their mental health and that of their families. Canning and Robinson (2021) highlight that school closures and remote education increased the stress and emotional burden on parents, especially those with children on the autism spectrum. Consistent with these findings, Soriano-Ferrer et al. (2021) report that children with dyslexia also experienced higher levels of depression and anxiety, while parents reported increased stress due to the difficulty in establishing study routines at home.

O'Connor Bones et al. (2022) highlight how parents assumed educational roles, facing emotional and practical challenges in balancing the care of their children with SEN and the educational and work demands. The lack of access to therapies and in-classroom support exacerbated these issues, negatively affecting students' emotional and social well-being (O'Connor Bones et al., 2022). Greenway and Eaton-Thomas (2020) underscore the inequalities in learning and the lack of structure during home-based education, while Couper-Kenney and Riddell (2021) point out the initial lack of attention to the rights of children with SEN, highlighting unequal access to technology and inadequate support.

Despite these challenges, some studies have identified effective strategies to mitigate the pandemic's negative impacts. Ruiz-Eugenio et al. (2020) highlight dialogic literary gatherings (DLG) as a successful practice that improved reading performance and strengthened family bonds, suggesting its adoption as public policy. Parmigiani et al. (2021) and Schuck and Lambert (2020) emphasize the importance of communication and collaboration between schools and families, as well as adapting educational strategies to ensure the inclusion and success of students with SEN during the crisis. The creative solutions implemented in special schools in England, as mentioned by Crane et al. (2021), also demonstrated how prioritizing effective communication and holistic support could benefit these students, emphasizing comprehensive approaches to addressing the needs of students with autism.

Moreover, the literature highlights the urgent need for inclusive public policies that address inequalities in care and prioritize the psychological well-being of children with SEN. Lazarus et al. (2022) advocate for a proactive model that promotes equity in care and access

to services, emphasizing the implications for school psychology training and educational practice. Tremmel et al. (2020) highlight the importance of adapting teaching to meet the individual needs of students, especially in rural areas and during remote education, while Chafouleas and Iovino (2021) stress the need for support strategies aimed at family caregivers to mitigate the emotional and psychological impact on them.

5 Conclusion

The bibliometric and thematic analysis conducted in this study provides a detailed overview of the educational response offered to families with children with special educational needs (SEN) during the COVID-19 pandemic. The literature review shows a significant increase in the number of publications since the start of the pandemic, with a particular surge in 2022, reflecting the urgency of studying the difficulties experienced by these families in a global health crisis and its impact on the mental health and emotional well-being of children and their caregivers.

The research highlights the involvement of researchers and institutions from various countries, underscoring the global nature of the challenges faced by families and the international collaboration in the search for solutions. Institutions such as UCL, University of Oregon, and University of Valencia have been key in developing more inclusive educational practices, while authors like Lambert and Schuck, the most cited, have demonstrated significant influence in this field.

Finally, the study highlights the urgent need for inclusive public policies that address disparities in educational access and prioritize the psychological well-being of children with SEN. A proactive and equitable approach to school psychology training and educational practice is essential to ensure that educational systems are resilient and better prepared for future emergencies. In summary, this analysis provides a solid foundation for future research and the implementation of improvements in schools, emphasizing the importance of maintaining and strengthening support for families of children with SEN.

Author contributions

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Developing a participatory research framework through serious games to promote learning for children with autism

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People with autism, or Autism Spectrum Condition (ASC), is becoming increasingly common worldwide. Since individuals with ASC vary in their skills and methods that work for one may not work for another, many technology designers find it challenging to engage effectively with this population. Serious games (SGs) offer an intelligent learning environment that supports lifelong learning for individuals with ASC. Despite the availability of several frameworks, the question of whether SGs for individuals with ASC can have a dedicated framework remains unresolved. The objective of this study is to create a general framework for the design of serious games that can be applied to a variety of SGs targeting individuals with autism. A new participatory research framework is presented to assist game designers and relevant stakeholders in developing effective SGs for people with ASC. Through participatory sessions and a design thinking process, this framework seeks to involve users and relevant stakeholders as "design partners" in the design process. The framework was employed in the development of a new SG, called SALY (Simulation, Attention, Learn, and PLAY), designed to improve attention span and emotion recognition in individuals with ASC. Three research questions are discussed, and the mixed-methods approach adopted for the investigation. Several usability metrics were used to evaluate the game's effectiveness, efficiency, and user satisfaction. The results show that the proposed game holds significant potential and will be of interest to educators and learners alike.

KEYWORDS

participatory research, serious games, autism, design thinking, machine learning

1 Introduction

Participatory research (PR) has gained prominence in pedagogical research, particularly in the field of special educational needs. PR involves systematic inquiry conducted in close collaboration with individuals affected by the research topic, with the goal of initiating action or change (Vaughn and Jacquez, 2020). Unlike traditional research, PR prioritizes co-constructing research through partnerships between end users, communities, and other stakeholders affected by the issue being studied (Vaughn et al., 2018). Key et al. (2019), for example, describe research engagement as ranging from community-informed to community-driven. Recently, several studies have encouraged researchers to move beyond merely gathering children's opinions to more meaningful engagement (e.g., Bakhtiar et al., 2023; Scott-Barrett et al., 2023; Kelly et al., 2023; Kay et al., 2023; Simpson et al., 2022; Anselma et al., 2020; McVeety and Farren, 2020). Bakhtiar et al. (2023) found that 23 out of 25 studies

reported a wide range of benefits from conducting research with children, including authentic and meaningful participation, greater understanding of end users' rights, and personal characteristics such as increased confidence, well-being, and sense of agency. Social benefits were also noted, such as collaboration, leadership, inclusivity, and contributing to the community. The knowledge children possess was valued and used as a foundation for research and planning. According to Vaughn and Jacquez (2020), researchers across disciplines view PR as a collaborative inquiry process that extends beyond knowledge generation to achieving real-world impact. They provided a comprehensive list of participatory research frameworks, orientations, and approaches. Building on these frameworks, our study rethinks the role of users in research, shifting them from informants to active participants in the design process. By involving users' voices throughout the entire research project, not just at the results stage, we present an innovative participatory research framework. This framework aims to support experts, educators, and designers in creating effective SGs for individuals with autism and provides practical guidance to practitioners, educators, and other stakeholders on the benefits of involving users and related parties in the planning and design phases of research. Autism, also known as Autism Spectrum Condition (ASC), is a neurodevelopmental disorder that can negatively affect children's development (Bottema-Beutel et al., 2021). It is a lifelong developmental disability, often accompanied by learning difficulties, that impacts how people learn, behave, communicate, and interact with others. Individuals with ASC may experience difficulties in various areas of daily living, including emotion recognition (Glumbic et al., 2022). Since autism is a spectrum condition, its effects on individuals vary widely. The term "spectrum" refers to the broad range of behaviors and challenges faced by individuals with ASC. According to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5, 2013), individuals with autism often exhibit deficits in social interaction, social communication, and imagination. These deficits lead to difficulties in attention to social inputs and in understanding the emotions and actions of others, which can hinder learning. Hobson (1993a, 1993b) highlights the challenges people with ASC face in understanding complex emotional expressions, pointing to a fundamental deficiency in interpersonal connections.

2 Problem statement, objectives and research questions

Human emotion recognition plays a central role in everyday life. An emotion recognition task is a powerful and useful technique for assessing human emotional states. Generally, this task is easy for neurotypical individuals, but it becomes more challenging when considering children with ASC. Since children with ASC tend to prefer interacting socially with objects rather than people, a growing number of studies have examined the effectiveness of digital technology (DT) for people with ASC, including serious games (SGs) (e.g., Gallud et al., 2023; de Carvalho et al., 2023; Abd El-Sattar, 2023b; Pavez et al., 2023; Tsikinas and Xinogalos, 2020), virtual agents (e.g., Abd El-Sattar, 2023a), immersive technologies (e.g., Tene et al., 2024; Tang et al., 2022; Abd El-Sattar, 2024), robots, and more. In the context of disability, the use of social robots, particularly with children diagnosed with autism spectrum conditions (ASC), may help foster the development of novel social behaviors and enhance skills in areas of difficulty (Ferrari et al., 2009; Conti et al., 2015). According to Dunst et al. (2013), robots can act as social mediators, helping children with autism engage with humans after they initially interact with the machine. Baron-Cohen's (2009) empathizing-systemizing (ES) hypothesis suggests that people with autism often prefer interacting with formal, predictable systems that have clear engagement rules. With sufficient programming, robots can be tailored to meet the specific needs of children with ASC, creating predictable social scenarios that reduce anxiety and fear. On the other hand, serious games (SGs) create a smart learning environment that supports individuals with ASC in pursuing lifelong learning, offering a new paradigm for education. Interacting with robots and/or SGs has various benefits for children with ASC, including increased social acceptability (Dunst et al., 2013), imitation-based motor communication (Duquette et al., 2008), and the ability to maintain shared attention (Robins et al., 2004). SGs are educational multimedia tools designed to help learners acquire specific skills. Through gameplay, learners can develop certain competencies or knowledge as part of the educational strategy. This approach transforms academic material into a game format, making learning more engaging and interactive (Fedwa et al., 2014). However, engaging individuals with autism in the development of digital technologies, such as SGs, poses challenges due to the diversity and uniqueness of each person's needs and talents, which may change over time. This variability makes it difficult for technology designers to create effective, personalized solutions. As a result, autistic children's perspectives are often overlooked in research. Furthermore, most studies in this field focus on guidelines and decisions rather than on creating a design framework for SG development. Despite the existence of several frameworks, the question of whether SGs for individuals with ASC should have their own framework remains unresolved. This research aims to address these challenges by proposing a general framework for SG design that can be applied to a wide variety of SGs targeting individuals with autism. It emphasizes the importance of providing autistic children with practical and meaningful opportunities for interaction and promoting their voices. An innovative participatory research framework is presented for developing effective SGs for individuals with ASC, with the goal of improving their attention span and emotion recognition abilities. The framework combines design thinking with participatory design sessions to generate creative solutions that meet users' needs. In a case-based learning research approach, the framework was applied to the development of a new SG called SALY (Simulation, Attention, Learn, and PLAY). The SALY game is designed to help individuals with autism enhance their attention span and emotion recognition abilities by blending technology with learning. It also served as a tool to investigate the research questions presented in Table 1.

3 Literature review

This section outlines some of the prior research on the use of serious games (SGs) for teaching and enhancing emotion recognition in individuals with different learning disabilities, including Autism Spectrum Condition (ASC):

1. LIFEisGAME (Alves et al., 2013) is an iPad prototype with five game modes: *Build the Face*, *Recon Mee Match*, *Recon Mee Free*,

TABLE 1 The study's research questions (RQs).

ID	Research Question (RQ)
RQ1	What pedagogical components and game characteristics are required to assist educators and game designers in creating effective games targeted at people with ASC?
RQ2	How can games that use technology-enhanced learning interventions help people with ASC acquire specific skills like emotion recognition?
RQ3	What opinions do users and other relevant stakeholders have on the degree of acceptability of digital technology, such as the SALY game? Do they think they are satisfied?

Sketch Mee, and *Memory Game*, designed to improve autistic children's ability to recognize faces and emotions. The analysis indicates that while LIFEisGAME is visually appealing and entertaining, therapists suggested several modifications for each game mode. These include adding more customization options, increasing levels of difficulty, incorporating musical stimuli to boost motivation and feedback perception, and providing clearer instructions on how to play the game.

2. JeStiMulE (Serret et al., 2014) is a serious game designed to teach emotion recognition to children with both low and high-functioning autism. It consists of three phases: calibration, learning, and training. The learning phase includes three levels of increasing complexity: recognizing faces, faces with gestures, and faces with gestures and verbal cues. One limitation highlighted by the authors is the lack of a control group, as the study was exploratory and primarily aimed at identifying potential JeStiMulE users. However, descriptive analyses showed that JeStiMulE is adaptable, effective, and efficient in teaching emotion recognition to individuals with autism. A more recent review of JeStiMulE by Elhaddadi (2022) and Elhaddadi et al. (2021) confirmed the effectiveness of the game for addressing deficits in emotional facial expression (EFE) recognition among children with autism.
3. Emotiplay (Fridenson-Hayo et al., 2017) is an engaging and successful psycho-educational intervention that was used to teach emotion recognition (ER) to children with high-functioning autism across three distinct cultures. This was achieved through the interpretation of facial expressions, speech patterns, and body language, and the integration of these insights into context using Emotiplay's serious game (SG). As a computer-based intervention, Emotiplay's SG demonstrates cross-cultural benefits. The study highlighted two key design elements that enhance user motivation and improve learning outcomes: the use of a storyline with goal-directed behaviors, and increased gaming elements that facilitate the transfer of learning.
4. EmoStory (Min et al., 2018) is a game-based interactive narrative system designed to support children's emotional development. It includes three narratives set in different contexts (school, home, and park), which use animations and emotional sounds to help autistic children understand six emotions, associated contexts, and facial expressions. The game features multi-level challenges embedded within the narrative, allowing autistic children to practice step-by-step, and provides real-time feedback based on facial expression recognition and visual cues to assist in making facial expressions.
5. JEMImE (Grossard et al., 2019) is a serious game aimed at helping autistic children learn to produce emotions such as happiness, anger, and sadness in a 3D virtual environment with social contexts. The game has two phases: training and playing. In the training phase, two imitation games and two emotional production games are used to teach participants to make adaptive facial expressions (FE). Each game has two variants—one with a less confusing design and without emotionally charged background images, and the other with a social context. The authors concluded that JEMImE has significant potential for supporting autistic children's emotional development.
6. ALTRIRAS (Almeida et al., 2019) is a role-playing game (RPG) designed to assist children with autism in recognizing facial expressions associated with four basic emotions: joy, sadness, anger, and surprise. Unlike competitive games, ALTRIRAS focuses on social interaction. The game offers a variety of puzzle-solving tracks and follows the adventures of two characters, Rex and Tina, as they teach another character, Emotion. Players take on a central role in the story and gain abilities as they progress through the plot. The game aims to improve autistic children's communication, perception, and quality of life.
7. GDF (Tsikinas and Xinogalos, 2020) proposes a serious games design framework (GDF) to help experts, special education instructors, and designers create effective SGs for individuals with ASC and intellectual disabilities (ID). The GDF consists of three main components: learning content and game mechanics, assessment, and pedagogy. The pedagogical component includes learners, educators, participatory design, and learning objectives. Additional game elements, such as self-learning, immersion, and continual challenge, are integrated to create an immersive experience that supports learners with ASC and ID in achieving their learning goals.

4 Contribution, discussion of research questions and methodology

Our study has made the following contributions to address the challenges of technology development for individuals with ASC, in response to the research questions outlined in Table 1:

1. New Participatory Research Framework: We developed a participatory research framework to assist game designers and relevant stakeholders in creating effective serious games (SGs) for individuals with ASC. Through participatory sessions and a design thinking process, the framework actively involves users and relevant stakeholders as "design partners" in the design activities.

2. Development of SALY: Using case-based learning research, the framework was applied to develop a new SG called *SALY*. This game helps individuals with ASC recognize facial expressions related to six basic emotions while also improving their attention and observation skills. SALY incorporates four mini-game engines: *Simulation*, *Attention*, *TASALY*, and *Matching*, which are based on both visual and auditory stimuli. The fantasy music-based social narrative game, *TASALY*, provides intrinsic rewards, while extrinsic rewards like points, levels, and badges enhance motivation and flow, keeping learners emotionally engaged, satisfied, and immersed in the game.
3. Advanced Techniques in Simulation Engine: To support individuals with ASC in learning how to express their emotions, we employed advanced computer graphics and machine learning techniques in the development of the simulation mini-game engine.
4. Usability Evaluation: We used a variety of usability metrics to evaluate the proposed game's effectiveness, efficiency, and user acceptance. Comparisons were made with existing techniques, and the game was tested with a wide range of users, including those without impairments. A mixed-methods research approach was used to gather and analyze the data.
5. Technology Acceptance Model (TAM): To assess the level of acceptability of the technology, we applied the Technology Acceptance Model (TAM) proposed by Davis (1989).
6. The research questions raised in Table 1 are reviewed below, followed by a discussion of the research methodologies and methods employed to address them.

4.1 Discussion of RQ1 and the proposed framework

Developing serious games (SGs) is a complex task, requiring the integration of four primary components: learning elements (pedagogy and educational content), game design (fun), technology, and learning theories (Abd El-Sattar, 2023b). Each component demands collaboration among various stakeholders and specialists with diverse expertise, a process often facilitated through the participatory design (PD) method. The paradigm for design research has recently shifted from a user-centered approach—where the user is treated as the subject—to a participatory one, where the user is a partner (Maun et al., 2023; Wohofsky et al., 2023; Kinnula and Iivari, 2021; Luck, 2018). Bakhtiar et al. (2023) identified three primary types of engagement strategies in 25 studies: (a) child-led research, (b) children as co-researchers, and (c) youth participatory action research. Our approach, inspired by these findings, significantly rethinks the role of users—transforming them from mere informants into active partners in the design process. Table 2 outlines a set of design guidelines along with detailed explanations, which form the foundation of our proposed framework. The framework consists of three core parts: pedagogy, educational content and game characteristics, and assessment, as illustrated in Figure 1. The initial step in the proposed framework focuses on the pedagogical elements of SGs, specifically participatory design and design thinking. Once these pedagogical elements are determined and agreed upon, game characteristics and educational content are applied and organized into three key attributes: game elements, game aesthetics, and user experience. After the game is developed, an evaluation process is conducted to determine whether the prototype meets the desired objectives. Feedback from this phase is used to update instructions and review any elements that did not result in the intended learning outcomes. This process continues iteratively until all goals and objectives are met.

4.1.1 Participatory design (PD) and participatory sessions

The diversity among individuals with Autism Spectrum Condition (ASC)—in terms of their unique needs and evolving talents—makes it challenging for technology designers to engage with them effectively. Technology designers often struggle to address the entire system when developing solutions for ASC, making a community-driven design approach necessary. Participatory Design (PD) offers a solution by involving users and relevant stakeholders in the design process. PD is a design methodology that integrates users in every stage, from ideation to prototype testing (Maun et al., 2023; Wohofsky et al., 2023; Luck, 2018). By engaging as "design partners," users can provide valuable insights into the tasks, context, and expected behavior of the future system. Stakeholders also play an essential role, representing the various adults and people in the user's life. We categorized stakeholders based on the system proposed by Borjesson et al. (2015) as follows:

1. User/Participant: Individuals or children who interact with the system or technology developed.
2. Proxy: The user's immediate environment, including parents, teachers, and supporters, who speak on their behalf.
3. Expert: Specialists such as therapists, psychologists, or teachers who assist in the design process. Unlike proxies, they provide insights representing groups of children rather than individual experiences.
4. Facilitator: Adults who help establish relationships between children and researchers/designers and provide practical support during activities.

The participatory sessions, a form of group work, proved invaluable in assisting the design process. These sessions validated initial design proposals, gathered new ideas, facilitated the understanding of user needs, and assessed which features foster higher motivation and engagement. Users were able to act as informants throughout the design process. Our participatory sessions followed a multi-stage process inspired by the Bluebells process (Kelly et al., 2006). The workflow was iteratively developed based on feedback from relevant stakeholders, including users. Figure 2 illustrates the steps of the participatory sessions, based on the Bluebells process:

> [1] Stage #1 (Before Play):
> The design team conducts fact-finding and identifies required activities, which are validated by experts. The goals at this stage are:

A. A better understanding of system objectives, tasks, user needs, preferences, and context of use. Meetings were held with experts (e.g., psychologists, psychiatrists) to identify goals and gather user data through qualitative and quantitative methods (e.g., surveys, interviews, focus groups).
B. Visualizing the final system through design elements such as characters, avatars, scenarios, and storyboards. Scenarios illustrate intended user behavior and specific use cases.

[2] Stage #2 (During Play):

Participants engage in design activities. At the start of this phase, users are introduced to the system's objectives and activities by a therapist. Participants are then assigned tasks that align with the session's goals.

[3] Stage #3 (After Play):

After the sessions, the design team compiles and analyzes the results. The final evaluation process takes place, with each participant's game data being gathered for analysis to confirm usability.

4.1.2 Design thinking (DT)

The Design Thinking (DT) technique was integrated with participatory sessions to dismantle traditional barriers and produce research more aligned with the objectives and preferences of the autistic community. DT is a methodology that connects user needs with what is technically feasible and practical, utilizing strategies such as participation, co-design, co-creation, and intuitive problem-solving (Braun and Clarke, 2022; Fabri et al., 2016; Koh et al., 2015). At its core, DT emphasizes empathy—the capacity to understand and solve problems from the perspective of another individual, according to Efilti and Gelmez (2023). Empathy enables designers to step into another person's shoes, comprehend their situation, and devise solutions that address their challenges. Several frameworks exist to implement the DT process, including:

- Inspiration-Ideation-Implementation (3-step) process.
- Discover-Define-Develop-Deliver (4-step) process.
- Empathize-Define-Ideate-Prototype-Test (EDIPT) process (5-step).

TABLE 2 A lists of design principles for individuals with ASC, along with an explanation.

Design principles		Descriptions
Attributes	Components	
Participatory design (PD)	Pedagogy	PD is a design methodology that actively incorporates users in all stages of the process, from ideation to prototype testing.
Design thinking (DT)	Pedagogy	DT is more dedicated to the prototyping of innovative ideas. Innovative ideas are brought to life to satisfy user demands through the use of design thinking, a human-centered design (HCD) methodology.
Users: those who use or control the video game; in this study, people with ASC.	Personalization	Permit content personalization based on user requirements. A SG can succeed by using personalized material to increase immersion and engagement.
	Customization	Permit customizing game elements based on user requirements. A SG can succeed by allowing game elements customization to increase enjoyment and motivation.
Stakeholders	Personalization	Special education teachers and specialists set individual goals for each user, and they keep track of their progress towards achieving them.
Learning	Personal learning plan (PLP)	PLP is a detailed plan that describes the difficulties those individuals with ASC are having and what the game/school is doing to meet those needs.
Objectives: Educators set learning objectives, which are goals they want users to accomplish.	Monitoring	Monitoring strategies should be used to gather useful data about the game, including efficacy and efficiency, in order to track the progress of fulfilling the learning objectives in an SG.
Game Aesthetics: sensations that the user experiences when playing the game.	Graphical User interface (GUI)	The GUI should be clear, simple, and user-friendly.
	Game world	The environment where users go while playing the game should be attractive and immersive.
	Game context/ Cultural factors	Culture and contextual aspects need to be considered. Please refer to Emotiplay SG (Fridenson-Hayo et al., 2017), as an example.
User Experience: represents the experience that the user has when engaging in the game.	Self-learning	Giving users' freedom of choice and letting them explore the game independently improves the experience and keeps people interested. People with ASC often exhibit repetitive behavior, so even after they have completed the task in the game, they might want to do it again. Therefore, adding the element of repetition to learning can benefit people with ASC.
	Feedback	For generating flow state, it is important that activities provide immediate and clear feedback, which can be provided with the help of visual and audio elements. In the SALY game, to engage users and promote their learning experience, various emotional sounds were used to better draw users' attention and assist their learning. For feedback, other different sound effects were also used when the users' answer was correct or incorrect.
	Monitoring	To keep track of the development, provide a user profile with data.
	Usability	The game should be easy to use and safe.

(Continued)

TABLE 2 (Continued)

Design principles		Descriptions
Attributes	Components	
Game Elements: The parts that make up a game and give learners an engaging experience		
	Flow state	To feel the fun users, have to be in the channel of flow state.
	Clear goals	When people are aware of their responsibilities, the goals are crystal clear. Clear objectives improve attention.
	Level progression	User/Player growth and development, which should gradually increase to motivate users.
	Challenges	Challenges are game tasks or exercises that require effort to perform. In the SALY game, there are a lot of tasks for each mini-game to be completed. Once achieved, some rewards (e.g., TASALY gaming engine) are provided.
	Badges	Badges are virtual goods that have a visual representation. They are awarded to participants after completing certain challenges or reaching certain achievements
	Rewards	A reward is a component of the game that gives the users satisfaction and inspires them to work harder. There are two types of rewards: extrinsic rewards like points, levels, etc., and intrinsic rewards where tasks are rewarding by their nature (e.g., the TASALY mini-game engine).
	Game fantasy	The series of events that occur as users play the game. Game fantasy elements include sensation and narrative.
	Immersion	Immersion refers to engagement or participation. The goal of engagement is to maintain users' interest in the task or activity.
	Visual aesthetics	Include visual elements such as the overall look and feel of the game. It determines how tools and functions of the game mechanics are visualized and how feedback is displayed.
	Levels	Levels can have different meanings in games. Levels can refer to the rating of the participant based on his/her score or can be related to the difficulty of the game. The SALY game supports both.
	Emotions	Games are good for creating emotions among users. Those emotions can be created through gameplay, storytelling or socialization. Through the TASALY storytelling-based gaming engine, the SALY game generates fun and creates emotions among participants.
	Game mechanics	The procedures and rules of the game. It refers to the set of activities repeated by the learner throughout the game.
	Sound object	An object for playing sounds at the beginning of the level or when the user is successful or gives an incorrect response. In the SALY game, to engage users and promote their learning experience, various emotional sounds were used to better draw users' attention and assist their learning. For feedback, other different sound effects were also used when the users' answer was correct or incorrect.
	Scaffolding	Support and help during learning within the games
	Technology	It is the medium through which the tale will be told, the mechanics will occur, and the visual aesthetics will take place. As a technology for the SALY game, we employed cutting-edge machine learning and computer graphics methods based on Unity.
Assessment	Usability testing and technology acceptance model (TAM).	One method to assess the effectiveness and level of satisfaction of the developed SG among the intended audience is usability testing. To analyze the level of acceptability of the technology being used, we employed the technology acceptance model (TAM).

For this study, we employed the 5-step EDIPT process, which was thoroughly explored by Fabri et al. (2016) and is illustrated in Figure 3.

4.1.3 Research methods

A research method is a procedure for generating or gathering data. It is important to note that mixed-methods research was employed to collect and evaluate the data for this study. We utilized a mixed-methods approach (qualitative and quantitative) to examine the topic from multiple perspectives, offset the limitations of one data type with the strengths of the other, and enhance the evaluation by combining the advantages of both methods. Our findings build upon those reported by Pettersson et al. (2018) and Borjesson et al. (2015).

4.2 Discussion of RQ2

The use of 'technology-enhanced learning,' along with game elements, attributes, user experience, accessible design, and assessment, presents promising research avenues for educating individuals with ASC. The concept of 'technology-enhanced learning' emphasizes the importance of leveraging technology to improve learning outcomes. In our study, we utilize machine learning and computer graphics techniques to assist individuals with ASC in expressing emotions and accurately recognizing facial expressions associated with the six basic emotions: anger, disgust, fear, happiness, sadness, and surprise. This is achieved through the implementation of a simulation mini-game engine, which is discussed in greater detail in the 'System Development and Implementation' section.

4.3 Discussion of RQ3

Initially created by Davis (1989), the technology acceptance model (TAM) was used to assess the degree of acceptability of the technology in use. In terms of usability testing, a number of usability metrics were used to assess and evaluate the functionality and performance of the proposed application, including the Fun Toolkit (Gavin and Matthew, 2012) and the System Usability Scale (SUS) (McLellan et al., 2011). A thorough description of each of these elements may be found in the section under "Assessment, Usability Testing, and Obtained Outcomes."

5 System development and implementation

5.1 System architecture and design

A graphical overview of the SALY system architecture is presented in Figure 4, while a complete navigation scheme of the developed system is shown in Figure 5. The first level displays the primary user interface, and the second level showcases the various modules of the system. This level includes the registration page, login screen, play mode, assessment file folder (which stores game data for each player throughout the gaming experience), and the logout screen. Registration occurs only during the first time participants access the system, during which they fill out a form requesting their name, age, and other relevant information. After registering, participants log in to the system using the username and password they previously created. The assessment file folder is utilized to monitor each participant's results and track their learning progress. The third level provides a general overview of the four mini-game engines, each featuring a different level of difficulty included in the play mode.

5.2 System modeling

System modeling is the process of creating abstract representations of a system, with each model offering a unique perspective. The Unified Modeling Language (UML) (Rafael and Nuria, 2016) is a type of graphical notation used for system modeling. UML includes several diagram types, which are divided into two categories: structure diagrams and behavior diagrams. Structure diagrams, such as class and package diagrams, represent the static structure of the system, whereas behavior diagrams depict the dynamic behavior of objects within the system, illustrating a sequence of changes over time. Common types of behavior diagrams include use case, state, activity, and sequence diagrams. A use case diagram describes a system's functional requirements in terms of use cases. It simulates the system's intended functionality (use cases) and its environment (actors), illustrating how the system interacts with its surroundings. Appendix A provides illustrated examples of the four different types of behavior diagrams—use case, state, activity, and sequence—for the SALY system.

5.3 Simulation game engine implementation

This subsection provides a comprehensive explanation of the answer to RQ2 (Table 1). A recent branch of modern machine learning (ML) research called deep learning (DL) learns features and tasks directly from data (e.g., images, text, or sound). One of the most frequently applied DL networks for various classification problems is the convolutional neural network (CNN) (e.g., Alzubaidi et al., 2021; Samar et al., 2023a; Samar et al., 2023b). The success of CNNs is largely due to their inherent ability to automatically extract features from input data without requiring operator intervention (Li et al., 2021). We employed CNNs for emotion detection in the simulation game engine implementation. The implementation process comprises a feature extraction subsystem and a neural network that acts as a classifier subsystem, as illustrated in Figure 6. The role of the CNN as a classifier is to take the input image and output the probability of it belonging to a specific class (anger, disgust, fear, happiness, sadness, or surprise). Our simulation game engine is based on a CNN that was trained using the Radboud Faces Database (Langner et al., 2010), which is publicly available. The CNN analyzes an image as input and employs a strategy to predict the corresponding emotion as output. As demonstrated in Figure 7, the CNN architecture generally consists of four layers: input, convolution, pooling (sub-sampling), and fully connected. The input layer stores the pixel values of the input image. The image is divided into receptive fields that feed into the convolutional layer. Receptive fields are the areas of the visual field where a single neuron is activated in response to a stimulus. Features from the input image are extracted using the convolution layer. Convolution layers are based on the mathematical operation called "convolution," performed on two variables (f*g) to produce a third variable. Figure 8 visually depicts a convolutional layer. Before training the network, a group of parameters called hyper-parameters is associated with the convolution layer, including learning rate, filter size, stride, activation function, and zero-padding (Alzubaidi et al., 2021). The stride refers to the number of units by which the filter slides over the input image. Hyper-parameters are constants whose values must be determined before building the models. The stochastic gradient descent (SGD) optimization algorithm (Habib and Qureshi, 2022) and its variants are the most widely used algorithms for training CNNs. The goal of any optimization problem during neural network training is to find the ideal weights and biases that minimize the cost—also referred to as loss or error—where a larger cost indicates a less efficient network. The amount by which the weights are updated during training is referred to

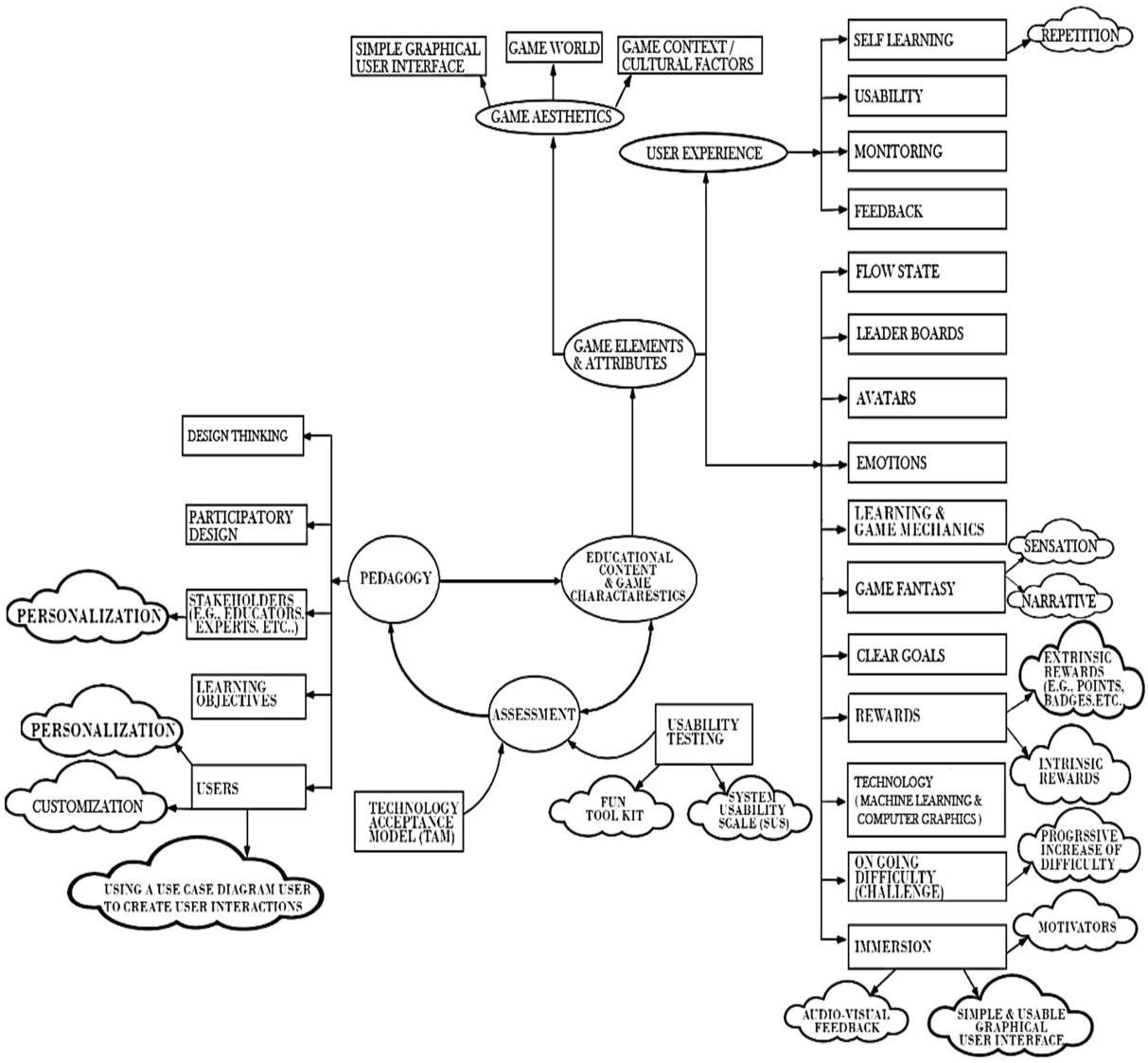

FIGURE 1
The proposed framework.

as the "learning rate (LR)." The learning rate is a critical hyper-parameter that cannot be defined through explicit formulation and should be carefully considered during the training process. Typically, this parameter is determined through trial and error, with some researchers setting it to a constant value [e.g., 0.01, as in Pavez et al., 2023]. Joshi et al. (2019) indicate that even a small variation in the learning rate can significantly impact the network's convergence, learning speed, and overall performance. Therefore, to enhance and accelerate the learning process, we employed a cyclic learning rate throughout the training phase, as described in Samar et al. (2023b). Convolution produces "feature maps," which are collections of various features. Consequently, a pooling layer is employed to reduce the dimensionality of each feature map while retaining the most critical data. Max pooling, min pooling, and average pooling are three commonly used pooling techniques. A visual representation of the pooling layer using the max pooling technique is depicted in Figure 9. Before the convolutional layer, the system had been performing computations in a linear fashion. The selection of an appropriate activation function—such as Sigmoid, Tanh, Rectified Linear Unit (ReLU), or variants of ReLU (e.g., Leaky ReLU and PReLU)—introduces non-linear combinations of features (Alzubaidi et al., 2021). In our implementation, we used ReLU to expedite and enhance training by retaining positive values and mapping negative values to zero. The final layer, used for classification tasks, is fully connected and is responsible for performing a global operation by taking input from all the various feature extraction stages and conducting a global analysis of the outputs from all the preceding layers. Given that there are six basic emotions, its purpose is to receive an input volume and produce an N-dimensional vector, where N equals six (anger, disgust, fear, happiness, sadness, and surprise).

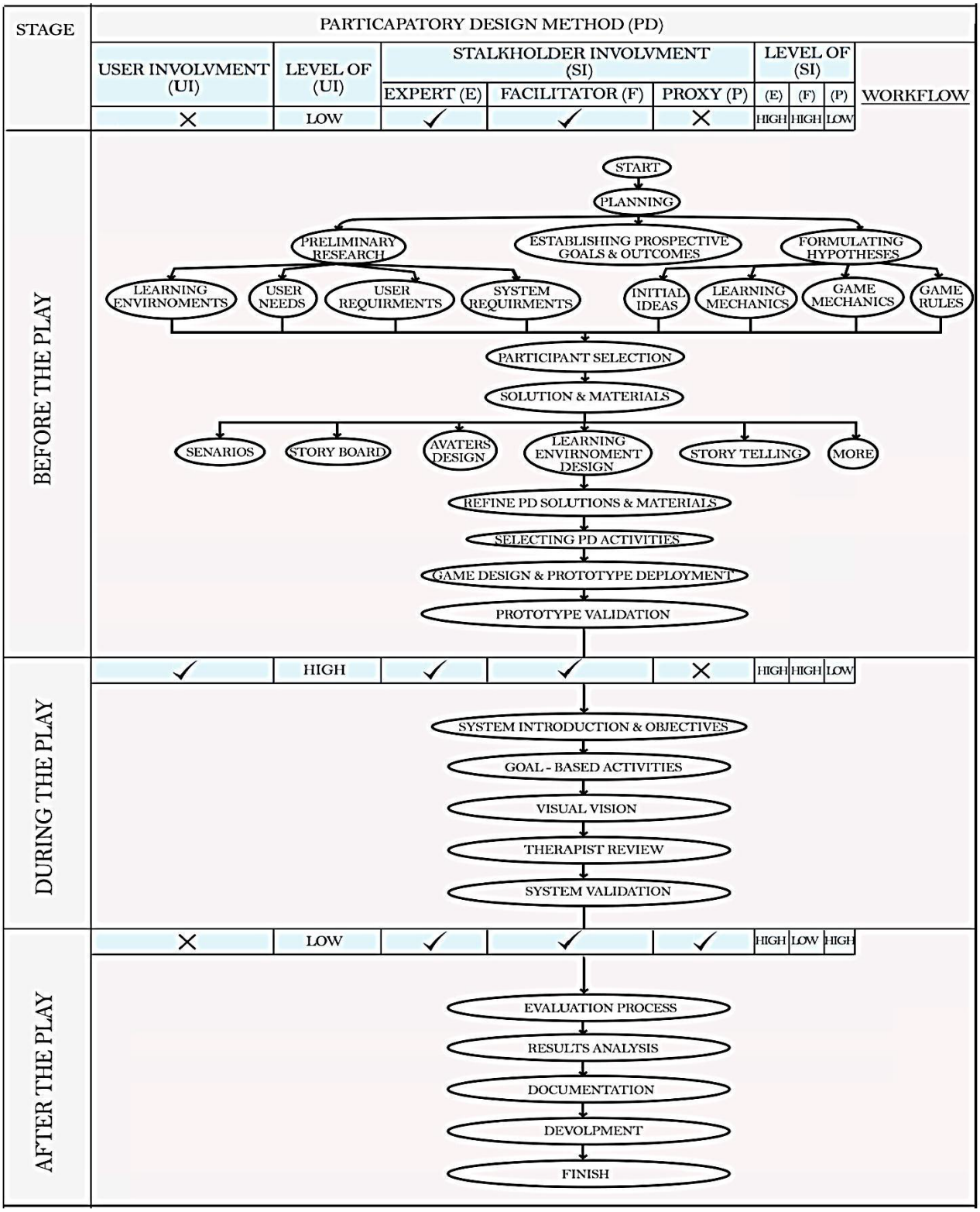

FIGURE 2
Workflow for PD Sessions.

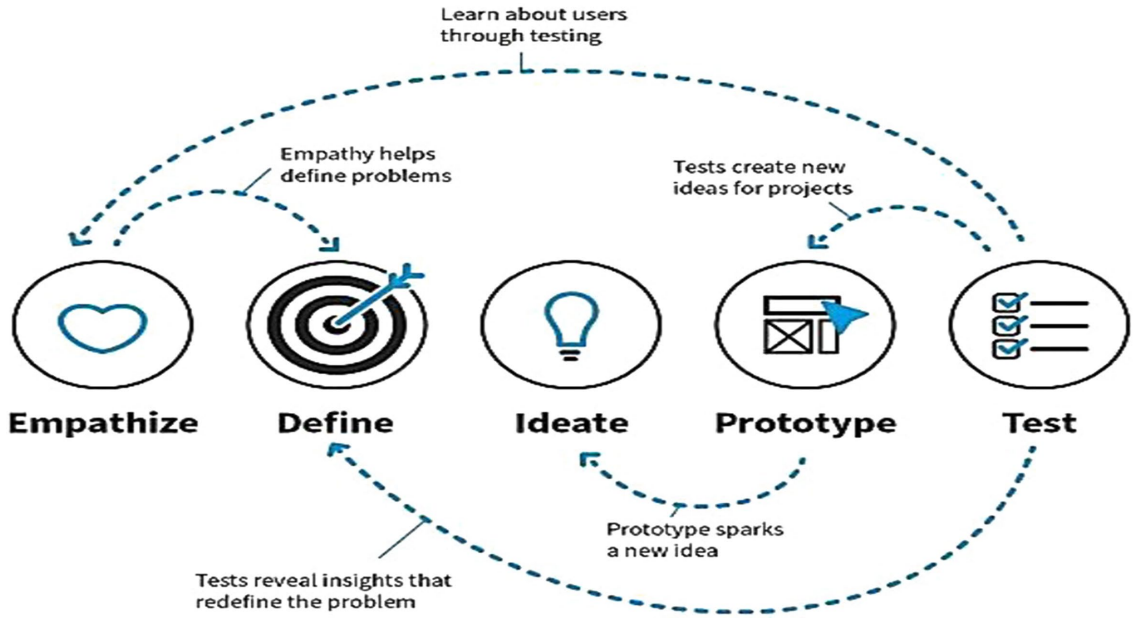

FIGURE 3
The 5-step empathize-define-ideate-prototype-test (EDIPT) DT process.

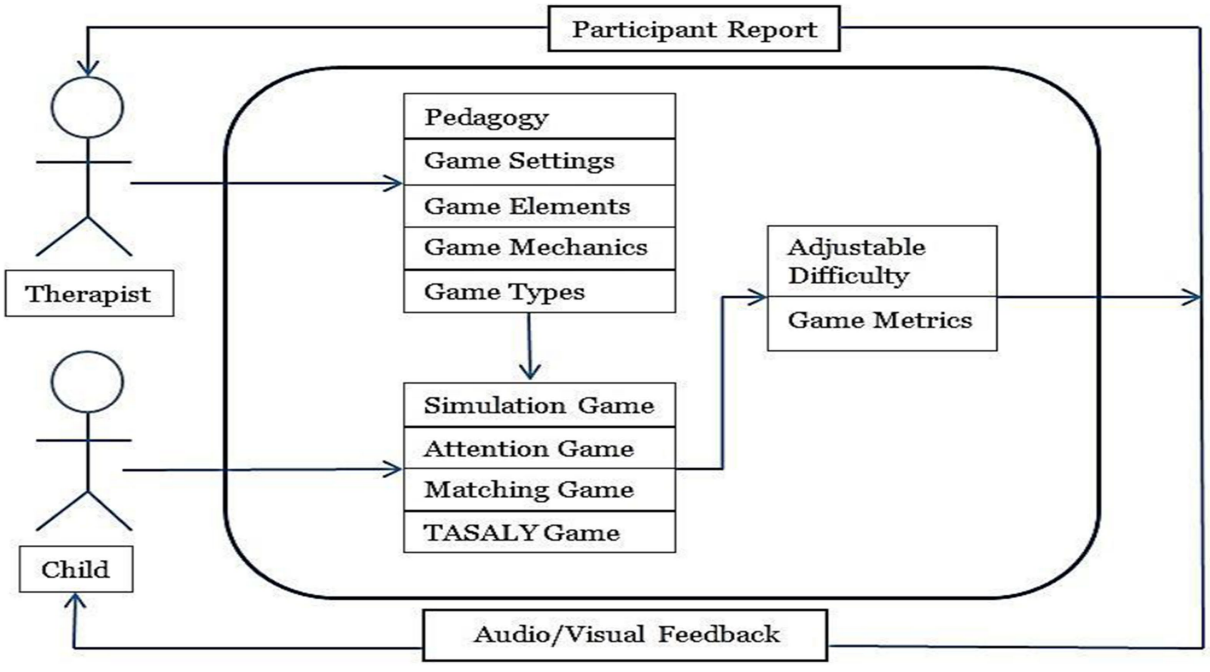

FIGURE 4
SALY's system architecture.

6 The SALY game's design elements

6.1 Design elements

The main elements of the SALY game design are:

- Acts: It is defined as the highest-level element in the SALY game, which structures it into different parts. This structure includes the main user interface, registration page, play mode, and assessment mechanism for monitoring participants' progress, among other features. The choice of language, gameplay, and goal setting are determined based on the specifications and directions provided by the therapist or parent.
- Scenes: The gameplay is structured into acts, with each act further divided into scenes. Scenes occur within one or more scenarios, each presenting varying levels of difficulty. Each scene

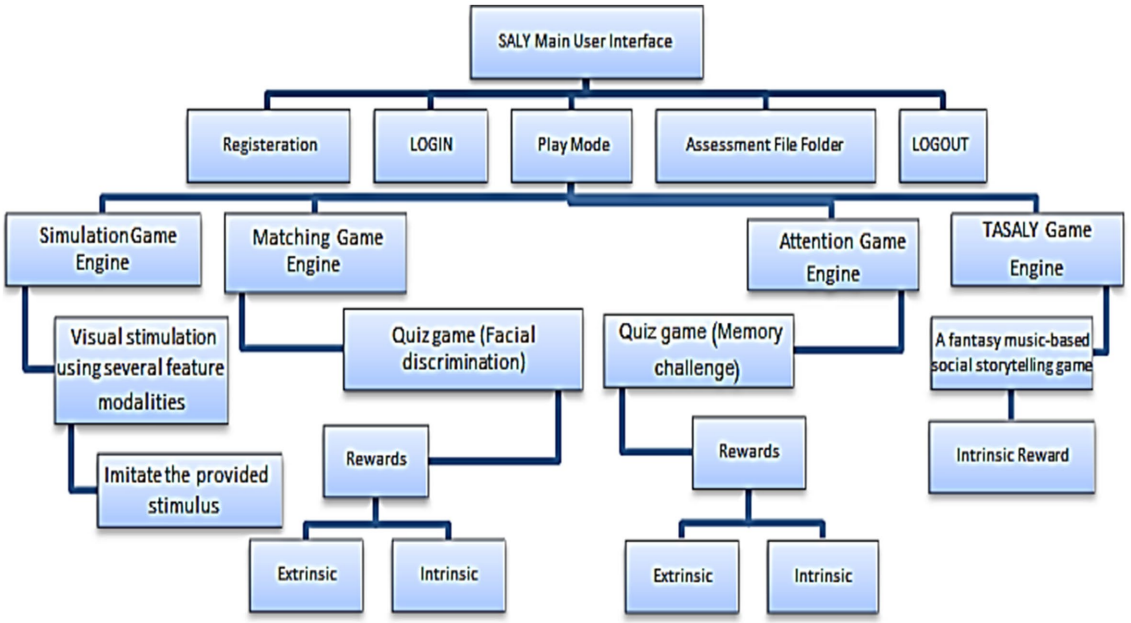

FIGURE 5
SALY's system navigation scheme architecture.

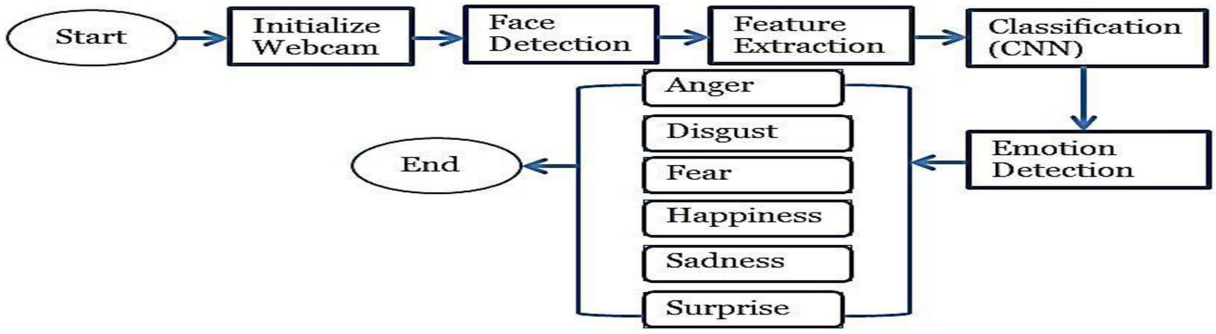

FIGURE 6
The simulation game engine workflow.

comprises several actions that outline the events taking place in the SALY game. For example, the following actions are included within the simulation game:

- o Set the Emotion Character → Associated Action.
- o Simulate a Character's Emotion Visually → Challenge Action.
- o Count the Success and Failure → Count Action.
- o Timer Control → No Associated Action.
- o Rewards → Two types of rewards: (1) Extrinsic like points and badges, and (2) Intrinsic for creating emotions among participants by playing TASALY & Matching games.

- Characters: To facilitate stimulation and emotion recognition, SALY features a variety of characters, including photographs of human faces, human cartoon faces, and emojis (Bai et al., 2019). Emojis, derived from the Japanese words "e" for "picture," "mo" for "write," and "ji" for "character," are utilized to convey and enhance feelings. The game's startup user interface includes a tutorial featuring an animated human cartoon face displaying various emotions, which combines visual and auditory stimulation to engage users and help them understand the necessary tasks (see Figure 10).

6.2 SALY gameplay

Gameplay defines how the learner and the game interact with each other. It simply means playing the game. The SALY gameplay is briefly discussed below:

1 The psychologist explains the therapy procedure.

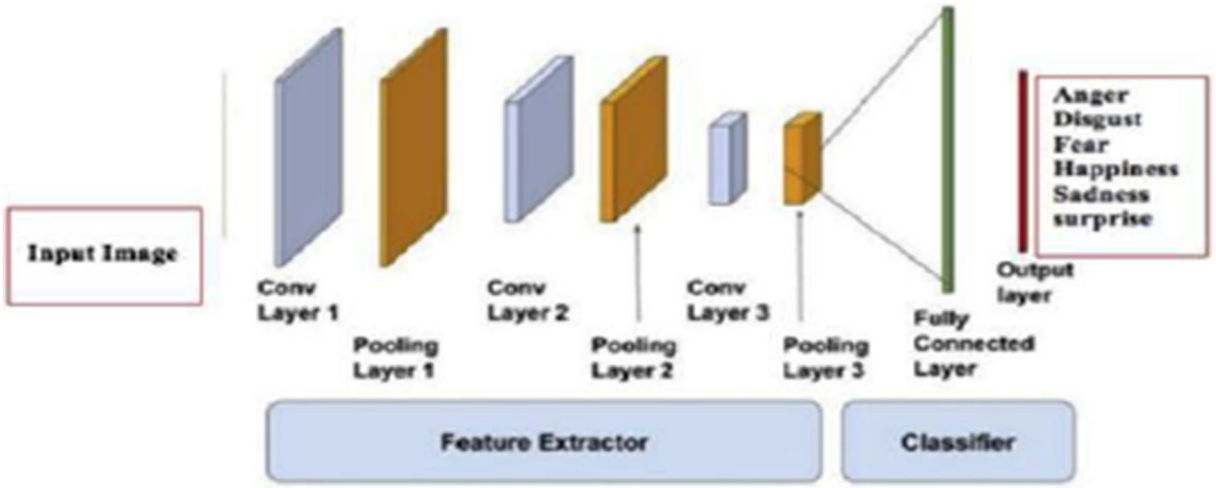

FIGURE 7
The CNN general architecture for emotion detection.

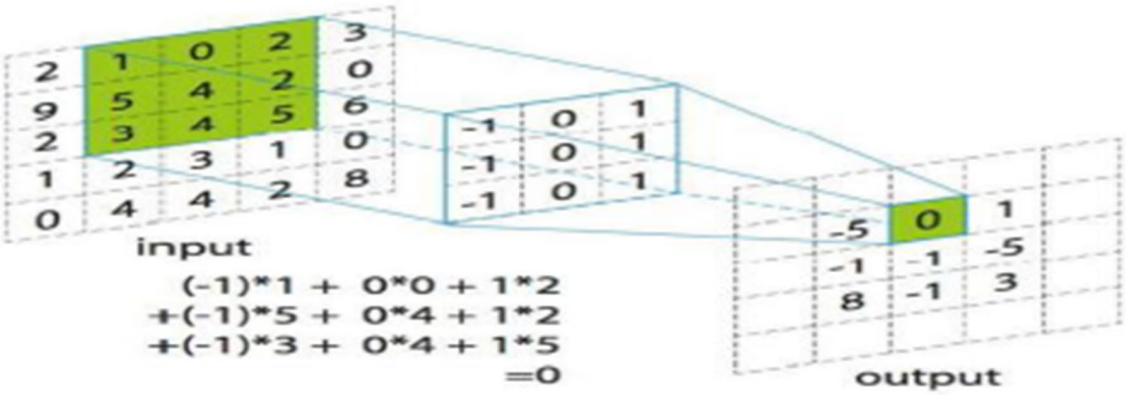

FIGURE 8
A visual representation of a convolutional layer.

2 Each participant must log in to start the game.

3 A main menu screen is displayed, featuring four types of mini-game engines: Simulation, Attention, TASALY, and Matching. Participants begin playing according to the guidelines and directions provided by their therapist or parent. To engage participants and enhance their learning experience, the game's startup user interface includes an animated clip with emotional sounds, designed to capture participants' attention and aid their learning (see Figure 10).

4 Simulation Game Engine: Figure 11 shows a screenshot of participants interacting with the simulation game. This game teaches children to recognize six basic emotions. To facilitate stimulation and emotion recognition, various 2D visual stimuli featuring different modalities are displayed randomly, one at a time, in front of the participants. As a challenge, the participant's role is to correctly mimic the presented emotion. The simulation game tracks gameplay through metrics such as response time and the successes and failures that occur during play mode, which can be recorded and saved after each session. These recorded metrics provide valuable feedback to therapists, enabling them to evaluate clinical results following each play session.

5 Matching Game Engine: Before progressing to the next task, participants must complete a short and entertaining quiz known as the matching game after practicing with the simulation game. The matching game serves as a facial discrimination intervention aimed at helping participants identify and match emotions displayed on faces (e.g., happy, sad, etc.). A single or multiple target emotional faces are shown at the top of the screen, with corresponding "choices" displayed at the bottom. Participants are prompted to select the emotional expression that matches the target(s). For example, if the target shows a happy face, the participant must match it with another happy face. To assist players, the game starts by displaying basic emotional expressions, accompanied by sound effects. Feedback is provided through different sound effects when

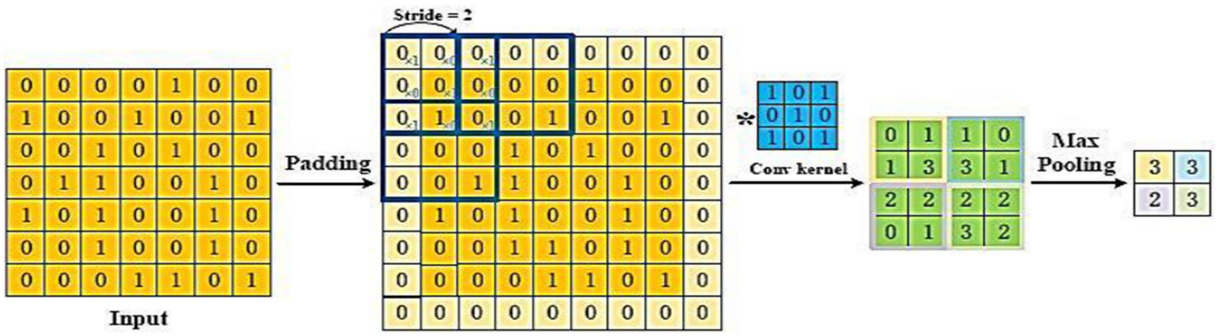

FIGURE 9
A visual representation of CNN using the max pooling technique [as presented by Li et al., 2021].

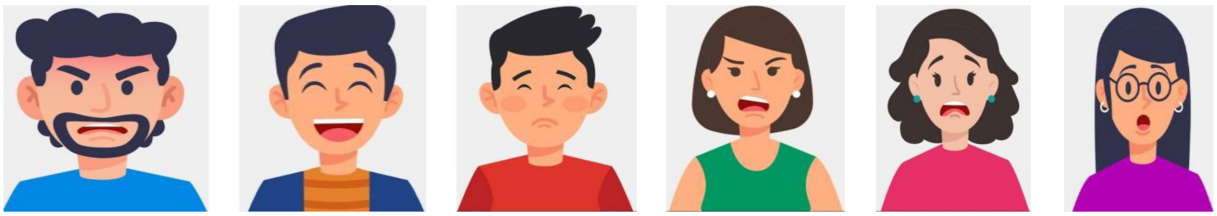

FIGURE 10
A snapshot of an animated human cartoon face with different emotions.

participants answer correctly or incorrectly. The matching game tracks gameplay using metrics such as (1) response time (the duration it takes for a participant to match a face) and (2) player scores (indicating how well the participant performed). Participants receive rewards based on their achievements upon completing the game. Two types of rewards are provided: extrinsic rewards (e.g., badges or trophies) and intrinsic rewards from playing the TASALY game.

6 TASALY Game Engine: TASALY is a fantasy, music-based social storytelling game designed to generate fun and evoke emotions among participants. It serves as an intrinsic reward intended to enhance participant engagement through two gaming mechanics: an easy-to-use graphical user interface and audio/visual feedback. The game features a self-learning component, allowing participants to retry after failures or attempt to achieve better scores. The concept for TASALY is inspired by music therapy and interactive storytelling (Marquez-Garcia et al., 2021), as music fosters emotional expression, motivation, and feedback perception. In TASALY, goals are visualized through storytelling. The game promotes cooperation, socialization, and friendship among participants while indirectly teaching them about musical scales. The narrative begins with a character receiving a message on their mobile phone, stating that it is their friend's birthday, and that friend enjoys music. The character decides to buy a piano as a gift and visits a music shop with their friend. As a challenge within the game, the player must navigate through the musical scale, which serves as an obstacle. When the player touches any tone (e.g., Do, Re, etc.) in the musical scale, a corresponding sound effect plays, and a score is awarded. Players use the left and right arrow keys for movement and the space bar to jump. The game elements in TASALY include sound, a timer, levels, and score objects. To enhance engagement and mitigate boredom or frustration after failures, TASALY incorporates a feature known as difficulty scaling or an "even game" (Pieter et al., 2004), which adjusts the challenge level to match the player's skill, thus increasing both the entertainment factor and gameplay strength. The storyboard illustrating the scenario scope in the TASALY game is shown in Figure 12a, while Figure 12b displays a screenshot of participants interacting with the TASALY game.

7 Attention Game Engine: The goal of the attention game is to improve the child's attention skills and observation as it encourages the participant to observe and analyze different emotional faces. The participant is asked to memorize several images of different emotional expressions arranged in a matrix of different sizes (2×2, 3×3, etc.) from a slider. As a challenge in this game, the role of the participant is to select the right pair of similarities according to their interpretation of emotional expressions images. The difficulty levels are embedded in the matrix size and adjusted by the help of the therapist/parent. The metrics for the attention game are: (1) response time (How long in milliseconds does it take for the participant to respond?), (2) participant's score, and (3) difficulty levels. Participants are rewarded using extrinsic reward (e.g., badges/trophies), and intrinsic reward by playing TASALY game.

8 By the end, feedback meetings were organized, and results were analyzed.

FIGURE 11
An illustration of some participants interacting with the simulation game engine.

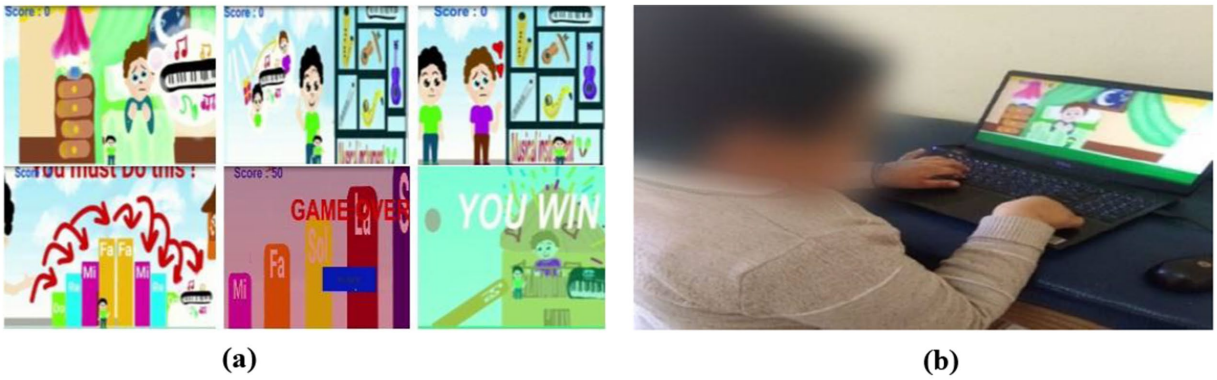

FIGURE 12
(A) Screenshots for TASALY game storyboard. **(B)** An illustration of some participant interacting with the TASALY game engine.

TABLE 3 Characteristics of participants.

Characteristics	Number/Range
Gender	25 (76%) male, and 8 (24%) female
Age (Years)	7–15 years
Verbal	27 (82%)
Non-verbal	6 (18%)
WASI	35–115
Education (Hours/Week)	0–49
Special care (Hours/Week)	0–49

7 Materials and methods

7.1 Selections of participants

We gathered a sample of 33 children aged between 7 and 15 years to play the SALY game for at least one and a half hours per week over a period of 7 weeks during an open trial. For each participant, data on their educational background and any special care (therapeutic or educational) was also collected. One participant was unable to continue playing because he refused to participate. Additionally, one child (3%) had fine motor skill problems. Most participants were diagnosed with autism by a psychiatrist or clinical psychologist. The sample consisted of 25 boys (76%) and eight girls (24%), referred to collectively as "Group 1." These children were recruited from the Faculty of Graduate Studies for Childhood's Center for Special Needs Care. This center not only provides assistance to individuals with learning difficulties but also trains parents on how to manage their child's specific impairments using cutting-edge scientific research. To measure IQ, the Wechsler Abbreviated Scale of Intelligence (WASI) was employed. Table 3 presents the characteristics of the participants. The developed application has also been tested with educators, parents, and typically developing children to ensure its accessibility for those with Autism Spectrum Conditions (ASC). Eleven typically developing children were invited to participate; they were designated "Group 2." This group took part in the application to evaluate its functionality and to assess the efficiency and effectiveness of its use in educational contexts.

7.2 Ethical issues

Because of the crucial importance of the research and the confidentiality considerations involved, there are a number of challenges and ethical issues that come up when people with ASC are

involved in the production of an SG. A written consent form asking for permission for three separate research components was delivered to all the parents and other pertinent parties of the children participating in the study. The first was the child's involvement in the research; the second was access to the child's academic and medical data; and the third was keeping track of the child's progress throughout the study.

7.3 Materials and procedures

The intervention protocol for participants consists of three distinct phases: pre-intervention, intervention, and post-intervention. After obtaining consent from both parents and children, participants and their parents took part in a two-day pre-intervention assessment. During these sessions, children underwent IQ testing that measured both verbal and performance IQ, using the 2nd edition of the Wechsler Abbreviated Scale of Intelligence (WASI-II). Meanwhile, parents completed the Social Responsiveness Scale, 2nd edition (SRS-2), and the Vineland Adaptive Behavior Scales, 2nd edition (VABS-II) to confirm the children's diagnostic status. The WASI-II exam assesses a child's verbal, nonverbal, and overall cognitive abilities, providing an estimate of their general intellectual capacity. The SRS-2 measures the severity of autism symptoms, evaluating areas such as social cognition, social motivation, social communication, and social awareness. The VABS-II adaptive behavior scale gauges the ability to convert cognitive potential into practical life skills, rating performance across various domains, including sociability, daily living skills, and communication.

8 Assessment, usability testing and obtained outcomes

This section offers an extensive explanation for the response to RQ3 (Table 1). It demonstrates how effectively the application functions in terms of effectiveness, enjoyment, ease of use, usefulness, satisfaction, improvements, and attitudes toward future usage from the perspectives of the participants, their parents, and other relevant stakeholders.

8.1 Usability testing

Usability testing is a technique employed to evaluate the effectiveness of the SALY game and user satisfaction. This method assesses how well-liked and efficient the system is among participants, their parents, and other relevant stakeholders. Several usability metrics, which are discussed in the following subsections, can be utilized to evaluate the system's usability from the perspectives of both participants and their parents, as well as other stakeholders. These tests aim to gather feedback from a diverse range of users, including those without disabilities (Group 2), to ensure that individuals with Autism Spectrum Conditions (ASC) can navigate and use the system effectively.

8.1.1 Usability testing with users and their parents

To evaluate parents' expectations and satisfaction regarding the usability of the developed application, a variety of questions were posed using a 10-point Likert scale during both pre-intervention and post-intervention assessments. The System Usability Scale (SUS) questionnaire (McLellan et al., 2011) was employed, which includes 10 questions focusing on learning efficiency, ease of learning, memorization, occurrence of execution errors, and overall satisfaction. Each question utilizes a five-point scale ranging from one (totally disagree) to five (totally agree). Sample SUS questionnaires can be found in Table 4. Participants were also invited to share their feedback on the application, including aspects they liked or disliked, as well as their favorite games. For this purpose, we used the Fun Toolkit (Gavin and Matthew, 2012), incorporating the Smileyometer rating scale to assess participants' satisfaction. As illustrated in Figure 13, the Smileyometer is a visual analog scale that allows participants to easily express their feelings by circling one face for each question, eliminating the need for written responses.

TABLE 4 Sample assessment questionnaires for parent expectations and satisfaction.

#	Parent expectations sample questionnaire	Parent satisfaction sample questionnaire
1	Do you think that this SALY game is educational for your child?	How motivated was your child to play the SALY game?
2	How much improvement do you expect in your child's emotion recognition tasks after playing the SALY game?	Do you think the SALY game had an effect on your child's performance on the different emotion recognitions tasks?

FIGURE 13
A smileyometer.

8.1.2 Usability testing with relevant stakeholders

In the realm of special educational needs, user testing alone is insufficient without expert input, as individuals with Autism Spectrum Conditions (ASC) may struggle to articulate their thoughts and may respond atypically in various assessments. To identify usability issues related to efficiency and satisfaction in the developed application, evaluations were conducted not only from the perspective of experts but also through user testing, including feedback from typically developing individuals (Group 2). This study employed a mixed-methods approach to gather insights on the app's effectiveness and potential implementation challenges. Eight subject-matter experts were invited to participate, representing diverse academic backgrounds: two were involved in education and game design, one was a special education instructor, one was an occupational therapist, and another was a speech and language therapist. Additionally, three researchers with expertise in psychiatry and psychology, including one of the authors, contributed their insights. Experts were provided with a list of the interface and tasks associated with the four mini-game engines in the SALY gameplay for usability analysis to ensure suitability for the target audience. The experts' perspectives were categorized into five themes: effectiveness, usefulness, enjoyment, ease of use, and attitudes toward future usage.

1. Effectiveness: Most experts agreed that the game was effective due to:
   - o Clear presentation of goals in the game's introduction, which enhances children's attention and learning (e.g., in the simulation game).
   - o The integration of music with visual material (e.g., in the TASALY game).
   - o Immediate and clear feedback provided through visual and audio elements (e.g., in the attention game).
   - o Defined goals and feedback that support concentration, aligning with desired learning outcomes.
2. Usefulness: Experts in psychology and psychiatry emphasized that the game is beneficial compared to traditional intervention techniques—such as social skills classes, narrative therapy, and role-playing—that can be costly, time-consuming, and tedious for participants due to repetitive exercises and long waiting lists. They noted that the game:
   - o Is cost-effective and supports self-confidence.
   - o Can aid in developing motor skills.
   - o Saves educators' time.
3. Enjoyment: Experts from game design and teaching highlighted that the game is enjoyable because:
   - o It aims to increase concentration and curiosity among individuals with ASC.
   - o It incorporates audio-visual feedback and both extrinsic rewards (e.g., points, badges, leaderboards) and intrinsic rewards (e.g., from the TASALY game) to enhance motivation and engagement.
   - o Participants experience joy from completing tasks independently, particularly when they see their own faces on the computer screen during gameplay.
4. Ease of Use: Most experts concurred that the game is user-friendly, with simple content and a logical flow of topics. They noted:
   - o A good balance between challenge and skill that aligns with the player's ability.
   - o Straightforward mechanics and interface that are easy to understand and access.
5. Attitudes: All experts agreed that the game could serve as an effective teaching tool for individuals with ASC in a cost-efficient manner.

TABLE 5 Six example questionnaires for PU and PEU component assessments.

Q#	PU sample questionnaire	PEU sample questionnaire
1	Do serious games have the potential to be used by more people?	Do serious games offer an easy-to-interact interface to learners with ASC?
2	Is it possible to use serious games as an aid to learner's learning?	Was the game rules and learning mechanics process simple and interest?
3	Is it feasible to use serious games as a strategy to reduce children' social isolation and offer them novel experiences that can improve their cognitive abilities?	Do serious games require a lot of effort to be used?

Overall, the input from experts reinforced the potential of the SALY game as a valuable resource for therapeutic and educational purposes for children with ASC.

8.1.3 Obtained outcomes and the technology acceptance model (TAM)

To investigate the acceptance of the developed SALY gameplay by its target group, we employed Davis's (1989) Technology Acceptance Model (TAM). TAM is a well-established framework for predicting user acceptance of new technology, focusing on the factors that influence a user's decision to adopt or reject it. This model provides insights into future technology usage intentions by examining five dimensions: perceived usefulness (PU), perceived ease of use (PEU), perceived enjoyment (PE), attitude toward its use (AU), and intention to use it (IU), as illustrated in Figure 14. According to Granic and Marangunic (2019) and Sprenger and Schwaninger (2021), both PU and PEU are crucial for educators and learners, significantly affecting their attitudes toward using technology in the classroom. Table 5 presents six example questions provided to the specialists in this study, with three questions assessing PU and three assessing PEU. To evaluate attitudes toward specific technologies, we utilized the number of questions indicating agreement (AgrP) and disagreement (DisP) to gauge the level of consensus on each proposition, referred to as the Degree of Agreement Proposition (DAP). Based on DAP results, Granic and Marangunic (2019) provided a table (see Table 6a) that summarizes an individual's level of agreement or disagreement with a proposition in straightforward terms.

The following terms are used in the computation of DAP:

- Strongly Agree (SA)
- Partially Agree (PA)
- Neutral (N)

- Partially Disagree (PD)
- Totally Disagree (TD)

The DAP is computed using the counts of agreements (AgrP) and disagreements (DisP) based on the aforementioned terms, as follows:

$$AgrP = SA + PA + \left(\frac{N}{2}\right), DispP = TD + PD + \left(\frac{N}{2}\right),$$
$$DAP = 100 * \left(\frac{AgrP}{AgrP + DisP}\right) \quad (1)$$

Using Equation 1, Table 6b presents the survey results from five experts for each of the six sample questions, resulting in values for Disagreement (DisP), Agreement (AgrP), and Degree of Agreement Proposition (DAP). The DAP values indicate that experts strongly agree on several aspects of the application: it is perceived as helpful, easy to use, authentically developed, user-friendly, and features a well-structured flow of topics in both the Perceived Usefulness (PU) and Perceived Ease of Use (PEU) categories.

8.2 Assessment and usability metrics

The SALY system's usability was assessed using the game data of each participant. The data for the game is stored in internal structures and contains the participant's score for each game successfully completed, the participants' rating based on his or her score, how long it took them to complete each activity, etc. The system creates reports in the assessment file folder when the participant has finished playing the games, providing the therapist with feedback. In order to test the system with users and to measure the efficiency and effectiveness of the application's use in education, we considered the following usability metrics (Albert and Tullis, 2013):

1. Success score = (Number of completed tasks/Total number of attempts). The range of the value would be 0 to 1 (or 0 to 100%). It demonstrates if the requested task was successfully completed or not. Figure 15 displays the participants' success scores for the various SALY system tasks both before and after the interventions.
2. Success rate: There are many success levels included here: a) Complete success indicates that the user completed the task correctly and without error; b) Success with a minor issue

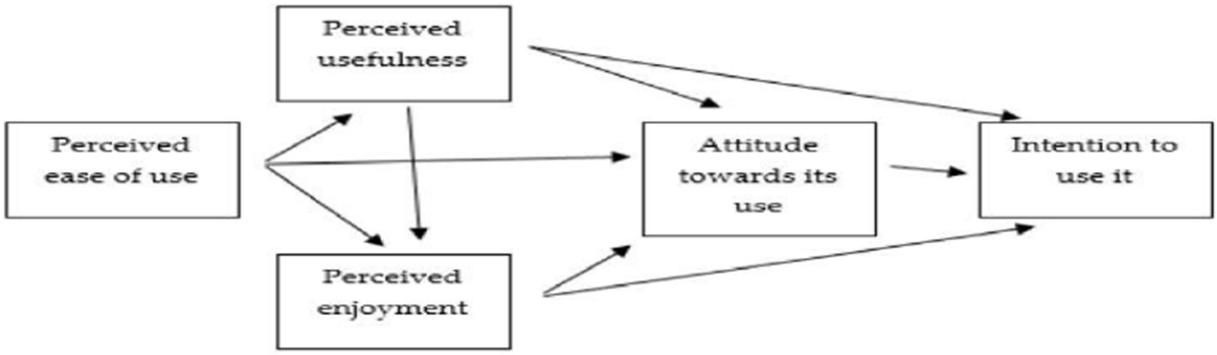

FIGURE 14
The TAM by Davis (1989).

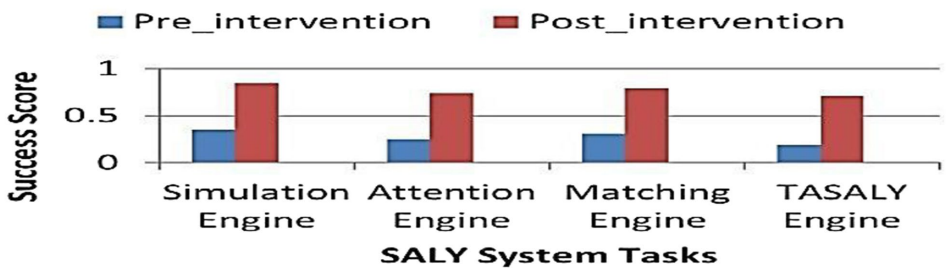

FIGURE 15
Participants' success score.

TABLE 6 DAP values interpretations and obtained outcomes.

(a) Interpretations of DAP values

DAP value	Proper phrase
90 or more	Extreme agreement
80 to + 89,99	Substantial agreement
70 to + 79,99	Moderate agreement
60 to + 69,99	Low agreement
50 to + 59,99	Negligible agreement
40 to + 49,99	Negligible disagreement
30 to + 39,99	Low disagreement
20 to + 29,99	Moderate disagreement
10 to + 19.99	Substantial disagreement
9.99 or less	Extreme disagreement

(b) Survey outcomes

Q#	TD	PD	N	PA	SA	DisP	AgrP	DAP
Perceived ease of use (PEU)								
1	0	0	0	3	5	0	8	100
2	0	0	0	2	6	0	8	100
3	4	0	4	0	0	6	2	25
Perceived Usefulness (PU)								
1	0	0	0	2	6	0	8	100
2	0	0	0	1	7	0	8	100
3	0	0	0	3	5	0	8	100

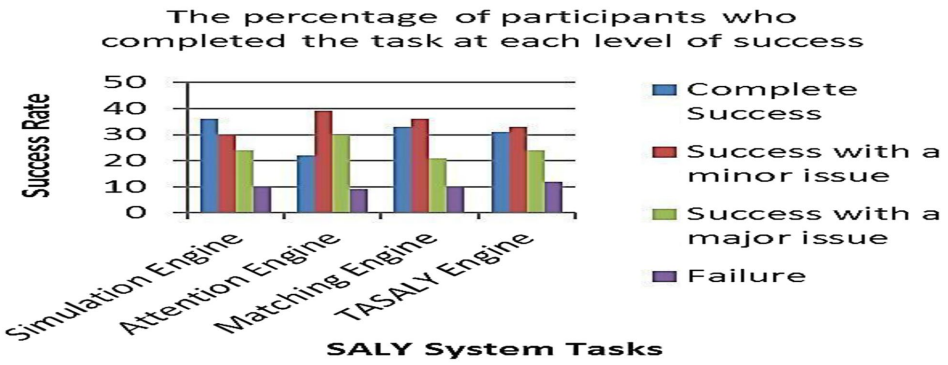

FIGURE 16
Participants' success rate at each level of success.

indicates that the user completed the task but encountered a minor issue; c) Success with a major issue indicates that the user completed the task but encountered a major issue; and d) Failure indicates that the user was unable to complete or finish the required task. Figure 16 sketches the participation success rate for each level of success.

3. Task time = (Time$_{1st\ user}$ + Time$_2$ + … + Time$_n$/Total number of users). This is how long it took the user to do the task. Task time is used to gauge efficiency. To calculate task time in terms of time-based efficiency, use Equation 2 below:

$$Time-based-Efficiency = \frac{\sum_{j=1}^{R}\sum_{i=1}^{T}\frac{N_{ij}}{M_{ij}}}{T*R} \quad (2)$$

Where, T is the overall number of tasks, R is the entire number of users, N_{ij} is the result of task i by user j; if the user succeeds in the task, $N_{ij}=1$, otherwise, $N_{ij}=0$, and M_{ij} is the amount of time user j spent on task i. A visual representation of the time-based efficiency average rate for various SALY system task activities for diverse users is shown in Figure 17.

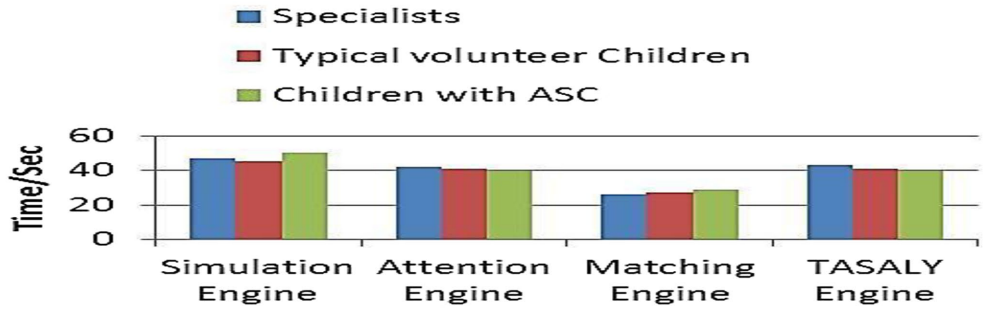

FIGURE 17
A diagram displaying the efficiency rate.

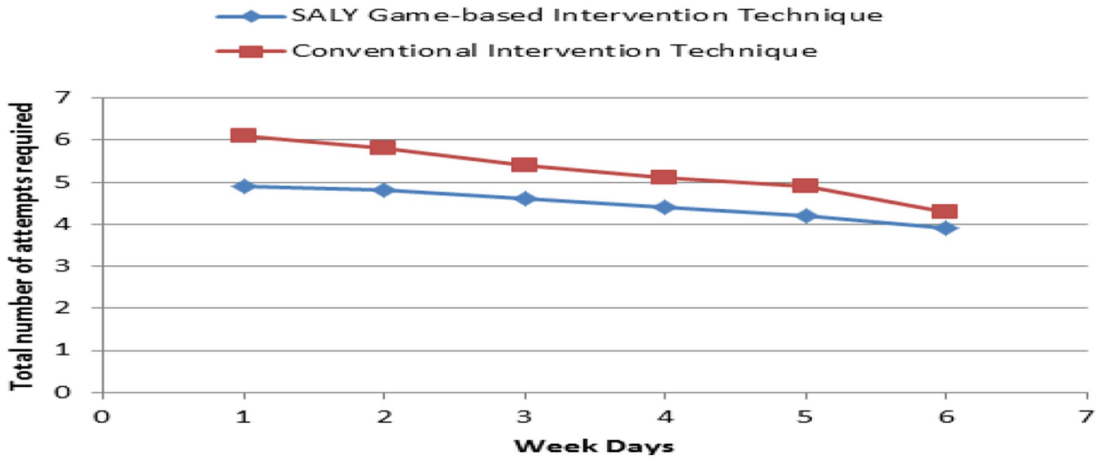

FIGURE 18
Learnability rate.

4. Learnability: Learnability considers both the ease of use of the task for users on their first attempt and the number of tries required to accomplish it correctly. The learnability rate for the participants' responses in conventional and non-traditional methods is shown in Figure 18 following practice with our SALY game. It is clear that after practicing with our game, their performance improved significantly.

9 Results and discussion

This section describes the findings of the responses collected from experts, parents, and their children. This was done to help children recognize the SALY game as a learning tool and determine which features of the game are more attractive. The results are displayed as follows, and the data collected demonstrate how effective the game is:

1. Most of the participants agreed that the proposed game is helpful, straightforward to use, user-friendly, and has simple content with good topic flow.
2. Regarding game motivation, all participants enjoyed playing the game and seeing their faces on the computer screen; the favorite game was the "Attention and TASALY" which was the most selected and played the longest.
3. When it comes to game usability, most of the participants were able to play the game because participants' preferences were achieved via factors like simple GUI, audio-visual feedback and both extrinsic (e.g., points, badges/trophies, etc.) and intrinsic rewards (e.g., playing TASALY game). Most experts rated the usability of SALY game as "excellent" based on the results collected.
4. Regarding emotion expression and emotion recognition abilities, experimental results after training show that about 83% of participants can recognize sadness, 87% happiness, 77% anger, 65% surprise, 50% disgust and 55% fear.
5. Results analysis shows that the six fundamental emotions are difficult for people with autism to recognize in general, with fear, disgust, and surprise being the hardest.
6. Our results analysis suggests that participants with ASC had an 87% achievement rate while mimic the emotional expressions of faces using a stimulus of human caricature faces and emojis

in comparison with an achievement rate of 77% for human faces. These observations have been comparable to (Atherton and Cross, 2018; Rosset et al., 2008) whose studies confirmed that children with ASC prefer cartoons and items over real faces.

7. The majority of the experts, as well as parents and their children were satisfied with SALY game. Experts indicated that the system appears to have outstanding potential and can be objectively used as a teaching aid for assisting people with ASC. Parents also reported that 7 weeks of SALY's use significantly improved their children's performance on the different emotion recognition tasks and social skills.

9.1 Comparisons

According to the taxonomy discussed in Fedwa et al. (2014), Table 7 compares our proposed game, SALY, with seven existing frameworks previously examined in this research. These frameworks include Emotiplay (Fridenson-Hayo et al., 2017), EmoStory (Min et al., 2018), JEMImE (Grossard et al., 2019), JeStiMulE (Serret et al., 2014), LIFEisGAME (Alves et al., 2013), ALTRIRAS (Almeida et al., 2019), and GDF (Tsikinas and Xinogalos, 2020). Several similarities emerge between the SALY system framework and these other frameworks, particularly concerning the following criteria:

1. Social Presence: Number of players, such as a single-player mode.
2. Interaction Style/Technology: How participants interact with the system via keyboard and mouse.
3. Performance Feedback: The system's ability to convey interaction outcomes to the participant.
4. Progress Monitoring: The system's capability to save participants' interaction outcomes.

TABLE 7 Comparison between our proposed SALY Game and the other existing frameworks.

Criteria	Sources/References for the seven existing frameworks							
	SALY	Emotiplay (Fridenson-Hayo et al., 2017)	EmoStory (Min et al., 2018)	JEMImE (Grossard et al., 2019)	JestiMulE (Serret et al., 2014)	LIFEisGAME (Alves et al., 2013)	ALTRIRAS (Almeida et al., 2019)	GDF (Tsikinas and Xinogalos, 2020)
Application area	Cognitive (Cog.)	Cog.	Cog.	Cog.	Cog.	Cog.	Cog.	Cog.
Game interface	2D	2D	2D	3D	3D	2D	2D	2D
Game genre	Serious (S)	(S)	(S)	(S)	(S)	(S)	RPG	(S)
Number of players	Single Player (SP)	SP	SP	SP	SP	SP	SP	SP
Interaction style	Keyboard (K)/ Mouse (M)	K/M	K/M	K/M	K/M Tactile gamepad	K/M	K/M	K/M
Modality	Audio (A)/ Visual (V)	A/V	A/V	A/V	Multi-sensory	A/V	A/V	A/V
Mobility	No	No	Yes	No	No	Yes	No	No
Performance feedback	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Progress monitoring	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Game portability	Home/ Hospital	Home/ Hospital	Home	Home/ Hospital	Hospital	Home/ Hospital	Home/ Hospital	Home
Adaptability	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Usability testing	Yes	No	No	Yes	Yes	Yes	Yes	No
Generating innovative ideas to meet user needs	Yes, by applying the design thinking process alongside participatory design	No	No	No	No	No	No	No

Additionally, SALY aligns with the GDF framework (Tsikinas and Xinogalos, 2020), which emphasizes assessment as a core design element. However, Tsikinas and Xinogalos (2020) did not validate their GDF to determine the effectiveness and satisfaction level of the produced serious games (SG) for the target audience. In contrast, our framework addresses these gaps by incorporating several usability metrics, including the Technology Acceptance Model (TAM). Moreover, the SALY framework integrates design thinking methodology combined with participatory design sessions, ensuring innovative solutions to meet user needs. Several distinctions between SALY and other frameworks are also noted, as highlighted in Table 7. These include:

1. Game Portability: The system's ability to be used in various settings such as home, hospital, or clinic.
2. Game Interface: Whether the game uses a 2D or 3D interface.
3. Adaptability: The system's ability to adjust the game's difficulty or challenge based on the participant's performance.
4. Usability Testing: Verifying whether the proposed game is well-received by the target audience.

10 Conclusion

In the realm of pedagogical research, particularly within special educational needs, participatory research (PR) has garnered increasing recognition. The involvement of individuals with Autism Spectrum Condition (ASC) in developing digital technologies—where children and relevant stakeholders collaborate to devise strategies and make decisions—is becoming more prominent in the special educational needs' community. Digital technologies, such as serious games (SGs), are often employed to help individuals with ASC learn more effectively than through conventional methods. However, engaging individuals with ASC in technology development presents challenges because each person is unique, and their needs and abilities may evolve over time. This variability complicates efforts by technology designers to interact with them effectively. Moreover, despite the existence of several frameworks, the question remains: can SGs designed for individuals with ASC benefit from their own dedicated framework? This paper addresses this question by proposing a participatory research framework that treats education as a collaborative process with goals extending beyond knowledge creation to practical application. The framework is built on two key pedagogical elements: participatory sessions and the design thinking process. It was applied in a case-based learning study to design a new SG called SALY (Simulation, Attention, Learn, and PLAY). SALY system aims to enhance attention span and emotion recognition abilities in individuals with ASC by integrating technology and learning. Three research questions were explored in this study, with data analyzed using mixed-methods research. Various usability metrics were employed to evaluate the game's effectiveness, efficiency, and user satisfaction. SALY distinguishes itself from previous frameworks in the following ways:

1. An innovative participatory research framework was developed and implemented in the design of a new SG, called SALY; to help game developers and designers create effective SG, particularly for people with ASC. Playing the SALY game, which blends technology and learning, can help people with ASC improve their ability to recognize emotions and attention skills.
2. Participants may express their emotions through the intrinsic rewards offered by TASALY, a fantastical music-based social story game. This helps to motivate players and keeps them emotionally engaged, captivated, happy, and fully immersed in the game.
3. Through music therapy (Marquez-Garcia et al., 2021), people may communicate their feelings, which also aids in motivation and feedback.
4. SALY possesses an "even game" feature (Pieter et al., 2004), in which the game challenge level matches the skill of the human player, consequently raising the playing strength and the entertainment factor;
5. A wide range of users, including those without impairments (Group 2), were taken into account when evaluating the game.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author/s.

Ethics statement

The studies involving humans were approved by Faculty of Postgraduate Studies for Childhood. The studies were conducted in accordance with the local legislation and institutional requirements. Written informed consent for participation in this study was provided by the participants' legal guardians/next of kin. Written informed consent was obtained from the minor's legal guardian or next of kin for the publication of any potentially identifiable images or data included in this article.

Author contributions

HA: Conceptualization, Formal analysis, Investigation, Methodology, Project administration, Supervision, Validation, Writing – original draft, Writing – review & editing, Data curation. MO: Formal analysis, Investigation, Methodology, Validation, Writing – original draft. HM: Data curation, Formal analysis, Validation, Writing – original draft.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

The Supplementary material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/feduc.2024.1453327/full#supplementary-material

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A review of research on the development of inclusive education in children with special educational needs over the past 10 years: a visual analysis based on CiteSpace

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Background: Childhood is a critical developmental stage, especially for children with special educational needs (SEN), as it can profoundly affect their development and future well-being.

Purpose: To assess the state of research on inclusive education for children with SEN over the last 10 years, 1,024 documents from the Web of Science (WoS) core collection were analyzed.

Methods: Using CiteSpace, a comprehensive analysis included an overview of the field, keyword distribution, research foci, and emerging trends.

Results and conclusions: This study identified that research in inclusive education for children with SEN primarily concentrates on education, psychology, and the development of children with SEN. Furthermore, future research must involve education, psychology, sociology, medicine, rehabilitation, public policy and law, neuroscience, and family studies. Primary research questions should address the effectiveness of education and learning outcomes for children with SEN, their social and emotional development, family support and participation in education, educational policy and practice, and professional development and training for inclusive education teachers. We expect that the future development of research on children with SEN will become more multidimensional and comprehensive. The research focus should shift toward comparative studies of the developmental history of special children and their peers. Methodologically, the integration of quantitative and qualitative approaches is essential. From a research perspective, a stronger emphasis should be on cross-national comparative studies. Moreover, interdisciplinary research and collaboration should be increased to enrich the theoretical and knowledge system of inclusive education for special children, thereby providing a more robust evidence base for inclusive practices.

KEYWORDS

inclusive education, special educational needs, visual analytics, knowledge mapping, CiteSpace, web of science

Introduction

We recognize that the early years of a child's life constitute the most critical development period. However, many young children experience less-than-optimal situations and circumstances during their formative years. The United Nations (UN) Convention on the Rights of Persons with Disabilities (CRPD; United Nations General Assembly, 2006) is an important step in the direction of promoting inclusive education. It is advocated as a means to eliminate barriers, improve outcomes, and eradicate discrimination. Therefore, it is particularly necessary to include the specifics and multidimensional strengthening of inclusion in the education of children with SEN in the definition of its development. Previous attempts at providing inclusive education for children with SEN and numerous studies have been researched in different areas related to integrated education for children with SEN from different disciplinary backgrounds. It is now well established from various studies that the factors affecting the development of inclusive education for children with SEN are multi-dimensional and comprehensive. In terms of the different dimensions of development of children with SEN, most of the literature since 2000 has emphasized their cognitive development (e.g., abilities in memory, attention, and language; Baranek, 2002), social skills (focusing on their ability to interact with others; Kasari et al., 2011), emotional development (involving self-esteem and emotion regulation; King et al., 2003), educational needs (including individualized education plans and effective teaching strategies; Nilsen, 2017), family environment (e.g., family support and coping strategies; Kiami and Goodgold, 2017), physical health and rehabilitation (involving motor skills and medical needs; Coates and Vickerman, 2010), behavioral problems (e.g., assessing and managing behaviors such as attention deficit, ADHD, etc.; Jull, 2008), and the cultural and social context (focusing on the role of social biases and support systems; Warnock et al., 2010). Integrated research across different dimensions has profound implications for understanding the needs and developmental characteristics of children with exceptionalities and developing effective interventions and support strategies to promote their holistic development. Regarding the factors affecting the development of inclusive education for children with SEN, studies have highlighted factors that are associated with the family parenting environment, peer groups, socioeconomic status, family resilience, and policy support, specifically, parents' educational philosophy, attitudes, emotional support, and practical involvement (Kasari et al., 1999; Palmer et al., 2001), school curricula, teacher training and resourcing (Denman, 2015; Drake and Reid, 2018), peer group social interactions (Weiss et al., 2003), and the construction of extensive social networks (Murphy, Carbone, and the Council on Children With Disabilities, 2008; King et al., 2003), as well as society's cultural climate, policy systems, and public attitudes (Amado et al., 2013; Bigby, 2012), which influence the developmental processes of children with SEN in different ways. In addition, many published studies have focused on identifying and evaluating the impact of childhood development on the adjustment and integration of children with SEN into society in adulthood. Firstly, in the area of vocational development and employment, Van Der Veen et al. (2010) explored the current status of children with SEN in obtaining and retaining jobs and the challenges faced by them, as well as the effectiveness of vocational training and support services. Living independently is another key area, with research pointing to assessing their daily living skills and the role of community and family support (Myklebust and Ove Båtevik, 2005). According to Garrote et al. (2017), attention should be paid to social skills training for children with SEN, community participation opportunities and support networks, and other influences on the social adjustment of children with SEN. In the area of education and continuous learning, Shutaleva et al. (2023) suggest that the opportunities and challenges of higher education and lifelong learning programs should be explored. Notably, one study suggests that changes in family roles and the impacts of the family in supporting the independent living of children with SEN should be analyzed through the framework of family dynamics (Desforges and Abouchaar, 2003).

This study employs scientometric analysis to visualize and examine the literature on inclusive education of children with SEN from the past decade in the WoS database. By utilizing knowledge mapping, the aim of this article is not to present an exhaustive study but rather an attempt to generate an overview of progress toward the inclusion of children with SEN in the domain of special education, minimize the impact of researchers' subjective experiences, and objectively identify research hotspots in this field. The aim is to improve the understanding of the current status and trends in the development of inclusive education while comprehensively analyzing its research focus and emerging issues.

Methodology and data sources

Methods

Scientific knowledge mapping is a research method that has emerged in recent years in the fields of scientometrics and informetrics and can be used in the form of mapping to reveal trending research topics in related fields. We chose CiteSpace (Chen, 2004) as a literature data analysis tool to explore the impact of special children's inclusive education in the 10 years from 2015 to 2024 through bibliometric methods and scientific knowledge mapping methods. The study used CiteSpace to map the visualization of research on inclusive education for children with SEN and performed a descriptive statistical analysis of the literature collected regarding country of origin, time of publication, institution, etc. Trends in research themes, general trends, and the relevance of research in different areas of inclusive education for children with SEN were revealed in the form of mapping the underlying aim, leading to answers to the following questions: (1) How did the number of publications and citation frequency in the field of inclusive education for children with SEN change from 2015 to 2024? (2) What are the main research directions in the field? (3) What are the key nodes of literature in the field of inclusive education for children with SEN? (4) How have trending research topics changed and evolved?

First, statistics on the number of annual publications and citation frequency of research on the impact of the inclusion of children with SEN over the last 10 years are presented using a bibliometric method, and the changing trend of both kinds of literature over time from 2015 to 2024 is analyzed.

Subsequently, in the scientific knowledge graph analysis, the CiteSpace 6.3.R1 network visualization tool was used to visualize word frequency statistics and co-occurrence networks for two node types:

cited literature (clustering analysis of research directions and key node literature analysis) and keywords (analysis of the evolution of trending research topics). In the presented visualization scheme, node size is used to represent word frequency (both types of nodes represent the number of citations and frequency of occurrence of keywords, respectively).

Besides word frequency, centrality also serves as a crucial indicator for assessing the significance of nodes within the network. In the CiteSpace visualization scheme, this indicator refers strictly to betweenness centrality, quantifying the degree to which a node falls on the shortest path between any network node. In the context of cluster analysis, we examine two key structural indicators of the clustering network: the Q value and the Mean Silhouette. The former indicates the significance of each cluster within the network, while the latter assesses the homogeneity of nodes within the clusters (Chen et al., 2010).

Data sources

In this study, the relevant literature on child development in the WoS Core Collection over the past 10 years was collected and subjected to statistical analysis. The impact of inclusive education for children with SEN between 2015 and 2024 was investigated. The Social Sciences Citation Index (SSCI) and Arts and Humanities Citation Index (A&HCI), two major citation databases within WoS that are internationally recognized and reflect the level of scholarly research, were chosen as search sources.

A comparison of the literature data obtained by various search methods revealed that the optimal search terms were TS = ("special education" and "inclusion" and "inclusive education"). The document type was identified as an article, the time frame was set to 2015–2024, and the language was specified as English. The search was conducted on May 16, 2024.

Non-research articles, such as book reviews and calls for articles, conference abstracts, letters, data papers, books, news items, and articles not related to the topic, were manually deleted. Finally, 1,024 valid articles were retrieved, and each article includes key information such as the author's name, institution, article's keywords, title, abstract, and publication year. The 1,024 pieces of literature were processed using CiteSpace, which revealed no duplicates. The time parameter in CiteSpace was set to 2015–2024 (slice length=1), and the pruning method for subsequent analysis was Pathfinder. The "Export/References" tool in WoS extracted data from 1,024 articles in plain text format, saved as Download_XXX. This data was subsequently imported into CiteSpace and processed using the Data function. Following creating a new project within CiteSpace, a series of tables and graphs were generated to facilitate the analysis of research trends in inclusive education for children with SEN.

Research on inclusive education of children with SEN

Since 2012, the volume of literature on the topic of inclusive education has experienced a year-on-year increase, consistently exceeding 60 articles annually (see Figure 1). During the 2014 to 2020 period, the international research literature has shown a fluctuating upward trend; since 2020, the amount of literature on the topic of inclusive education research has continued to climb, with the number of articles showing a consistent upward trend. The remarkable increase and stabilization of research publications on inclusive education for children with SEN is closely related to the international emphasis on their development. As the state pays attention to inclusive education for children with SEN, relevant ministries are expected to formulate policies that provide protective measures for this population. Consequently, the availability of educational resources and services for children with SEN should be expanded, in line with the need for

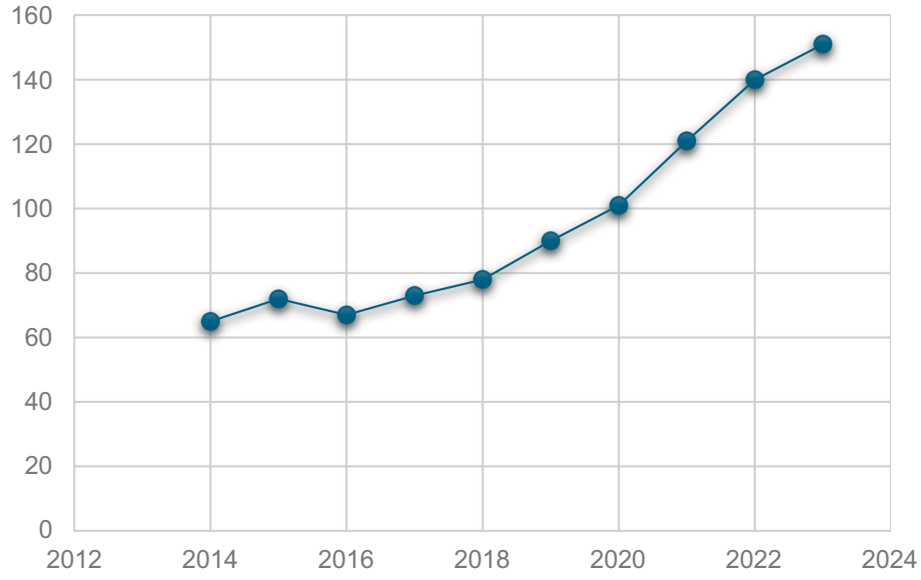

FIGURE 1
Annual publication (2012–2024).

greater awareness in society and support for the holistic development of these children. As a result, there should be a corresponding increase in research efforts in this area.

Table 1 shows that the United States leads significantly in the number of published articles by country, followed by the United Kingdom, Spain, Germany, Australia, Sweden, Canada, South Africa, and others. These nations collectively represent a substantial proportion of global publications in this field. This phenomenon, in addition to being influenced by the relevant policies of international child development and protection, is related to the great importance attached to the development of integrated education for children with SEN by countries around the world, especially developed countries such as the United States and the United Kingdom, in recent decades.

An examination of the institutional distribution presented in Figure 2 indicates that the University of Kansas has emerged as the leading institution in the field of "inclusive education" over the past decade, boasting 34 publications and a centrality measure of 0.07; the institution with a second highest number of publications is North West University—South Africa, with 22 articles and a centrality of 0.02, followed by the University of Vienna, University of Wisconsin System, University of North Carolina, University of London, and other institutions, all with more than 15 articles. Integrating the publication timeline with the analysis reveals that institutional research themes predominantly concentrate on contextual variables, student perceptions, and severe disabilities, as well as Chinese communities, measuring collective efficacy, specific inclusive concern, inclusive classrooms, inclusive preschool, and meaningful change.

TABLE 1 The distribution of countries of publications and their betweenness centrality.

Count	Centrality	Year	Countries
283	0.45	2014	United States
93	0.38	2014	England
79	0.14	2014	Spain
78	0.08	2014	Germany
69	0.31	2014	Australia
50	0.02	2014	Sweden
41	0.07	2014	Canada
41	0.09	2014	South Africa
38	0.08	2014	Norway
37	0.07	2014	Peoples R China
34	0.05	2015	Austria
33	0.02	2014	Finland
31	0.12	2014	Ireland
29	0	2014	Turkey
29	0.01	2018	Saudi Arabia
24	0.06	2015	Italy
24	0.02	2014	Netherlands
18	0.02	2015	Greece
18	0.07	2017	Switzerland
17	0	2014	Israel
15	0.08	2014	Belgium
15	0	2014	Denmark
13	0	2017	France
12	0	2014	Cyprus
11	0	2014	Singapore
10	0.03	2014	Poland
10	0	2014	Scotland

*The data is derived from countries with a publication count of 10 or more.

A co-occurrence map of inclusive education research for children with SEN was generated by dividing the main keywords into time zones. Figure 3 presents more details. In general, the time zone map depicts the different hot topics in inclusive education research for children with SEN during different periods. However, as time progresses, the nodes in the time zone map gradually become smaller. Additionally, the density of hot topics keeps shrinking, and the connection between hotspots is constantly declining.

Four stages of inclusive education research for children with SEN can be identified over the past 10 years: formation (2014), growth (2015–2016), maturity (2017–2020), and decline (2021–2024).

During the formation period, researchers in this field were devoted to exploring the special needs of students with different disabilities and teaching and intervention issues, such as focusing on emotional-behavioral interventions for children with autism and on inclusive education initially involving children with SEN. The research hotspots in the growth period mainly concentrated on the problem of combining theory and practice. Scholars began to introduce early intervention for children with SEN, individual self-efficacy, and the experience of disability and further called for social integration. In the mature period, researchers in the field mainly focused on the challenges encountered by children with SEN and perceptions of disability among different groups (e.g., carers, educators, and people with disabilities themselves, as well as other stakeholders). During the decline period, the popularity of inclusive education research for children with SEN dropped sharply, and no new progress was made, which shows that the research in this field has waned.

Research hot spots and trends

Firstly, keyword analysis was performed in the literature. While the keyword analysis was performed, the node types were selected as Keywords. The period is 1 year; each year, the top 50 keywords with the highest number of citations were analyzed. The resulting network graph of keyword co-occurrence had 253 nodes, 2,104 connecting lines, and density = 0.066, as shown in Figure 4. Keywords with high centrality include inclusive education, students, children, disabilities, special education, attitudes, special educational needs, inclusion, teachers, learning disabilities, instruction, intervention, autism spectrum disorders, learning disabilities, perspectives, behavior, achievement, and self-efficacy.

Figure 5 shows the co-citation cluster mapping of the results of the relevant literature from the WoS database. Several clusters of related literature on inclusive education research can be seen, including young adults, teaching practice, early childhood inclusion, differentiated instruction, and social participation. The seven key clustering areas and their associated keywords were analyzed based on the relevant literature.

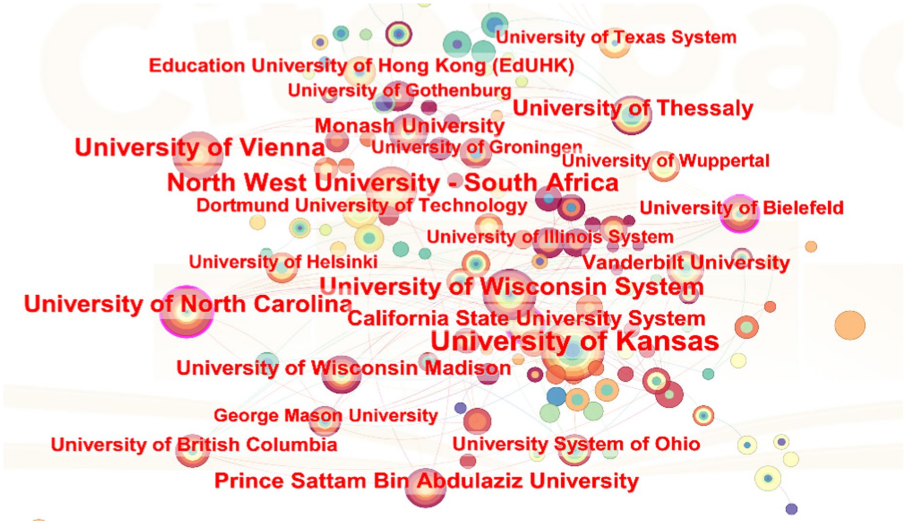

FIGURE 2
Bibliometric analysis of research institutions publishing on the inclusive education of children with SEN from 2015 to 2024.

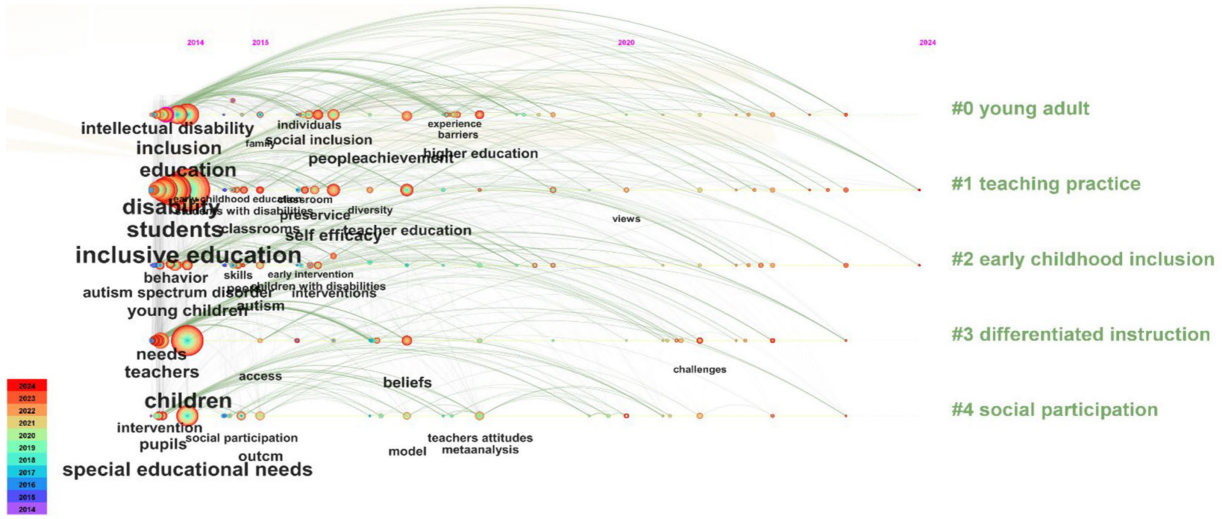

FIGURE 3
Time zone view on inclusive education of children with SEN (2014–2024).

Studies on the impact of educational attitudes and perspectives on inclusive education

Educators' attitudes have a critical impact on the implementation of inclusive education. Norwich (1994) found that positive attitudes toward inclusion are essential for its success, with these attitudes being primarily influenced by child-related factors, such as the nature and severity of the disability (Avramidis and Norwich, 2002). In other words, teachers with inclusive attitudes are more willing to adapt teaching strategies and classroom management styles to meet the needs of children with SEN (Lautenbach and Heyder, 2019). In addition, teachers' perceptions and understanding of disability can directly impact their teaching behaviors and interactions with children with SEN. According to Jordan et al. (1997), teachers with a "pathognomonic" perspective view disabilities as inherent characteristics of the individual, leading to more rigid instructional methods, while those with an "interventionist" perspective see student issues as arising from interactions with their environment and thus adopt more proactive, supportive, and flexible teaching approaches to foster student development. Zagona et al. (2017) further confirmed that when teachers believe disabilities can be mitigated with appropriate educational support, they are more likely to provide positive accommodations for students with SEN. Thus, educators' beliefs about the nature of disability and their responsibilities significantly affect the effectiveness of inclusive education, thereby influencing overall instructional outcomes (Moberg et al., 2019).

Additionally, typical students' attitudes toward children with SEN also affect the effectiveness of special children's access to inclusive education. Positive peer relationships and acceptance contribute to the

FIGURE 4
Network of keywords from publications on inclusive education of children with SEN research (2015–2024).

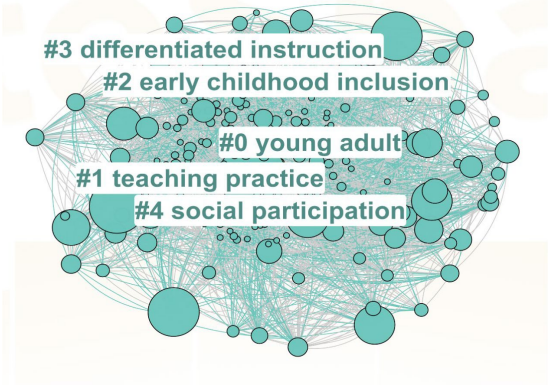

FIGURE 5
Statistics of the literature co-citation network.

development of social skills and emotional support for children with SEN (Freer, 2021), and the support and friendship extended by typically developing peers to children with SEN can enhance the self-esteem and self-confidence of these children, subsequently mitigating their experiences of isolation and anxiety (Taheri et al., 2016).

Parents' attitudes toward a school's program, including implementing inclusive education, are important in promoting inclusion (Paseka and Schwab, 2019). The severity of the disability influences parents' perceptions regarding inclusive education for their children. Research shows that parents of children with mild to moderate disabilities generally support and are satisfied with inclusive educational practices and find them beneficial for academic progress and social integration (Bennett et al., 1997; Orłowski and Wódkiewicz, 1990).

Previous research has highlighted the critical role of principals, in partnership with teaching staff, in promoting an inclusive school environment (Ainscow, 1999; Leo and Barton, 2006). Specifically, school leaders who advocate inclusive education are essential in providing teachers with the necessary training and resources to cultivate a supportive school culture (Cobb, 2014; DeMatthews et al., 2020; Óskarsdóttir et al., 2020; Urton et al., 2014).

Research on the effectiveness of instruction and intervention for children with SEN

Research has shown that individualized teaching approaches and interventions significantly improve children's learning outcomes and self-confidence with SEN (Friend and Cook, 1992). The emphasis on collaborative teaching is grounded in the principle that students are optimally supported in environments that closely resemble those of their non-disabled peers (Vaughn et al., 2023), which stresses the necessity for cooperation between general education and special education teachers (Cook et al., 2017; Friend and Cook, 1992). Moreover, the field of special education is witnessing significant growth in research and applications related to Positive Behavioral Support (PBS), which is an applied science aimed at enhancing individuals' quality of life and mitigating problem behaviors through educational strategies and systemic interventions, emphasizing the development of positive behaviors that foster success and satisfaction across academic, occupational, social, recreational, community, and familial environments (Carr et al., 2002). Additionally, it is well established from a variety of studies that early intervention and social skills training are essential for the early identification of diagnoses and the enhancement of social skills in children with SEN (AAMR

(American Association of Mental Retardation), 2002; Reichow et al., 2014). Research and the implementation of pedagogy focused on multisensory concepts and technological tools in special education are very important because providing multisensory stimulation and using modern technological tools significantly improves the learning outcomes of children with SEN in integrated education (Swanson et al., 2013).

Studies concerning teacher training for inclusive education indicate that effective training encompasses developing teaching skills and integrating theory and practice, thereby enabling educators to tailor their responses to the diverse learning needs of children with SEN (Gidlund, 2018). Another study on interdisciplinary collaboration argues that it is closely related to professional development, where teachers collaborate with special education specialists and social workers to develop support plans to maximize students' learning potential with SEN (Friend and Cook, 1992). According to Karten (2015), teachers obtain feedback from colleagues and experts during their professional development, allowing them to refine their teaching methods through reflective practice and ongoing assessment. This feedback and assessment mechanism helps to continuously improve the quality of teaching and personal competence to better meet the educational needs of children with SEN. In recent years, with the application of the latest research findings and technological advances in the field of special education, for example, virtual environments have exhibited considerable potential within the realm of special education. Initial studies demonstrate that learning in this way transfers to the real-life situation in which the skills are required (Standen et al., 2001). Interactive software fosters active engagement in learning and empowers the user by giving them a sense of control over the learning process (Mora et al., 2017). In addition, evidence-based teaching strategies to support the learning and development of children with SEN have become a significant focus of academic inquiry (Murawski and Swanson, 2001; Pratt et al., 2017). However, professional development involves individual growth and cultivating an entire school culture. Many recent studies (e.g., Gidlund, 2018; Molina Roldán et al., 2021; Wilson et al., 2018) have shown that establishing supportive and inclusive school environments can help children with SEN to integrate better into school life and achieve holistic development.

Studies on the differentiated needs of children with SEN and various types of disabilities

Research on the differentiated needs of children with SEN in inclusive education has centered around their different types of impairments. Odom (2014) suggest that students with intellectual disabilities need the support of an Individualized Education Plan in inclusive education with clear, specific, and achievable learning goals. In addition, the 'small-steps approach' (incremental learning) is widely used in teaching children with exceptionalities, whereby complex tasks are broken down into small, manageable steps and provide repetition and positive feedback (Standen et al., 2001). Furthermore, employing visual support, such as pictures and diagrams, constitutes a vital teaching strategy for differentiated instruction for children with intellectual disabilities (Armstrong et al., 2015). With respect to research on the needs of children with autism spectrum disorders, relevant studies have pointed out that structured teaching, clear routines, and classroom structures are crucial for these students (Mesibov, 2018). Social skills deficits are a prevalent characteristic of children with autism, prompting extensive research focused on enhancing these skills. According to Wolstencroft et al. (2018), social skills training improves social competence through methods such as role-playing and group activities. Regarding research on the behavior management skills of children with autism, Sugai and Horner (2014) suggested that PBS effectively guides and manages the behavior of children with SEN. Additionally, providing sensory-friendly environments and conditioning tools such as noise-canceling headphones and sensory toys are necessary intervention strategies (Case-Smith et al., 2015).

To date, the diverse needs of children with learning disabilities have emerged as a prominent area of focus within the domain of special education. Learning disability is a neurodevelopmental disorder impeding the ability to learn and use academic skills in reading, reading comprehension, spelling, writing, and math (American Psychiatric Association, 2022). However, an earlier study showed that the definition of learning disabilities (LD) emphasizes exclusions: LD cannot primarily result from mental retardation, emotional disturbances, cultural differences, or various disadvantages. Therefore, the concept of LD centers on the notion of a discrepancy between a child's academic performance and their evident capacity to learn (Lyon and Moats, 1997). In the context of research on differentiated teaching strategies for children with learning disabilities, pedagogy based on the multisensory concept helps fully engage the multiple senses of a child with SEN, such as visual, auditory, and tactile senses, in teaching and learning activities (Alenizi, 2019). In addition, technological aids (e.g., reading software and speech recognition technologies), as well as the provision of extra time and specialized support tools (e.g., reading tutoring and writing software), are also key measures to promote effective learning and enhance the outcomes of children with SEN in inclusive education (Edyburn, 2013; Fletcher et al., 2018).

In the field of research on emotional and behavioral disorders, the term 'emotionally disturbed' refers to students whose educational outcomes are adversely affected by a particular type of inappropriate behavior (Wehby et al., 2003). Numerous studies have demonstrated the importance of self-regulation and emotion management skills, as well as the provision of safe and supportive learning environments, in better-controlling emotions and promoting the development of positive behaviors in children with SEN (Gueldner et al., 2020; Sugai and Horner, 2014). In addition, the availability of counseling and emotional support services is essential (Wehby et al., 2003). Regarding research on the differentiated needs of children with sensory and physical impairments, studies have shown that students with visual impairments need Braille textbooks, large print materials, and access to screen reading software and Braille displays (Kizilaslan et al., 2021). Environmental adjustments, including adequate lighting and an optimal classroom layout, are also important (McLinden and McCall, 2016). In addition, orientation and mobility training help students move freely and safely around the campus (Corn and Erin, 2010). With respect to research on the differentiated needs of students with hearing impairments, Mayer and Trezek (2015) reported that students with hearing impairments need to be supported effectively in their access to inclusive education with the help of hearing aids or cochlear implant devices, as well as sign language interpreting services in the classroom. Lip-reading training and incorporating

visual information as a substitute for verbal communication, such as captions and written materials, also play an essential role (Moores, 2014). Data from several studies suggest that many children with autism have sensory and motor difficulties in the early developmental stages (Adrien et al., 1993; Guthrie et al., 2013; Simmons et al., 2009). However, these children have variable performance and significant differences in motor skills (Amato Jr and Slavin, 1998; DeMyer et al., 1972; Rinehart et al., 2001). In the early years of the foundation stage, the acquisition of motor skills is required to learn key competencies such as academic and social skills, and therefore, educational programs or related therapeutic services may need to address motor-related issues (Baranek, 2002). It is important to note that participation in social and physical activities significantly enhances the physical, emotional, and social well-being of children with and without disabilities (Kasari et al., 2011; Murphy et al., 2008), but these children often lack opportunities for participation, resulting in developmental limitations and social isolation (King et al., 2003; Rimmer et al., 2010; Sachsman, 2007). Individuals with developmental disabilities are often excluded from social activities, have limited social networks, and rely primarily on family members and staff (Amado et al., 2013; Bigby, 2012).

Studies on the factors influencing the inclusive education environment

Research on the factors influencing the creation of inclusive education has focused on the physical, community, and social environments. Darling-Hammond et al. (2020) suggest that school buildings and classrooms should have accessibility features, such as ramps, lifts, spacious doorways, and accessible toilets, to ensure the free movement of physically challenged students. Corn and Erin (2010) state that adapted classrooms should be provided in inclusive teaching and learning environments and that classroom arrangements must accommodate the diverse learning needs of students with various special needs, including collaborative learning areas, quiet zones, and zones for sensory manipulation. Related studies have found that different forms of community organizations are likely to exhibit varying attitudes toward individuals with intellectual and developmental disabilities, which can influence the effectiveness of social inclusion efforts (Simplican et al., 2015). As a result, Mitchell (2008) pointed out that community resources and services, such as regular mental health services, vocational training, and extracurricular activities, should be strengthened to provide supportive services and create a positive inclusive community environment for students with SEN. To foster an inclusive social environment, schools should cultivate a culture that values diversity and encourages all students to embrace and support one another's differences (Ronfeldt et al., 2015). Buddy programs and group activities promote interactions and friendships between typical students and students with SEN to help special education students integrate into the group (Wolstencroft et al., 2018).

Moreover, awareness-raising programs within the social environment are crucial in promoting understanding and empathy among students and reducing the stigma faced by students with SEN effectively (Aubé et al., 2021; Scior et al., 2020). For example, organizing workshops themed "Understanding Differences" encourages students to share their experiences, or hosting a "Friendship Day" event where students with and without disabilities participate in activities together to enhance mutual understanding and support.

Studies on the relationship between the inclusive environment and the development and achievement of special students

Inclusive educational environments significantly enhance the academic achievement of students with SEN. Studies indicate that these students access the same high-quality education as their peers and engage with a more comprehensive curriculum in such settings. This exposure fosters their academic growth and promotes their overall performance (Kahu and Nelson, 2018). In addition, teachers in inclusive settings can provide individualized instructional support and assistive technology based on the specific needs of their exceptional learners, such as using pedagogy based on the principles of a multisensory approach and technology-enhanced devices to help them better understand and manage what they are learning (Edyburn, 2013; Smith et al., 2012). Yakut and Akgul (2023) suggested that students with SEN tend to exhibit higher self-esteem and self-efficacy in an inclusive environment. This occurs because they are recognized as integral class members, engage actively in school activities, and receive peer acceptance and support. As a result, this sense of belonging and acceptance enhances their confidence in their own abilities. Moreover, the social interactions and support within the inclusive education environment significantly enhance students' self-efficacy with SEN. Through participation in cooperative learning and group activities, students with SEN can form friendships with their typically developing peers and acquire essential social skills, thereby fostering increased self-confidence and self-efficacy (Wolstencroft et al., 2018).

Studies on the impact of inclusive education on the behavior and social skills of children with SEN

Sugai and Horner (2014) suggested that adopting PBS and a Behavioral Intervention Plan effectively reduced inappropriate behaviors of children with SEN. Furthermore, within an inclusive environment, exceptional children can observe and emulate the positive behavioral patterns of their typically developing peers, thereby establishing and reinforcing beneficial behavioral habits (Ronfeldt et al., 2015). There is a wealth of relevant research addressing the development of social skills in children with SEN. Social skills refer to socially accepted behaviors acquired through learning which help individuals engage with others in ways that promote positive responses and reduce negative responses (Elliott and Gresham, 1993). Developing social skills is among the most significant achievements of the education process. Many children who are not accepted by their peers and have trouble with social interactions are vulnerable to social–emotional issues and poor academic performance (Parker et al., 2015; Wolstencroft et al., 2018). Moreover, relevant studies on the quality of friendships of children with SEN show that integrated environments enable these children

to establish lasting friendships and feel accepted and supported by their peers, which helps not only to improve their social skills but also to enhance their sense of belonging and self-esteem (Simplican et al., 2015).

Moreover, social skills training programs help children with SEN to develop and apply effective social strategies through role-playing, modeling, and practice, thereby improving the quality of social interactions, which further helps them to develop the necessary social skills and increase their self-confidence (Gueldner et al., 2020).

Mutative keywords refer to keywords that have a sudden increase in frequency within a certain period (Sun et al., 2023). Burst detection allows for the identification of evolving trends in research on inclusive education in the field of special education. This method enables the review and prediction of key issues that are likely to become prominent or have a continuous bursting trend in the future (Shen et al., 2022). Figure 6 shows the emergent keywords of research on integrated education for children with SEN, from which three characteristics can be summarized. First, an analysis of the keywords reveals that the highest centrality is social inclusion, followed by mental retardation, social skills, and programs, each exhibiting a centrality score of 3.5 or higher. Over the past decade, the research focus on inclusive education for children with SEN has shifted. In the early period (2014–2017), scholars primarily concentrated on issues such as intellectual disability, social skills, education policy, preparing teachers, sentiments, and general curriculum. However, in the middle to the late period (2018–2024), the emphasis transitioned toward meta-analysis, experiences, participation, challenges, social integration, physical education, interventions, teacher training, etc., to provide educational resources and support services.

Top 25 Keywords with the Strongest Citation Bursts

Keywords	Year	Strength	Begin	End	2014 - 2024
mental retardation	2014	3.52	2014	2018	
social skills	2014	3.51	2014	2016	
programs	2014	3.51	2014	2016	
education policy	2014	3.3	2014	2016	
preparing teachers	2014	3.04	2014	2017	
sentiments	2014	3	2014	2015	
general curriculum	2015	2.81	2015	2016	
special education	2014	2.55	2015	2016	
competence	2015	2.28	2015	2016	
positive behavior support	2017	2.72	2017	2018	
model	2017	2.71	2017	2018	
metaanalysis	2018	2.44	2018	2021	
experiences	2014	3.24	2019	2021	
program	2015	3.14	2019	2020	
outcm	2015	2.81	2019	2021	
views	2020	2.64	2020	2021	
engagement	2021	2.98	2021	2022	
challenges	2021	2.28	2021	2024	
social inclusion	2016	5.22	2022	2024	
physical education	2014	3.4	2022	2024	
support	2014	3.15	2022	2024	
interventions	2016	3.12	2022	2024	
teacher training	2014	3.12	2022	2024	
students with disabilities	2015	2.77	2022	2024	
classroom	2016	2.77	2022	2024	

FIGURE 6
Keywords mutation chart.

Third, all the keywords have a relatively short period of mutation, which also indicates that most of the keywords are prone to be replaced by new words over time, but in comparison, the keywords that have a slightly longer time of mutation are mental retardation, preparing teachers, meta-analysis, and challenges, which last for about 3 years.

Discussion

This study applied visual mapping to analyze the current literature on the progression of inclusive education for children with SEN, highlighting key research areas and trends from the past decade. A familiar statement of the basis of the right for inclusion is the Salamanca Statement (UNESCO, 1994), which is an explicit statement concerning children's rights that refers to education and level of learning rather than a mechanism (inclusion). Since then, the development and research of inclusive education for children with SEN has become a hot topic in the academic world, but the focus of research on the development of inclusive education for children with SEN varies in each country as a result of the differences between countries and circumstances of the researchers, as well as differences in the policy system. This study addressed the following topics in the discussion.

Firstly, research on the development of inclusive education for children with SEN has become increasingly comprehensive, addressing not only teaching methods and interventions for children with SEN, the differentiated needs of children with SEN across different disabilities, the development and achievement of students with SEN, and behavioral and social skills but also attitudes and concepts of education, teacher training, and professional development, as well as the key influencing factors of the inclusion environment.

Secondly, there is a diversified trend in the disciplines of research on the development of inclusive education for children with SEN. In addition to education and psychology, which have traditionally focused on inclusive education for these children, interdisciplinary fields such as medicine and sociology have also produced extensive literature on this topic. Numerous disciplines have explored the development of inclusive education for children with SEN from various perspectives and at multiple levels. Neuropsychology has recently become an important concept that supports the notion of inclusive education. It is a tool for understanding and addressing the specific needs of pupils with different neurodevelopmental, cognitive, and emotional disorders in certain areas. The refined diagnosis of specific learning disabilities such as dyslexia, dyscalculia, ADHD, autism, and others has implications for the development of Individual Education Plans (IEPs) that reflect the unique needs of each student, particularly in the areas of students' cognitive skills such as memory, attention, executive functioning, and others.

Thirdly, in exploring the development of inclusive education for children with SEN, it is common to differentiate between children with different disabilities because of the greater heterogeneity among children with different types of disabilities in the field of special education (see, for example, Norwich, 1996). Parents of children with severe disabilities tend to support inclusive education, perceiving benefits such as enhanced social integration (De Boer et al., 2010; Downing and Peckham-Hardin, 2007; Hanline and Halvorsen, 1989). Nevertheless, they express concerns about safety, peer attitudes, and the quality of educational services (Hanline and Halvorsen, 1989; Palmer et al., 2001). It should be noted that apart from the topic of the development of inclusive education for children with autism spectrum disorder (ASD), the body of literature addressing the career and social adjustment of students with ASD in adulthood, cross-cultural comparative studies, long-term mental health and emotional development, and the effectiveness of technology and assistive devices is markedly limited.

Fourthly, regarding selecting topics for research on inclusive education for children with SEN, prior research often began its exploration with narrow and specific topics related to the development of these children. Notably, studies within the realm of psychology have predominantly employed quantitative methodologies, utilizing more precise and in-depth focal points. This approach has yielded findings that are notably more targeted and relevant.

Limitations and future research

Research on issues related to the development of integrated education for children with SEN has already formed a relatively advanced research system, including the understanding and analyzing relevant concepts, measurement and operationalization, identification of influencing mechanisms, intervention mechanisms and policies, etc. In future research endeavors, the following aspects can be explored.

(1) The research on the development of children with SEN is multidimensional and heterogeneous. Alongside supplementary education for children with deafblindness and emotional and behavioral interventions for children with SEN, the assessment and monitoring of mental health, self-determination, and resilience in this population represent a critical area of focus. Consequently, advancing the research framework concerning children with SEN is essential. This advancement should include a comprehensive exploration of concepts related to special needs, particularly those associated with psychological development, and an examination of how to effectively synthesize relevant theories with practical implementation strategies.

(2) The study of the development of children with SEN is interdisciplinary and encompasses various fields, including pedagogy, psychology, sociology, social work, social security, public administration, etc. Therefore, it is crucial to incorporate findings from cutting-edge research across various disciplines, rectify the shortcomings associated with fragmented research fields, and promote interdisciplinary collaboration. This approach will enrich the theoretical and methodological framework related to the psycho-social development of children with SEN.

(3) In the future, the developmental fields of children with SEN should be classified and researched more scientifically and specifically. For example, scientific measurements and operations should be carried out in specific areas such as the cognitive development, physical development, and psychological development of children with SEN to build a system of indicators of children with SEN with validity and credibility and to expand the depth of research on the development of children with SEN. The topic of inclusive education currently makes little use of the point of view of one group of prominent participants—the pupils with SEN themselves. The topic calls for a qualitative methodology and the acquisition of feedback information for researchers and educators in practice.

(4) Future efforts should focus on conducting comparative research across different countries. International comparative

research can address similarities and differences in the developmental milestones of children with SEN and typically developing children in different countries or regions, as well as their difficulties and challenges, mechanisms of influence, social policies, and other related topics. International comparative research can facilitate establishing a research dialog, promoting access to quality education and development for children with SEN.

Conclusion

In summary, CiteSpace, as a tool for visual analysis, is effective at illustrating the overall landscape of literature and research related to the development of inclusive education for children with SEN through map representations. This visualization facilitates a clearer understanding of the prevailing hotspots and trends within the entire research domain.

On the other hand, it is essential to recognize that CiteSpace has both analytical capabilities and limitations. Firstly, it mainly relies on the WoS database, and literature and citations not included in this database cannot be analyzed comprehensively, which may lead to a lack of representativeness and comprehensiveness of the results. Considering that the WoS database offers extensive coverage of literature in the natural sciences, engineering, and technology, CiteSpace may have a disciplinary bias when analyzing social sciences and humanities literature. At the same time, the database is updated with a certain time lag, so the latest research results may not be reflected promptly in the analysis results. It should be noted that when the visual mapping and analysis results are being interpreted, the subjective judgment of the researcher will affect the interpretation, which may lead to differences in the interpretation of the same results by different researchers. Thus, future research ought to endeavor to overcome the limitations of current tools by integrating multiple visualization and analysis techniques, thereby augmenting the study and obtaining more persuasive results.

It is important to highlight that, from the perspective of academic journals, there exists a variety of specialized publications dedicated to the development of children with SEN and their rights, such as the Journal of Special Education, Journal of Autism and Developmental Disorders, Exceptional Children, Research in Developmental Disabilities, Disability and Society, Journal of Intellectual Disability Research, etc., which has a significant impact on the field. In future initiatives, it is hoped that these specialized journals could function as platforms for advocacy regarding children with SEN.

Moreover, exploring modern outreach strategies, such as utilizing short video platforms to effectively disseminate knowledge about special education, is crucial. Developing a series of micro-lesson videos focused on inclusion could further enhance public awareness and foster greater acceptance of children with SEN. Additionally, promoting the fulfillment of special children's potential at international events such as the Paralympics and Special Olympics could contribute further to this goal.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Author contributions

XL: Data curation, Resources, Writing – original draft, Writing – review & editing, Conceptualization, Formal analysis, Funding acquisition, Investigation, Methodology, Validation. MP: Data curation, Resources, Writing – original draft, Writing – review & editing, Supervision.

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While preparing this work, the author used ChatGPT to optimize language and enhance sentence wording in parts of the content. After using this tool, the author reviewed and edited the content as needed and took full responsibility for the content.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Generative AI statement

The author(s) declare that Generative AI was used in the creation of this manuscript. Grammarly was used for editing.

Publisher's note

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Cognitive load and neurodiversity in online education: a preliminary framework for educational research and policy

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This theoretical paper presents the development and analysis of an inclusive educational framework designed to manage cognitive load for neurodivergent students in online learning environments. Drawing from cognitive load theory and neurodiversity studies, the framework is based on existing literature, empirical work conducted by the authors, and iterative feedback from a participatory research advisory board. Taking a neurodiversity-informed perspective that focuses on interventions addressing challenges common across a range of conditions, it identifies six critical areas that might impact cognitive load in online learning for neurodivergent students: format, environment, delivery, instruction, support, and research (FEDIS+R). To assess the external factors influencing the potential implementation of the framework and its place within the broader landscape of inclusive education, a PESTEL (Political, Economic, Social, Technological, Environmental, and Legal) analysis was conducted. The analysis highlights challenges such as resource disparities, institutional commitment to inclusion, and legal requirements for accessibility, which may affect the adoption of the framework. Given the evolving nature of both cognitive load theory and neurodiversity studies, future research directions are suggested to evaluate its effectiveness across diverse educational contexts. This paper contributes to the growing body of knowledge on neurodiversity in education and offers practical recommendations for educators and policymakers seeking to create inclusive online learning environments.

KEYWORDS

online learner, neurodiversity, inclusive education, ADHD, autism, dyslexia, cognitive load

1 Introduction

Thirty years ago, the Salamanca Declaration marked a turning point in the global movement toward inclusive education, advocating for the fundamental right to access quality education regardless of diverse needs and abilities (Ainscow et al., 2019; United Nations, 1994). Published in 1978, the Warnock committee's report on Special Educational Needs (SEN) further emphasized the importance of both recognition and support of the unique learning needs of all students (Warnock, 1978). Those frameworks, in alignment with the World Health Organization's vision of inclusive education and the UNESCO goals of education, have since

inspired several initiatives and policy changes worldwide (Lindsay et al., 2020).

The emergence of the neurodiversity paradigm has further supported the goals of inclusive education. Neurodiversity, a term coined in the late 1990s, refers to the natural variation in human brain functioning, encompassing attention deficit hyperactivity disorder (ADHD), autism spectrum disorder (ASD), dyslexia, and other neurological differences (Armstrong, 2010). Neurodivergent people, whose brain functions differ from what is considered typical neurodevelopmental and cognitive functioning, are estimated to account for 15–20% of the global population (Doyle, 2020; Jurgens, 2020). The concept of neurodiversity challenges the notion that neurological differences should be viewed as deficits or disorders (Rosqvist et al., 2020). Instead, neurodiversity advocates for a strengths-based approach to understanding neurocognitive differences, recognising that these variations can lead to unique skills, talents, and perspectives (Armstrong, 2010; Rosqvist et al., 2020). As neurodevelopmental conditions are the largest category of qualifying disabilities in education (Hubble and Bolton, 2021), this shift has been instrumental in promoting inclusive education practices and fostering mixed-ability classrooms, where the diverse needs and abilities of all students are valued and supported (Rentenbach et al., 2017), and extensive research has been conducted to investigate strategies for supporting neurodiversity in education (Clouder et al., 2020). Studies called to attention the importance of providing accommodations, such as extended time on tests and alternative assessment methods, to ensure that neurodivergent students have equal opportunities to demonstrate their knowledge and abilities (Lovett and Nelson, 2021). Additionally, research has emphasized the need for educators to receive training in understanding and supporting neurodiversity, enabling them to create inclusive classroom environments (Griffin and Pollak, 2009). The use of evidence-based interventions such as cognitive-behavioral therapy has also been found to be effective in supporting the academic, social, and emotional development of neurodivergent students (Fleury et al., 2014).

However, neurodivergent students still face distinct barriers in educational environments that can impact their learning experience. Variations in executive functioning (EF), which include differences in working memory, cognitive flexibility, and inhibitory control can affect how students engage with multiple learning platforms, organize materials, and maintain attention during lectures (Diamond, 2013). These neurocognitive variations are well-documented across neurodevelopmental conditions, with ADHD associated with challenges in response inhibition and working memory, ASD characterized by differences in cognitive flexibility and planning, and dyslexia connected to working memory and processing speed difficulties (Barkley, 2012; Hill, 2004; Smith-Spark et al., 2016). Language processing differences, including varying interpretations of figurative language, can influence how neurodivergent students engage with discussions and written instructions (Williams et al., 2008). Social interactions can shape participation in class discussions and group work, where traditional turn-taking structures and interpretation of non-verbal cues may not align with their preferred communication styles (White et al., 2016). These patterns align with theoretical frameworks such as Barkley's theory of EF as an extended phenotype, which explains how EF differences might impact self-regulation and learning (Barkley, 2012). In addition, the social model of disability suggests that these challenges often arise from environmental and institutional barriers rather than inherent deficits, with traditional educational systems frequently failing to accommodate neurodiversity (Chapman, 2020; Oliver and Barnes, 2012; Woods, 2017). The significant increase in the adoption of online learning platforms over the past decades, which has been accelerated by the COVID-19 pandemic (Dhawan, 2020), has presented new challenges for supporting neurodivergent students (Becker et al., 2020; He et al., 2021; Young and Clerke, 2024). The unique characteristics of online learning environments, such as the reliance on digital communication and the absence of face-to-face interactions, may pose additional barriers for neurodivergent students (Ballantine et al., 2023; Le Cunff et al., 2022; Smith, 2023). As such, there is a pressing need for research further investigating strategies and best practices for supporting neurodiversity and ensuring that all students have access to inclusive and equitable learning opportunities in online education. Understanding these barriers is crucial for transforming educational systems to create genuinely inclusive learning environments that value neurodiversity rather than expecting students to conform to neurotypical norms.

Cognitive load refers to the amount of mental effort required to process and retain new information (Sweller, 1988). It is a crucial factor in determining students' acceptance of educational content, their overall well-being, and their academic performance (Sweller et al., 2019). Cognitive load theory distinguishes between two main types of cognitive load: intrinsic and extraneous (Sweller et al., 2019). Intrinsic cognitive load represents the inherent difficulty of the learning material and the natural complexity of the task at hand (Paas and van Merriënboer, 2020). Extraneous cognitive load, in contrast, stems from the way information is presented and how learning activities are designed—it is the unnecessary mental effort imposed by poor instructional design or distracting elements in the learning environment (Mayer and Moreno, 2003). While intrinsic cognitive load is considered necessary for learning, extraneous cognitive load might interfere with learning and should be minimized through careful instructional design (Sweller et al., 2019). Managing cognitive load is particularly important for neurodivergent students, who often show differences in working memory (Habib et al., 2019; Jeffries and Everatt, 2004; Kofler et al., 2020). In ADHD, differences in working memory are associated with difficulties in maintaining and manipulating information, which can negatively impact academic performance (Roodenrys, 2012). Similarly, autistic individuals often demonstrate differences in working memory which can hinder their ability to process and retain complex information (Kercood et al., 2014). Dyslexia is also associated with working memory differences, particularly in the phonological domain (Menghini et al., 2011). While cognitive load in online learning has been extensively studied in neurotypical populations (e.g., Mayer and Moreno, 2003; Paas et al., 2003), research on its impact on neurodivergent students in online learning is limited (Le Cunff et al., 2024a). This gap in research has significant implications for the design and delivery of inclusive online education, as it may lead not only to the development of online learning materials and strategies that do not adequately address the unique needs of neurodivergent students but might also hinder the identification of accessibility issues in software that is already widely used.

Because learning differences associated with neurodiversity affect a variety of cognitive processes that are not all easily observed, online learning can make neurodiversity more difficult to support: without

physical indicators, difficulties can remain "hidden," impeding the implementation of inclusive learning strategies (Matthews, 2009). Understanding the impact of cognitive load on neurodivergent students in online learning environments is crucial for policymakers and practitioners alike as it can inform the development of inclusive online education strategies that cater to the diverse needs of all students. While the importance of cognitive load in educational settings is well-established, particularly in online environments, there is currently no empirically grounded framework that specifically addresses the unique needs of neurodivergent students. This gap has led to fragmented approaches in supporting these students (Bănut and Andronache, 2023; Caskurlu et al., 2021).

To address this gap, this article builds upon a body of research, including the authors' prior empirical work, to develop an applied framework that addresses the challenges of managing cognitive load for neurodivergent students in online learning environments, designed to guide educators and policymakers in creating inclusive online learning environments. We adopt a neurodiversity-informed approach that recognises the overlapping challenges faced by neurodivergent students, including those with ADHD, ASD, dyslexia, and other conditions (Chapman, 2020). While each condition presents unique characteristics, many neurodivergent traits—such as difficulties with information processing, executive functioning, and task completion—are shared across these groups (Armstrong, 2010). Rather than fragmenting interventions for specific diagnoses, this framework aims to identify strategies that can broadly help manage cognitive load for all neurodivergent students in online learning environments.

The framework integrates insights from prior studies into practical recommendations for reducing challenges associated with cognitive load in online learning. It draws on a diverse range of studies, including qualitative, quantitative, and neurophysiological data, to provide a holistic understanding of cognitive load in neurodivergent students. This mixed-methods approach is critical for identifying patterns of cognitive load that might not be captured by a single methodology, allowing the framework to address both cognitive and experiential aspects of neurodivergent students' learning (Dwyer et al., 2023). Additionally, this paper includes a Political, Economic, Social, Technological, Environmental, and Legal (PESTEL) analysis to evaluate the external factors influencing the implementation of this framework in real-world educational contexts. PESTEL analyses have been used in education research to evaluate potential changes to policies (Graham, 2018; Musa and Suryono, 2022; Yasir et al., 2023). By synthesising research findings into a cohesive structure and then evaluating the applicability of the framework, this work not only highlights key challenges in the current educational landscape but also proposes concrete steps for future research and policy development. Ultimately, this preliminary framework serves as both an operational tool and a roadmap for future empirical studies, advancing the growing field of inclusive online education for neurodivergent students.

2 Framework development

Developing a framework that addresses the specific challenges neurodivergent students face in managing cognitive load in online learning environments requires the integration of theoretical and empirical insights. Existing applied frameworks, such as Zimmerman's framework for academic self-regulation (Zimmerman, 2002), focus on how students regulate their learning but do not consider the specific barriers neurodivergent students encounter in online education. Similarly, Laurillard's conversational framework (Laurillard, 2002) supports adaptive teaching processes but does not account for how neurodivergent students might experience excessive cognitive load during online learning. The Emerging Technologies Framework (Millea et al., 2005) explores technology's role in education but does not address how cognitive load impacts neurodivergent students specifically. These gaps highlight the need for a new applied framework that integrates both theoretical and empirical insights, specifically geared toward managing cognitive load in online education for neurodivergent students.

The development of this framework was guided by integrating key insights from cognitive load and neurodiversity research, with a particular emphasis on adapting these models to the needs of neurodivergent students in online education. Cognitive load theory provided the foundational understanding of how cognitive load impacts learning (Sweller, 1988; Sweller et al., 2019), while our systematic review revealed underexplored patterns in the relationship between neurodiversity and cognitive load in online learning (Le Cunff et al., 2024a). Additionally, our own empirical research identified specific barriers faced by neurodivergent students, such as inaccurate transcripts, inaccessible content presentation, and unclear curricula, that can lead to difficulties in regulating cognitive load (Le Cunff et al., 2024b, 2024c, 2024d). These findings directly shaped the development of the framework by identifying key areas where neurodivergent students encounter the most significant challenges, allowing us to suggest strategies aimed at managing cognitive load in online learning for these students.

Each component of the framework was developed to address specific aspects of the learning process that might contribute to cognitive load for neurodivergent students. To ensure methodological rigor, we followed Kern's six-step framework development process (Kern et al., 1998), which is widely recognized in educational research for designing applied frameworks. This process involves defining the problem, identifying necessary components based on empirical evidence, and iterative testing and refinement (Figure 1). The framework was developed in collaboration with a Research Advisory Board (RAB) consisting of neurodivergent students, who contributed throughout the iterative development process. Their input was integrated at various stages to ensure that the framework effectively addresses the challenges neurodivergent students face in online education. The RAB members also co-authored this manuscript, reflecting their active role in shaping the framework.

To assess the framework's applicability in real-world educational settings, we structured the discussion section around a short PESTEL analysis, which evaluates the Political, Economic, Social, Technological, Environmental, and Legal factors that could influence the framework's implementation (Graham, 2018; Musa and Suryono, 2022; Yasir et al., 2023). First, we reviewed current political policies related to neurodiversity and inclusion in education, identifying legislative support and potential barriers to implementing neurodivergent-specific strategies. Next, we assessed the economic implications, considering the costs of adopting the framework and the availability of funding for neurodivergent students. We then examined social factors, such as attitudes toward neurodiversity and the demand for inclusive education practices. The analysis also included a

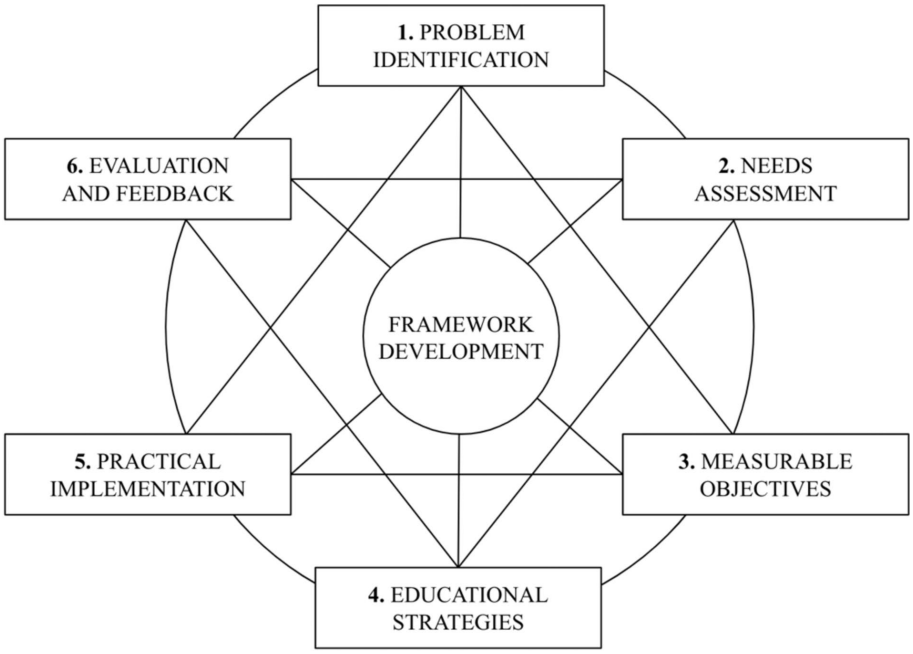

FIGURE 1
Visual representation of Kern's six-step framework development process.

discussion of current technological capabilities in education, determining whether existing digital tools could support the framework's recommendations. Environmental factors were also considered, particularly the shift to remote learning during the COVID-19 pandemic, which has had significant effects on neurodivergent students in online education (Adnan and Anwar, 2020). Finally, we evaluated legal barriers by reviewing accessibility and inclusion laws that impact education. By evaluating these external factors, we aim to provide practical recommendations for educators and policymakers that are adaptable across a variety of educational contexts.

It is important to note that this paper synthesises findings from previously published research. As such, detailed methodological aspects, such as participant inclusion/exclusion criteria, control variables, study designs, and ethical approvals, are thoroughly described in the original studies referenced throughout the framework's development.

3 Preliminary framework for educational research and policy

Based on the insights gained from our systematic review and empirical studies, and following the steps of Kern's development process, we identified six key areas that impact cognitive load for neurodivergent students in online learning environments: format, environment, delivery, instruction, support, and research (FEDIS+R). These six areas provide a structured approach for educators and policymakers to design online learning environments that minimize extraneous cognitive load and promote inclusive practices for neurodivergent students. Figure 2 illustrates the framework, highlighting how each of these areas can be addressed to support neurodivergent students and reduce the cognitive barriers they face in online education.

3.1 Format

Providing content in written format such as transcripts and captions may help in reducing cognitive load for some neurodivergent students in online learning environments. Captions might be helpful for neurodivergent students when used as part of recorded lectures where they can pause, slow down, or speed up the video, making the content more functionally adaptable to their unique needs (Horlin et al., 2024). For dyslexic students, such recordings enhanced with captioning and transcripts can reduce the cognitive load of taking notes during live lectures, reducing the risk of falling behind (Nightingale et al., 2019). Autistic students can also benefit from text being provided in addition to audio visual media as they can experience difficulties in auditory processing that make speech difficult to separate from background noise (Kent et al., 2018). While transcripts and captions have been found to be beneficial to a wide range of students, including neurotypical students (Clossen, 2014), the effectiveness of different formats can vary significantly among students and there can be a complex interplay between engagement and accessibility, where formats that increase engagement might simultaneously impose higher cognitive load (Dahlstrom-Hakki et al., 2020). For instance, research has shown that captions can actually increase cognitive load for some students with ADHD due to the redundancy effect (Brown et al., 2016). Inaccurate transcripts and poorly synchronized captions have also been found to increase perceived cognitive load in online learning for neurodivergent students (Le Cunff et al., 2024b). Therefore, educators should consider providing flexible format

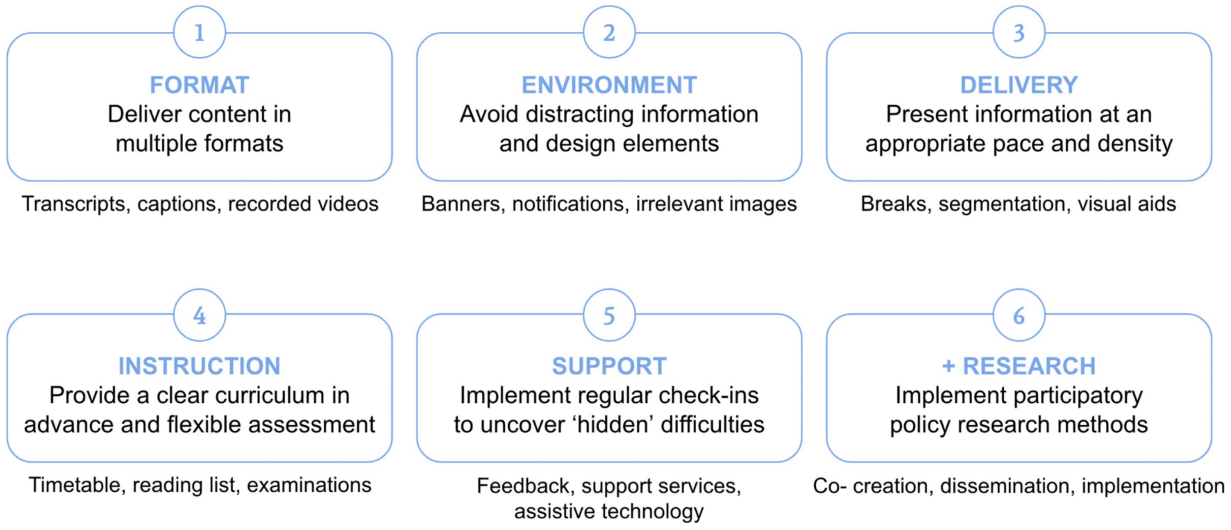

FIGURE 2
FEDIS+R framework to manage cognitive load in online learning for neurodiverse classrooms.

options that allow students to choose the presentation mode that best suits their individual learning needs. By ensuring that captions and transcripts are error-free and matching with the audio content, educators can help neurodivergent students focus on the lecture material without the added cognitive load of deciphering the content.

3.2 Environment

To reduce extraneous load, online learning platforms should avoid including unnecessary visual elements such as banners, advertisements, or irrelevant images (Clark and Mayer, 2023; Oviatt, 2006). These distracting elements can divide students' attention between the primary content and irrelevant stimuli, leading to cognitive overload (Mayer and Fiorella, 2014). Similarly, cluttered interfaces with too many navigation options or overwhelming amounts of text can increase extraneous load, particularly for neurodivergent students who may struggle with information processing (Chen et al., 2011; Le Cunff et al., 2024d). Conversely, research suggests that increasing intrinsic load by designing learning tasks that require a high level of focal-task engagement may decrease extraneous load by reducing peripheral processing of task-irrelevant information (Sörqvist et al., 2016). Educators should also be mindful of how they present announcements and notifications within online learning environments. While timely communication is essential for student engagement and success, poorly timed or excessive notifications can disrupt the learning process and increase extraneous load (Arnold et al., 2023; Ohly and Bastin, 2023; Okoshi et al., 2017; Wang, 2022). To minimize extraneous load, announcements should be concise, relevant, and strategically placed within the learning platform (Humphrey Jr et al., 2021; Lai et al., 2020). By designing online learning environments that minimize distracting elements and optimize the presentation of intrinsically relevant information, educators can help manage cognitive load for all students, including those who are neurodivergent.

3.3 Delivery

Educators should strive to deliver information at an appropriate pace, with sufficient breaks to support understanding and avoid cognitive overload. Presenting content too quickly or too densely can increase perceived cognitive load, particularly for neurodivergent students who may require more time and mental effort to process information (Le Cunff et al., 2024b). This aligns with research suggesting that the pace and density of information presentation can significantly impact cognitive load and learning outcomes (Chang et al., 2012; Costley et al., 2021; Mo et al., 2022). To address this issue, educators can use the segmenting principle, which involves breaking down complex information into smaller, more manageable chunks (Ibrahim et al., 2011; Mayer and Pilegard, 2005). By presenting content in shorter segments with clear timeframes and breaks between each segment, educators can help students process information more effectively and reduce cognitive load (Liu, 2024). Incorporating visual aids, such as diagrams, images, and videos, can also help reduce cognitive load by presenting information in multiple modalities (Mayer and Pilegard, 2005). This may be particularly beneficial for neurodivergent students who may struggle with auditory or visual processing (Le Cunff et al., 2024b). By using visual aids to complement verbal explanations, educators can help neurodivergent students better understand and retain information without experiencing excessive cognitive load (Mayer and Fiorella, 2014).

3.4 Instruction

Neurodivergent students can experience increased perceived cognitive load due to unclear expectations and lack of guidance on assignments and assessments (Le Cunff et al., 2024b). To address this issue, educators should provide a clear curriculum in advance of online lectures, along with detailed instructions, rubrics, and examples for assignments and assessments (Gronseth et al., 2021; Rao et al., 2015). Ideally, educators should clearly communicate which parts of

the curriculum are mandatory for exams and provide guidance on where to start when assigning reading materials (Le Cunff et al., 2024b). This approach can help neurodivergent students better understand what is expected of them and reduce the cognitive load required to navigate ambiguous tasks. Offering flexible deadlines and submission formats might further help neurodivergent students in managing their cognitive load and demonstrating their knowledge in ways that align with their strengths and preferences (Cai and Richdale, 2016; Zeedyk et al., 2019). Finally, providing clear, concrete, and unambiguous instructions is essential when working with neurodivergent students, as they may struggle with interpreting figurative language or deciphering unclear directions (Gurbuz et al., 2019; Toor et al., 2016). By breaking down complex tasks into manageable steps and offering explicit guidance, educators can provide more inclusive instruction that both reduces extraneous load and accommodates the unique needs of neurodivergent students.

3.5 Support

Implementing regular check-ins, providing timely and good quality feedback, and ensuring access to support services can help address the hidden nature of cognitive load in online learning for some neurodivergent students. Research suggests that university neurodivergent students may use compensatory strategies to maintain academic performance despite experiencing higher cognitive load, which might remain undetected in online learning environments (Le Cunff et al., 2024d). To provide inclusive and equitable education, practitioners might consider incorporating regular check-ins and providing opportunities for feedback, which could help identify when and where neurodivergent students are struggling and offer targeted support to manage their cognitive load. Furthermore, ensuring that neurodivergent students have access to support services, such as disability services, counseling, and assistive technologies, is crucial for helping them manage their cognitive load and succeed in online learning (Andersen and Jensen, 2018; Cai and Richdale, 2016; Zeedyk et al., 2019). Providing support services to neurodivergent students is essential, but equally important is fostering a psychologically safe environment that encourages them to access and make use of these services (Hamilton and Petty, 2023). Psychological safety refers to the belief that one can express oneself without fear of negative consequences, and it plays a significant role in neurodivergent students' willingness to seek help and engage with support systems (Edmondson, 1999; Hamilton and Petty, 2023). To foster psychological safety for neurodivergent students, educators should strive to create inclusive environments that promote open communication, validate students' experiences, and offer accommodations without judgment (Accardo et al., 2024; Sarrett, 2018; Zeedyk et al., 2019). By implementing these strategies, educators could better identify and address the unique challenges faced by neurodivergent students, ensuring that they have the necessary resources and accommodations to manage their cognitive load effectively.

3.6 Research

Recent research has highlighted the importance of participatory policy research methods in ensuring that the lived experiences and perspectives of neurodivergent students are central to the development of inclusive education policies and practices (Chown et al., 2017; Parsons et al., 2020). Given the hidden nature of cognitive load in online learning for some neurodivergent students (Le Cunff et al., 2024d), it is crucial that policymakers engage directly with neurodivergent students as co-creators of research to better understand their unique challenges and develop effective solutions (Rosqvist et al., 2019; Gillespie-Lynch et al., 2017). Participatory research methods, such as co-design workshops, focus groups, and advisory boards, can provide valuable insights into the experiences of neurodivergent students and help identify areas where support and accommodations are needed (Le Cunff et al., 2023; Nicolaidis et al., 2019; Pellicano et al., 2018). By involving neurodivergent students as active participants in the research process, researchers, policymakers, and practitioners can ensure that their decisions are grounded in the real-world experiences of those most affected by their policies, leading to more effective and equitable outcomes for all students (Fletcher-Watson et al., 2019; Le Cunff et al., 2024e; Parsons et al., 2020; Sonuga-Barke et al., 2024). Furthermore, this approach can help foster a sense of agency and empowerment among neurodivergent students, promoting self-advocacy and reducing the stigma associated with neurodiversity in education (den Houting et al., 2021; Gillespie-Lynch et al., 2017).

The FEDIS+R framework takes a neurodiversity-informed perspective, focusing on interventions that address the neurodivergent traits common to a range of conditions (Armstrong, 2010; Chapman, 2020; Clouder et al., 2020). For example, providing clear, structured instructional materials, reducing distractions, and offering multiple ways to engage with content are strategies that can benefit all neurodivergent students, regardless of specific diagnosis. By focusing on universally accessible design principles, this educational framework seeks to create an inclusive learning environment that supports all students.

4 Discussion

The rapid growth of online learning has presented both opportunities and challenges for supporting neurodivergent students in higher education. The following discussion based on a short PESTEL analysis provides a preliminary evaluation of the broader political, economic, social, technological, environmental, and legal factors that might impact the implementation of the FEDIS+R framework, as well as potential avenues for future research.

First, the political landscape plays a significant role in shaping policies that affect neurodivergent students. Legislation and educational guidelines aimed at supporting neurodiversity and inclusion vary across regions, which influences the ability of institutions to implement the FEDIS+R framework. For example, in some countries, governments have introduced policies that promote inclusive education practices, ensuring that neurodivergent students have access to appropriate resources and accommodations (Parsons et al., 2020). However, in regions where such policies are absent or underdeveloped, the lack of legislative support can hinder the adoption of inclusive frameworks (Chown et al., 2017). The success of the FEDIS+R framework depends on political will and the enactment of policies that prioritize the needs of neurodivergent students. Future research could explore how shifts in government priorities and

political support for inclusive education initiatives impact the implementation of cognitive load management strategies in online learning environments.

Economic constraints also play a crucial role in determining how effectively institutions can implement strategies to manage cognitive load for neurodivergent students in online learning. The FEDIS+R framework suggests targeted interventions, such as offering accessible content formats, personalized instructional delivery, and structured support systems, all of which may require significant financial investment. For example, minimising extraneous cognitive load through revised instructional materials and training staff to implement cognitive load management strategies all carry associated costs (Jones et al., 2023). Institutions with limited financial resources may struggle to meet these economic demands, potentially resulting in increased cognitive load for neurodivergent students who lack the necessary support. In contrast, well-funded institutions can provide more robust accommodations and tools, allowing for a more effective implementation of the FEDIS+R framework and thus reducing extraneous cognitive load for students. This financial disparity risks exacerbating inequalities in how neurodivergent students experience online learning. Furthermore, the availability of funding for neurodivergent students themselves, such as scholarships or subsidies for assistive technologies, is critical in providing equitable access to inclusive learning environments (Griful-Freixenet et al., 2017). As such, policymakers might consider establishing dedicated funding streams to help under-resourced institutions adopt such inclusive educational frameworks, ensuring that all students can benefit from reduced extraneous cognitive load and a more accessible online learning experience.

Social attitudes toward neurodiversity also play a key role in shaping how well inclusive educational frameworks can be implemented. Public awareness and acceptance of neurodivergent students' needs are critical in ensuring that inclusive practices are embraced by both educators and the students themselves (Satterfield et al., 2015). In some cases, neurodivergent students face stigma or misunderstanding, which can create additional barriers to their full participation in online learning environments (Rosqvist et al., 2019). By fostering a culture of inclusivity, institutions can promote the successful adoption of frameworks that support cognitive load management for neurodivergent students. Fortunately, despite many remaining challenges, the societal demand for inclusive education is growing, which may drive institutions to adopt frameworks such as FEDIS+R as part of their commitment to equity and diversity in education (Ainscow, 2020; Ferguson, 2008).

Technological advancements present both opportunities and challenges for implementing the FEDIS+R framework. Emerging technologies, such as artificial intelligence (AI), virtual reality (VR), augmented reality (AR) have the potential to create more personalized and accessible online learning environments for neurodivergent students (Hutson, 2022; Zhang et al., 2022). These tools allow for flexible learning experiences that adjust to students' neurocognitive profiles, making online education more inclusive (Kulik and Fletcher, 2016; Xie et al., 2019). Additionally, adaptive technologies such as text-to-speech and speech-to-text tools, can make content more accessible (Erdem, 2017; Lyamuremye et al., 2023). However, the implementation of these technologies comes with challenges, such as concerns about cost, accessibility, and data privacy (Jones et al., 2023). Moreover, offering too many accommodations without clear guidance can overwhelm students and increase cognitive load by forcing them to frequently switch between formats, leading to distraction (Chrysochoou et al., 2021; Cole et al., 2024; Boyd, 2024; Landry, 2021). To mitigate this, practitioners should aim to provide focused and concise information, as well as clear guidance on how to effectively use the available accommodations (Cai and Richdale, 2016). By thoughtfully leveraging emerging technologies as part of instructional design, educators can create more inclusive and equitable online learning experiences for all students, regardless of their neurocognitive differences.

Environmental factors, including the ongoing effects of the COVID-19 pandemic, have significantly reshaped online education, with implications for neurodivergent students. The rapid shift to remote learning highlighted both the potential of online platforms to support flexible education and the challenges of designing inclusive digital environments that minimize cognitive load (Adnan and Anwar, 2020). For many neurodivergent students, the abrupt transition to remote learning increased their cognitive load due to poorly designed digital environments, inaccessible content, and lack of structured support (Le Cunff et al., 2024b). As online learning becomes more entrenched in higher education, institutions must consider how to design flexible yet inclusive learning environments that can adapt to both global shifts and the evolving needs of neurodivergent students. Future research might further explore how environmental factors, such as prolonged isolation and changing work-study arrangements, impact neurodivergent students' cognitive load and well-being.

The legal landscape surrounding accessibility and inclusion in education is critical for ensuring that neurodivergent students receive adequate support. In many regions, laws such as the Equality Act (UK) and the Americans with Disabilities Act (US) require institutions to provide reasonable accommodations for students with disabilities, including those who are neurodivergent. However, the enforcement and interpretation of these laws vary, and gaps in legal protections can limit the ability of some institutions to fully implement inclusive educational frameworks (Chown et al., 2017). Additionally, issues related to privacy and disclosure present significant legal challenges. Many neurodivergent students may be hesitant to disclose their diagnosis due to concerns about stigma or how their personal information will be used, which can hinder their access to necessary accommodations (Brown, 2020; Kerschbaum et al., 2017). Institutions must navigate these complexities while ensuring that students' rights to privacy and confidentiality are protected (Fletcher-Watson et al., 2019). By working closely with legal experts, educators and policymakers can ensure that their implementation of the FEDIS+R framework aligns with local and international legal standards for accessibility, while also respecting students' autonomy and confidentiality regarding their neurodivergent status.

This analysis highlights the complexity of implementing the FEDIS+R framework in diverse educational settings. Each external factor—whether political, economic, social, technological, environmental, or legal—plays a significant role in shaping the success of this framework. While some institutions may have the resources and support needed to fully adopt inclusive educational frameworks, others may face barriers that require additional attention from policymakers and stakeholders. Addressing these external factors through informed decision-making will be essential for creating inclusive online learning environments that support neurodivergent students effectively.

5 Limitations and future directions

The FEDIS+R Framework was developed through the integration of theoretical and empirical research and designed in collaboration with a Research Advisory Board of neurodivergent students. Using Kern's six-step method, it was conceptualized to address cognitive load challenges in online learning, with a PESTEL analysis to evaluate its applicability in real-world educational contexts. However, it is important to view it as a tentative model that includes the critical need for further research and development. The framework is grounded in the current understanding of cognitive load theory (Sweller et al., 2019) and neurodiversity (Armstrong, 2010; Knoop-van Campen et al., 2020; Le Cunff et al., 2024a), but as research in these areas evolves, so too must the framework. Additionally, while the PESTEL analysis provides a preliminary review of external factors, it is not exhaustive, and other influences, such as cultural differences, may also affect the framework's implementation (Parsons et al., 2020; Griful-Freixenet et al., 2017). The practical application of the FEDIS+R framework may differ significantly between institutions depending on available resources, staff training, and institutional commitment to inclusion (Chown et al., 2017; Fletcher-Watson et al., 2019). Therefore, future research should explore how the framework can be adapted to diverse educational settings and evaluate its effectiveness in reducing cognitive load for neurodivergent students.

While the FEDIS+R framework does not offer condition-specific interventions, we believe that a neurodiversity-informed approach offers a flexible and inclusive way to address the shared cognitive challenges of neurodivergent students (Armstrong, 2010; Chapman, 2020; Mirfin-Veitch et al., 2020). Although our approach aims to provide immediate, broadly applicable strategies that benefit all neurodivergent students (Clouder et al., 2020), future research may explore how tailored interventions for specific conditions such as ADHD or dyslexia can be integrated into a more comprehensive framework.

Overall, advancing inclusive online education for neurodivergent students requires a collaborative effort among researchers, policymakers, and practitioners. Researchers play a critical role in generating evidence-based knowledge about the experiences, challenges, and effective strategies for supporting neurodivergent students in online learning environments (Clouder et al., 2020). Policymakers, in turn, can use this research to inform the development of inclusive education policies and guidelines that prioritize the needs of neurodivergent students and ensure equitable access to online learning opportunities (Chown et al., 2017; Parsons et al., 2020). Practitioners, such as educators, instructional designers, and support staff, can apply research findings and policy guidelines to create inclusive online learning environments that accommodate the diverse needs of neurodivergent students (Griful-Freixenet et al., 2017; Satterfield et al., 2015).

However, effective collaboration among these stakeholders requires open communication, shared goals, and a commitment to participatory research and decision-making processes that involve neurodivergent students as active partners (Rosqvist et al., 2019; Fletcher-Watson et al., 2019). By engaging neurodivergent students in the research process and seeking their input on the design and implementation of online learning environments, researchers, policymakers, and practitioners can ensure that their efforts to manage cognitive load are grounded in the lived experiences and needs of neurodivergent students. Through cross-disciplinary collaboration and the meaningful inclusion of neurodivergent voices, stakeholders can work together to create a more inclusive and equitable future for online education that effectively supports the learning and well-being of all students, regardless of their neurocognitive differences.

6 Conclusion

The FEDIS+R framework offers a preliminary set of recommendations for managing cognitive load in neurodivergent students within online learning environments. By focusing on six key areas—format, environment, delivery, instruction, support, and research—the framework provides educators and policymakers with a structured approach to creating more inclusive and accessible online learning environments. The accompanying PESTEL analysis reveals critical external factors that might influence the successful implementation of the framework. While the framework holds potential, it should be viewed as an evolving model that requires further research to adapt to diverse educational settings and respond to new developments in the understanding of cognitive load and neurodiversity. Future research should explore the framework's application across various educational contexts, examine its long-term effectiveness in reducing cognitive load, and assess its adaptability in response to institutional and cultural change. Moreover, as emerging technologies continue to shape the landscape of online education, it is crucial that researchers, policymakers, and practitioners work together to ensure that these innovations are thoughtfully leveraged to create more inclusive and equitable learning opportunities for all students, regardless of their neurocognitive differences. This requires a commitment to participatory research centred on the voices and experiences of neurodivergent students.

Author contributions

AL: Writing – original draft, Writing – review & editing. BM: Writing – review & editing. CG: Writing – review & editing. EA: Writing – review & editing. RF: Writing – review & editing. VG: Writing – review & editing. ED: Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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What about extra adaptions and special support in Swedish School Age Educare Centers?

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This study's background is the lack of research and knowledge about special education in Sweden's School-Age Educare Centers (SAEC), focusing on extra adaptations and special support. The study is important for international educational research because it draws attention to a research area that is lacking. Additionally, out-of-school programs are beginning to question and develop the field of special education. The study aimed to determine to what extent staff of various professional groups support students in need of special support and extra adaptations in SAEC. It is based on a web survey with 412 responses from SAEC staff. The empirical material was analyzed with descriptive and inferential statistics. As a theoretical frame, we used the relational perspective. The result shows that various professional groups have different and distinctive perceptions of students needing special support and extra adaptations in SAEC, especially the principals. Another result was that few students have action programs in SAEC. The results suggest that the students do not receive the special educational support needed to attain sufficient development and learning in the SAEC, which does not meet the governing documents for the SAEC. This study makes an important contribution for all professionals in SAEC (or internationally similar after-school settings) because staff is predicted to receive increased importance in the SAEC to compensate and supplement schools. Implications for practice are the need to allocate resources to implement the special education reform, prioritize SAEC and support staff in the implementation.

KEYWORDS

extra adaptations, professional groups, School-Age Educare Centers, significant differences, special educational support

Introduction

Worldwide, after-school care includes various programs for students aged 6–13 before and after school, differing by country. In the US, there are after-school programs; in Japan, extracurricular programs; in Germany and Switzerland, all-day schools; in Australia and England, school-age care; and Sweden, School-Age Educare Centers. These programs support learning, social development, and meaningful leisure time. They help parents balance work and parenting, contributing to family stability. For society and students, they enhance educational outcomes and foster a safe, cohesive community (Plantenga and Remery, 2017).

This article focuses on Swedish SAEC, which is part of the Swedish school system. In Sweden, most students (almost 90%) aged 6–9 attend SAEC, before and after school as well as during holidays. It has its own curriculum, focusing on both personal development and supplementing academic subjects. Activities often include arts, sports, crafts, and problem-solving tasks that encourage collaboration and independence. This comprehensive approach helps students learn in a playful manner. SAEC works closely with schools to ensure seamless

integration of learning objectives, promoting continuity in the child's overall education. SAEC also play a crucial role in promoting equity, as all students, regardless of background, have access to these services at a minimal cost. In Sweden, SAEC must adhere to the national curriculum (part 4), particularly the section outlining goals for SAEC, which emphasizes social development, creativity, and complementing formal education (Skolverket, 2023).

Since SAEC aligns with the regular school curriculum, the interest is how the staff in SAEC expresses how they can meet students' different needs. In Sweden, there is a special teacher training program for SAEC teachers for 3 years. In the past, the academically trained personnel were called leisure pedagogues but were changed to SAEC-teacher 2001. There is a requirement for at least one trained SAEC-teacher per SAEC. SAEC-teachers usually lead the pedagogical work for the staff. There is a wide variation in the formal competence of the staff. In 2023, 39.4% had the intended training (Skolverket, 2023). Other groups working in SAEC include childminers, assistants, and people who have no post-secondary education at all. SAEC-teachers often share their working time in SAEC and primary school because they are usually authorized to teach up to grade 6 in, for example, sports or art.

There is a growing international knowledge base on education's conditions for learning, focusing on children's social and cognitive development outside school, related to SAEC in Nordic countries and similar settings (Haglund and Peterson, 2017). Plantenga and Remery (2017) describe educational care infrastructures in 33 EU countries, with Sweden leading in accessibility and quality. Kirkpatrick et al. (2019) discuss SAEC equivalents in the US, and Hurst (2019) highlights after-school centers in Australia. While there are similarities between Swedish SAEC and these counterparts, differences exist in staffing, governing documents, and supervision. The first comprehensive Swedish research overview (Skolforskningsinstitutet, 2021) concludes that providing meaningful leisure and promoting development requires a strategy to create creative environments and varied teaching situations.

Since many students are shown in after-school-like environments before and after school, the staff also meet students needing special educational support there. An important question is what competencies staff have in handling special educational questions and whether there are resources in the organization to meet students with different needs. In Sweden, the SAEC has both a supplementary and a compensatory assignment according to The education act (SFS 2010:800, n.d.), which means that SAEC has an important role in enhancing student's learning from an all-day perspective (Skolverket, 2023). In addition, the SAEC teachers are responsible for meeting students' needs (Skolverket, 2014) and assessing which students need extra adaptations and special support and what teaching is required. SAEC—teachers are responsible for meeting students' needs, but individual solutions for students can be problematic since SAEC is not a compulsory part of the school system, and the foundation of the SAEC is participation, togetherness, and community (Wernholm, 2023a). This means that there may be an inherent conflict in singling out individual students' needs as it goes against the inclusive ideal of SAEC programs that emphasize collective values such as teaching as a group and not assessing individual student's achievements. Ultimately, the principal is responsible for the SAEC staff planning and teaching based on current governing documents (Skolverket, 2023). The SAEC has an important role in all students' development and learning and should, according to Lundbäck (2022), be strengthened by initiating and developing special educational issues based on the mission of the SAEC.

Two basic concepts within special education in the Swedish context and also adaptable in SAEC, whose meaning is mandatory, are *extra adaptations* and *special support*. Extra adaptions mean less intrusive support measures that can be made within the framework of regular teaching. Extra adaptations and special support are individual-oriented and are introduced when a student needs to develop in the direction of the knowledge goals in the curriculum or toward reaching the minimum knowledge requirements that must be achieved. *Extra adaptations* are less intrusive support efforts compared to special support and are about making teaching more accessible to the student in different ways. The SAEC program can be about visual support or support for students in their play. If extra adaptations are insufficient, the student's need for *special support* must be urgently investigated, and the principal must decide how the special support will be offered, for example, as an action program. Special support is a more intrusive support measure. For example, the student is taught in a different place, which requires a formal decision, and the measure is documented in various ways (Skolverket, 2024b).

These concepts are enshrined in The education act (SFS 2010:800, n.d.) and specified in the curriculum (Skolverket, 2014). They must be implemented in regular teaching (Skolverket, 2014, 2023). Thus, teachers and principals must ensure that students receive extra adaptations and special support in teaching. Support for students in need of special support must be provided throughout the school day and in SAEC. According to the Swedish Education Act, students in need of support must be reported to the principal, and an investigation needs to occur immediately. A mapping or pedagogical investigation of students' needs and learning environment must be done. Thereafter, an action program must be presented with special educational support measures (SFS chapter 3 §5–9). In the academic year 2023/24, 6.2 percent of primary school students are covered by an action program, corresponding to just under 68.600 students (Skolverket, 2024a). Despite this injunction, the knowledge about how many students have an action program written and adapted for SAEC is deficient.

Previous research has also shown that knowledge about how to work with extra adaptions and special support is low among SAEC staff (Boström et al., 2024).

In 2023, the Swedish school inspectorate (2024) investigated schools and SAEC's work with extra adaptions and special support during students' whole day. The results show that there is a risk that students will not gain the support they have a right to have because needs reported to the principal are only sometimes followed up. Further competencies needed to be improved; SAEC was not a part of the school's support work, and their competencies were often neglected.

Despite the mandates of the Swedish education act, there is insufficient knowledge about the number of students with action programs specifically adapted for SAEC. Additionally, previous research indicates that SAEC staff have limited knowledge of implementing extra adaptations and special support. This gap in understanding and practice highlights the necessity for targeted research on specialized pedagogic support within SAEC, which is the primary focus of the present study.

Aim and research questions

The study aims to determine to what extent staff, consisting of various professional groups, describe how they support students in need of special support and extra adaptations in SAEC.

- RQ 1. How do staff perceive special support and the handling of it?
- RQ2. How do staff value different aspects of support for students in need of special support in SAEC?
- RQ 3. Are there differences within professional groups? If so, how?

Students' need for support in SAEC settings is almost not researched at all in a Swedish context (Lundbäck, 2022; Skolinspektionen, 2024a; Skolinspektionen, 2024b) and internationally (After-school Alliance, 2014; Lundbäck and Fälth, 2019), *which* made us reflect on the SAEC-staff's view of the work with extra adaptations and special support. Therefore, we believe that this study is of good relevance to policy actors and researchers in other countries who are actively reviewing, improving, or reforming SAEC programs, especially considering that Sweden is seen as a forerunner and is high in the international ranking regarding SAEC (cf. Plantenga and Remery, 2017).

Previous research

Research on special education in the SAEC environment is scarce (Andishmand, 2017; Göransson et al., 2015), and interventions are largely non-existent (Boström et al., 2024). Some studies deal with specific functional variations in SAEC, such as visual and hearing impairments (Engel-Yeger and Hamed-Daher, 2013), physical disability (Finnvold, 2018), and disabilities in general (Parish and Cloud, 2006). One meta-analysis that takes a broader approach is Cirrin and Gillam (2008), who reviewed research regarding language interventions with children in kindergarten, first grade, and after-school care and found relatively little evidence supporting the language intervention practices being used with school-age students with language disorders. On the other hand, a study (Martínez-Álvarez, 2017, 2019) addresses concepts for expanding the educational involvement of bilingual students with language disabilities perceived as potentially in need of special education services. It shows how bilingual students in after-school care settings, who may be considered to need special educational interventions, learned science via digital tools. Martinez-Alvarez named the concept multigenerational learning.

Other important research findings that describe what functions are needed to adequately cater to school-age students with disabilities in childcare and other environments outside of school are described by Jinnah-Ghelani and Stoneman (2009). The adaptations encompassed modifications to the physical environment and activities, strategies to enhance socialization with peers, staff training to manage these adaptations, ensuring student safety, and maintaining clear communication with parents regarding the appropriate treatment of student. An even broader international perspective on students in need of support and after-school programs in the USA is described by Haney (2012) and specific diagnosed with autism whose parents claim that the children do not receive the support they need. On the other hand, Yamashiro (2021) points out that most parents of children in need of special support are very satisfied with the after-school experience. Regarding the situation in Germany, Ahrbeck et al. (2018) question whether it is even possible to educate *all* children with and without disabilities together in the same setting.

Research in the Nordic countries in this field is also sparse. Even the research area that deals with students' need for support in SAEC teaching in Sweden is little explored (Lundbäck, 2022; Skolinspektionen, 2024a; Skolinspektionen, 2024b). Two studies highlight that students in SAEC who are in need of extra support but do not always get it are often unable to access it (Karlsudd, 2020; Wernholm, 2023b). A troubling circumstance is a lack of overall statistics on the number of students in SAEC who is in need of extra support (SOU 2022:61, n.d.; SOU 2020:34, n.d.). Lundbäck (2022) emphasizes the importance of SAEC staff competence in critically evaluating activities to identify where students require special support. The SAEC teachers should know how SAEC promotes and supports all students' learning and development and that the problem should not be placed on the individual student.

The opportunities for after-school programs to meet the needs of all students can be related to the conditions that prevail in the organization. In an ethnographic study, Lager (2015) focused opportunities and obstacles in Swedish SAEC and revealed a wide variation in the staff's level of education, local conditions, available materials, and time for planning. This ultimately creates different conditions for the SAEC activities. In their research review, Boström and Grewell (2020) showed that physical learning environments in SAEC are varied, often undersized, and poorly adapted for after-school activities. For example, they can be characterized by crowding, which negatively affects students' learning and concentration. Inadequate premises can also make activities more structured and adult-controlled (Boström and Augustsson, 2016). In a qualitative survey, Elvstrand et al. (2022) investigated how staff in SAEC describe their work on making activities accessible to all students. The results show that the staff have a strong ambition to work inclusively, but various support forms are uncommon. Furthermore, it emerges that few are offered guidance or special educational support, and the resources are often perceived as insufficient.

Concerning the mandatory special educational concepts in SAEC, extra adaptions, and special support, one study shows these concepts are visible differently. The concepts are unclear to the staff, and they mix them up, making adaptations more or less consciously and using different artifacts and working methods (Boström et al., 2024). The results also indicate that the realization of the concept has not spread in the SAEC.

A survey that focused explicitly on extra adaptations and special support was carried out by Sweden's Teachers Union (Sveriges Lärare, 2023) for 1 week and was based on approximately 400 responses. One survey result was that only 37% of the students considered to be in need of special support, received this. Another was that many students are not given special support and that it varies widely between different SAECs whether support is given.

Theoretical perspective

In this study, we take our starting point from the relational perspective. It is a special educational perspective that focuses on the relationship between the environment and those in it. It is usually opposed to the categorical perspective, which has a psycho-medicine connection where the individual's characteristics are the basis for any measures (Haug, 1998). We have chosen the relational perspective because many formulations in the Swedish curriculum can be derived from a relational perspective.

In this perspective, school problems are attributed to the school's organization and activities (Ahlberg, 2009; Skrtic, 1995; Haug, 1998). In the relational perspective, the term *students **in** need of special support* is used. Problems that arise for students must be identified, and solutions must be offered with a focus on the learning environment and learning situations. It is particularly important in this personal assessment that the entire school staff reflects on how teaching is organized and how special education teaching takes place. Ahlberg (2009) makes it clear that from this perspective, school difficulties are described with a focus on the relationship and interaction in the learning environment. The learning environment must be adapted to create good learning situations for students needing support, not vice versa. It is the responsibility of the staff to design learning situations in such a way that the difficulties experienced by the student are addressed with possible solutions (or alternative approaches). It is the staff's responsibility to create the learning situation so that what the student experienced as difficulties has possible solutions (or alternative approaches). In this way, the teacher takes responsibility for the learning situation and lifts the responsibility from the student's shoulders.

The concepts of "extra adaptations" and "special support" fit well with the relational perspective because this perspective focuses on the interaction between the individual and the environment rather than seeing problems and solutions solely as the individual's responsibility. It is about adjusting the environment, the teaching, or the support system to better meet the needs of the students who need special educational support.

Since the study focuses on special education, several different theoretical frameworks could be used. A possible alternative theoretical lens could have been system theory from a social-constructionist perspective (Rapp and Corral-Granados, 2024), which could have shed light on underlying mechanisms that create inclusion at different institutional levels. This was not chosen because the study is close to practice.

Methods

Respondents

This study is based on a web survey sent out to various networks and social media in autumn 2023 with the SAEC staff as stakeholders. Data were collected using a web-based survey administered via a link to the survey tool Netigate.[1] Responses were received from 412 people; 102 (21%) were men, and 390 (79%) were women, which reflects quite well the gender balance in Swedish SAEC. The study followed the Swedish Research Council's guidelines. And ethical recommendations for studies in social science research (Vetenskapsrådet, 2017). An introductory text described the study, and that participation was voluntary and anonymous. The respondents gave their consent by answering the questionnaire. Initially, they stated their current professional position as SAEC teachers, SAEC pedagogues, SAEC leaders, principals, childminders, teacher students, assistants, and the category "other." The criteria for selecting professional services were based on the most common professions in SAEC. According to the data presented in Table 1, approximately 40% of the staff in School-Age Educare Centers (SAEC) are teachers, around 30% are pedagogues/leaders, and 12% are principals. Other staff members account for just over 20%, indicating that a minority lacks formal educational training for SAEC. For those with a teaching degree, some teaching related to special education is included. Among the 412 respondents, it was not possible to deduce how many had a special education teacher degree.

Method and data analysis

This sub-study has a quantitative approach. The survey consists of both open-ended and fixed answers for SAEC staff. The survey consisted of four themes. The first was background variables such as age, gender, occupational category and number of years in the profession. The second theme was about the SAEC where they worked at and extra adaptations and special support as well as action programs, in total 10 open ended questions and 5 with fixed responses. The third theme was about special pedagogy and after-school pedagogy, a total of eight open-ended question. The fourth theme consisted of 14 questions with fixed responses about extra adaptions och special support and one open question to comment on the answers. The aim was to determine how the various professional groups meet students in need of extra support, what adaptations are made, and to distinguish perceptions between the groups. In addition to demographic information such as age, gender, profession, and years of work in the SAEC, the questionnaire contained statements about extra adaptations and special support in the SAEC. Before the questionnaire was sent out, it was reviewed by 10 persons in different positions in the SAEC to validate the feasibility of the survey.

Data were analyzed using SPSS Statistics (version 27). Frequency analyses were conducted to describe the survey questions. Frequencies, means, and medians were used to analyze individual statements. The empirical data was analyzed with descriptive and inferential statistics. Descriptive statistics presented an overall picture of the various claims on a group level. The Mann–Whitney test investigated the distinctions between professional categories for significance testing. It is a nonparametric test comparable to the parametric *t-test* and tests the null hypothesis when two samples are drawn from the same population. It determines whether the difference between the average ranking of the two groups is significant. By employing both descriptive and inferential statistics, the analysis benefits from a dual approach: descriptive statistics offer a broad view of the data, while the Mann–Whitney U-test provides a more detailed examination of specific differences between groups. This combination enhances the robustness

TABLE 1 Frequency of occupational positions.

Professional position	Frequency	%
SAEC teachers	162	39.4
SAEC pedagogues/leaders	125	30.4
Principals	49	11.8
Other (assistants, childminders, students)	76	18.4
Total	412	100

1 www.netigate.se

of the findings and supports more nuanced interpretations of the results.

Methodological discussion

Like all similar studies, the results presented here should be seen as snapshots. Perceptions may change over time and depend on context and topics (Boström et al., 2024; Skolinspektionen, 2016). Repeated measurements and longitudinal studies are required to deepen knowledge of the problem. The study is limited to four occupational groups, and the results are only valid for those included. This was an adequate design choice for the study (cf. Hassmén and Koivula, 1996).

Participants in the study were recruited mainly through social media and specific groups aimed at staff working in SAECs. This type of sampling allowed us to obtain diversity in terms of, for example, geographical spread and level of education. However, the selection approach may have contributed to a preponderance of participants interested in educational issues as they were recruited in these types of groups.

A strength of the chosen statistical method is that extreme values cannot affect the test, which can occur in parametric tests. A weakness is that it requires more interpretation of the results (i.e., it is not as clear about conclusions of the material as parametric tests; Siegel and Castellan, 1988). The study could have been supplemented with qualitative data to explore nuanced perspectives. This was opted out due to the study design. Future research could incorporate mixed methods to provide a more comprehensive understanding of SAEC support structures. A follow-up study incorporating observational data would also strengthen the findings.

Results

The following are the results of staff answers based on each research question. The first concerns how the staff perceives special support and how they describe it is handled. The results highlight that different professional groups experience the role of special education in SAEC differently. The results also show various conditions for working with extra adaptations and special support in SAEC.

Related to extra adaptations and special support, the respondents took a stand on five statements, shown in Figure 1. When asked if the staff reported to the principal if students needed special support, 60% of the respondents answered Yes, and 40% answered No. The answers differed in a follow-up question on whether the notification of special support led to an investigation by student health staff. Most principals believed this was the case (80%), while the other staff estimates were about half as high (25–40%). These differences may be because the principals have an overall picture of the school, or they overestimate that the health staff has handled the notification.

When asked whether students needing special support have action programs explicitly aimed at SAEC, the answer was Yes (11% or below). This indicates that very few students in SAEC have action programs. When asked about whether there is a lack of targeted support efforts, the staff agreed with this statement to a great extent (65–78%), except for the principals (39%). In conclusion, approximately two-thirds of the respondents, excluding the principals, believe that support measures in the SAEC need to be improved. From the answers, we conclude that support efforts could be more robust in SAEC and that action programs aimed at SAEC and targeted efforts in the action programs are less common.

The second research question was about how staff values different aspects of support for students needing special support in SAEC. For example, they assess their team's and school's

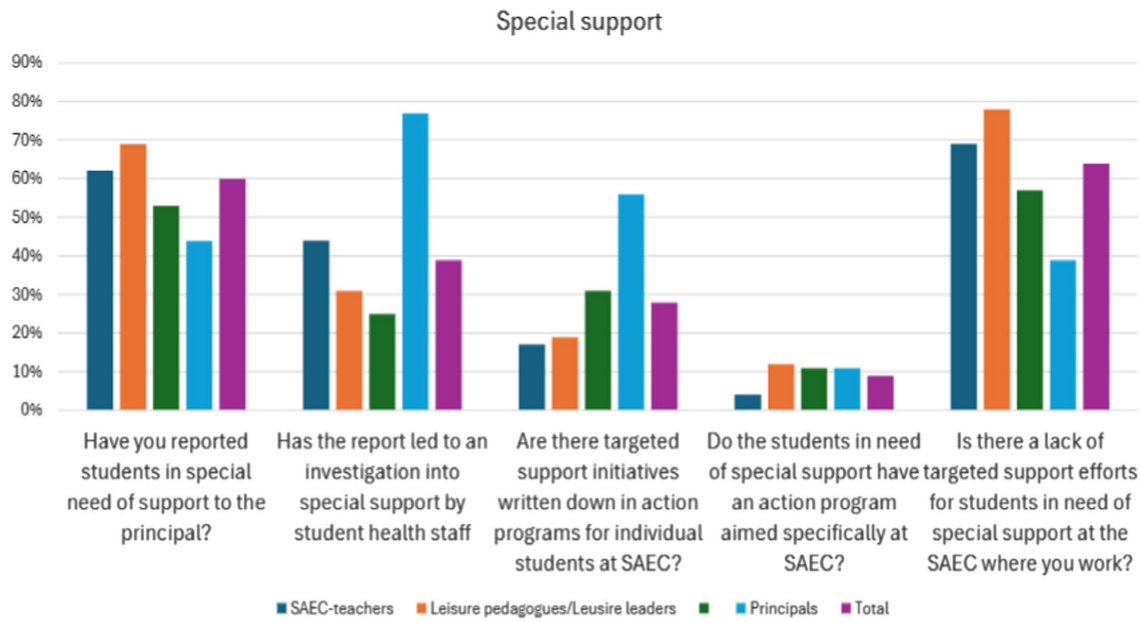

FIGURE 1
SAEC staff perceptions of special support. SAEC staff perceptions of special support. The percentage indicates whether they agree with the statement (Yes).

competence to meet students with special educational support needs and the possibilities of the premises and the outdoor environment. The respondents rated 14 statements on a Likert scale from 0 to 5. The results of the means are shown in Figure 2.

The results show that staff values their competence higher (m = 3.8) than the teams' (m = 3.1) and the schools' competence (3.2). They also agree that extra adaptations are made in the learning environment at SAEC to meet the students individually (m = 3.1). All other statements are, on average, three or below. The estimate of the premises (no 9) has a low average value, which means that the staff believes the premises, to a low degree, meet students' need for special support. The conclusion is that there is great potential for improvement.

The third research question focused on differences within professional groups. Four of the 14 items concerning support to students needing special support show significant differences in responses between groups of respondents. A clear recurring pattern is that principals exhibit response patterns that deviate from those of other staff (assistants, SAEC teachers, and other staff); see Table 2.

The statistical results show that principals assess the school unit's competence to meet students in need of special support significantly higher than SAEC pedagogues/ leaders and others (assistants, childminders, etc.). Furthermore, it appears that principals assess their support in working with students in need of special support significantly higher than SAEC pedagogues/-leaders. Principals assess support from special ed. teachers/-pedagogues significantly higher than SAEC pedagogues/-leaders. Principals assess support from students´ health staff significantly higher than SAEC pedagogues/-leaders. Principals have distinctive perceptions of special support and extra adaptations compared to part-time pedagogues/leaders and other staff. They appreciate to a greater degree that students are offered special educational support in SAEC. No statistically distinct perceptions between principals and SAEC teachers appear.

Discussion

This is a study which, in contrast to previous research, took as its starting point special functional variations (cf. Finnvold, 2018; Parish and Cloud, 2006) in SAEC-like environments but instead focused on special pedagogical concepts such as extra adaptation and special support in Swedish SAEC. Two previous studies (Karlsudd, 2020; Wernholm, 2023b) and an authority report (Skolinspektionen, 2024a; Skolinspektionen, 2024b) have clearly shown that many students in Swedish SAEC require special support but have yet to receive it. The need for extra support for school-age-students with disabilities is also emphasized in international research by, for example by Jinnah-Ghelani and Stoneman (2009). Concerning other countries, there is a lack of research in this area, but indications from other studies confirm similar situations (cf. Cirrin and Gillam, 2008; Haney, 2012; Martínez-Álvarez, 2017, 2019). Therefore, this study aimed to investigate to what extent different professional groups in SAEC perceive/describe how they support students needing special support.

The result shows that various professional groups have different and distinctive perceptions of students needing special support and extra adaptations in SAEC. In this context, it should also be remembered that the support given in different SAECs varies greatly between them (Sveriges Lärare, 2023). This can also be related to the fact that the conditions in SAEC differ a lot in connection to the staff's educational level, planning time (Lager, 2015), and learning environment (Boström and Grewell, 2020).

The theoretical starting point of the study, the relational perspective (Ahlberg, 2009; Haug, 1998; Skrtic, 1995), emphasizes the importance of the environment, in this case, the SAEC, being adapted to the needs of different students. In cases where this happens in the Swedish SAEC, it is difficult to determine. If one looks at the low extent to which staff state that they make extra adjustments or that action plans are developed, there are concerns that students do not receive the support they are entitled to. The survey also shows that the resources are inadequate and insufficient, which has also appeared in previous studies.

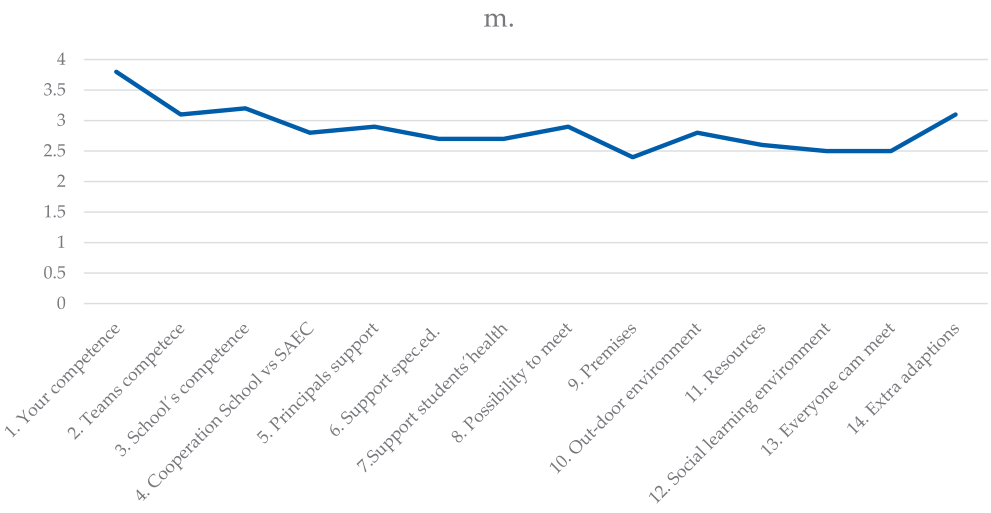

FIGURE 2
SAEC staff perceptions of the staff and the learning environment can meet students in need of special support.

TABLE 2 Significant differences between professional groups (ST = SAEC-teacher, SP = SAEC-pedagogues).

Items with significant differences	Asymptotic sign.	Adjusted sign.
3. How do you assess the school unit's competence to meet students in need of special support?	0.005**	
Principals vs. Others		0.026
Principals vs. ST/SP		0.028
5. How do you assess the principal's support in working with students in need of special support?	0.021*	
Principals vs. *ST/SP*		0.012
6. How do you assess that support is given from spec. ed. Teachers/spec. ed. pedagogues teachers in working with students in need of special support?	0.017*	
Principals vs. *ST/SP*		0.026
7. How do you assess the support given by student health when working with students in need of special support?	0.04*	
Principals vs. *ST/SP*		0.025

*Significant at 0.05-level. **Significant at 0.01-level.

Given that the results show different perceptions of how the special educational support is given, and in particular principals' deviant perceptions, it seems to be a crucial task to get the entire staff, both in school and SAEC, in agreement in order to create a good learning environment for all students (cf. Ahlberg, 2009).

Above all, the principals' perceptions differ from those of the other professional groups, even though The education act prescribes a clear and logical process regarding students in need of support (SFS 2010:800, n.d.). The question is whether the principals' distinctive perceptions compared to professional groups with lower academic education are due to the principals having more insight into and knowledge of the area. Alternatively, if the principals overestimate the efforts, the staff closest to the students will have the best practical insight. Somewhat paradoxically, the SAEC-teachers do not differ with statistical significance from the principals. However, the result confirms that it prevails ambiguities in the type of support students are entitled to in SAEC (cf. Boström et al., 2024).

Another evident result of the study is that, regardless of the professional group's opinion, very few students have action programs in SAEC. According to staff, less than 10% of students in SAEC have remedial programs. This can be compared to Sweden's Teachers Union (Sveriges Lärare, 2023), which, in a survey, concluded that only 37% of the students deemed to need special support in SAEC receive it. However, according to the staff, reporting to the principal seems to have been quite extensive, but then the investigations and statements do not seem to occur on a proportionate scale. This can also be compared to Karlsudd (2020) and Wernholm (2023b) studies and the School Inspectorates report (2024), which stated that students in SAEC who need extra support but do not always get it are often unable to access it. It is time to take action following the Swedish education act. The question is, what is the lack of special support due to? Is special educational support not needed to the same extent in the SAEC as in school? Or, are the need of special support not just as important to address in the SAEC? Or are special educational interventions under-prioritized in the SAEC? Or is it that simple that special education in the SAEC has yet to develop and find its forms? The results suggest that the students do not receive the special educational support needed to attain sufficient development and learning in the SAEC, which does not meet the governing documents for the SAEC.

A third overall result of the study is that the staff sees great potential for improvement in the special educational support in SAEC, both in staff development and learning environments. But then the staff must also be given the conditions in terms of time and training (cf. Boström et al., 2024).

Bridging the gap

To bridge the gap in special support and extra adaptions in SAEC, extensive development work is needed both for policymakers and staff. First, resources need to be allocated to ensure adequate resources are allocated for special education. This includes additional staff with competence in special education, providing necessary materials, and creating conducive learning environments tailored to students in need of extra adaptions and special support. It is also important that the support measures developed are aligned with the SAEC's teaching practices, which can ultimately help to create a holistic approach to students' support needs (Skolinspektionen, 2024a; Skolinspektionen, 2024b).

This should be linked to regularly reviewing and updating policies related to special education support to ensure they are aligned with current research and best practices. Ensure these policies are effectively implemented across all SAECs.

Secondly, comprehensive training programs should be implemented for all staff members, including principals, teachers, and support staff, to ensure a consistent understanding of special educational needs and the importance of extra adaptations and special support. Foster a collaborative environment where all professional groups, regularly meet to discuss and plan the support needed for students. This can help align perceptions and strategies across different roles. This can lead to, for example, creating learning environments that are flexible and adaptable to the needs of all students. This includes physical spaces, teaching methods, and the use of technology to support learning.

Implications

The implications for the actors who govern SAEC are to take research and authority reports seriously and allocate resources so that

students receive statutory support. Resources should be allocated not only to the activities but also to training staff. Without knowledge of special pedagogy, it is difficult to adapt to learning environments. Insight can also be found in research. In 2009, Jinnah-Ghelani and Stoneman highlighted important factors for implementing special education in the SAEC setting: adaptations in the learning environment, staff training, and conscious communication about the treatment of students in difficulties.

Another implication of this study is the importance of prioritizing research in special education in SAEC settings. This is required to understand and fulfill SAEC's mission for approximately 500.000 students in Sweden. SAEC has both a complementary and compensatory mission in relation to the school. This will be difficult to fulfill if there are insufficient resources, competence, and research to drive development forward within SAEC. Since countries with similar extended education do not have curricula, international comparisons are difficult. However, some countries, for example, Australia, have, to some extent, governing documents, and Switzerland has none (Hurst et al., 2024), and this issue is discussed in our Nordic neighboring countries. Therefore, this study is important from an international perspective.

It also appears to be very important that staff working in SAEC gain more knowledge about how to support the different needs of students in this type of after-school care. It is also crucial that the support is provided in a way that is adapted to the specific mission of the SAEC, and thus, it may not always look the same for students in the SAEC as in school. Couture (1999) asked 25 years ago whether school-age care could meet the specific requirements students in need of support can have. Our answer is yes, but the framework factors should be implemented to give the school-age-care an honest opportunity to do so. However, international research in similar settings (extended education) in other countries is needed to gain a broad and comprehensive understanding, so students in need of special support will receive special pedagogical support even outside the context of the school.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Written informed consent from the participants or participants legal guardian/next of kin was not required to participate in this study in accordance with the national legislation and the institutional requirements.

Author contributions

LB: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Writing – original draft, Writing – review & editing. HE: Formal analysis, Methodology, Writing – review & editing.

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The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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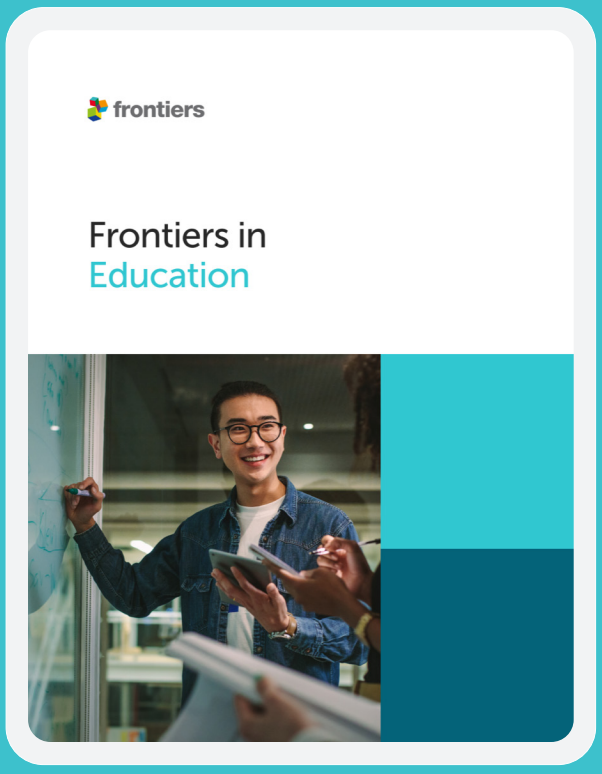

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