Unlocking Potential: Raising educational outcomes for students with Special Needs

Students with special educational needs and disabilities (SEND) have poorer educational outcomes compared to their typically developing peers (Tuckett et al., 2021, UNICEF, 2021).

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Executive Summary

- The growing number of students with SEND in mainstream education, coupled with their lower educational outcomes compared to their peers, underscores the urgent need to improve educational outcomes for students with SEND.
- Barriers to improving educational outcomes for those with SEND include: a lack of comprehensive research on "what works", insufficient teacher training, and difficulties in applying research findings practically.
- Innovative initiatives such as data standardisation across different schools, flexible online teacher training programmes and co-production to create stronger collaboration between researchers and educational practitioners are considered as potential solutions.
- By fostering a more integrated approach, we can better support students with SEND, ensuring they receive the tailored educational interventions necessary to achieve their full potential.

Students with special educational needs and disabilities (SEND) have poorer educational outcomes compared to their typically developing peers (Tuckett et al., 2021, UNICEF, 2021). Whilst the prevalence of students with SEND varies across countries and regions, within certain western countries there is evidence that the number of students with SEND is rising. For example, in England the number of students with SEND has continued to increase for several consecutive years and in 2023 there were 13% of students who needed SEN support (up from 12.6% in 2022)[1]. The same is true for Australia (24.2% of total enrolments up from 22.5%)[2] and the USA (15% compared to 14% of total student population)[3]. There are several reasons why the number of students with SEND is on the rise (see discussion in Van Herwegen, 2022).

Seeing the number of students with SEND, it is important for parents, educators, specialist professionals and policymakers to understand the best evidence-based practice to raise educational outcomes in students with SEND. However, there are currently a number of barriers that need to be overcome to address the learning needs of students with SEND. These include 1) the lack of research in the mechanisms of learning in students with SEND as well as intervention research related to SEND, 2) the lack of teacher knowledge related to SEND, 3) issues around translating findings from research into the classroom.

Barriers related to raising their educational outcomes for students with SEND

Although there is an established literature base on students with SEND, various reports have shown that most publications and funding for research in the UK focuses on basic science, that is understanding biology, brain, and cognition, as well as the co-occurring medical and behavioural conditions, with comparatively little research being funded or conducted related to social issues (living independently, employability), services (such as wellbeing, inclusion, safety and community), and treatments and interventions (including, pharmacological, behavioural, complementary, dietary, occupational, sensory-based therapies, technology-based interventions and support) (see Pellicano et al., 2014 for autism; Cristescu et al. 2024 for genetic conditions; Royal College of Speech and Language Therapists, 2021, for learning disability community). Although this might not be the case for all countries, (e.g., the USA spends a lot more funding on research on autism than the UK, Pellicano et al., 2014), a recent meta-analysis on published research studies from across the globe that focused on interventions for students with SEND to raise educational outcomes, only identified 467 studies that were published between January 2000 and January 2023 (Van Herwegen et al., 2024).

Although the number of randomised controlled trials and quasi-experimental design interventions studies for students with SEND is increasing year on year, this finding shows that there is a lack of high-quality research evidence on how students with SEND can be supported in the classroom. In addition, most studies are small scale (i.e., less than 50 participants across the intervention and control group) and are implemented for short periods of time. Finally, the systematic review by Van Herwegen and colleagues (2024) showed that, although there is some evidence for those with reading difficulties and mathematical learning difficulties, very few studies have evaluated what targeted interventions work to raise educational outcomes for students with the most common diagnoses, namely Autism and Speech, Language and Communication Needs. In sum, most research on SEND focuses on biology and cognition and how the brains of individuals with SEND differ from those without SEND in terms of their structure (e.g., brain volume and connections). Still, there is little research yet on what these differences mean in practice and how their brains differ in terms of function or alternative pathways to learning. Indeed, "our current understanding of the mechanistic basis of compensatory strategies lags behind that of causes of deficits themselves" (Thomas et al., 2019, p 484), which hinders the development of effective interventions.

Secondly, to raise educational outcomes for students with SEND, it is important for teachers and those supporting students with SEND to recognise the needs of these students and to know how these needs can be addressed. However, teachers across the globe endorse many incorrect beliefs about students with SEND and about how they can appropriately be supported (Armstrong-Gallegos et al., 2023; Bei et al., 2024; Gini et al., 2021). Although awareness courses may help to some extent (Gini et al., 2021), it is important for teachers to have more formalised and broader training in SEND (Mintz, 2022). In the UK, whilst topics such as autism and SEND are now taught in the initial teacher training (ITT) programme, this training does not cover approaches specific to particular students with additional needs, such as dyscalculia, dyslexia etc. Instead, the training is restricted to universal support that teachers can implement in their classrooms for all students. However, students with SEND often require targeted interventions that these frequently require specific training before they can be accessed and delivered appropriately by teachers. As a result, in-service teachers continue to highlight a need for more training in SEND. Yet, several reports have highlighted that teachers have very few opportunities for continued professional development in relation to SEND (Wall et al., 2019; Ofsted, 2023), due to financial and workload constraints. The lack of understanding of the needs of students with SEND is not unique to the UK or to teachers. There is evidence that neuromyths influence policymakers to invest public resources, rolling out interventions based on neuromyths such as learning styles (visual, auditory, and kinaesthetic) or the Mozart Effect, playing classical music to babies to improve IQ (Rousseau, 2021).

A third important barrier is the translation from research on SEND into the classroom. Whilst there has been an increased focus on the use of evidence-based practices in both special and general education classrooms in many countries, what teachers understand to be evidence varies greatly. Whilst some teachers focus on evidence from external published research, others use word of mouth and recommendations by others as evidence of what works (Antalek et al., in prep). The lack of focus on research evidence often is related to a lack of access to that research or understanding of the research methodologies (Antalek et al., in prep). Most research is published behind paid walls and even when teachers have access to the research in terms of availability, it is often written in a way that is inaccessible to them. Even with access to the research, studies across the globe often do not describe clearly how the research has been or should be implemented in classrooms and rarely do research studies describe what the active ingredients or theory of change of the interventions are (Van Herwegen et al., 2024). As there are many individual differences within groups of SEND, even for prescriptive commercialised interventions teachers often adapt the implementation of the evidence-based interventions to suit the "spiky profiles" of their students (Antalek et al., in prep). Although these adaptions allow for students to receive very personalised interventions, without detailed information about what the active ingredients of the intervention practices are and what key aspects should not be changed, teachers may adapt the intervention practices to such an extent that these practices may become ineffective over time (Mintz & Roberts, 2023).

A future towards unlocking potential for students with SEND

The necessity of addressed the educational needs of those with SEND has never been greater than before. There is clear evidence that those with SEND have lower educational outcomes, the numbers of students with SEND continues to increase, and more students with SEND remain in mainstream school classes (UNESCO, 2016). Despite the proposed barriers, some examples of good practice and solutions to address the barriers above have been achieved and these include: 1) addressing the need for robust evidence but also research that addresses the needs of teachers, 2) providing training for teachers, 3) closing the gap to translation through co-production.

- Addressing the need for robust evidence

Students with SEND are frequently dispersed across numerous classes and schools, complicating the evaluation of effective interventions through rigorous research designs. Such studies require a sufficient number of participants to be appropriately powered (Farran & Scerif, 2022). As a result, research infrastructure is required that allows for bigger data samples and there are at least three options: 1) large governmental datasets, 2) data harmonisation, 3) collating and using teacher data and collate this.

Currently, many governments are tracking student progress within schools at a local or national level using normed or high-stake formative exams which allow for large data samples. However, this is not always the case for students with SEND, as some students with SEND cannot access the standardised assessment set by education departments as these assessments are often too difficult for them (Narem, 2005). These formative exams typically do not account for the diverse learning needs and abilities of students with SEND and the fact that they may make progress in other areas than academic progress that need to be recognised. As a result, these students may be unable to demonstrate their knowledge and skills and progress

effectively within the constraints of these exams. To ensure that all students have equitable opportunities to succeed, it is crucial to consider alternative assessment methods and broaden formative assessments to assess the progress students with SEND make. This approach will help provide a more accurate reflection of their abilities and potential.

Even though some governments are tracking students' progress, this data may not always provide the required information about response to intervention. Our research has shown that research that assesses what works for students with SEND uses a wide range of different pre-and post-intervention assessment tools which makes it difficult to make comparisons between studies. Instead, research groups should collaborate to harmonise their data. This will include agreeing on the best measures to evaluate educational progress and agree on ethical protocols and data sharing methods. This data harmonisation approach will ensure that sample sizes are sufficiently large to support robust findings. There are now a few examples where data harmonisation approaches have been put into practice for various SEND groups. For example, the WisDom network is a multi-lab approach that brings together data from different research groups to examine cognitive development in Williams syndrome, a rare genetic disorder (Van Herwegen, 2019). This data pooling has allowed for larger sample sizes and even longitudinal data studies. Funding and infrastructure are required to harmonise data collection, collate, and share such data sets and to maintain them longitudinally.

In addition to data from research studies, teachers do track response to intervention for their students (Antalek et al., in prep). Yet, this data is often stored locally and the assessments may not always be reliable. However, together with researchers, teachers could agree on the best measures to be used to track response to intervention (see Outhwaite et al. 2024). One solution would be for this data to be stored in a national database that would contain information about the student, the type of the practice or intervention implemented and the baseline and post-intervention or even follow-up data. Such a database would not only allow for larger sample sizes but would also address the issue that there is a gap between what is being evaluated by researchers and the approaches and interventions that are being used in the schools (Van Herwegen et al., 2024). Some countries already track entire student cohorts in high stake exams (for example, National Pupil Database (NPD) and the Long-term Education Outcome (LEO) data in the UK), and thus, there is a precedent of this level of individualised data being tracked and used to improve educational provision.

- Providing adequate teacher training related to SEND

It is evident that teachers and educational professionals would benefit from additional training on SEND. It has been shown that teachers with greater knowledge are more likely to implement evidence-based practice in their settings (McNeill, 2019). One possibility is to deliver more training around SEND during initial teacher training. However, it is almost impossible to prepare a preservice teacher for all the different SEND groups and causes of SEND that they may encounter in their career. Instead, a more flexible approach is required that allows teachers to obtain training as and when required, especially as it has been shown that continued professional development may be linked to enhanced pupil learning and higher teacher retention rates (Fletcher-Wood & Zuccollo, 2020).

One possibility to deliver this training is through short online courses, that are evidence-based and endorsed by stakeholder groups. The online format decreases the cost and time demands associated with delivering the training relative to in-person delivery. Teachers and other related professionals are also able to complete the training at their convenience and receive a certificate upon completion. Certificates are only awarded once users pass a quiz assessing the content covered. Such short online courses are available (e.g. https://www.ucl.ac.uk/short-courses/search-courses/special-educational-needs-and-disability-send-developing-quality-inclusive-practice). However, without these courses being mandated by educational policy, educational practitioners will struggle to find the time and resources to complete such courses.

- Closing the research-practice gap

Research shows that there is gap between the questions educational practitioners want to be answered and the questions that researchers tend to focus on (see Van Herwegen et al., 2024 as an example). As such, there is greater collaboration required between researchers and educational practitioners. Despite steps having been made through various knowledge exchange programmes, most of the research is not guided by educational practitioners. This has the risk that research will continue to be perceived by teachers as having limited relevance to their classroom practice (Vanderlinde & van Braak, 2010).

Instead, funders and policy makers could encourage more research to be co-produced with educational practitioners. In 2019, the Education Endowment Foundation (EEF) in the UK launched the Teacher Choices initiative[4]. This programme aims to evaluate the impact of specific classroom decisions made by teachers. It is based on co-production principles in that teachers frame the research questions and select relevant contexts, while involving researchers to lend expertise in methodology, experimental design, and analysis. So far, the EEF has initiated trials focusing on areas such as cognitive science (e.g., retrieval practice and teacher modelling), early oral language (e.g., vocabulary instruction and language use in play), and early mathematics (e.g., virtual versus physical manipulatives). Although it is too early to evaluate the overall success of this initiative, the Teacher Choices trials signify an effort to strengthen the role of teachers in bridging research and practical application.

In summary, the growing number of students with SEND in mainstream education highlights the urgent need to address their educational outcomes. While substantial progress has been made in understanding the biological and cognitive aspects of SEND, there remains a significant gap in translating this knowledge into effective classroom practices. This lack of investment, design, and implementation of policies represents a violation of human rights and a critical need that must be addressed to contribute to the Sustainable Development Goals (SDGs). Key barriers include a lack of comprehensive research on interventions, insufficient teacher training, and difficulties in applying research findings practically. Addressing these challenges requires robust evidence-based research that meets the practical needs of educators, enhanced and flexible training for teachers, and stronger collaboration between researchers and educational practitioners. By fostering a more integrated approach, we can better support students with SEND, ensuring they receive the tailored educational interventions necessary to achieve their full potential.

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