

## Empowering Struggling Learners: A Research Roadmap for the Dyslexia Association of Singapore

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### Abstract

In Singapore, individuals who experience learning difficulties without a formal diagnosis of a learning disability are increasingly recognised as individuals who learn differently and are also known as struggling learners. Despite forming a significant fraction of Singapore's student population, they may be excluded from receiving targeted support or government subsidies, even though there is a growing body of research highlighting the feasibility and effectiveness of locally adapted evidence-based interventions that meet their needs. To foster a more equitable educational landscape, policymakers must prioritise expanding access, appropriateness, and affordability of programming for children who learn differently.

**Keywords:** Struggling learners, structured intervention, individuals who learn differently, neurodiverse

### Who is a struggling learner?

For the purposes of this essay, struggling learners are individuals who experience difficulties in reading, writing, numeracy, or other areas of learning, but without formal diagnosis of a learning difficulty such as dyslexia. At any one time, struggling learners constitute up to 25% to 30% of the student population in Singapore, forming a group up to two times larger than the population of students diagnosed with special educational needs (SEN) (Dyslexia Association of Singapore, 2023a).

This group varies widely for reasons related to the fundamental nature of learning - a dynamic process that draws on a wide range of abilities and contextual factors that work together - as individuals may face very different underlying issues. For instance, some individuals may have specific areas of difficulty, such as processing speed, while at the same time excelling in other areas, such as phonological awareness. This makes it effortful for them to keep up with the typical demands of a fast-moving schoolroom with large class sizes, although they may be more able than their peers in other ways. Issues faced by any one individual may also manifest differently over time and environment, resulting in episodic struggles that may not appear in an everyday setting but that nonetheless undermine a learning journey.

While Singapore has made significant strides in supporting learners with dyslexia and special educational needs, it is important to remember that this group of struggling learners deserves attention (Shantha Ram, 2022). With the introduction of compulsory education in 2003, all Singapore Citizens must attend a national primary school unless an exemption is granted. This includes children with mild SEN, such as attention deficit hyperactivity disorder and dyslexia, who attend mainstream schools which are well-resourced to provide additional support for a range of learning needs (Ministry of Education, 2021).

### **Why are their unique needs difficult to meet?**

Matching the needs of struggling learners to effective support is a challenge at many levels. A child who learns differently ideally requires identification, a holistic assessment followed by targeted interventions to address learning gaps, as well as strategies to manage the root causes of their learning difficulties. For families and individual educators, awareness, as well as knowledge, time, and financial resources may be binding constraints.

At the same time, conventional educational systems may find it a stretch to fulfil the mandate of addressing the needs of all learners. Providing support at scale for those whose challenges do not rise to the level of a diagnosis is particularly difficult when overall resources are scarce and interventions for the diagnosed population are prioritised. Even without resource constraints, determining and delivering the appropriate coverage and quality of intervention for this diverse population is a complex affair. Screening into services can be subjective or unsystematic, especially for learners whose struggles are less visible or more intermittent, while the ability to deliver specialised or individualised attention in a school-based setting may be limited by the setting and curricular time. For adults, these challenges may extend to continuous education outside school.

These multiple challenges across the wider spectrum of learning difficulties leave struggling learners at risk of “falling through the cracks” in a formal education system (Dyslexia Association of Singapore, 2023a). Learning difficulties, especially if unaddressed, can lead to a chain of events including school absences, poor academic performance, as well as behavioural and psychological problems (Koifman, 2023). In particular, twice-exceptional students – a subset of struggling learners who possess both exceptional ability and learning difficulties that mask each other – are typically difficult to identify, although they also need appropriate support to help unlock their full potential (Brody & Mills, 1997). Instead of actualising their individual potential, school may contribute towards a cycle of academic underachievement and diminished self-esteem that eventually materialises as a yawning gap between capable students and struggling learners through the years (Stanovich, 1986, cited in Merga, 2020).

Beyond the consequences for individuals and their families, the societal cost of learning difficulties is high. In 2010, the Organisation for Economic Co-operation and Development (OECD) conducted a landmark Programme for International Student Assessment (PISA) study on the cost of poor educational performance, revealing that learning outcomes (rather than years of schooling) have large impacts on the future well-being of countries. The study estimated that learning gaps, relative to a universal minimum level of proficiency, were responsible for total gross domestic product (GDP) losses of up to USD 200 trillion worldwide (OECD, 2010). Other studies have also estimated the wider lifetime

impact of learning disabilities. For instance, dyslexia was estimated to cost California approximately USD 12 billion in 2020 and USD 1 trillion over the next 60 years of the working lifetime of dyslexic learners, with these costs attributed to increased educational support needs, unemployment, and criminal justice involvement (Boston Consulting Group, 2020). Finally, to the extent that access to timely, effective and sustained intervention is associated with socioeconomic status, failing to address these issues reinforces inequity and reduces social mobility.

### **What is currently being done in Singapore?**

Although children below six years of age are too young for a school-age psychological assessment, preschool interventions can help children at risk of becoming struggling learners. The Early Childhood Development Agency (ECDA) provides support to children who are identified to be at risk of development delay, including those with early learning difficulties. Those with moderate to higher needs may receive subsidised centre-based early intervention and an individual education plan under the Early Intervention Programme for Infants and Children (EIPIC) (Early Childhood Development Agency, 2024b). Early intervention and screening into EIPIC at this stage are based on formal assessments by a medical professional. For children requiring less intensive intervention, ECDA is expanding Development Support-Learning Support (DS-LS), which is a set of short-term individual/group interventions delivered by learning support specialists and educational therapists in collaboration with preschools in K1/K2, to help bridge the transition to primary school (Early Childhood Development Agency, 2024a). The majority of struggling learners then go on to attend mainstream schools, where they have access to school-based dyslexia remediation, learning support for English, Mathematics and Mother Tongue during the early primary years, as well as SEN allied educators (Ministry of Education, 2023a, 2023b).

Alongside the formal education system, evidence-based intervention services are offered by social service organisations as well as private providers. The Dyslexia Association of Singapore (DAS) has long recognised the critical need to address these challenges through targeted interventions, research, and advocacy, aiming to create a more inclusive educational environment, not only for students with dyslexia whom it had set out to serve but also for struggling learners (Dyslexia Association of Singapore, 2023b). DAS provides a comprehensive range of learning support interventions from Specific Learning Differences (SpLD) assessments, and literacy support as well as specialised educational programmes such as Mathematics or Chinese – these are offered to struggling learners of all ages from preschool to adult, even without a formal diagnosis.

For example, subject to a profiling test, DAS, which has been serving individuals with dyslexia for more than three decades, may recommend struggling learners to their Main Literacy Programme, which is a relatively mature programme serving hundreds of dyslexic students annually, or to other more specific interventions that cater to their needs in areas such as Mathematics and Chinese. However, only students with a formal diagnosis of dyslexia on the Main Literacy Programme are eligible for subsidies from the Ministry of Education (MOE). Nonetheless, through the generous support of funders, DAS provides bursaries to support learners with dyslexia from lower-resourced families in their non-MOE-funded programmes and services. As of 2023, more than 50% of DAS students receive financial support to access intervention.

Other social service organisations (such as Care Corner, TOUCH and SHINE) also provide specialised learning support as part of holistic care for socioeconomically disadvantaged children and families, although the nature and extent of such programming varies. Families may also choose to pursue specialised educational therapy or counselling in the private sector, albeit at their own cost.

Finally, beyond formal intervention approaches, a wide range of individual and group tuition/homework support services are offered to the general population by community-based self-help groups, such as the Chinese Development Assistance Council (CDAC) and MENDAKI, as well as social service organisations and private providers.

### **Why might this not be enough?**

While the current landscape includes many helping hands at many stages, for an individual family the journey can be complex and fraught, with issues related to access, coverage, and quality, especially for those without a diagnosis of SpLD. At early ages, access to early intervention and the requirements of medical referral may be a primary concern. Families who are not in the preschool system or within the ambit of social service agencies may be completely excluded. Even for a family of means, both the direct and indirect costs of a journey towards diagnosis have been recognised as a significant barrier, but ironically, a journey without a diagnosis can be even more challenging as subsidies are scarce. Other families may be financially able but unaware or unready to explore services.

During the formal school years, those who require formal intervention beyond school-based support can in principle access it. However, as noted, only students with a formal diagnosis of dyslexia are subsidised. Moreover, continued eligibility for subsidies requires continuous monitoring of both attendance and performance over time. Alternatively, families identified independently by social service agencies may also receive support services, but the capacity of such agencies to support their beneficiaries may be constrained by resources and mandate.

There is a trend of more students from low-income households progressing further in education - in 2018, nine in ten students from the bottom socio-economic quintile had progressed to post-secondary education, compared to five in ten students 15 years earlier (Ministry of Social and Family Development, 2018). Nevertheless, children from humbler homes and communities continue to have lower academic performance than their classmates from higher socio-economic backgrounds (Juhari & Tan, 2022), and the gap between the top and bottom socio-economic status quarters of students in Singapore is larger than the average difference of OECD countries (Teng & Davie, 2023). This disparity underscores the importance of providing targeted financial support for struggling learners, as well as broadening this for older learners who encounter lifelong learning difficulties and who would thus benefit from interventions to support their learning.

The ubiquity of tuition services is not a substitute for evidence-based interventions – for some struggling learners, tuition services and providers can be a valuable platform for redressing gaps focused on curricular requirements through individual or small group learning and dedicated revision. However, if such approaches are not adequately responsive to learning differences, they may end up simply being ineffective or – at worst – even counterproductively replicating challenges faced in the classroom.

Finally, certain features of the Singapore education system also place added demands on struggling learners. Bilingualism requires that they navigate two distinct linguistic systems, within which learning difficulties may manifest in different ways depending on the language. Individuals might struggle with letter-sound relationships in English while struggling with the memorisation of characters and meanings in Chinese. Differences in phonetic rules across English and Malay or grammar structures between English and Tamil can also cause challenges. Singapore's approach to Mathematics as a core subject presents its own issues, as answering word problems requires competency in both mathematical and language comprehension (Abdullah, 2023). The demands of the Primary School Leaving Examination (PSLE) also require that students develop higher-order examination skills before the end of primary school education. All this implies that even best-in-class interventions developed in other educational systems may not be fit for purpose without thoughtful, intentional adaptation to the needs of local students.

### **What do we already know about what works in Singapore?**

Previous work focused on dyslexia in Singapore has validated the application of the Orton-Gillingham (OG) approach with local students as “a direct, explicit, multisensory, structured, sequential, diagnostic, and prescriptive way to teach literacy” (Lim & Oei, 2015; Orton-Gillingham Academy, n.d.). The OG approach differs from the general classroom teaching method in that it simultaneously engages with the visual, auditory, and kinaesthetic/tactile senses (Stevens et al., 2021). In addition, it uses trained educational therapists to deliver “explicit instructions to teach phonological awareness, letter-sound knowledge and other literacy skills” (Weng, 2018, p. 220)

Currently, there is no separately established framework for working with struggling learners. Local interventions have largely taken the practical approach of extending the OG approach to this group, in line with research outside Singapore (Stevens et al., 2021).

To better understand the real-world evidence for interventions for struggling learners in Singapore, we reviewed studies from the DAS and others published in the last five years (from July 2018 to June 2023).

Starting with preschoolers, two studies – Weng (2018) and Sathiasilan et al. (2022) – reported on different approaches to supporting early literacy.

- The Family Literacy Programme (FLP), a two-session parenting workshop lasting two hours each, showed no effect on children's early literacy achievement outcomes. However, it was well-received by the parents who were also the target of intervention and who had reported gaining knowledge, skills, and confidence that would help them interact effectively and improve their child's literacy development.
- On the other hand, completion of the Preschool Early Literacy Programme (PELP), a ten-week therapist-led small group intervention, had statistically significant effects on early literacy, suggesting that more explicit remediation may be helpful for preschoolers identified to be at risk of literacy difficulties.

In the primary school setting, two further studies by the DAS have highlighted successful interventions for struggling learners.

- Abdul Razak et al. (2018) report on the English Examination Skills Programme (EESP), an intervention targeting struggling non-dyslexic learners. The aim is to improve their examination techniques and overall proficiency, with an eye to the requirements of the PSLE. Over 20 weeks (an hour per week), the programme focused on enhancing students' test-taking strategies, reading comprehension, writing skills, and time management. The results showed that the structured, skill-focused intervention was associated with statistically significant improvements in examination performance among struggling learners. These benefits are comparable with another study of the same programme but targeted at dyslexic students (Leong et al., 2017).
- Rui et al. (2020) evaluated a Chinese language education programme designed for dyslexic and struggling learners in primary school, which focused on addressing the specific challenges in a character-based writing system. This programme was delivered over 18 weeks in a structured small-group format. It integrated multisensory learning approaches, phonological awareness training, and character recognition strategies to enhance reading and writing skills. This evaluation compared both dyslexic and struggling learners to a comparison group and found that not only was this intervention successful for both groups, but also that struggling learners benefitted more than the dyslexic group. The results highlight the potential for significant improvements in literacy outcomes by both dyslexic and struggling learners in a bilingual setting.

Both studies also noted that individual factors such as behavioural issues or language exposure at home would moderate outcomes.

From a methods perspective, all the studies adopted pre-post study designs with a peer-based comparison group. They all drew upon mixed quantitative and qualitative methods to triangulate data and gain insights beyond literacy scores. Although relatively small samples (ranging from n=4 to n=14 in some groups) limited statistical power and generalisability, taken together, these studies make a suggestive case for sustained direct interventions to support literacy based on the OG approach and developed specifically for the local context, with language or subject specialists involved in addressing the unique needs of the Singapore setting.

Table 1: Studies of interventions for struggling learners in Singapore

Age	Study and Intervention	Sample
Preschool	<b>Weng (2018)</b> Family Literacy Programme (FLP)	The participants were 9 Singaporean preschool children, aged 4 to 7 years old and at risk of literacy difficulties, who were enrolled in the DAS Preschool Programme and split into a control group (n=5) and an experimental group (n=4).
Preschool	<b>Sathiasilan et al. (2022)</b> Preschool Early Literacy Programme (PELP)	27 Kindergarten 1 and 2 students split into a control group (n=14) and an intervention group (n=13).



Primary School	<b>Abdul Razak et al. (2018)</b> English Exam Skills Programme (EESP)	The 10 participants were Primary 3 to Primary 6 students who had come to the DAS for academic support because of their struggles with school despite not having a diagnosis of dyslexia.
Primary School	<b>Rui et al. (2020)</b> Chinese literacy	Participants were aged between 6 and 11 studying in a mainstream primary school who had demonstrated difficulties learning Chinese. They were divided into three groups: struggling learners in an intervention group (n = 14); dyslexic children in an intervention group (n=20); dyslexic children in a control group (n=14).

According to the literature, there are three tiers of educational support: typical classroom instruction is considered to be Tier 1 while supplemental interventions and intensive/extensive interventions are considered Tier 2 and Tier 3, respectively (Truckenmiller, 2024).

In their meta-analysis of the effects of Tier 2-type reading interventions among students in Grades K-3 (i.e., aged 5 to 9) with or at risk for reading difficulties, Wanzek et al. (2016) found that such interventions led to the overall improvement in both standardised and non-standardised measures of foundational skills, as well as both standardised and non-standardised measures of language/comprehension skills. A later study with the same study population undergoing Tier 3-type interventions also found positive outcomes, suggesting the benefits of educational support for early struggling readers (Wanzek et al., 2018).

It should be noted, however, that these studies do not distinguish between struggling learners and students with a learning disability, which could be important to consider in seeking to understand the effectiveness of these interventions for different student populations.

### What are we hoping to learn?

These promising albeit early findings point towards new directions for both researchers and practitioners as well as a potential roadmap for future research efforts.

An immediate direction of travel would be to continue the investigation of comparative effectiveness and potential trade-offs across a wider scope of interventions and populations. Larger, longer-term studies could potentially follow students and families longitudinally to assess final educational attainment, continuing education, employment and a wider range of outcomes related to well-being and life satisfaction.

Key priorities for such research would include other pedagogical approaches beyond OG, delivery modalities apart from the small-group in-person setting, subject areas that extend beyond English and Chinese literacy to Mathematics as well as the study of Malay and Tamil, and adaptation to a wider range of age groups and educational settings. In addition, the potential use of educational technology as a tool to enable personalised

learning remains an exciting potential research gap to be further explored.

Reflecting on these, new studies are in the field to examine a more expanded set of interventions that support DAS' recent commitment to support struggling learners without a formal diagnosis (Table 2). The effectiveness of some of these programmes for dyslexic students has already been established, such as iStudySmart (Wee & Abdullah, 2023). Upcoming trials will specifically assess the feasibility and effectiveness of extending the intervention to struggling learners at the post-secondary level, for which published research not only locally but also worldwide is relatively scarce.

Table 2: Upcoming studies on interventions for struggling learners in Singapore

<b>Age</b>	<b>Intervention</b>	<b>Description</b>	<b>Method and Experimental Design</b>
Primary school	Prep 2 PSLE	Complements the DAS Main Literacy Programme and aims to equip upper primary students with essential skills and strategies such as active listening, note-taking, grammar concepts and visual text analysis for the PSLE English Language Paper as well as bridging to secondary school.	Mixed-methods quasi-experimental study
Primary to Secondary school	iReaCH	Aims to support learners in Reading Comprehension and Writing through vocabulary instruction and educational technology based on the OG principles, and to increase their confidence and preparedness during examinations.	Mixed-methods pre-post observational study
Primary to Secondary school	Chinese	Provides small-group literacy intervention for the Chinese language to support regular language learning as well as PSLE preparation.	Mixed-methods quasi-experimental study
Primary to Secondary school	Maths	Focuses on three streams of maths curricula structured around MOE curricular requirements.	Mixed-methods quasi-experimental study
Secondary to Post-Secondary / Tertiary education	iStudySmart	Empowers students with time management and prioritisation skills, planning and organisation skills, tertiary writing skills and presentation skills, delivered online through e-learning and scheduling online consultation sessions.	Mixed-methods experimental study



In addition to these ongoing efforts, interventions addressing supporting adult figures such as teachers and parents remain to be explored further. While parental education was not found to significantly alter student outcomes in the previous study from a statistical perspective, the qualitative evidence from the same source concluded that parents found it appropriate and helpful in bolstering their confidence, suggesting that this remains a feasible possibility for more intensive intervention.

There is also considerable scope for understanding and overcoming disparities in outcomes within the population of struggling learners, such as the role of individually specific learning difficulties and the impact of the family and home environment.

Following intervention development and outcomes evaluation, economic analysis is also highly relevant to policymakers and researchers seeking to understand the value to the overall education system of expanding services for struggling learners, to unlock new investments and make a strong case for expanding subsidies or grants. It is critical to assess the returns from implementing a more inclusive approach to learning support as well as the cost-effectiveness of alternative models from the individual and societal perspective.

Finally, serving struggling learners at scale requires not only that we identify interventions that work effectively and efficiently, but that organisational and systemic changes take place to ensure that these interventions are successfully adopted and integrated into mainstream practice for all. Beyond the initial proof-of-concept showing that an intervention can impact outcomes for students in a localised setting, decision-makers may also benefit from implementation research. Such research could identify how we should most appropriately be delivering a specific intervention and to whom, contextual factors that may curb or facilitate adoption in different organisational settings, and implementation strategies that can help ensure sustained take-up, such as leadership engagement, training, role revisions, toolkits and other similar supports.

### **What can we do next?**

Building a more inclusive educational landscape that recognises and accommodates the diverse needs of all learners will take time, trust, and evidence.

Today, in spite of ongoing innovation in programming and worthy efforts to widen the base of support, outcomes for struggling learners still rely significantly on individual families' knowledge and financial resources. The frustrations already faced by struggling learners and their families may be further exacerbated by barriers to accessing support, especially when missed opportunities for intervention can significantly impact a lifelong relationship with learning in the classroom and beyond.

The challenges at hand should not be underestimated, and indeed the complex and multifaceted issues faced by struggling learners call for a complex and multifaceted response. All stakeholders in the wider education ecosystem have a role to play in this regard, starting with efforts to raise awareness of the range of evidence-based interventions already offered by social service organisations aimed at supporting the diverse linguistic and academic needs of struggling learners and to shift societal attitudes towards learning difficulties at every stage.

A strong commitment is then required from policymakers, practitioners and researchers to

work together. This starts with further developing, evaluating and improving our existing pioneering movements for struggling learners. Beyond individual programmes, critical work then remains to integrate profiling, referrals and financial support more seamlessly across schools and social service organisations, and to monitor and evaluate these systems-level changes.

Throughout this process, credible and robust data will be needed to drive practice and policy towards a common understanding of the landscape and options available. A strong research roadmap is the first step towards building a shared purpose and direction on the long but worthwhile journey of making sure that high-quality interventions that truly answer families' needs are available and affordable to all in Singapore.

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