AERO'S submission to the Inquiry into Literacy and Numeracy in ACT public schools

February 2023

> The ACT Education Directorate should commit to implement evidence-based practices that maximise students' literacy and numeracy outcomes. This includes working collaboratively with schools to implement evidence- based literacy teaching practices based on the Science of Reading and multi-tiered system of supports within each school's local context.

The Australian Education Research Organisation (AERO) would like to thank the ACT Government and Literacy and Numeracy Education Expert Panel for the opportunity to provide a submission to the Inquiry into Literacy and Numeracy in ACT public schools.

AERO is Australia's leading independent education evidence body. Its vision is for Australia to achieve excellence and equity in educational outcomes for all children and young people through effective use of evidence. In support of this vision, AERO:

- generates high-quality evidence.
- presents high-quality evidence that is relevant and accessible.
- encourages effective implementation of evidence in practice and policy.

Introduction

There is clear evidence that the quality of teaching has the greatest impact on students' literacy and numeracy outcomes, and that evidenced-based teaching practices are the most effective and efficient ways to maximise student learning (AERO 2023a; Australian Government 2023).

AERO has identified three evidence-based practices that maximise student outcomes in literacy and numeracy, and recommends that these practices form the core content basis of the ACT's support to schools:

- general evidence-based teaching practices
- evidence-based literacy teaching practices
- multi-tiered system of supports.

To support high quality delivery of these practices, the system must consider schools as the site of implementation of any system-led policy, procedure or strategy. Careful consideration of clear and consistent messages regarding what practices should be implemented, the type of system supports, and the working relationship between schools and systems is therefore critical to ensure that system-led changes within schools are effective.

This submission will also outline principles that the ACT Education Directorate can draw upon to ensure effective implementation, as well as mechanisms, including high-quality centralised resources, guidance, resourcing and training, to support schools to implement such practices.

Effective teaching practices

There is clear evidence on the most effective teaching practices

Empirical evidence demonstrates that all students benefit from evidence-based practices that align with the processes of acquiring, retaining, retrieving and consolidating learning (AERO 2023a; Department of Education 2023).

In developing its model of teaching and learning (model), AERO has drawn on empirical evidence that shows consistent positive impact on learning outcomes for students of all ages and across diverse contexts. The model identifies four key student learning processes and links these to associated teaching practices:

- to align with the evidence that learning is a change in long-term memory, teachers develop a teaching and learning plan for the knowledge students will acquire
- to align with the evidence that students process limited amounts of new information, teachers manage the cognitive load of learning tasks
- to align with the evidence on how students develop and demonstrate mastery, teachers maximise retention, consolidation and application of learning
- to align with the evidence that students are actively engaged when learning, teachers foster the conditions of a learning-focused environment.

The teaching practices detailed in AERO's model involve considering and monitoring what students have already learned and managing their cognitive load so that they can effectively process new information. In practice, this means that there is a focus on explicit teaching and guided practice while students are learning new information, and a gradual release of active guidance as students master their learning and begin to apply it with greater independence.

These practices are also reflected in the new 'core content' for Initial Teacher Education programs that were identified by the Teacher Education Expert Panel. This core content will soon be mandated in national accreditation processes for tertiary providers delivering initial teacher education. By extension, knowledge of how students

learn and the associated teaching practices should be core knowledge for all current practising teachers in order to drive the best outcomes for students.

The general evidence-based practices can be applied to the teaching of all students regardless of year level, subject and background. For example, to support the attainment of mathematical automaticity, one of the four essential proficiencies in numeracy, teachers can use explicit teaching and modelling with formative assessment, spacing and retrieval practices to support students. This links to the underpinning concept of moving knowledge from working memory to long-term memory, whereby automaticity and the ability to quickly master addition, subtraction, multiplication and division frees up working memory for more complex problem solving.

There is clear evidence on the most effective literacy teaching practices

In addition to these general practices, which are impactful across all subjects, there is a rigorous evidence base that details how students attain mastery in literacy (AERO 2023b).

Empirical evidence indicates that when a child is taught to read, neural networks that have evolved to specialise in language and visual recognition are repurposed for the process of reading and writing (Dehaene 2010; Snow 2021). This body of work is referred to as the Science of Reading and encompasses multi-disciplinary knowledge from education, linguistics, cognitive psychology, special education and neuroscience.

Reading comprehension is largely the function of two broad skill sets: word recognition and language comprehension. Word recognition includes decoding and the capacity to recognise printed words. Decoding begins with early phonological awareness, phonemic awareness and phonics. (Buckingham 2020). Language comprehension is the ability to derive meaning from spoken and written words. Reading comprehension, conceptualised in the Simple View of Reading, is a product of word recognition and language comprehension.

Teaching literacy in the most efficient and effective way should incorporate general evidence-based teaching practices as well as the more specific practices detailed in the Science of Reading. For example, phonological awareness, phonemic awareness and phonics should be explicitly taught in the early years of school to enable children to master letter/sound recognition and accurately decode phonetically regular printed words. A high level of student engagement, carefully sequenced lessons, regular and spaced opportunities to retrieve new knowledge and scaffolded practice have been shown to support students to attain mastery in foundational literacy skills in the most effective and efficient way.

By upper primary and secondary school, most readers have been exposed to decoding, but issues with language comprehension commonly create barriers to being able to read at an appropriate level. Teachers should explicitly teach words that do not appear in everyday speech through well sequenced and highly engaging lessons. In addition, teachers can apply formative assessment practices, detailed in AERO's model, that

allow them to check for student achievement, and thereby plan for deliberate spacing and retrieval opportunities in line with students' knowledge progression.

Reading is a biologically secondary skill consisting of multiple cognitive functions. Literacy should be taught with evidence-based teaching practices from the AERO's model, and the practices supported by the Science of Reading. This will help ensure that literacy, which is a core aspect of students' success in school, is delivered in the more efficient and effective way.

Supporting the implementation of effective teaching practices

While there is a coherent body of literature emphasising the importance of maintaining fidelity of evidence-based practices to drive impact, the literature on the best process to mobilise these practices in schools, and the ways in which a system can support this process is general in nature.

Schools are ultimately responsible for the implementation of system led policies, procedures and strategies that shape teaching practices. Any intended advice or changes to be implemented should therefore be implemented by schools in a way that considers their local context and is sustainable.

Literature from the field of implementation science provides insight as to how to best support implementation at the school level. For example, a school's contextual factors such as demographics, staffing, school readiness and resourcing will impact how a school will change practices amongst their staff. Supporting schools to assess the fit and feasibility of changes, including timelines and prioritisation, is critical to achieve credibility, buy-in, and ultimately, success.

There is an existing research body of implementation resources that can be applied to helping schools improve teaching practices. For example, the Education Endowment Foundation in the United Kingdom undertook a comprehensive literature review to support their [Schools guide to implementation paper](#). This paper makes 6 recommendations to assist in the successful implement of a program, policy or strategy within a school:

- Recommendation 1: Treat implementation as a process, not an event; plan and execute it in stages.
- Recommendation 2: Create a leadership environment and school climate that is conducive to good implementation.
- Recommendation 3: Define the problem you want to solve and identify appropriate programs or practices to implement.
- Recommendation 4: Create a leadership implementation plan, judge the readiness of the school to deliver that plan, then prepare staff and resources.
- Recommendation 5: Support staff, monitor progress, solve problems, and adapt strategies as the approach is used for the first time.
- Recommendation 6: Plan for sustaining and scaling an intervention from the outset and continuously acknowledge and nurture its use. (Education Endowment Foundation 2019).

To support these recommendations, the ACT Education Directorate could:

- share examples of successful implementation and enhanced practice in schools
- promote professional collaboration within and across schools
- promote effective implementation approaches in schools
- produce and disseminate high quality resources
- resource teacher-led or in-school instructional support to schools such as on-site coaching, classroom observations, modelling effective practices and needs-based professional development
- develop self-evaluation resources for schools to meet objectives and build capacity through the process. This point has the additional benefit of allowing schools to continue to reflect on their progress and provide ongoing feedback to the ACT Education Directorate about the type of support it requires.

Ultimately, both the ACT Education Directorate and individual schools should work collaboratively to consider the stage schools are at and the ways in which core content can be introduced and scaled in a sustainable way. Implementing core content with fidelity in a staged and sustainable process can maximise students' learning by:

- reducing the burden on schools to conduct education research on how students learn best and associated teaching practices
- providing a clear and limited number of priorities to schools
- providing assessment tools and data to schools that complement school's data sets
- providing high-quality and consistent teaching resources to schools.

Multi-tiered system of supports

There is clear evidence on the most effective practices to support students who have fallen behind in their learning

The most effective and efficient method to maximise student learning is to ensure the use of evidence-based teaching practices in all classrooms, including explicit instruction, paired with systematic provision of additional support for students who have fallen behind in their learning (de Bruin et al 2023; Burns and Symington, 2002; Burns et al. 2005).

This reflects the empirical evidence in the above section, namely that the mechanisms for learning are the same for all students, but some students who experience persistent difficulties or differences in processing information, require more frequent, intense and sustained scaffolding.

Students who have not developed foundational literacy and numeracy skills will, without significant support, struggle to participate in classes that require them to engage with more complex materials and topics.

Identifying these students early and providing targeted intervention using evidence-based instructional practices can reduce the risks of learning gaps widening over time.

AERO's research has identified the multi-tiered system of supports (MTSS) framework as the best way to organise support for these students (de Bruin et al 2023). Within the context of MTSS, students are divided into three tiers:

- Tier 1 refers to the evidence-based practices, received in general education classrooms, being provided to a diverse cohort of students to gain the learning defined in the curriculum.
- Tier 2 refers to interventions being provided to small groups in addition to the instruction received by all students at Tier 1.
- Tier 3 refers to interventions where content is targeted precisely at the students' areas of urgent need (such as word reading) regardless of curricula.

Within the MTSS framework, schools implement general evidence-based practices across all learning environments, identify students requiring additional targeted supports, and monitor the impact of such general practices and interventions.

Supporting the implementation of multi-tiered system of supports

There are five requirements that need to be in place in delivering MTSS:

- deliver evidence-based instruction in all classrooms
- administer universal screening assessments early to identify students who need additional support
- administer diagnostic assessments for students who need additional support and align interventions to the skill gaps identified
- use monitoring tools to track progress, ensuring that interventions are having the intended impact
- use monitoring tools against skills being targeted to assess impact of interventions and determine next steps.

While the first of these points is addressed in the section above, this section focuses on resources and guidance that the ACT Education Directorate could provide to schools to implement the assessment, intervention and monitoring components within the MTSS framework.

Collection and analysis of assessment data

There are three main sources of assessment data that inform instruction and intervention within an MTSS framework:

- universal screening (domain-specific assessments delivered to a whole cohort)
- diagnostic assessment (more targeted assessments used to identify skill gaps)
- progress monitoring (short skill-specific evaluations of student responses to instruction and intervention).

Universal screening assessments administered to all students can provide teachers with a clear indication of which students across a cohort may need additional literacy

and numeracy intervention. These assessments are ideally administered over a short period of time and can be done individually or in a group, in-person or online. Administration and scoring should be quick (possibly automated) and not require advanced qualifications. However, specialist guidance (such as speech pathologists or psychologists) can support the effective interpretation of specific screening assessments to ensure validity and reliability.

To support reducing the burden on schools, it is not recommended for schools or staff to develop their own universal screening assessments. Instead, the ACT Education Directorate could provide centralised, high-quality assessments to screen for competence in foundational skills and make these available to schools along with test administration training.

The ACT Education Directorate can also consider centralised collection of this screening assessment data to help support monitoring and allocate additional support where needed. Other screening data such as teacher judgements, information from feeder primary schools and national assessments can also be used to triangulate and make informed decisions in which students require further intervention.

The ACT Education Directorate can work collaboratively with schools to identify the stage and need in which to develop and implement in-school teams to analyse cohort data, select students who require further intervention, plan interventions and monitor student progress. This may require additional resourcing if professional development or in-school expertise is required, which can be ascertained via a feedback loop from the school to the ACT Education Directorate.

Diagnostic assessments should be conducted with students who fall below the defined benchmark in reading, writing or mathematics – as measured by universal screening tools – to identify the specific skills that may require intervention. This enables interventions to be appropriately targeted (for example, focusing on strengthening phonemic awareness) rather than applying the same intervention for all students who struggle in each domain. Diagnostic assessments often take longer to administer than universal screening assessments and are typically administered by a specifically trained staff member in a one-on-one or small group setting. The ACT Education Directorate can consider providing specialised training and / or resource the provision of specialist staff members to implement and analyse the results of diagnostic assessments.

Specialised teaching and progress monitoring

The evidence indicates that Tier 2 support should predominantly come in the form of small group tuition with instruction targeted to the specific areas of student need. For success to be achieved with small group tutoring, targeted interventions should be delivered to small groups of students (e.g., no larger than 6), at frequent intervals (e.g., 3 or more times per week) with each session running for twenty minutes to one hour, for a defined period (e.g., a single school term) (Education Endowment Foundation 2021).

Tier 3 interventions are intensified and targeted to meet specific individual learning needs and gaps. This is achieved by increasing the frequency and/or length of each session, duration of the intervention, and/or lowering the group size (to either very small groups, or one-to-one). There is also a greater frequency of progress monitoring.

Both Tier 2 and Tier 3 interventions should be delivered by a staff member trained in evidence-based reading, writing or mathematics interventions. Interventions should be time-limited and have clear goals and entry and exit criteria that indicate when students will no longer need support in the specific skill or knowledge targeted. Similarly, carefully monitoring students receiving Tier 2 and 3 interventions enables intervention to be adjusted as required. Progress monitoring allows staff to assess the effectiveness of instruction and intervention on a student's learning.

To support the effective implementation of Tiers 2 and 3, the ACT Education Directorate can consider the provision of a centrally funded intervention program to provide consistency across schools and to promote system-wide knowledge. The scope of this funded program could include:

- providing short assessments
- in-school instructional support to schools, such as on-site coaching, modelling effective practices and needs-based professional development
- resourcing teachers with the appropriate intervention training to oversee intervention processes and decisions
- resourcing leading staff to conduct instructional rounds to support teachers and teacher assistants delivering intervention programs.

Additional comments on implementation

Ultimately, for MTSS to be as successful as possible, there will need to be a commitment to getting Tier 1 right, including a whole school vision, evidence-based instructional model, and buy in for collecting and using data to drive decisions and practice. This has been addressed in the above section on evidence-based teaching practices.

To support system wide adoption of MTSS, the ACT Education Directorate could work collaboratively with public schools to introduce a new commitment for systematic provision of additional support for students who have fallen behind in their learning.

This aligns with how high performing and high equity education systems, like Singapore, Finland and Hong Kong, function to ensure that all students are on track with their learning. In line with the MTSS framework, these systems ensure that as soon as students are identified as having fallen behind their peers, there is an intervention to help them catch up before learning loss accumulates and the students' self-belief is undermined. For example, in Finland, 23 per cent of comprehensive school students received intensive or special support in 2021 (Statistics Finland, 2022). The ubiquity of this additional support also helps to reduce the potential stigma of receiving targeted teaching.

Finally, there will need to be an agreement between the ACT Education Directorate and schools that schools are the site of implementation and that the ACT Education Directorate supports the provision of system-wide evidence-based practices. To support the ongoing effective and sustainable implementation of MTSS, schools can:

- establish a shared understanding of the desired outcomes of the implementation and assessment need

- conduct an inventory of existing programs and resources
- negotiate timetabling
- organise an MTSS implementation team
- plan for staff professional learning, particularly development that strengthens staff buy-in and staff capacity to implement MTSS
- plan to secure buy-in and engagement from students and the wider school community.

This will also help ensure that schools are providing feedback to the ACT Education Directorate about the level of required support, thereby strengthening the likelihood of the long-term effective implementation of its MTSS framework.

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