Excellence and equity through effective use of evidence

Submission by the Australian Education Research Organisation to the Productivity Commission inquiry into the National School Reform Agreement

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Introduction

The Australian Education Research Organisation (AERO) would like to thank the Productivity Commission for the opportunity to comment on the National School Reform Agreement 2019-2023.

AERO is Australia's independent education evidence body and is itself a product of the latest National School Reform Agreement (NSRA). As such, AERO is uniquely placed to comment on the effectiveness and appropriateness of the National Policy Initiatives and the Measurement Framework. AERO believes that while there have been successes arising from the current agreement, not least AERO's own establishment, there is room to capitalise on past reforms to ensure that schooling provides high quality and equitable education for all students.

AERO proposes that to maximise impact and hasten progress towards nationally agreed schooling outcomes, the next NSRA needs to focus on 'what works'. This should address both what the evidence says are the drivers and solutions to improving outcomes for students and how system-level reforms are best implemented to achieve the desired outcomes.

We know that the main variance in student achievement comes down to two factors – teaching quality and student characteristics. While the national agreement cannot directly influence all drivers – given some lie outside the education system's sphere of influence – the national policy initiatives are a significant opportunity to use national policy levers to enable the conditions for students to flourish. Research shows us that the most successful system-level reforms have a focus on high quality teaching, high quality teachers, intervention for students who have fallen behind, and using data to ensure we're on track. The research also shows us that for system-level reforms to work effectively they must: cause whole of system improvements; be measurable in practice and in results; and provide a clear rationale for why strategy x produces result y.[1]

AERO recommends that the next NSRA focus on a small number of reforms which capitalise on previous deliverables and build on the evidence base of what works, both in terms of educational outcomes and system-level reform. AERO is

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proposing a limited set of 4 new targeted initiatives that could form the basis on a new NSRA. These are:

- system-led implementation of evidence-based teaching practices;
- expert career paths for teachers;
- intensive learning support for low performing students, and
- establishment of a national, integrated education dataset.

Assessing the effectiveness of the National Policy Initiatives

AERO was established as a direct result of the 2019-2023 National School Reform Agreement. The agreement, through one of its 8 national policy initiatives, sets out the need for an independent national evidence institute 'to inform teacher practice, system improvement and policy development'. AERO was formally incorporated in April 2021 and is a ministerial-owned company, governed by an independent Board and jointly funded by the Commonwealth, state and territory governments.

AERO's vision is 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 has 3 objectives:

- generate high-quality evidence
- present high-quality evidence that is relevant and accessible
- encourage adoption and effective implementation of evidence in practice and policy.

AERO's actions against each of these objectives will focus on both education practitioners and policymakers. The anticipated outcomes are:

- practitioners and policymakers will regularly access high quality evidence to inform their decisions
- practitioners and policymakers will be motivated, confident and effectively supported to use evidence in their work
- practitioners and policymakers adopt and effectively implement evidence-based strategies.

Since its incorporation in April 2021, AERO has begun a substantial program of work across 7 research priority areas:

- Literacy and numeracy
- Wellbeing of children and young people
- Continuity of learning and development across early childhood education and care (ECEC) and schools
- Improving outcomes for Aboriginal and Torres Strait Islander children and young people
- Addressing educational disadvantage
- Supporting continuous school improvement
- Examining evidence use in ECEC and schools.

AERO identified these priorities by considering demand (the areas the education community nominated as the most pressing challenges) and impact (the areas the evidence base suggests would most improve excellence and equity in educational outcomes).

AERO has also begun several initiatives to ensure its work becomes embedded in teaching practice, recognising that education systems have often struggled to incorporate evidence-based approaches even when understanding 'what works'.[2] Some of our early initiatives geared towards this outcome include:

- setting up an inaugural evidence use survey investigating how Australian educators and teachers use evidence in practice
- creating 3 evidence-use tools including 'standards of evidence', an 'evidence decision-making tool', and a 'research reflection guide' to inform and guide practitioners and policymakers about using evidence in practice.
- establishing an online 'practice hub' where practitioners can find relevant, accessible, high-quality practice guides and resources that will support them to implement evidence-based practices in their settings
- forming 7 'Project Advisory Groups' with representatives from government, peak and other organisations across Australia that provide advice to and work with AERO to ensure maximum engagement and impact with policymakers on all our priority projects.

AERO's Board has approved a 3-year evaluation plan to monitor and report on the progress and impact of AERO's work. Currently, the evaluation is focused on process evaluation questions ('Have we have done what we said we'd do?' and 'How well did we do it?'), with an aim to assess whether AERO appears on track to contribute to meaningful change. Indicators of the reach, relevance and usefulness of AERO's work will include use of the AERO website (for example, downloads, page views), end user feedback, and stakeholder perceptions of AERO's engagement with the education community. From 2023, AERO will begin trialling supported implementation of its resources in selected sites, and the evaluation will move towards investigation of impact. Indicators of impact will include evidence of change at sites engaged in implementation trials, content analysis of relevant stakeholder websites, policies, publications, and/or professional learning, and stakeholder perceptions of change. An external evaluator will be contracted to ensure independence and objectivity.

Drivers of student outcomes

For student outcomes to improve in Australia, it is first important to understand what the drivers of student outcomes are. Research consistently shows that one of the most important factors in understanding variance in student achievement is teaching quality. Hattie's seminal meta-analysis on the influences on student achievement found that teaching quality accounts for up to 30% of the variance in student achievement.[3] In particular, he found that feedback, instructional quality and explicit instruction are strongly associated with learning. A more recent Australian analysis undertaken by Deloitte Access Economics has re-iterated the importance of teaching quality in student achievement.[4] The Deloitte Access Economics study used PISA and TIMSS data to rank the estimated drivers of school quality by their ability to explain variation in students' scores. The study found that 'teaching efficacy - practice'[a] had the greatest impact on PISA and

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[a] The study defined 'teaching efficacy' as broadly synonymous with the notion of 'teaching quality', and 'teaching practice' as the teaching practice itself, which includes factors such as ongoing professional development and approaches to teaching and learning in the classroom.

TIMSS scores. The study went on to note the magnitude of the importance of teaching practice relative to other factors, such as school leadership, and governance and autonomy.

Nonetheless, it is not only teaching quality that explains the variance in student achievement. The other significant factor that explains variance in student achievement are individual student characteristics. Hattie, in his meta-analysis on the influence on student achievement, found that individual student characteristics account for up to 50% of variance in student achievement. He found that it is what students bring (for example, prior ability, disposition to learn, physical attributes etc) that predicts achievement more than any other variable.[5] Similarly, the Deloitte Access Economics analysis noted the influence of student level characteristics, including the student's home environment, as primary factors known to determine educational outcomes.[6]

There is also a significant body of research and analysis that outlines the influence of demographic characteristics on achievement. The 2011 Review of Funding for Schooling (the 'Gonski report') noted that there are 5 factors of disadvantage that have a significant impact on educational outcomes in Australia. At the student level these factors are socioeconomic status, Indigeneity, English language proficiency, and disability, and, at the school level, remoteness.[7] It is worth noting, however, that the research also shows that within these groups there are high and low performing students and that background doesn't 'determine' achievement.[8]

Assessing the appropriateness of the National Policy Initiatives

While it is important to know the factors that are responsible for variance in student achievement in Australia, it is also important to contextualise this within a framework of what schools can influence and what system-level reform can or should aim to influence. There are some factors, particularly those related to student characteristics, that are difficult for schools to influence, such as prior ability or physical attributes. However, other factors, such as teaching quality, can be influenced at the school and system level and can impact all students, irrespective of student characteristics. This is why Hattie (and others) suggest that we should focus on the greatest source of variance that can make the difference – the teacher – in order to improve outcomes. He goes on to state that we need to direct attention at higher quality teaching, including higher expectations that students can meet appropriate challenges.[9]

Similarly evidence from high-performing school systems such as Singapore, South Korea and Finland, has shown us there are 3 things that matter the most when it comes to improving student outcomes at the system level:
- getting the right people to become teachers
- developing them into effective instructors
- ensuring that the system is able to deliver the best possible instruction for every child.[10]

The research on high-performing systems emphasises that these 3 things work irrespective of the culture in which they are applied, as long as best practices are used. It also highlights that substantial improvement in outcomes is possible in a

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short period of time if these practices are applied consistently and systematically, and that applying best practices universally could have enormous impact in improving whole systems, wherever those systems might be located.[11]

AERO would suggest that the current national priority initiatives go some way towards a focus on teaching instruction, but that this focus needs to be applied more consistently, systematically and universally for change to occur. One way this could be achieved in future agreements could be a move towards fewer national policy initiatives and towards a smaller number of targeted initiatives that speak directly to the factors that make a difference. That is, quality teaching instruction and ensuring that the system can deliver the best possible instruction for every child. The evidence consistently shows that for whole system reform, there needs to be a systemic rather than fragmented approach.[12] It also shows that reform initiatives should avoid being short-term responses to political and public aspirations, and developed in the light of careful consideration of what is actually deliverable as educational objectives.[13]

The small number of targeted initiatives should also focus on closing the loop, or 'finishing off unfinished business' in terms of previous initiatives. For instance, NAPLAN was created to give us insights into student performance *so* that we could do something with these insights. Yet successive reform agreements have not addressed in a consistent, coherent manner how we respond to the issues NAPLAN is highlighting, such as the number of students below National Minimum Standard. Similarly, national reform agreements saw the development and adoption of the Australian Professional Standards for Teachers, including description of what teachers should demonstrate for certification at the Highly Accomplished and Lead Teachers (HALT) levels. But there has been no systematic, national approach put in place to identify and certify these teachers or to build upon the potential of having such accomplished practitioners in our schools. In another example, we now have AERO, Australia's national evidence institute, but how do we leverage AERO to ensure that teachers, school leaders and policymakers are consistently and systematically making evidence-informed decisions? Finally, we also have a National Measurement Framework and a proposal for a unique student identifier, but how do we ensure the national data collection is fit for purpose and can be used to improve policymaking and program design?

> 'There is a discernible pattern of leaving education reform half done. We created a national assessment, but did not use it to help improve learning. We created standards for teachers, but did not use them systematically to identify the best practitioners and deploy them effectively. We have created AERO, but there is a risk that systems do not engage with the evidence it offers, and the promise of improved learning outcomes is not realised for all students.'
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> Dr Jenny Donovan, CEO AERO

Based on the above analysis, AERO has developed 4 proposed national policy reforms. If used as the national policy initiatives for the next NSRA, these 4 reforms would address the drivers of student achievement and improve excellence and equity for all students in Australia.

These reforms or targeted initiatives are:
- system-led implementation of evidence-based teaching practices;
- expert career paths for teachers;
- intensive learning support for low performing students; and
- establishment of a national integrated education dataset.

Detail on these initiatives can be found at Appendix A.

Measurement framework and performance indicators

Key to an effective national reform agenda are appropriate measurement frameworks and performance indicators. Evidence tells us that measurement frameworks and indicators need to be designed effectively to achieve their intended aims. An effective system performance measurement framework should provide an understanding of how well schooling is being delivered and a means to analyse performance and identify priority areas for planning, intervention and policy.[14] Decisions about appropriate interventions and strategies at any level (classroom teachers, school leaders, system managers or governments), depend on good information about the prevailing circumstances, as well as effective monitoring and evaluation of the effectiveness of decisions and actions.[15]

However, the existence of measurement frameworks and performance indicators on their own do not necessarily lead to the insights needed for better learning, better teaching or more effective schools.[16] Effective frameworks and indicators should be informed by high quality data and evidence, but not driven by the availability of such information. The measures of system performance also need to be broad enough to capture the range of student learning and the influences on learning. Policy, interventions and planning should also, ideally, be informed by a range of both quantitative and qualitative measures and these should be identified in any measurement framework.[17] Common policy challenges for evaluation of education systems include: meeting information needs at the system level, monitoring key outcomes of the education system, and maximising the use of system-level information.[18]

AERO suggests that the current National Measurement Framework and performance indictors could be better aligned to the principles outlined above for effective measurement and evaluation. This would see the creation of a more coherent and connected suite of measures that can give us appropriate insights relative to our aims, and give us the evidence we need to monitor and evaluate whether the policy or reform is solving the problem we are setting out to address.[19] It would also improve the ability of the National Measurement Framework to:
- provide information about what is happening in schools
- give insights into the impact of policies and reform initiatives
- inform future reform initiatives and interventions
- help answer key questions about whether national education policy has been effective at improving outcomes.

Some specific examples of where improvements could be made to the National Measurement Framework and performance indicators (noting that these are not

intended to be exhaustive) could include incorporating metrics derived from the Australian Early Development Census (AEDC) in the National Measurement Framework. To fully understand a student's learning trajectory, it is necessary to know what is happening not just from when they enter school, but also (ideally) from birth. Incorporating these metrics would provide data about the years of schooling prior to Year 3, in relation to literacy and numeracy, as well as data related to physical health and wellbeing, social competence, emotional maturity, and communication skills and general knowledge, and whether students are developmentally on track. Similarly, the school readiness measures which are intended to test whether preschools are preparing students for the transition to school could be included as part of any revised National Measurement Framework.[b]

Changes could also be made to the way equity is conceptualised and measured within the National Measurement Framework. The Review of School Funding – Final report (2011)[20] noted that there are 5 factors of disadvantage that have a significant impact on educational outcomes in Australia. At the student level, these factors are socioeconomic status, Indigeneity, English language proficiency, and disability, and, at the school level, remoteness. Yet, the current NSRA does not consider 'English language proficiency' under its definition of 'priority equity groups'. Similarly, the National Measurement Framework makes note of collecting data related to 'language background', where possible and appropriate, but does not collect data on English language proficiency. This lack of inclusion of factors of disadvantage such as English language proficiency, limits our ability to understand the impact different initiatives are having on equity groups at a national level, and our understanding of disadvantage in relation to educational outcomes.

Finally, the National Measurement Framework could also consider how it might incorporate additional measures that have been developed or collected individually by states and territories, but which are not measured or collected at the national level. For example, every state and territory in Australia has designed its own entry to school assessment which could provide valuable national insights on learning trajectories. Similarly, all states and territories collect data on English Language Proficiency based on the national English as an Additional Language or Dialect (EAL/D) progressions, but that information is not reported nationally or currently included in the National Measurement Framework. There are also datasets collected by individual states and territories which could provide valuable insights. For example, New South Wales has developed and implemented 'check-in' learning assessments to track learning progress, which were made compulsory during COVID/remote learning periods, and which have provided rich insights into the disruption to learning of students in that state.

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[b] The proposed school readiness measure is due to be trialled in 2025. This new measure is intended to test whether preschools are preparing students for the transition to school, including the 'value add' preschool provides and considerations of quality, dosage and learning approaches.

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Proposed national policy reforms

Targeted initiative 1: System-led implementation of evidence-based teaching practices

What does the evidence say?
We know teaching quality influences student outcomes

For Australian students to improve in their learning progress, we need teachers to use evidence-based teaching practices. Multiple studies over the last 15 years have shown that teaching quality is one of the most important in-school factors in improving student achievement.[21] Hattie, in his synthesis of 800 meta-analyses on influences on achievement, showed that of the top 5 factors influencing student achievement, 4 were directly related to quality teaching practices, including: feedback, instructional quality and explicit instruction. He went on to state that teachers account for 30% of the variance in student achievement.[22]

Australian empirical research using PISA and TIMSS data to investigate the drivers of student outcomes has also highlighted the impact teaching quality has on student achievement for Australian students. In this study, teaching quality had an impact when comparing teaching practice (that is the teaching practice itself) to teaching attributes (that is, the skills and qualifications of teachers which inform the effectiveness of their teaching practice). Teaching quality also had an impact when compared to other in-school factors such as school governance, leadership and culture. Within the category of teaching practice, this research found that instructional approaches were one of the most important factors in student achievement.[23]

We also know, to a large extent, which teaching practices have been proven to make a difference to learning outcomes for students. Cognitive science, and particularly cognitive load theory (that is, the 'science of learning'), have provided the science around how the brain learns and which instructional techniques are successful.[24],[25] For instance, the science of learning tells us that when teaching new content and skills to novices, teachers are more effective when they provide explicit guidance accompanied by practice and feedback, as this helps to manage the 'cognitive load' of the human brain to ensure that learning can occur.[26]

There is also a large body of evidence describing what these different practices look like and how they are best implemented in the classroom. For instance, there is an extensive body of research on how to effectively implement formative assessment in the classroom,[27] or explicit instruction,[28] or teach for mastery learning.[29] AERO's own Tried and Tested series distils 8 evidence-based practices into carefully sequenced guides for practitioners, providing a step-by-step outline of how to effectively implement the practices.[30] Similarly, the NSW Department of Education does this through its What Works Best series, which includes a literature review on the evidence base, and a practice guide for teachers.[31]

What is the challenge?
We are not effectively implementing evidence-based teaching practices in the classroom

Despite having a good understanding of the importance of teaching quality to the outcomes of Australian students, including a well-supported evidence base indicating which practices work to improve outcomes, turning this knowledge into practice is a

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challenge. A recent AERO survey of teachers across Australia examining their use of evidence-based teaching strategies, found that while many teachers reported they 'often use' effective teaching practices, 71% of teachers reported using strategies which have not been proven to be effective for student learning in 'most or every lesson'. The survey also found 41% of teachers and educators lack confidence in determining whether evidence is rigorous or relevant to their practice.[32] Similarly, New South Wales analysis of TALIS 2018 data shows that 45% of lower secondary teachers in the state, and 41% of teachers across Australia, say that analysis and use of student assessments is an area where they would like professional development, indicating that there is not a good understanding of data use in practice,[33] an essential skill to have to implement effective teaching practice.

There also appear to be gaps and a lack of consistency in what states and jurisdictions promote as 'evidence-based practice', and a lack of knowledge as to what practices are being used from class to class. For instance, the evidence tells us that a systematic phonics approach is the most effective way to teach novices to read.[34] However, not all states and territories are promoting phonics appropriately through their system-level instructional guidance and assessments, and/or do not know the classrooms where an effective phonics approach is being used. Similarly, despite a robust evidence base about the effectiveness of timely, quality feedback,[35] data from the 2018 PISA survey tells us that only 60% of students reported that their teacher tells them where they can improve and how to improve, and that students in New South Wales and Queensland reported receiving more feedback in class than students in other states and territories.[36]

What is the solution?
We need to make sure that there is a consistent and systematic focus on implementation of evidence-based practices in classrooms

While we know 'what works' in terms of effective teaching practices in the classroom, we do not know and cannot monitor the extent to which there has been systematic implementation of these practices in classrooms across Australia. Reform is needed to ensure that all levels of the Australian school system are focused on implementing best-practice teaching and are accountable for doing so.

AERO suggests that a targeted initiative in the new NSRA could include development of measurement tools to report on and monitor the use of evidence-based practice in schools.

Targeted initiative 2: Expert career paths for teachers

What does the evidence say?
We know a quality teaching workforce is a driver of improved student outcomes

For Australian students to improve in their learning, we need not just quality teaching, we also need a quality teaching workforce. A study into the world's best-performing school systems found that a consistent characteristic of education systems that achieve top rankings in international learning assessments is that the teacher workforce is highly qualified.[37] This means not only that the right people become teachers, but also that these systems develop these people into effective instructors who can implement targeted strategies to ensure all students are improving.[38] Nations that have improved their students' achievement (such as Singapore and Finland) attribute much of their success to their focused investments in not only teacher preparation, but also teacher development.[39]

We know that one of the key ways we can improve the quality of the existing teaching workforce is through investing in better teacher professional learning and implementing system-wide strategies that make professional learning effective in all schools.[40] Studies have shown that improving professional learning for educators is a crucial step in improving academic achievement for students.[41] For instance, a US study for the 'What Works Clearinghouse' found that teachers who receive substantial professional development (an average of 49 hours) can boost their students' achievement by about 21 percentile points.[42] We also know high-performing systems like Singapore and Shanghai employ 'master teachers' to lead and coordinate professional learning and that this has been an integral part of their success in improving outcomes.[43] Professional development can be seen to offer bigger and faster benefits than other high priority 'quality teaching workforce' reforms, such as attracting more high achievers to teaching, or improving the quality of initial teacher education which can take many years to see results.[44]

The evidence also shows that not all professional development works equally well, and that some types and components of professional learning are more effective than others. Recent research shows that 'teacher coaching' has emerged as a promising alternative to traditional models of professional development.[45] Teacher coaching is defined as instructional experts working with teachers to assist translate knowledge into classroom practice. It is considered different to mentoring or peer-to-peer feedback. A 2018 meta-analysis found that the difference in effectiveness between teachers with instructional coaches and those without, was equivalent to the difference between novice teachers and teachers with 5 to 10 years of experience.[46] This research goes on to show that well-designed instructional coaching programs provide: individualised, intensive, sustained, context-specific and focused one-on-one or small group support.[47] Other research highlights that anyone providing feedback to teachers to improve practice needs to be well-versed in how to do it and have the time to do it.[48]

What is the challenge?
We are not effectively utilising our best teachers

Despite the evidence showing that a quality teaching workforce is necessary to improve outcomes, and that professional learning is a way to achieve a quality teaching workforce, Australia's challenge is that it does not effectively make use of the processes and initiatives it currently has it place to ensure that we are effectively using our best teachers to create a quality teaching workforce. These initiatives include the Australian Professional Standards for Teachers, the Highly Accomplished and Lead Teacher (HALT) certification and state and territory led professional learning programs such as instructional leaders and coaching programs. In other words, our existing teacher

career paths do not systematically build, recognise and deploy teaching expertise across the teaching workforce to create a quality teaching workforce.

The best teachers are currently under-utilised in sharing their expertise and supporting others to improve. A survey conducted by the Grattan Institute in 2019 of 700 instructional leaders, teachers and principals across Australia found that Australia's best teachers are often confined to their own classrooms, or stretched with 'add-on' instructional leadership responsibilities without adequate time, guidance or support to improve teaching in their school.[49] They are rarely given access to an expert to be a mentor or provide feedback, and were usually provided with no initial training in being an instructional leader.[50] Respondents to the survey also said that while they value learning from instructional leaders in theory, 70% said that in practice their teaching has not changed.[51]

There is also poor take up of Australia's existing certifications. For instance, since 2012 when the Highly Accomplished and Lead teacher (HALT) certifications were introduced, only 1,025 teachers have become certified HALTs.[52] On top of this poor take up, of those teachers who have been accredited as HALTs, 42% indicate that they do not have sufficient time and opportunity to lead, initiate or plan professional or collaborative learning activities post-certification.[53] Individual state and territory governments have also invested in using the best teachers as instructional leaders or coaches, but evidence shows that this is also not working well, with poor selection, role design and support.[54]

We are also not recruiting the best and brightest to the teaching profession in the first instance. The proportion of young high achievers (students aged 20 and under with an ATAR of 80 or more) choosing teaching has declined by a third from 2006 to 2019, and there has been an overall 5% decline in the number of students graduating from initial teacher education (ITE) from 2009 to 2019.[55] A 2019 Grattan survey found bright young people across Australia are often turned off teaching due to a perception it lacks career progression opportunities or high enough salaries.[56] Far fewer high achievers in Australia choose teaching today than 30 years ago, and over the past decade demand from high achievers for university education courses has fallen further.[57]

What is the solution?
We need to make sure that there is a comprehensive, large-scale, nationally consistent system in place for improving the teaching workforce

While we know 'what works' to create a quality teaching workforce, we need to ensure that there is a comprehensive, large-scale, nationally-consistent system in place to improve the teaching workforce. This could be achieved by reforming the teaching career path, to create the right conditions for Australia's top teachers to lead professional learning in schools and to assist in attracting high achieving young people to teaching by increasing the salary for top teachers.[58] The Grattan Institute states that a new career path for expert teachers could transform Australian schools and boost student learning by 18 months by the time they turn 15.[59]

AERO suggests that a targeted initiative in the new NSRA could include a commitment to a 10 year-plan to improve the 'expert teacher' career path. This would include the establishment of new roles at significantly higher pay scales and with responsibility for improving teaching practice in their schools, often described as Master Teachers and Instructional Specialists. This reform initiative would build on the existing High Achieving and Lead teacher accreditation program and capitalise on the evidence, which says that a quality teaching workforce is critical to improving outcomes.

Targeted initiative 3: Intensive learning support for low performing students

What does the evidence say?

We know targeted interventions is a driver of improved outcomes

We know that even with high quality instruction, a small percentage of students will require additional targeted interventions to achieve the same as their peers. Evidence from high performing systems tells us that high performance requires every child to succeed. Not only do high performing systems implement effective interventions at the school-level, they also do this at the individual student level, by developing processes and structures within schools that can identify when a student is starting to fall behind and intervening to improve that student's performance.[60] The importance of focusing on individual students aligns with Australian data which shows that low achieving students are found in every classroom in every school, and that all students can be high achievers irrespective of background or school, assuming appropriate interventions are put in place.[61]

The evidence shows us that it is targeted interventions that can best improve learning outcomes, and that this is particularly the case for reading and maths and for students with, or at risk of, academic difficulties. For example, a recent systematic review of school-based interventions (that is interventions delivered in school, during the regular school year, and where schools are a key stakeholder) targeting students with, or at risk of, academic difficulties in Grades 7 to 12 showed, on average, positive effects on standardised tests in reading and maths.[62] Targeted interventions have also been shown to help close the achievement gap for disadvantaged students. For instance, a systematic review and meta-analysis on academic interventions for elementary and middle school students with low socioeconomic status showed that tutoring had an effect size of 0.36 on this group of students. The research concluded that it is possible to substantially improve educational attainment for low socioeconomic or disadvantaged students through school-based interventions such as tutoring.[63]

One targeted intervention that has shown particular promise is one-to-one or small group tuition. Evidence shows that one-to-one tuition can improve learning by around 4 months over one or two school terms.[64] In Finland, a high-performing nation in terms of education, special education teachers provide one-on-one or small group support to 30% of students in any given year who are at risk of falling behind. This support is mainly provided in the subjects of Finnish and mathematics.[65] Singapore, another high performing nation, has a similar program in place through its 'Learning Support Program' for mathematics, English language and first language.[66] In order for targeted interventions such as tutoring to be successful, the evidence says interventions should be brief and regular, that assessments should be used to identify and track students, that the intervention is clearly structured, carefully timetabled, delivered by a qualified teacher (or trained teaching assistant) and that the intervention program is followed precisely and suggested delivery protocols followed.[67]

What is the challenge?

Increasing numbers of Australian students are not reaching their learning potential

There is a large number of Australian students who struggle to meet minimum standards of literacy and numeracy. Approximately 4% of Year 7 students are achieving below the National Minimum Standard (NMS) in most NAPLAN domains. An additional

13% of Year 7 students are at risk, performing only at NMS. By Year 9, this has increased to almost 9% of students below the NMS across most domains and approximately 19% at national minimum standard. These figures have become even more concerning following the learning disruptions caused by COVID-19 with a greater number of Year 7 and 9 students not meeting the NMS in 2021 than in previous years. For Year 7 and Year 9 Reading and Numeracy, the rates of students who did not meet the NMS were the highest since 2015.[68] This trend is also replicated in international assessments with more than 2 in 5 Australian students falling short of benchmark proficiency in PISA maths, reading and science.[69]

Students achieving below national minimum standards are also not making gains as they move through school. The data suggests that the number of these students increases from primary to secondary school and, once these students fall behind, they do not catch up. For instance, analysis of NAPLAN data shows that students who are achieving mostly below the NMS, fall further behind the average student, with their average gain in literacy domains between Year 7 and 9 being below average.[70] A report by the Mitchell Institute on educational opportunity in Australia also highlights that large gaps in learning usually widen as children get older and that these students are not receiving the support they need to catch-up to their peers.[71]

Aboriginal and Torres Strait Islander students, regional and remote students, males, students from low socioeconomic backgrounds and students in government schools are over-represented in the number of students performing at or below NMS.[72] The Mitchell Institute report showed that the gap in the percentage of low and high socioeconomic status students above the NMS in reading and numeracy increased from 22.4 percentage points in Year 3 to more than 30 percentage points in Year 9.[73] Similarly, the Grattan Institute, in a study of learning gaps in Australia based on NAPLAN data, found that disadvantaged students are falling further behind each year they are at school. They found that the gap between children of parents with low and high education grows from 10 months in Year 3 to more than two years by Year 9.[74]

What is the solution?
We need to make sure that there is a systematic and coherent national approach to improving learning for those not reaching minimum standards

While we know that not all students are meeting national minimum standards, and we know what works to improve outcomes for these students, there is no systematic and coherent national initiative reform to address this issue. In light of this gap, some states and territories (namely New South Wales and Victoria) are putting in place tuition to help students 'catch up' after the disruptions caused by COVID, but this initiative is not being rolled out across Australia or equally to all students who need it.

AERO suggests that a targeted initiative in the new NSRA could include a commitment to a 'guarantee' of intensive tuition support. This would help low-achieving students in all schools, in every state and territory across Australia, acquire fundamental literacy and numeracy skills.

Targeted initiative 4: Establishment of a national integrated education dataset

What does the evidence say?
We know good data is essential to ensure we're on track

While quality teaching, high quality teachers and targeted interventions are all evidence-based means to improve student outcomes, we also need good data so that we can know what is working and if we're on track. High performing systems across the world not only collect data but also use it effectively to measure outcomes and drive improvements.[75] Systems cannot improve what they do not measure, and problems can't be defined or solved without good data.[76] A 2010 study on how the world's most improved school systems keep getting better, found that high performing systems: gather, analyse and share data on system performance (schools, students, educators, geographic areas), and use data as a tool to direct the allocation of system support.[77] Research shows that data-based decision-making can contribute to increased student learning and achievement.[78]

One way that data can be effectively shared and used in system improvement is through data linkage. Data linkage is a technique that connects pieces of information about a person, family, place or event. It involves identifying and combining information from different source datasets, resulting in a linked dataset that contains some data from each of the source datasets.[79] Connecting sets of data in a linked dataset can provide a more complete picture of how certain factors interrelate and impact across domains and provide many rich insights for policy and research, including: a) determining whether intervention programs are working or failing, b) identifying areas that need greater resources, and c) tracking trends to promote novel intervention strategies.[80] The benefits of data linkage have been well established in medicine and health.[81] For example, data linking helped to identify the role of folate in pregnancy in reducing neural tube defects, such as spina bifida.[82] The Centre for Health Record Linkage (CHeReL) is an example of a successful secure, high performing data linkage system which facilitates high-quality research and health policy decisions – it is also one of the largest of its kind in Australia.[83] In education, the National Pupil Database in England – a record-level administrative data resource curated by the UK government's Department for Education – has been found to be an extremely valuable resource for researchers, providing a near complete picture of student trajectories and outcomes. Benefits include ability to assess outcomes of interventions, explore relationships between disparate factors, improve education services and policy, as well as providing essential information on comparative effectiveness of reforms and initiatives.[84]

Effective data linkage cannot, however, occur unless appropriate mechanisms for data collection are in place. Datasets contain identifiable information and there is an increased risk of identification of an individual/organisation when two datasets are linked.[85] According to research into the history of data linkages in Australia, privacy and confidentiality concerns are always a high priority and shape the approach to systematic linkage. Use of the 'best practice protocol' (that is, separation of identifiers and separation of roles) mitigates some of these concerns. Another challenge in Australia with data linkages is obtaining support from decision-makers to establish systems. Several existing data linkage systems in Australia (including CHeReL) were set up only in light of significant support from research users and only later relocated to respective government agencies.[86]

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What is the challenge?
There is a lack of high-quality data available to inform policymaking and program design

Australia collects a multitude of education data at both the national level and in the states and territories, but this data is not always available at the national level, or at cross-jurisdictional or cross-sectoral levels. This collection of data by multiple levels of government, and the lack of visibility of this data, is partly a function of the way responsibility for education is split between the Commonwealth government and the states and territories. It has also come about because states and territories have often viewed the National Measurement Framework as limited and some have pursued their own education measurement solutions separately to the National Measurement Framework and/or from each other. The result is that measures differ from state to state and data is held in separate jurisdictions and not shared. For example, currently only a limited amount of demographic data can be accessed at a national level in a form linked to NAPLAN. This means that there is no ability, at the national level, to track the progress of a student across Years 3, 5, 7, and 9. This lack of data visibility at a national level, and between jurisdictions, hinders the ability to gain access to rich insights needed to improve policymaking and program design.

There have been some attempts at the national level to create some data linkage resources – for example the Multi-Agency Data Integration Project (MADIP) run by the Australian Bureau of Statistics – but there is no linked data resource specific to education. The most recent National Schools Reform Agreement has attempted to address this through the introduction of a unique student identifier (USI) which is intended to provide a unique identifier to every school student in Australia. This will facilitate the sharing of information between schools, sectors and jurisdictions without using a student's name. The purpose of the USI is to support better understanding of student progression and improve the national evidence base. However, this reform has been delayed by the complex legal and privacy frameworks across jurisdictions.

What is the solution?
We need to make sure that policymakers have access to appropriate data to inform system improvement

Australia cannot know whether students are on track or which reforms are successful if the appropriate data cannot be accessed. A national and cross-sector student dataset should be created to overcome limitations in the use of education data in policymaking and program design.

AERO suggests that the next reform agreement include an initiative to invest in a national integrated education dataset to improve policymaking and program design. This dataset could be housed and accessed within existing data infrastructure, limiting the cost to negotiating the pooling of data across systems and setting up the appropriate legal and privacy protections. It could accommodate the unique student identifier when it becomes available.

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