KPMG

Australian Institute for Teaching and School Leadership

Understanding progress to improve teaching: A tool for teachers and school leaders

Business Case

Final Report
28 June 2017

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Executive Summary

Introduction

KPMG was engaged by the Australian Institute for Teaching and School Leadership (AITSL) to support its Board in considering the case for the development of a tool to support Australian teachers and principals to better understand the progress of students to be able to more effectively address their individual learning needs.

Information on individual student learning and growth can help teachers improve their teaching practice. The regular collection of such information can assist teachers to more effectively set and target learning goals, provide feedback, give instruction, and formulate future actions that are tailored for each student. Developing an accurate and detailed understanding of individual student learning and growth requires technical skills and sufficient time for teachers to administer assessments in the classroom – both of which are not necessarily available to many classroom teachers.

> ***Formative assessment*** *is any form of classroom interaction that generates information on student learning, which is then used by teachers and students to adjust teaching and learning strategies throughout the education process.*

This business case proposes the development of a technology-driven assessment tool to support teachers and school leaders to collect evidence about the learning needs of each student by assisting in the processes of formative assessment creation, marking and the interpretation of results. This tool would be developed and offered for use on a voluntary basis to all teachers and school leaders across Australia. The tool would allow teachers to customise assessments across multiple subject areas to gauge student learning at the beginning of a learning unit, as well as the growth within a unit. Furthermore, the tool would provide teachers with the added benefit of assessing students' general capabilities, such as critical thinking, reasoning, and problem-solving, which are also part of subject-specific learning. The tool would produce reports that provide student-specific feedback in real-time. The collection of this data would benefit teachers by providing them with advice on how to adjust their teaching strategies to best respond to individual student needs, and benefit systems and sectors by providing aggregate data on student performance within schools to inform policy development and inform better and more targeted support for teachers and principals.

Strategic Context

The development of an assessment tool for teachers and school leaders such as that described on the previous page meets a number of strategic government priorities and objectives at both a state and federal level.

The Council of Australian Governments (COAG) Education Council has expressly detailed its interest in developing a technology-based teacher support tool in a number of Education Council papers, and State and Territory Governments have begun work to build and promote their own feedback practices in their schools. Notably, the National STEM (Science, Technology, Engineering and Mathematics) School Education Strategy 2016-2026 recommends the need for a national collaborative action on the development of a formative assessment tool.

The concept of an assessment tool is the topic of ongoing discussions between AITSL, the Australian Curriculum, Assessment and Reporting Authority (ACARA) and Education Services Australia (ESA), who have indicated their interest in jointly progressing its development at the national level. Each organisation has expressed enthusiasm for the tremendous value and potential they see in the evidence and guidance such a tool would provide to teachers and school leaders, as well supporting significant improvement in student outcomes across all Australian schools.

An assessment tool will support teachers by producing a number of benefits

The following diagram provides a summary of the key features of the proposed assessment tool. These features are illustrated alongside the five key steps that a teacher would undertake to use the tool.

Teachers would use the tool repeatedly throughout the school year with an assessment developed at the beginning of a unit to provide a teacher with a detailed baseline understanding of each student's skills and gaps in learning. This information would enable teachers to construct differentiated teaching strategies based on a detailed understanding of each student's needs.

The process would be repeated throughout the unit to provide revised information about student learning and growth. This regular flow of data and evidence would enable teachers to continually adjust teaching strategies to the needs of their students, with the tool also providing evidence-based advice on strategies and tasks that have had the greatest impact in classrooms.

Overview of the proposed assessment tool: process and key proposed features

1 Teacher accesses the tool

Key system features

- Available and accessible by **all Australian teachers and school leaders** on a **voluntary basis**
- Accessible through **multiple devices**
- **Easy-to-use / well-designed**
- Built on a **student/teacher information management system**

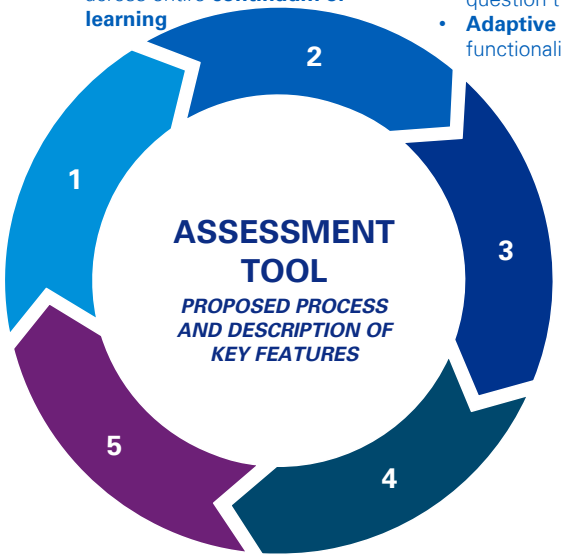
2 Teacher customises and provides assessment to students

- Large store of **validated assessment items**
- **Multiple subject areas**, mapped across entire **continuum of learning**
- **Customisable test features**, including subject area, level of difficulty, question type, test duration
- **Adaptive testing** functionality

Key tool design principles

- **Focus on measuring and tracking student growth and progress** (throughout the unit, across a year, between years)
- **Voluntary use and access** for all teachers and school leaders
- **Reporting and advice that is meaningful and understood by teachers**
- Accessible through **multiple devices**
- **Secure data and regime of access rights**

Process undertaken at the beginning of the learning unit and regularly thereafter



3 Tool automated marking and scoring

- **Automated marking** across all assessment and question types (including open ended)
- **Teacher review and validation for open-ended questions** (with supporting examples)
- **Marking across continuum of learning**
- **Scaled/equating scores** to indicate learning growth

4 Reporting on student learning, tailored advice and guidance

- Reporting that is **understood by teachers**
- Information that has a **consequence on interpretation of the student's progress**
- **Real-time** reporting of results
- **Accurately reflects the capabilities** of the students and **growth in learning**
- Identifies the **skills that the student has obtained, growth over time, and what is needed to be addressed next**
- Indicates **learning growth over time** (multiple years, longitudinal view)
- Advice on **professional learning for teachers**
- Information about the **best next steps in learning** for each student
- Suggestions for **teaching and learning activities,** based on the evidence and best practice
- **Crowd-sourced views and expertise of teachers** to build pool of guidance and advice
- **Results fully accessible at the school level. De-identified and aggregated data** for policy purposes

5 Outputs and Actions

- Teachers understand student skills and **capabilities at the start of the unit** and are able to **measure growth within the unit**
- Teachers are empowered to make **impactful, evidence-based changes** in order to respond to student needs
- Teachers are able to **address individual needs** and **use flexible grouping** to support learning
- Teachers **increase their skill base** in **formative assessment processes, use of data**, and **understanding of learning continuums**
- Teachers understand the **impact of the teaching strategies they use** and the **strategies that work best** in their context and with their students
- Teachers are able to **access the expertise and advice of other teachers**

The proposed assessment tool is intended to provide schools with an accessible, easy-to-use, resource that will:

- **Support teachers to collect evidence** about the learning needs of each of student (both in relation to specific subjects as well as their general capabilities) by assisting in the processes of assessment creation, marking, and interpretation of results. The tool would draw on a large database of validated assessment items spanning multiple subject areas from which teachers can frequently draw to assess learning in relation to relevant curriculum.[1] The reports produced by the tool would be created immediately, providing information to support teachers to answer critical questions about the student's understanding, growth, and the next steps in learning.
- **Provide reliable and accurate measurements of student understanding and learning growth about each student** through the use of validated assessment items mapped to learning continuums and in-built analysis and reporting. Students learn at different rates and there can be a vast difference within a class between least and most advanced. The tool would enable teachers to use the progressions in the Curriculum, but not be informed only by what the Curriculum defines as the next step in learning for that student, but what that student actually needs to progress. Ongoing use of the tool would enable each student's assessment responses to be connected over time, providing detailed baseline data about the student's learning, and the level and pace of growth in learning. Critically, this information would enable teachers to see and make reliable inferences about the impact they are having on a student's learning.
- **Enable teachers, school leaders and students to draw on evidence about each student to adjust teaching and learning strategies to respond to individual student needs.** It is envisaged that by providing high quality and reliable evidence and guidance through a technology-driven solution, the proposed assessment tool will empower teachers to respond to the needs of their students in an impactful and evidence-based way. The reporting provided through the tool (discussed above) would provide a rich source of information to supplement teachers' judgements in formulating future actions. The reporting will enable teachers to identify the specific skills that the student needs to address next along the learning continuum.
- **Provide tailored advice and guidance to support teachers to identify differentiated best practice teaching strategies and learning activities to support each student**. A critical feature of the proposed tool is the inclusion of tailored guidance and advice in the reporting, which would provide teachers with advice on what the next step in learning is for each student based on best practice regarding teaching strategies and learning activities that are known to have high impact. This advice may also point to professional learning that the teacher may access to assist them to deliver best practice teaching and learning strategies.
- **Encourage understanding and application of formative assessment approaches.** Student evaluation and assessment is a key area in which teachers indicate they need further professional development.[2] While not intended as a replacement for structured professional learning, the tool has the potential to assist in building the understanding of formative assessment processes, use of data, understanding of learning continuums and exposure to best practice teaching and learning activities more broadly (through the advice noted above). It is envisaged that the tool would be accompanied by a program of professional learning that not only supports schools to use the tool, but builds capacity in using the data to make decisions about teaching practice.

Data collected through a national assessment tool would likely benefit all key stakeholders in the education system, as described in the points below. Importantly, the tool is anticipated to improve student learning and teaching practice.

[1] This business case proposes that the initially-developed version of the tool focuses on one subject area, with the view to expand to other subject areas after the successful implementation of the initial version.
[2] McKenzie (2008); Santiago, et al. (2011)

- **Students** are likely to experience increased motivation and engagement[3] in education as a result of teachers tailoring their teaching practice to each student's learning needs throughout the academic year, as well as through having the opportunity to highlight areas for development and current strengths.
- **Teachers** will benefit from the tool through the tangible and experiential professional learning opportunities its use will provide, including through customising assessments and tailoring teaching practice using evidence-based information. Importantly, the provision of this tool will reduce the time burden that these activities would typically require of teachers. Use of a technology enabled tool will increase the efficiency, while reducing the workload of collecting evidence of student prior knowledge and current learning. The accuracy and consistency of information will also be increased through the use of automatic marking.
- **Parents and carers** will benefit from the proposed assessment tool through teachers being able to provide them with specific information on areas of focus for their child in the home, as well as their child's noteworthy strength areas and their progress over time, across teachers, and year levels.
- **State and Territory Governments and Non-Government School Sectors** will benefit from the aggregated and de-identified data on student's learning.. This rich information source will provide an evidence base to inform the development of system/sector improvement policies and strategies, support more targeted supports and interventions for teachers and principals, and contribute to the measurement of outcomes and policy effectiveness.
- **Policy makers and researchers** will be provided with aggregated and de-identified data upon which key decision-making and program and policy-design can be made. This data will enable these stakeholders to track the effectiveness of interventions in the form of new policies, curriculum features, programs, or school-wide practices.

Scope and objectives of this business case

The primary objective of this business case is to set out the vision and define the purpose for the proposed assessment tool by:

- confirming the rationale and need for an assessment tool;
- considering the delivery model to support the creation of the tool; and
- considering preliminary options for the development and delivery of the underlying technology that would support the tool.

This work was informed by consultation with internal AITSL stakeholders, as well as a review of documentation and published research. More extensive consultation with other stakeholders to inform the design and implementation of the tool (and associated costs) would be conducted as part of a subsequent stage of work.

This business case seeks to answer five key questions in order to meet these objectives.

Should AITSL, in collaboration with others, focus on promoting greater application of formative assessment to collect evidence to support targeted teaching (as opposed to other interventions / investments)?

Yes. ***The collection of evidence through formative assessment is proven to be one of the most effective education interventions to positively impact student outcomes.***

Research has shown that teachers play a crucial role in student achievement. Teachers are able to have the strongest impact on students' progress when they can monitor and evaluate the impact of

[3] Black, P. & Dylan, W. (2001). Inside the black box: Raising standards through classroom assessment. *King's College London School of Education Discussion Paper.*

their teaching strategies and use this knowledge to adapt approaches to the needs of individual students. As such, the practice of formative assessment allows teachers to effectively collect evidence that they can use to inform and tailor teacher practice.

Research in various countries provides strong evidence that improving the quality of formative assessment used by teachers in classrooms will raise student achievement levels.[4] If implemented effectively, it can have an impact on student learning that is larger than almost all other teaching interventions, according to John Hattie in his 2009 study, *Visible Learning*. Other studies have also estimated the scale of the impact achieved through a formative assessment and teaching approach to equate to an increase in student learning of, on average, an additional eight months in a year.[5]

Should a technology-driven solution be developed to create a tool that supports teachers to collect evidence more effectively / efficiently?

Yes. ***Teachers require support in order to collect reliable and accurate evidence regarding the ongoing development of their students' learning. No tools currently exist that support teachers to efficiently collect evidence about student learning on an ongoing basis, while also linking results to evidence-based guidance.***

Formative assessment can only contribute to positive learning outcomes if it is based on accurate assessment items, is timely, and is responded to appropriately by teachers through adaptive teaching.[6] As such, in order to undertake high quality, formative assessment, and, in turn, make evidence-based changes to respond to student needs, teachers must have:

- the necessary skills and understanding of formative assessment approaches;
- adequate time, capacity and expertise to design and mark assessment information; and
- access to the necessary evidence and expertise with which to make targeted changes to their teaching practice.

If teachers do not have access to these elements, there is the risk that they will not be able to develop and implement teaching strategies and lessons that would most effectively impact the learning and achievement of their students, either due to restrictions on their knowledge and access to high quality evidence, or due to time constraints.

It is currently difficult for teachers to reliably make such assessments without appropriate technical experience or support (or time to implement such rigorous approaches).[7] The knowledge and skills needed for teachers to carry out the diagnosis, understanding and measurement of progress and determining next steps is significant. The Australian Council for Educational Research (ACER) has developed a National School Improvement Tool that identifies nine areas of highly effective school practice. One of these areas – the collection and use of data – is commonly identified as one of the most important areas where schools need to make significant improvements.[8]

One way through which teachers can be equipped to collect formative assessment evidence about each student and make tailored and impactful changes to their teaching strategies is through a technology-based tool. Such a tool would enable teachers to collect reliable, accurate and real-time

[4] Black, P., & William, D. (2003). 'In praise of educational research': Formative assessment. *British educational research journal*, *29*(5), 623-637.
[5] The Education Endowment Foundation. (2016). 'The Teaching and Learning Toolkit', [online] Available at http://evidenceforlearning.org.au/toolkit/feedback/ [Accessed 25 May, 2017].
[6] Black, P., & William, D. (2003). 'In praise of educational research': Formative assessment. *British educational research journal*, *29*(5), 623-637.
[7] As shown in the 2011 OECD review of Australian assessment practices which highlighted variability in teacher judgments of individual students. Santiago, et al. (2011), p 43, 58.
[8] Grattan Institute, (2015), Goss, P., & Hunter, J. Targeted teaching: how better use of data can improve student learning

formative assessment evidence on each student's learning and growth. Importantly, such a tool would leverage teacher expertise by enabling them to set the parameters of the assessment. This ensures that the information gathered is targeted and useful. The tool would also help foster common conceptions of progress and knowledge within and between schools that are aligned in relation to the Curriculum.

The development of such a tool has been identified as a key gap and priority for Commonwealth and State and Territory Governments.

The National STEM (Science, Technology, Engineering and Mathematics) School Education Strategy 2016-2026, endorsed by Ministers at the 11 December 2015 COAG Education Council meeting (Item 5.04), details five areas for national action and specifically calls out the need for national collaborative action on the development of an assessment tool 'that helps teachers collect and use data about individual student learning needs, which builds on the continuum.'[9]

Australian governments have expressly detailed their interest in developing a technology based teacher support tool in:

- the Education Council paper on National School Reform (Item 3.01 of the 16 Dec 2016 meeting) which noted that implementation of such a tool would support all five of the national education reform themes identified in the paper; and
- the Education Council paper on Online Assessment (Item 5.1 of the 15 August 2014 meeting), which noted the intention for the national online assessment platform to deliver a range of assessments including formative assessment.

AITSL, ACARA and the ESA have experience, resources and expertise, and have developed important partnerships which can be drawn on in the development of an assessment tool.

AITSL, ACARA, and the ESA are responsible for supporting the policy directions set by the Education Council, including delivering national reforms to raise the quality of teaching and student performance across the country. The collective expertise and capabilities of these organisations could be leveraged in the delivery of the tool (discussed further below under question 4).

Should an assessment tool be designed, developed and managed at the National or State and Territory level?

National Approach. Adopting a national approach to developing an assessment tool would present several benefits, including:

- **enabling economies of scale** regarding the cost of development and implementation;
- providing all teachers with the **opportunity to draw on best practice approaches;**
- **supporting high quality teaching practice** across Australia in order to have maximum impact on student outcomes; and
- **enable a more granular, nation-wide view of the drivers of improved performance** in order to facilitate system level decision making and policy design.

In adopting a national approach, the balance between standardisation at a national level and tailoring of content to specific State and Territory contexts, as well as between the benefits of teacher autonomy versus those related to establishing a means for comparability, will need to be considered.

9 http://www.educationcouncil.edu.au/site/DefaultSite/filesystem/documents/National%20STEM%20School%20Education%20Strategy.pdf

In developing the tool, intergovernmental relations and how best to achieve consensus at the national level will also need to be considered.

Which organisations should be responsible for planning, developing, and ongoing management/ operation of the tool?

A partnership between AITSL, ESA and ACARA. Planning, developing, managing and operating a robust and effective assessment tool focused on providing practical support to improve teaching practice, will require a combination of expert skills, capabilities and experience. As national sector leaders in education reform, AITSL, ESA and ACARA have agreed to each contribute their unique capabilities and experience to this project.

The three organisations play a significant role in the educational infrastructure landscape for Australia, and the development of any large-scale, national reform project would require input from each organisation to ensure that critical insights, specialist expertise and strong sector relationships are utilised. Given the prior experience and capabilities each organisation holds, there is likely to be benefit in delivering the tool through a collaborative arrangement, with roles and responsibilities aligned with strengths and capabilities of each organisation.

Establishing a strong governance and delivery framework will be critical to the success of this project. A preliminary framework has been considered as part of this business case, with the goal being to leverage the strengths and capabilities of each organisation. This has informed the identification of proposed roles and responsibilities for each partner to adopt in the development of the tool.

Project governance should be established with a single point of accountability and appropriate separation of management, and decision making activities assigned according to organisational skills and strengths. An independent governance group or committee could be formed to guide the project, including assignment of project leaders and delegation of responsibilities in the first instance.

Critical to the successful implementation and the adoption of the tool will be the effective engagement with teachers, principals, Faculties of Education, State and Territory Education Departments, and the non-government school sector. Given that the key focus of the proposed assessment tool is to provide practical support to improve teaching practice, rather than enhance accountability, our preliminary assessment is that successful project leader(s) will require strong relationships with the sector, demonstrated expertise in developing guidance for teachers, and proven capabilities in the development of online assessment tools.

Given their roles and shared interest in this initiative, it will be critical that AITSL, ACARA and ESA work closely as partners as well as with education sector stakeholders to ensure that appropriate views and specialist capabilities are fed into the project. Should the AITSL, ESA and ACARA decided to proceed, consultation with the key stakeholders outlined above will be necessary to confirm the key purpose of the tool, and the final governance arrangements that are most likely to both guide development and build support for large scale adoption.

It is important to note that State and Territory governments will play a critical role in ensuring the success of the tool. In particular, they will be required to contribute to the development of the tool (in terms of providing in-depth information about curricula and content related to the subjects selected for inclusion in the tool) in order to ensure that standardised items are relevant and applicable across jurisdictions. Their assistance in socialising the tool and working with the education system participants at a State and Territory level will also be critical to its successful uptake and use by teachers and school leaders.

5 How should the technology be created?

Leverage current platforms, if suitable. Whilst there are a range of options available, preliminary analysis suggests that leveraging one of the several existing technology platforms, may represent the most effective and efficient mechanism to support the development of the tool.

Based on a preliminary assessment, existing technology platforms that could be utilised include the Online Assessment Program (ONAP), Victoria's Insights Platform and the New Zealand e-asTTle Platform. These may enable efficiencies, including:

- consistency of approach and national alignment in education platforms; and
- lessons learnt and initial investment of setup and configuration to be leveraged.

Whilst efficiencies seem possible at this early stage, further detailed analysis and consultation is required to test whether these current platforms provide the ability to tailor the solution to enable the unique requirements of the proposed assessment tool to be delivered. These requirements include the ability to design customisable assessment generation, including English and mathematics curriculum content, and the ability to provide feedback to support the 'what's next' reporting element of the tool.

If further investigation indicates that the current platforms are not able to be customised to cater for the requirements of the proposed assessment tool, it is advised that further investigation be undertaken into alternative options which include buying a closely aligned, off-the-shelf technology product or developing a tailored solution from the ground up.

One additional aspect of the tool which AITSL and its partners may seek to consider is its potential to link with other online adaptive assessment tools currently being used by schools in Australia. For example, the assessment tool could serve as a platform that provides a feature through which teachers could compare evidence regarding student learning obtained through the tool with evidence obtained through other tools, such as the Progressive Achievement Test (PAT) provided by ACER, of which more than 2.5 million have been delivered online every year.[10]

[10] https://www.acer.org/pat

2. Introduction

The purpose of this business case is to support the AITSL Board to consider the case for the development of an assessment tool to support Australian teachers and principals to better understand their student's progress and improve their ability to develop and administer formative assessment in the classroom.

The concept of an assessment tool to support formative assessment in the classroom is the topic of ongoing discussions between AITSL, ACARA and the ESA, who have indicated their joint interest in progressing its development at the national level.[11] Each organisation has expressed enthusiasm for the tremendous value and potential they see in such a tool in providing evidence and guidance to empower teachers and school leaders.

Formative assessment is any form of classroom interaction that generates information on a student's learning, which is then used by teachers and students to adjust teaching and learning strategies throughout the education process. Through the generation and use of timely evidence on individual students, formative assessment approaches enable teachers to improve the way they set and target learning goals, provide feedback, give instruction, and formulate future actions. Evidence in this case encompasses detailed diagnostic information about the skills and capabilities of individual students, progress against a learning continuum, gaps in learning, and growth in learning over time.

This business case envisages the development of a technology-driven tool to assist teachers in the collection and application of formative assessment evidence. This tool would be developed and offered for use on a voluntary basis to all teachers and school leaders across Australia. The tool would allow teachers to customise assessments across multiple subject areas to gauge student learning and growth at the beginning and throughout a learning unit. Although the tool would be designed with an initial focus on one subject area, it will be expanded to enable assessment and reporting for additional subject areas in the future. The tool would produce reporting that provides student-specific feedback in real-time as well as guidance to inform teacher decision making about what to do next.

The formative assessment tool is intended to provide schools with an accessible, easy-to-use, resource that will:

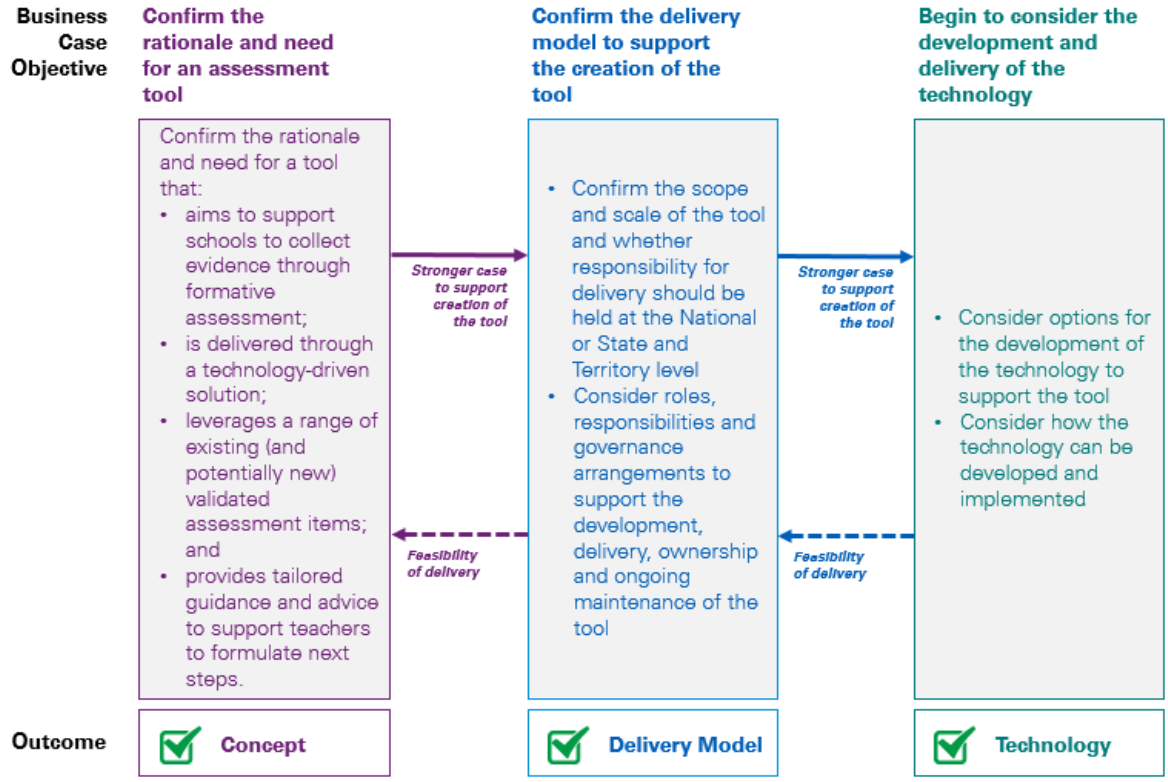
- support teachers to collect formative assessment evidence;
- provide reliable and accurate measurements of student understanding and learning growth;
- enable teachers, school leaders and students to draw on formative assessment evidence to adjust teaching and learning strategies to respond to student needs;
- provide tailored advice and guidance to support teachers to identify best practice teaching strategies and learning activities to support students; and
- encourage understanding and application of formative assessment approaches.

Business case objectives

Figure 1 summarises the key objectives of this business case. The primary aim of this report is to set out the vision for the formative assessment tool and confirm the rationale for its development. This then provides scope to consider the features of the delivery model and approach to development of the tool and supporting technology.

[11] As noted in the AITSL Board Meeting paper on the Formative Assessment Tool, dated February 3, 2017. Note these arrangements are yet to be formally endorsed by each organisation.

Figure 1: Business case objectives

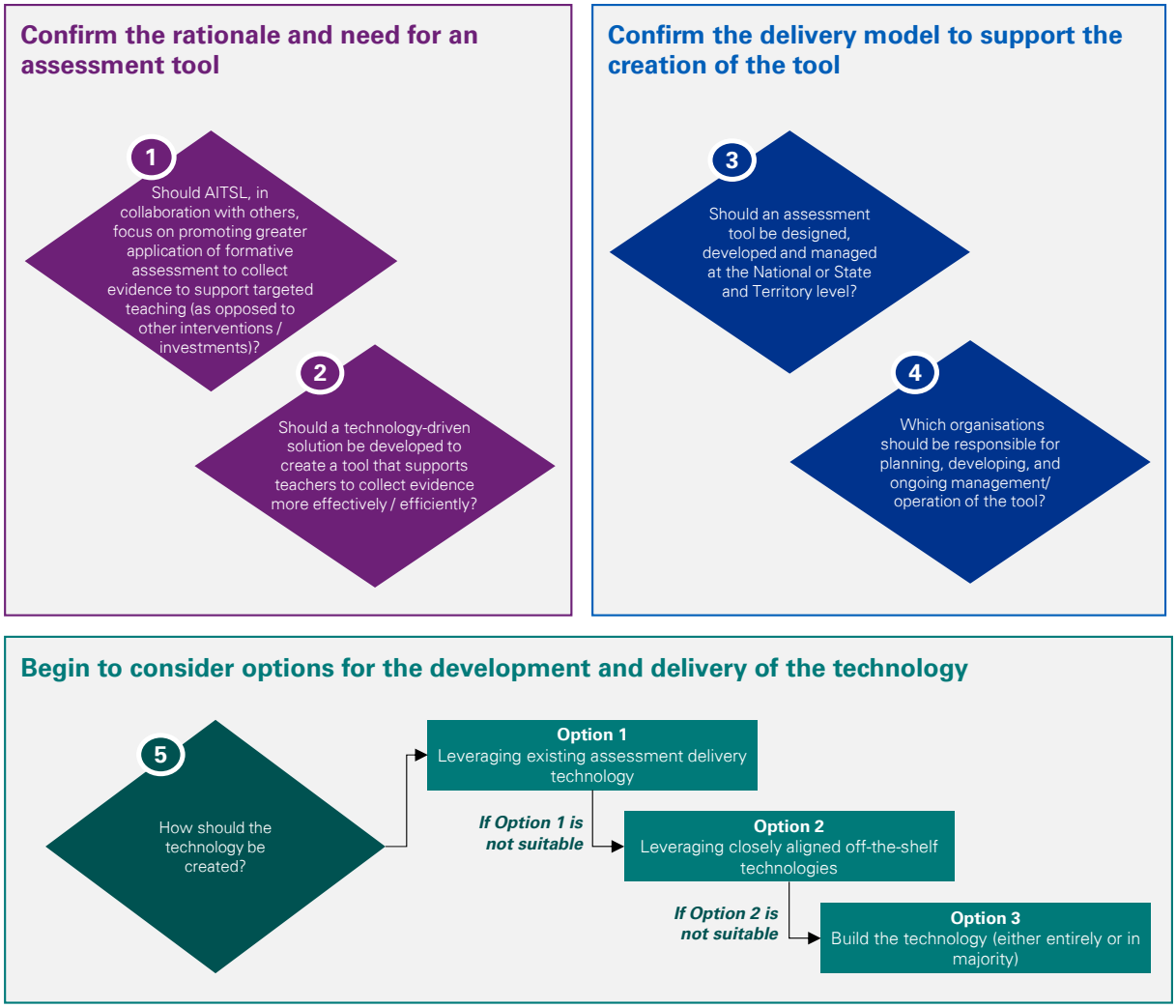


To support the AITSL Board in its decision and consideration of the creation of the tool in collaboration with other organisations, this business case considers a series of threshold questions (provided in Figure 2) that, together, provide:

- a clear rationale for the creation of a formative assessment tool, including a consensus around how aggregate data should be collected and used;
- a clear vision for the features and functionalities of the tool and the way in which it would support students, teachers, school leaders and other stakeholders; and
- an understanding of options available to AITSL and other partner organisations for proceeding with the creation of the tool and the supporting technology. Decisions related to the questions addressed within this business case would allow AITSL and other project partners to proceed to undertake more detailed planning, costing and stakeholder consultation activity, including potentially the development of a detailed business case[12] to seek endorsement and funding for the project from COAG Education Council. While the current business case is written with the assumption that funding for the development of the tool will be sourced primarily from government, it does not preclude potential partners from also contributing funding in the development of the tool. Further exploration of additional potential funding sources through partnerships and investments can be explored in the next stage of developing an expanded business case.

[12] In the form of a First Pass Business Case under the standard Commonwealth Government Department of Finance ICT Investment Approval Process.

Figure 2: Business case threshold questions and technology development options



The following table highlights the sections of this business case that relate to each of the threshold questions and options in the figure above.

Table 1: References to relevant sections of this business case that address the key threshold questions and technology development options

Question 1	See Section 3.2, Case for Change
Question 2	See Section 4.2, Benefits and Section 4.3, Current Risk
Question 3	See Section 5.1, National or State/Territory based Approach
Question 4	See Section 5.2, Project Roles, Responsibilities and Governance Arrangements
Question 5	See Section 5.3, Tool Development Options

Further information about the development of this business case

The chapter structure and contents of this business case have been developed in alignment with the Commonwealth Government Department of Finance *First Pass ICT Business Case* template. This approach was taken to support a direct transfer of much of the content in this business case to a detailed business case for funding and final COAG endorsement should the Board and its partner organisations decide to proceed.

The content of this business case has been derived from information and evidence provided by AITSL, desktop review of publicly available documentation and limited consultation with the AITSL project team (where possible in the time available). No other external consultation was undertaken to inform this business case at this stage.

If AITSL, ACARA and ESA agreed to continue to progress the development of a formative assessment tool, a more detailed business case would then need to be developed for consideration and endorsement by the Education Council, and to inform funding decisions. As noted above, this business case is written with the assumption that the Australian Government and State and Territory Governments will be the primary source of funding for the development of the tool.

However, AITSL, ACARA, and ESA may wish to explore additional options for funding, such as through partnerships, in its discussions about this businesses case, and in the development of the more detailed business case. The content of the business case presented here does not preclude any alternative funding arrangements.

3. Current situation

This section provides a summary of the current policy context, as well as the ways in which the proposed assessment tool aligns strategically with Commonwealth and State and Territory Government Policy.

Key points

- Education sector reforms that are focused on increasing the quality of teaching in Australia have been proposed and prioritised nationally. These reforms include proposals for creating additional support tools to help teachers collect and use data about individual student learning needs.
- The development of tools to assist teachers to undertake formative assessment have been proposed in strategic Australian Government policy documents. The development of an assessment tool as described in this business case would address these priorities.
- State and Territory Governments have noted their intentions to strengthen effective feedback practices in classrooms to provide a bridge between assessment and learning. For example, the Victorian Government has begun to take action down this path through the development of the Insight Platform, which allows teachers to access six Victorian Government assessments online. It should be noted that there are significant differences between the features and functionalities of the Insight Platform and the tool proposed in this business case.
- In addition to being aligned with government priorities, the development of an assessment tool is strongly aligned with the strategic priorities and key areas of focus and service delivery of AITSL, ACARA, and the ESA.
- AITSL, ACARA, and the ESA have all indicated a joint interest in progressing the development of an assessment tool at a national level. Each organisation has expressed enthusiasm for the tremendous value and potential they see in such a tool in providing evidence and guidance to empower teachers and school leaders and support significant improvement in student outcomes.

3.1 Policy Context

Australian Commonwealth, State and Territory Government Ministers with portfolio responsibility for school education are united in their focus on implementing reforms that ensure all students have access to high quality school education.

There is consensus across governments and peak bodies that implementing innovative reforms to support increased teacher quality is critical for student success. The Australian Government's *Quality Schools, Quality Outcomes (May 2016)* policy paper sets out the Australian Government's vision for education reform. This paper identifies 'quality teaching' as the first of four key pillars of reform, consistent with reform actions generated by the COAG Education Council throughout previous National Partnership Agreements (2008 and 2014) in the education sector.

COAG Education Council provides a forum through which strategic policy decisions in education can be coordinated at a national level and through which information can be shared and resources allocated to address issues of national significance. AITSL, ACARA, and the ESA are responsible for supporting the policy directions set by COAG Education Council including delivering national reforms to raise the quality of teaching and student performance across the country.

AITSL, ACARA and the ESA have all indicated a joint interest in progressing the development of an assessment tool at a national level.[13] Each organisation has expressed enthusiasm for the tremendous value and potential they see in such a tool in providing evidence and guidance to empower teachers and school leaders and support significant improvement in student outcomes.

As can be seen in the section below, the development of such a tool addresses a number of current priorities and objectives of Commonwealth and State and Territory Governments, and is strongly aligned with the specific strategic priorities of AITSL, ACARA, and ESA.

Strategic Alignment

Alignment with Commonwealth and State and Territory Government Policy

The development of a teacher support tool such as the assessment tool meets a number of strategic government priorities and objectives.

COAG Education Council

In 2016, the COAG Education Council tabled a paper on national reform in which the Australian Government proposed a new national agreement to replace the existing National Education Agreement (2014 supplementary) and other declarations. In the proposed agreement, there was a call to:

- Articulate shared objectives and targets for school education in Australia underpinned by a revised performance measurement framework that allows progress to be tracked, outcomes measured and policy effectiveness assessed;
- Set out a shared national, evidence-based reform agenda in the form of a forward work plan for COAG Education Council, and identify reforms to be pursued in individual States and Territories in bilateral agreements between the Commonwealth and each jurisdiction; and
- Include mechanisms for transparency and accountability, including an annual progress report.

It is important to note that the previous National Education Agreements, dating back to 2005, also emphasised outcomes and improvements which an assessment tool would support. These include:

- Quality teaching;
- Quality learning;
- Empowered school leadership;
- Meeting student need; and
- Transparency and accountability.

Furthermore, the National STEM (Science, Technology, Engineering and Mathematics) School Education Strategy 2016-2026, endorsed by Ministers at the 11 December 2015 COAG Education Council meeting (Item 5.04), details five areas for national action specifically calling out the need for national collaborative action on the development of an assessment tool 'that helps teachers collect and use data about individual student learning needs, which builds on the continuum and utilises the nationally agreed and supported online assessment platform.'[14]

[13] As noted in the AITSL Board Meeting paper on the Formative Assessment Tool, dated February 3, 2017. Note these arrangements are yet to be endorsed formally by each organisation.

[14] http://www.educationcouncil.edu.au/site/DefaultSite/filesystem/documents/National%20STEM%20School%20Education%20Strategy.pdf

In addition to supporting all governments nationally to achieve the policy reform initiatives underpinning the key drivers articulated in the 2016 COAG Education Council paper, COAG has also expressly detailed its interest in developing a technology based teacher support tool in:

- the Education Council paper on National School Reform (Item 3.01 of the 16 December 2016 meeting) which noted that implementation of such a tool would support all five of the national education reform themes identified in the paper; and
- the Education Council paper on Online Assessment (Item 5.1 of the 15 August 2014 meeting), which noted the intention for the national online assessment platform to deliver a range of assessments including formative assessment.

The Australian Education Senior Officials Committee (AESOC), the group directly responsible for the execution of Education Council decisions, recently supported ACARA to lead the development of a proposal for an assessment tool in close collaboration with other national agencies and with input from States and Territories.

As such, the proposed assessment tool would support Government priorities and objectives which are currently at the forefront but have also been of historical importance.

State and Territory Governments

Whilst the development of an assessment tool has been on the agenda at a national level, Australian State and Territory Governments have understood the need and taken action to strengthen effective feedback practices in classrooms to provide a bridge between assessment and learning.

For example, the Victorian Government has recently developed a support tool to build effective feedback practices and promote formative assessment practices in their schools. The Victorian Department of Education and Training introduced the Insight Assessment Platform in 2017 to provide teachers with access to current assessments in an online format. The Insight Platform currently houses six stand-alone assessments that were previously only accessible through different systems (paper based or online through different platforms). These assessments are now accessible at any time through the single platform, which provides consolidated reporting on student assessment results.

It should be noted that there are significant differences between the features and functionalities of the Insight Platform and the tool proposed in this business case. The proposed assessment tool is intended to draw on a large database of validated items to support teachers to develop customisable assessments. The items accessed through the Insight Platform are limited to those provided in the stand-alone assessments built into the platform. There are also differences in the proposed reporting of the assessment tool and those currently presented through the Insight Platform.

Alignment with strategic purposes and objectives of AITSL, ACARA and the ESA

The development of the tool strongly aligns with the strategic plans and reform priorities of all three partner organisations.

As the national leader in teacher support and development, AITSL plays a critical role in providing support to teachers and school leaders across Australia, promoting excellence in the profession of teaching, and building support and expanding the capacity and capability of leaders in Australian schools. AITSL's mission is to promote excellence so that teachers and leaders have the maximum impact on learning in all Australian schools and early childhood settings. AITSL's Strategic Plan (draft) includes goals that aim to promote evidence-based practices and to advance teacher and school leader capability.

ACARA is an independent statutory authority that is responsible for development of the national curriculum and administration of national assessments and associated reporting. The introduction of the Australian Curriculum has begun a national transformation in teacher pedagogy, engaging

teachers to develop a better understanding of practices involving the collection and analysis of information as evidence of student understanding to better support student learning.[15]

The delivery and development of the tool also closely aligns with ESA's mandate - to support the development and delivery of the COAG national education agenda as the leading technology-based service provider for the education sector.

3.2 Case for Change

This section addresses the key threshold question: *Should AITSL, in collaboration with others, focus on promoting greater application of formative assessment to collect evidence to support targeted teaching (as opposed to other interventions / investments)?*

Key points

- Schools and teachers must navigate an increasingly complex policy landscape driven by global comparisons and high stakes testing regimes.
- Teaching strategies with the greatest impact are those that use evidence of learning to inform and improve teaching. Investing in student progress requires giving every teacher the time, tools and training to collect and use robust evidence to target their teaching in this way.
- Formative assessment practices support teachers to effectively collect evidence that can be used to improve teaching practice. Specifically, formative assessment allows teachers to construct appropriate teaching and learning environments to meet the specific needs of each student. It also provides an ongoing source of information on progress and growth to support monitoring and assessment of their impact on the student's learning. These time consuming practices require a unique set of technical skills.
- In order to undertake high quality, formative assessment and, in turn, make impactful, evidence-based changes to respond to student needs, teachers must have:
  - the necessary skill and understanding of formative assessment approaches;
  - adequate time, capacity and expertise to design and mark assessment information; and
  - access to the necessary evidence and expertise with which to make targeted changes to their teaching practice.
- If teachers do not have access to these elements, there is the risk that they are not able to develop and implement teaching strategies that would most effectively impact the learning and achievement of their students.
- It is currently difficult for teachers to reliably make such assessments without appropriate technical experience or support (or time to implement such rigorous approaches). The knowledge and skills needed for teachers to carry out the diagnosis, understanding and measurement of progress and determining next steps (as described above) is significant.[16]

[15] For example, guidance developed by the Archdiocese of Canberra and Goulburn Catholic Education Office, ACT Association of Independent Schools, and ACT Government Department of Education: http://www.education.act.gov.au/__data/assets/pdf_file/0011/297182/Teachers_Guide_to_Assessment_Web.pdf

[16] For example, Connolly et al. (2012) and Duncan and Hmelo-Silver (2009) p.607 show that designing high quality assessments is technical, time consuming and very challenging for individual teachers working in isolation.

- It is also difficult to maintain consistent application of high quality assessment practices from teacher to teacher within a school. The tool will help foster common conceptions of progress and knowledge aligned to the Curriculum.
- One way through which teachers can be equipped to collect formative assessment evidence and make impactful changes to their teaching strategies is through a technology-based tool that is designed specifically to meet these objectives. Such a solution would enable teachers to collect detailed and accurate formative assessment evidence in real-time, while also providing supporting information to help teachers translate evidence into better teaching practices.

Today schools are, more than ever, having to position themselves within a globally competitive environment where policy reform is driven by high stakes testing regimes.[17] They are also having to navigate large-scale, national reforms such as the introduction of the Australian Curriculum. As such, it is a critical time for government and non-government organisations across Australia to develop tools that provide additional support for teachers to develop more sophisticated assessment techniques, which can effectively guide them towards adapting their practice to the needs of their students.

Teachers are not always equipped with the necessary tools, skills, and time to undertake high quality, formative assessments that are required to obtain evidence on which to base pivotal decisions in the learning process

In order to undertake high quality formative assessment, and, in turn, make impactful, evidence-based changes in order to respond to student needs, teachers must have the necessary skill and understanding of formative assessment approaches, adequate time, capacity and expertise to design and mark assessment information, and access the necessary evidence and expertise with which to make targeted changes to their teaching practice.

If teachers do not have access to these elements, there is the risk that they are not able to develop and implement teaching strategies and lessons that would most effectively impact the learning and achievement of their students, either due to restrictions on their knowledge and access to high quality evidence, or due to time constraints.

It is currently difficult for teachers to reliably make such assessments without appropriate technical experience or support (or time to implement such rigorous approaches).[18] The knowledge and skills needed for teachers to carry out the diagnosis, understanding and measurement of progress and determining next steps is significant. Teachers are too often left on their own to determine the next deliberate act of teaching.

ACER has developed a National School Improvement Tool that identifies nine areas of highly effective school practice. One of these areas – the collection and use of data – is commonly identified as one of the most important areas where schools need to make significant improvements.[19]

Student completion rates and achievement are an area of concern in Australia

Particular areas of focus and growing concern, which are pivotal to the success of the schooling system, are school completion rates and student learning outcomes. Specifically, recent research has

[17] National High stakes testing in Australia was introduced in 2008 by way of the National Assessment Program – Literacy and Numeracy (NAPLAN). Australian students also participate in a number of international high stakes testing programs including the Program for International Student Assessment (PISA), Trends in International Mathematics and Science Study (TIMSS), and Progress in International Reading Literacy Study (PIRLS).
[18] As shown in the 2011 OECD review of Australian assessment practices which highlighted variability in teacher judgments of individual students. Santiago, et al. (2011), pp 43, 58.
[19] Grattan Institute, (2015), Goss, P., & Hunter, J. Targeted teaching: how better use of data can improve student learning

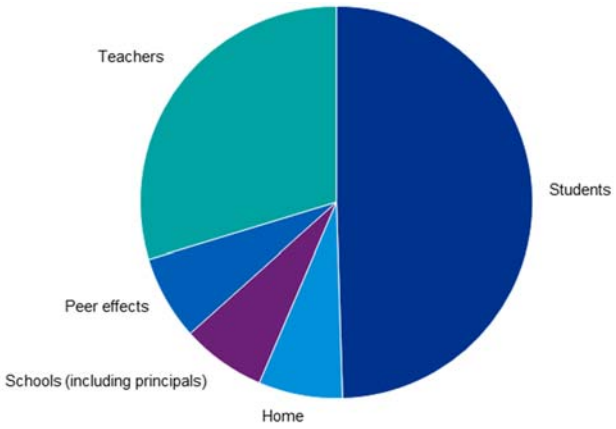
highlighted the consequences of one-quarter of Australian school students not completing Year 12,[20] and that national and international assessments suggest results have been plateauing or declining over the past 5-10 years.[21] Beyond the personal cost to individual students of not completing their own schooling, these trends impact the Australian economy, with Australian citizens bearing the cost of under-achievement in the form of costs related to welfare, crime, and forgone tax revenue.[22] The performance in, and completion of, school education by an individual student is impacted by a range of variables, from individual circumstances to broader socio-economic factors.[23]

Nevertheless, there is room for governments to ensure maximum return on public investment by improving the quality and standards of the features and characteristics of, as well as the options available to students through, the Australian education system. This can be done through building innovation and evidence-based approaches. Research demonstrates that the use of formative assessment is likely to positively impact on motivation and engagement, which is a critical indicator for student achievement and success.[24]

Teachers play a crucial role in student achievement

Research has demonstrated the important role teachers play in improving student learning outcomes, notwithstanding other features of the educational setting or socio-economic factors which impact on student achievement in schools. Specifically, teachers account for the largest proportion of variance in students' achievement (30%) after students themselves (50%), followed by peer effects, schools (including principals) and home, each contributing to 5-10% of the variance.[25] This is illustrated in Figure 3.

Figure 3: Contributors to student achievement in school setting by proportion contributed



Source: Hattie (2003)

Teachers are able to have the strongest impact on students' progress when they are able to exercise early intervention by monitoring and evaluating the impact of their teaching strategies, lesson plans, and broader curriculum on learning and by adapting lessons and teaching strategies to meet the

[20] Lamb, S., Jackson, J., Walstab, A. & Huo, S. (2015). Educational opportunity in Australia 2015: Who succeeds and who misses out. *Australian Policy Online.* Accessed via http://apo.org.au/node/58167
[21] Department of Education and Training (2016). NAPLAN results: Plateau not good enough. *Media Release.* Accessed via https://ministers.education.gov.au/birmingham/naplan-results-plateau-not-good-enough.
[22] Belfield, C. R., Levin, H. M., & Rosen, R. (2012). The Economic Value of Opportunity Youth. *Corporation for National and Community Service.*
[23] Hattie, J. (2003). Teachers Make a Difference, What is the research evidence? *Australian Council for Educational Research.* Accessed via http://research.acer.edu.au/research_conference_2003/4.
[24] Black, P. & Dylan, W. (2001). Inside the black box: Raising standards through classroom assessment. *King's College London School of Education Discussion Paper.*
[25] Ibid.

individual needs of students based on evidence about current levels of knowledge and skill. As such, in order to effectively improve student completion rates, learning outcomes, and achievement, schools, teachers, and policy makers need to have access to both formative and summative assessment data, which can shed light on areas for improvement in the process of learning, or key stages in the curriculum implementation, in addition to data which demonstrates the level of learning at the end of a key learning stage. Teachers are required to cater for a wide range of student skills and abilities in every classroom and this requires them to design differentiated tools and supports. Using formative assessment techniques to support teachers to build evidence of learning and understand how to better target their teaching practices and interventions is critical to student success, and evidence suggests this will positively impact student outcomes.[26]

Information obtained through formative assessments of students' knowledge and abilities would enable teachers to make in-time adjustments to lessons and contribute to improved student learning outcomes

Formative assessment is implemented at the beginning of and during a learning process or curriculum in order to progressively assess students' progress, provide feedback, and respond to learning needs.[27] If implemented successfully, a formative assessment approach avoids the 'black box problem'. This is the assumption that certain inputs fed into classrooms (such as additional resources or tools) create intended outputs (such as more knowledgeable students), without any guarantees of the connection between the two, nor an understanding of what happens within the classroom which receives inputs and produces outputs.[28] In other words, formative assessment can empower teachers with data to understand what is working particularly well for their students at both the classroom and individual student level. These data can also be used by parents, carers and students to understand how the student is progressing and in aggregate, at the school and policy level, to inform key decision-making and monitor progress.

Research in various countries has provided strong evidence that improving the quality of formative assessment used by teachers in classrooms would raise student achievement levels.[29] Formative assessment practices have been shown to have significant positive impacts on student learnings. If implemented effectively, it can have an impact that is larger than almost all other teaching interventions, according to John Hattie in his 2009 study, *Visible Learning*, while other studies have estimated the scale of the impact to be an increase in student learning of, on average, an additional eight months in a year.[30]

Formative assessment can only contribute to positive learning outcomes if it is based on accurate assessment items, is timely, and is responded to appropriately by teachers through adaptive teaching.[31] As such, teachers need to be equipped with the necessary tools and knowledge to ensure the success of a formative assessment approach, and to align such an approach with evidence-based best practice.

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[26] Grattan Institute, (2015), Goss, P., & Hunter, J. Targeted teaching: how better use of data can improve student learning
[27] Hattie, J. (2003). Formative and summative interpretations of assessment information. *University of Auckland*.
[28] Black, P. & Dylan, W. (2001). Inside the black box: Raising standards through classroom assessment. *King's College London School of Education Discussion Paper*.
[29] Black, P., & William, D. (2003). 'In praise of educational research': Formative assessment. *British educational research journal*, *29*(5), 623-637.
[30] The Education Endowment Foundation. (2016). 'The Teaching and Learning Toolkit', [online] Available at http://evidenceforlearning.org.au/toolkit/feedback/ [Accessed 25 May, 2017].
[31] Black, P., & William, D. (2003). 'In praise of educational research': Formative assessment. *British educational research journal*, *29*(5), 623-637.

A technology-based tool can assist teachers to undertake formative assessment by supporting them to deliver assessments more effectively and efficiently, and providing real-time evidence and advice on each student in a classroom

One way through which teachers can be equipped to collect formative assessment evidence and make impactful changes to their teaching strategies and lessons, while minimising additional time burdens and increasing access to evidence-based information, is through a technology-based solution.[32, 33] Such a solution would be most effective if it enabled teachers to develop assessments that provide highly detailed information on a student's knowledge and set the parameters of the assessment to ensure it assesses what has been taught, rather than using a pre-existing assessment.

[32] Scottish Government (2016). Enhancing Learning and Teaching Through the Use Of Digital Technology. http://institute-of-progressive-education-and-learning.org/k-12-education/k-12-testing-and-assessment-standards/
[33] Quellmalz, E. S. (2013). Technology to support next-generation classroom formative assessment for learning. *WestEd*.

4. Proposed Response

4.1 The Proposed Assessment Tool

Key points

- AITSL is proposing to develop an assessment tool for teachers and principals in partnership with ACARA and ESA, which would be made widely available for voluntary use by all Australian schools.
- The tool will provide teachers with the ability to develop and deliver customised assessments that draw on a large, validated item bank. The results of the assessments would provide teachers with real-time feedback on the strengths, achievements, and learning needs of their students. This would enable teachers to gauge the current understanding of their students at the start of a unit and to assess growth within the unit.
- One of the primary objectives of the tool is to enable teachers, school leaders and students to find out what students know, and can and cannot do, and to adjust teaching and learning strategies to respond to student needs. It is proposed that the tool include functionality that provides tailored advice and guidance to enable teachers to identify best practice teaching strategies and learning activities to support students.
- The success of the tool is dependent on the usefulness of its reporting. It is proposed that the tool include reporting on student learning and growth, as well as providing advice and guidance to assist teachers to understand the next steps in learning for each student, suggestions for teaching and learning activities, based on best practice approaches. It is critical to incorporate views of teachers in the development of reporting. This would ensure the information presented in reporting is understood by teachers and has a consequence on the interpretation of the student's progress.

This project envisages the development of an assessment tool made widely available for all teachers and principals in Australia to assist teachers in the collection and application of evidence regarding individual students. The primary output of the tool would be data on individual student learning needs and learning gains, which could then be used to inform teacher practice by revealing areas that require focus and the strategies and tasks that can have the greatest impact in their classrooms.[34] The formative assessment evidence gained through use of the tool would support teachers to answer critical question such as:

- What does the student know?
- What does the student not know?
- What would I expect the student to know?
- What do I need to go back and teach?
- What progress has the student made?
- Is the student on track to meet curriculum expectations?
- What is the next step in learning for each student?

[34] A detailed discussion of the anticipated impacts and benefits of the assessment tool on relevant stakeholder groups can be found in Section 4.2 below.

The tool would seek to draw from existing assessment items from validated assessment tools currently in use in the first instance, with the tool designed in such a way to enable addition of further assessment items over time. The items that the tool could currently draw on include:

- ESA's Improve – a bank of over 3,500 validated and moderated assessment items covering English, mathematics and science. Items are sourced from national and international test programs in which Australian students participate
- ACARA's NAPLAN items – a bank of Australian Curriculum-linked test items covering literacy and numeracy and sourced from previous NAPLAN assessments
- Victorian Curriculum and Assessment Authority's On Demand Testing – curriculum-linked items for students in Years 3-10, covering English and mathematics
- e-asTTle - New Zealand's internet-based assessment tool for teaching and learning is a system for New Zealand teachers, enabling them to select assessments in Maths, Reading and Writing (English and Marori) in Years 4-12 (ages 8-16), which are used to inform formative and summative assessment.[35]

The proposed assessment tool is intended to provide schools with an accessible, easy-to-use, resource that will:

- **Support teachers to collect formative assessment evidence on each student** by assisting in the processes of assessment creation, marking, and interpretation of results. Although the tool would be designed with an initial focus on one subject area, it will be expanded to enable assessment and reporting for additional subject areas in the future. As such, the tool would draw on a large database of validated assessment items spanning multiple subject areas that teachers can frequently draw on to assess learning against learning continuums. The reports produced by the tool would be created immediately, providing information to support teachers to answer critical questions about the student's understanding, growth, and the next steps in learning. Aspects of gamification (e.g. game elements) could be incorporated into assessments delivered through the tool, which provide further scope for delivering innovative assessment tasks and promoting student engagement.
- **Provide reliable and accurate measurements of student understanding and learning growth about each student** through the use of validated assessment items mapped to learning continuums and in-built analysis and reporting. Students learn at different rates and there can be a vast difference within a class between least and most advanced. The tool would enable teachers to use the progressions in the Curriculum, but not be informed only by what the Curriculum defines as the next step in learning for that student, but what that student actually needs to progress. Ongoing use of the tool would enable each student's assessment responses to be connected over time, providing detailed baseline data about the student's learning, and the level and pace of growth in learning. Critically, this information would enable teachers to see and make reliable inferences about the impact they are having on a student's learning.
- **Enable teachers, school leaders and students to draw on evidence about each student to adjust teaching and learning strategies to respond to individual student needs.** It is envisaged that by providing high quality and reliable evidence and guidance through a technology-driven solution, the proposed assessment tool will empower teachers to respond to the needs of their students in an impactful and evidence-based way. The reporting provided through the tool (discussed above) would provide a rich source of information to supplement teachers' judgements in formulating future actions. The reporting will enable teachers to identify the specific skills that the student needs to address next along the learning continuum.
- **Provide tailored advice and guidance to support teachers to identify differentiated best practice teaching strategies and learning activities to support each student**. A critical feature

[35] aeTTle – Assessment Tools for Teaching and Learning, for at http://www.worldclassarena.net/doc/file1.pdf, accessed on 16 June 2017.

of the proposed tool is the inclusion of tailored guidance and advice in the reporting, which would provide teachers with advice on what the next step in learning is for each student based on best practice regarding teaching strategies and learning activities that are known to have high impact. This advice may also point to professional learning that the teacher may access to assist them to deliver best practice teaching and learning strategies.

- **Encourage understanding and application of formative assessment approaches.** Student evaluation and assessment is a key area in which teachers indicate they need further professional development.[36] While not intended as a replacement for structured professional learning, the tool has the potential to assist in building the understanding of formative assessment processes, use of data, understanding of learning continuums and exposure to best practice teaching and learning activities more broadly (through the advice noted above). It is envisaged that the tool would be accompanied by a program of professional learning that not only supports schools to use the tool, but build capacity in using the data to make decisions about teaching practice.

Whilst the primary purpose of the tool is to support teachers in the classroom, there will need to be some consideration given to the extent to which the data is utilised for accountability and comparison purposes, both within and between schools. To ensure a strong up-take of the tool, learnings from similar models, (e.g. New Zealand's e-asTTle Platform) indicate it is critical that the tool be de-identified at the government reporting level and designed as a no consequences reporting tool at the school level. It is important that the data can be identified at the school level in order for it to be utilised by teachers and school leaders. However, there may be some benefits for schools and governments to identifying aspects of the data to inform teacher performance discussions within schools, and support collaboration between like schools about what works.

The key features and functionalities of the tool are summarised in the figure below.

[36] McKenzie (2008); Santiago, et al. (2011)

Figure 4: Overview of the proposed assessment tool: process and key features

1 Teacher accesses the tool

Key system features

- Available and accessible by **all Australian teachers and school leaders** on a **voluntary basis**
- Accessible through **multiple devices**
- **Easy-to-use / well-designed**
- Built on a **student/teacher information management system**

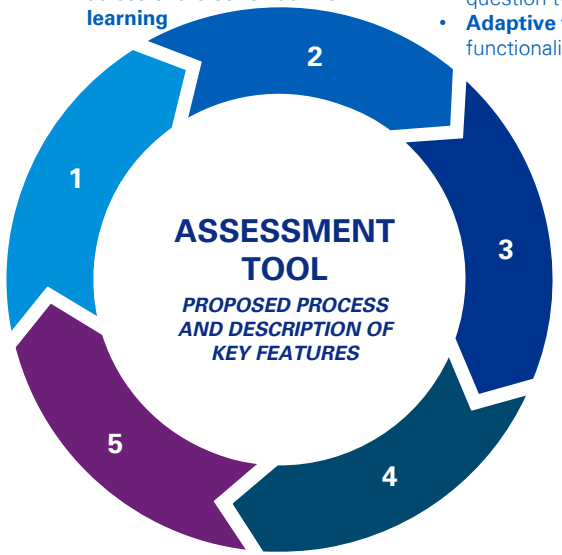
2 Teacher customises and provides assessment to students

- Large store of **validated assessment items**
- **Multiple subject areas**, mapped across entire **continuum of learning**
- **Customisable test features**, including subject area, level of difficulty, question type, test duration
- **Adaptive testing** functionality

Key tool design principles

- **Focus on measuring and tracking student growth and progress** (throughout the unit, across a year, between years)
- **Voluntary use and access** for all teachers and school leaders
- **Reporting and advice that is meaningful and understood by teachers**
- Accessible through **multiple devices**
- **Secure data and regime of access rights**

Process undertaken at the beginning of the learning unit and regularly thereafter



3 Tool automated marking and scoring

- **Automated marking** across all assessment and question types (including open ended)
- **Teacher review and validation for open-ended questions** (with supporting examples)
- **Marking across continuum of learning**
- **Scaled/equating scores** to indicate learning growth

4 Reporting on student learning, tailored advice and guidance

- Reporting that is **understood by teachers**
- Information that has a **consequence on interpretation of the student's progress**
- **Real-time** reporting of results
- **Accurately reflects the capabilities** of the students and **growth in learning**
- Identifies the **skills that the student has obtained, growth over time, and what is needed to be addressed next**
- Indicates **learning growth over time** (multiple years, longitudinal view)
- Advice on **professional learning for teachers**
- Information about the **best next steps in learning** for each student
- Suggestions for **teaching and learning activities,** based on the evidence and best practice
- **Crowd-sourced views and expertise of teachers** to build pool of guidance and advice
- **Results fully accessible at the school level. De-identified and aggregated data** for policy purposes

5 Outputs and Actions

- Teachers understand student skills and **capabilities at the start of the unit** and are able to **measure growth within the unit**
- Teachers are empowered to make **impactful, evidence-based changes** in order to respond to student needs
- Teachers are able to **address individual needs** and **use flexible grouping** to support learning
- Teachers **increase their skill base** in **formative assessment processes, use of data**, and **understanding of learning continuums**
- Teachers understand the **impact of the teaching strategies they use** and the **strategies that work best** in their context and with their students
- Teachers are able to **access the expertise and advice of other teachers**

4.2 Benefits

This section addresses the key threshold question: *Should a technology-driven solution be developed to create a tool that supports teachers to collect evidence more effectively / efficiently?*

Key points

- Data collected through a national assessment tool will impact and benefit all key stakeholders in the education system. In particular, use of the tool to generate detailed evidence is expected to improve student learning and teaching practice.
- Students are likely to experience increased engagement in education as a result of teachers tailoring their teaching practice to students' learning needs throughout the academic year, as well as through having the opportunity to highlight both areas for development as well as current strengths.
- Teachers will benefit from the tool through the tangible and experiential professional learning opportunities its use will provide, including through customising formative assessments and tailoring teaching practice using evidence-based information. Importantly, the provision of this technologically-supported tool will reduce the time burden that these activities would typically require of teachers if conducted without a centralised, online platform.
- School leaders will benefit from aggregated data from the whole school or specific year levels which could be used to understand student growth across the school, inform school improvement goals and strategies, help identify professional development opportunities for their teachers and identify areas for general school improvement.
- Parents and carers will benefit from an assessment tool through teachers being able to provide them with specific information on areas on which they can focus with their child in the home, as well as their child's noteworthy strength areas.
- States and Territory Governments will benefit from aggregated and de-identified data produced by the tool, which will provide an evidence base to inform the development of system improvement policies and strategies, support more targeted supports and interventions for principals, teachers and students, and contribute to the measurement of outcomes and policy effectiveness.

A national assessment tool will improve teaching practice, support student learning and better engage local communities in the education process

Data currently collected from national and international testing uses long-term trends to inform high-level decision-making and policy design, but is not utilised to support the needs of individual students and teachers. Due to being collected for a summative purpose, these data do not support teachers in making timely adjustments to their teaching practice in order to strengthen their support for individual students. By having access to an assessment tool, teachers will be empowered to further support their students at the individual level, as well as lift performance at the classroom level, through:

- Obtaining frequent and accurate data regarding their students' levels of skill and knowledge across a range of subjects and growth in learning. This will enable teachers, school leaders and students to draw on formative assessment evidence to adjust teaching and learning strategies to respond to student needs;

- Having access to evidence-based guidance on how to support individual students and their entire classroom based on up-to-date research, the presentation of which can be tailored according to results obtained through the formative assessment; and
- Improving feedback practices, including providing effective feedback which:
  - sets specific, tangible, and easy-to-understand goals;
  - reflects on positive areas of performance as well as constructive criticism, and is anchored in the context of changes in performance from previous efforts;
  - relates to tasks, processes and skills, and self-regulation levels; and
  - can be used in professional learning communities to identify, monitor and discuss student progress. [37,38,39,40,41]

In addition to supporting teacher quality, evidence suggests that undertaking and effectively implementing formative assessment activity has a powerful impact on student learning.[42] Increased transparency, for both students and parents alike, is more likely to keep students motivated, engaged and encourage students to drive their own learning.[43]

The impact of providing an assessment tool, which would collect the data required to make such adaptations, is mapped across different system levels and stakeholders in Table 2 below.

Table 2: Impact and benefit of utilising formative assessment tools across stakeholder groups

Stakeholder group	Impact/Benefits gained
Students	Students are more likely to successfully complete schooling and achieve higher learning outcomes due to having had opportunities to progressively improve learning outcomes and due to increased motivation and engagement.[44] By receiving timely feedback on what knowledge and skills they have across different areas, what they should know but do not yet know, and what they need to focus on for the next steps in learning, students will: • Understand where and how to **focus learning efforts** in areas requiring improvement; • Spend more learning time in an area of need, increasing the potential for **growth and engagement;** • Determine and **demonstrate instances** in which they have **mastered new skills**; • Provide teachers with **feedback** in order to enable them to **adjust their teaching strategies and lessons;** • Benefit from teachers' **use of evidence-based best practices** to respond to their needs, maximising opportunities for students to **improve their level of achievement and learning outcomes**; and • Benefit from teachers' **use and application of innovative assessment tasks,** such as through aspects of gamification.

[37] Hattie, J. & Timperley, H., (2007). The Power of Feedback. *Review of Educational Research, 77.*
[38] Black, P., & Wiliam, D. (2010). Inside the black box: Raising standards through classroom assessment. *Phi Delta Kappan, 92(1).*
[39] Wiliam, D. (2010). The role of formative assessment in effective learning environment. *The nature of learning: Using research to inspire practice.* Centre for Educational Research and Innovation.
[40] Heitink, M., Van der Kleij, F., Veldkamp, B., Schildkamp, K. & Kippers, W. (2016). A systematic review of prerequisites for implementing assessment for learning in classroom practice. *Educational Research Review (17).*
[41] Parr, J. & Timperley, H. (2010). Feedback to writing, assessment for teaching and learning and student progress. *Science Direct 15(2).*
[42] Hattie, J. & Timperley, H., (2007). The Power of Feedback. *Review of Educational Research, 77;* Black, P., & Wiliam, D. (2010). Inside the black box: Raising standards through classroom assessment. *Phi Delta Kappan, 92(1).*
[43] Black, P. & Dylan, W. (2001). Inside the black box: Raising standards through classroom assessment. *King's College London School of Education Discussion Paper.*
[44] Black, P. & Dylan, W. (2001). Inside the black box: Raising standards through classroom assessment. *King's College London School of Education Discussion Paper.*

Stakeholder group	Impact/Benefits gained
Teachers	Teachers better understand where their students are and what changes to their teaching practice they need to make in order to progress their students' learning. Access to accurate measurements of student growth enables teachers to see and make reliable inferences about the impact they are having on a student's learning. The tool would enable teachers to: • Implement **evidence-based, tailored interventions** to **respond to student needs** and **improve outcomes** for individual students as well as at the classroom level; • **Support professional conversations** with colleagues and performance and **development conversations**/appraisals with school leaders; • **Provide feedback** with characteristics that have been **determined through empirical research to be effective**; • **Develop professionally** and increase their knowledge of best practice in relation to how they can be more impactful in their teaching; and • Allow teachers to **assess students' general capabilities**, such as critical thinking, reasoning, and problem-solving, which are also part of subject-specific learning. An online platform would assist teachers to adopt formative assessment tools by providing **accurate and timely evidence on student learning** and **guidance on how to streamline and target their efforts**. In particular, the tool would assist teachers to: • **Efficiently and effectively** develop and mark **customised formative assessments**; • **Efficiently and effectively** implement assessments at the beginning and end of the term; and • **Access best-practice and evidence-based approaches** through which to tailor their teaching practice. This advice will be up to date with the latest evidence-based strategies and proven based on outcomes.
Parents / carers	Parents/carers are more involved in the educative process, are able to better understand and support their child's progress, and can discuss the feedback provided with their child as well as implement strategies outside of school to complement their child's in-school learning. In particular, parents/carers would be able to: • Through the tool, access the reports their child receives to **gain greater insight into areas of development and achievement**; • Teacher advice on **effective strategies or activities they can implement at home to support their child's learning**; and • **Maximise their own impact on their child's learning** outside of school by providing targeted support in areas of development and nurture skills in areas of achievement.
School leaders	A school leader uses the **aggregated data** from the whole school or specific year levels to: • Identify trends or patterns in the data in order to **identify and set evidence-based, whole-of-school improvement goals**; • Identify areas of need for **professional learning** and **provide targeted support based on evidence**; • **Understand student growth across the school**; and • **Inform school reviews** using data of student learning growth.
Systems / Sectors	Each system or sector uses **aggregated and de-identified data** from its schools to **inform policy-making and direction-setting,** as well as to assist in **prioritisation of resources to those areas that have a strong impact** and/or to **support professional learning** in required areas for teachers.

Stakeholder group	Impact/Benefits gained
	Transparency around school and sector performance is increased, leading to an **increase in accountability within the sector.**
States / Territories	The State or Territory uses **aggregated and de-identified data** to: • **Inform new directions or policies at a State/Territory wide level** using evidence on student learning within their jurisdictions. In particular, using this data as an evidence base to support more targeted supports and school/system interventions; • Contribute to **measuring outcomes and policy effectiveness** with reference to the proposed revised national performance measurement framework; • Contribute to **standardising best practice on a State level** in order to **support teaching practices and improve education outcomes**; and • Support the **implementation of the Australian Curriculum**, and maximise **opportunities for collaboration between expert educators** across the country.
National	• AITSL and ACARA use the **aggregated national data to refine and improve the tool** as well as **develop resources to support teachers in areas of need**. • The Commonwealth Department of Education and Training use the data to support the **measurement of outcomes and policy effectiveness**, referenced to the proposed revised national performance measurement framework. • **Support for schools and teachers** is provided in **areas of need based on evidence.** • **National policy decisions** are based on a greater level of **detailed evidence about student growth.**

A national assessment tool is likely to have a broader positive economic and social benefits for individuals and society

As described above, the introduction of an assessment tool is expected to have a range of positive benefits across all education stakeholder groups. Primary among these are the anticipated benefits related to improvements to teaching practice and teacher effectiveness. Notwithstanding other features of the educational setting or socio-economic factors which impact on student achievement in schools, research has demonstrated the important role teachers play in improving student learning outcomes. Teacher effectiveness has been shown to be one of the most influential factors affecting student educational outcomes.[45,46,47,48,49]

In addition, to the extent that such a tool contributes to improved teacher effectiveness and better student outcomes, its adoption is likely to result in broader flow-on economic and social benefits. Improvements in education outcomes have been shown to have a range of positive impacts for individuals and society. The education system contributes to building the human capital of individuals and overall levels of workforce innovation capacity and, as a result, sustains economic growth.

[45] Hanushek, E., J. Kain, et al. (1998). Teachers, Schools and Academic Achievement. Cambridge, MA, NBER Working Paper Series No. 6691.
[46] Hattie, J. (2003). Teachers Make a Difference, What is the research evidence? Australian Council for Educational Research. Accessed via http://research.acer.edu.au/research_conference_2003/4.
[47] Rockoff, J. E. (2004). "The Impact of Individual Teachers on Student Achievement: Evidence from Panel Data." American Economic Review 94: 247-252.
[48] Hanushek, E. A., J. F. Kain, et al. (2005). The Market for Teacher Quality. Cambridge, MA, NBER Working Paper Series No. 11154.
[49] Leigh, A. and C. Ryan (2010). "Long-Run Trends in School Productivity: Evidence From Australia." Forthcoming, Education Finance and Policy.

Besides the intrinsic value of being educated, education is associated with a wide range of specific social benefits for both individuals and society.

Much academic research has been devoted to the analysis of the effects of education on economic growth. A recent meta-analysis of 56 studies identified that this research generally finds that there is a positive effect of education (*measured in terms of the stock, or level, of human capital and quality of human capital*) on economic growth, regardless of the methodological approach used to measure this effect.[50]

Further, the research suggests that increases in education attainment and quality *cause* higher rates of economic growth, and the economic impact has the potential to be significant. A series of studies, driven by Eric Hanushek, Ludger Wößmann and Dennis Kimko, have estimated that one standard deviation increase in student performance, as measured by test scores, lifts gross domestic product (GDP) by 1.4-2 per cent in the long term.[51] It should be noted that these estimates can be sensitive to a range of methodological factors, and vary from one study to the next. Other studies suggest that the economic benefits of improving Australian school education may be smaller, although still significant.[52] Moreover, there are no estimates of the potential magnitude of the impact of a national assessment tool, separate to other initiatives, on student outcomes.

Research by the former director of School Education at the Grattan Institute, Ben Jensen, on the impact of investments in teacher effectiveness found that a 10 per cent increase in the effectiveness of Australian teachers would increase long-run economic growth by an estimated $90 billion by 2050. The study highlights five mechanisms to improve teacher effectiveness, three of which rely on effective teacher evaluation and development. While the tool would not directly address the mechanisms highlighted in this report, the evidence generated through regular and effective use of the tool could contribute to more effective teacher evaluation and development, thereby indirectly contributing to the realisation of the benefits noted in this report.[53]

A range of social benefits of education are also identified in the literature, including improved health outcomes, effective democratic participation,[54] increased awareness about environmental issues,[55] and overcoming disadvantage to promote equal access to fulfilled lives.[56]

4.3 Current Risk

This section addresses the key threshold question: *Should a technology-driven solution be developed to create a tool that supports teachers to collect evidence more effectively / efficiently?*

[50] Benos, N. & Zotou, S., (2013). Education and Economic Growth: A Meta-Regression Analysis.

[51] See OECD, (2010). The High Cost of Low Educational Performance: The Long-run Economic Impact of Improving PISA Outcomes. Paris, France, OECD Publishing. and Hanushek, E. A. & Kimko D. D., (2000). Schooling, Labor-Force Quality, and the Growth of Nations. American Economic Review 90(5): 1184-1208.

[52] For further discussion and overview of this research, see Jensen, B., (2014). Investing in Our Teachers, Investing in Our Economy. Grattan Institute

[53] Jensen, B., (2014). Investing in Our Teachers, Investing in Our Economy. Grattan Institute

[54] Putnam, R. and J. F. Helliwell (2007). "Education and Social Capital." Eastern Economic Journal 33(1

[55] OECD (2007). PISA 2006: Science Competencies for Tomorrow's World. Paris, France.

[56] Isaacs, J. B., I. V. Sawhill, et al. (2008). Getting Ahead or Losing Ground: Economic Mobility in America, Brookings Institute.

Key points

- The Australian education sector is currently in need of innovative solutions and tools to support teachers in their practice, and students in their learning, in order to increase Australia's competitiveness on a global scale.
- Failing to provide an intervention in the form of an assessment tool would mean that Australia would not experience the benefits that such a tool would offer, and that existing challenges in the education sector will continue to exist.
- Considering the progress that other jurisdictions (e.g. New Zealand) have made in the formative assessment space, Australia may not be competitive on an international scale should it not seek to develop its own assessment tool.

This section outlines the risks faced by the Australian education system and broader economy, should innovative strategies to improve student outcomes, such as developing an assessment tool, not be implemented.

Educators and policy makers have strong evidence about how to improve student learning and support teacher quality across the system through the provision of guidance regarding formative assessment tools. Not acting to support teachers to develop the tools they need in this critical area of their practice may risk a further decline in student outcomes at a national level.

Existing challenges faced within the Australian education system will be exacerbated, which will reduce Australia's success and competitiveness at the global level

Should Australia's education policy environment and systems fail to successfully address the challenges which it currently faces, its ability to meet the demands of society as they evolve will be reduced.[57]

A 2016 paper by the Australian Council for Educational Research (ACER) outlined five key challenges which the Australian education system currently faces. These challenges would be exacerbated should no proactive action be taken by governments to support schools to lift student outcomes. As noted in Section 3.2 - Case for Change, the provision of easy-to-use formative assessment tools, and of complementary, accessible, and high-quality evidence-based guidance to teachers, may be a form of proactive action which could help mitigate the associated risks. These challenges, the discussion of which has been updated for this business case using 2015 PISA results, are summarised as follows:

- ***Declining levels of the average performance of Australian 15 year olds since 2000, and for reading and mathematical literacy levels in particular:*** Not only has the overall performance of Australian school students been declining, their level of engagement and interest in advanced subjects, including mathematics and science, has also been on the decline in comparison with students in other countries.[58] Competitive performance in these subjects on a national level is required for Australians to be equipped for the workplace of the future, and for Australia as a nation to be competitive in a global economy.
- ***Large numbers of Australian students are not meeting minimum standards for their year levels:*** In 2016, seven per cent of Year 9 students had not achieved the national minimum standard for NAPLAN, with this proportion either remaining the same or experiencing slight

[57] Masters, A. O., & Geoff, N. (2016). Five challenges in Australian school education. *Policy Insights.* Australian Council for Educational Research. Accessed via: http://research.acer.edu.au/policyinsights/5/
[58] Masters, A. O., & Geoff, N. (2016). Five challenges in Australian school education. *Policy Insights.* Australian Council for Educational Research. Accessed via: http://research.acer.edu.au/policyinsights/5/

increases/decreases since 2008.[59] While this appears to be a positive result, PISA results show that Australia is lagging behind other countries in terms of achievement scores for 15 year olds. Specifically, in 2013, the OECD estimated that 20 per cent of Australian 15 year olds fail to achieve the minimum international standard for mathematics, and that 14 per cent of this cohort lack the required reading skills to adequately participate in the workforce and to contribute as productive citizens.[60] Furthermore, PISA results from 2015 indicated that these trends had not changed substantially, and that Australia performed worse than nine countries, with scores from the Northern Territory and Tasmania even ranking below the OECD average.[61]

- ***Growing disparity between Australian schools associated with socio-economic background:*** Students already at risk, such as due to being from a lower socio-economic background, may continue to be disadvantaged due to not having access to targeted teaching and instruction. In 2015, there was a 91 point difference between students in the highest and lowest quartiles for socio-economic background, which equals approximately three years of schooling or more than one proficiency level, and a decline of 15 points between the lowest and highest quartiles in the difference between 2006 and 2015. A similar trend was identified in literacy and mathematics, with a difference of 89 points for literacy, and 86 points for mathematics, between students in the highest and lowest socio-economic quartiles.[62]
- ***One in five Australian children are developmentally vulnerable upon starting school and are at risk of being locked into long-term low achievement:*** Twenty-two per cent, or approximately 60,000, of Australian children starting school are developmentally vulnerable[63] and are less likely to successfully transition to school and achieve strong long-term educational outcomes than their peers.[64] A deeper dive into these trends shows that children in some population groups are at more risk than others. For example, 42 per cent of Indigenous children were identified as developmentally vulnerable, whereas 21 per cent of non-Indigenous children were identified as such.[65]
- ***The attractiveness of teaching as a career is lower for more able school leavers:*** Governments in Australia aspire to recruiting teachers from the top 30 per cent of the population. However, most individuals offered places in initial teacher education courses have an Australian Tertiary Admission Rank (ATAR) below 70.[66]

Australian students are at risk of falling behind in their learning if their levels of achievement and learning needs are not well diagnosed and addressed.

As noted throughout this report, it is difficult for teachers to gauge student learning and growth in learning accurately. The knowledge and skills needed for teachers to carry out the diagnosis, understanding and measurement of progress and determining next steps is significant. Teachers are too often left on their own to determine the next deliberate act of teaching. This seriously under-utilises the evidence base around what works best, and puts every child's learning at jeopardy. It also requires all teachers to be up to date with the latest evidence-based strategies and be able to discern between the pedagogy to the approaches that are well-researched and proven based on outcomes.

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[59] Australian Curriculum, Assessment and Reporting Authority (2016). NAPLAN achievement in reading, writing, language conventions, and numeracy: National Report for 2016. ACARA, Sydney.
[60] Thomson, S., De Bortoli, L., & Buckley, S. (2013). PISA 2012: How Australia measures up. Camberwell: Australian Council for Educational Research.
[61] Thomson, S., De Bortoli, L., & Underwood, C. (2017). PISA 2015: Reporting Australia's results. Australian Council for Educational Research. Accessed via: http://research.acer.edu.au/ozpisa/22/
[62] Ibid.
[63] Commonwealth of Australia. (2016). *Australian Early Development Census national report 2015*. Canberra: Department of Education and Training.
[64] Masters, A. O., & Geoff, N. (2016). Five challenges in Australian school education. *Policy Insights*. Australian Council for Educational Research. Accessed via: http://research.acer.edu.au/policyinsights/5/
[65] Ibid.
[66] Ibid.

Without appropriate support to aid teachers to accurately measure student learning, teachers are unable to ensure that each student receives a year's growth for each year's input. This risk is compounded when teachers focus on delivering the curriculum for a particular year of school rather than understanding how well students have learnt what has been delivered and whether there are any gaps in their knowledge. Teachers should be using well mapped learning progressions, and agree on what progress is, to pinpoint where individuals are in their progress and to inform personalised stretch targets for each student. This information needs to be shared with the student, their parents or carers, and other classroom teachers who are likely to interact with that student.

Current levels of school completion and achievement rates impose a large economic cost on the Australian economy. These costs will continue to burden Australian tax payers in the absence of sufficient intervention.

In a 2017 study, the Mitchell Institute found that more than one-quarter of Australian 19 year olds do not complete Year 12 or equivalent qualifications, and that completion rates were particularly low in economically disadvantaged communities. [67] The study highlights the social and economic impacts of this situation on individuals as well as the Australian economy and society more broadly. The report estimates that the average fiscal cost to Australian governments (or taxpayers) is $334,600 for each early school leaver and $12.6 billion in total (based on modelling of lifetime costs associated with early school leaving in 2014 dollar terms).[68]

In 2012, Bellfield, Levin and Rosen estimated the total cost per 'opportunity youth' (young people who are largely disengaged and not accumulating human capital through education or in the workplace) to be USD$248,240 over their lifetime in present value, and estimated that the overall cost to society per opportunity youth equalled USD$755,900[69] - with this figure representing the cost of lost economic opportunities, fiscal costs from foregone tax revenues, and additional public costs such as crime, public health and welfare. Slightly different definitions regarding the identity of 'opportunity youth' exist in the literature,[70,71] although they all mention a lack of strong educational outcomes.

As described in the benefits section above, the introduction of an assessment tool is expected to have a range of positive benefits for all education stakeholder groups as well as broader economic and social impacts. These links to broader impacts are based in a vast academic literature that highlights, in particular, the impact of teachers on student outcomes (including attainment rates) and the influence of improved education outcomes on economic growth[72]. Notwithstanding other features of the educational setting or socio-economic factors which impact on student achievement in schools, research has highlighted teacher effectiveness as one of the strongest influences on student learning outcomes. By empowering teachers to implement evidence-based, tailored interventions to better respond to student needs, it is envisaged that the tool will enable teachers to improve the learning outcomes of individual students, with the broader economic and societal impacts identified in the research following as a result.

[67] Lamb, S., Huo, S. (2017) Counting the costs of lost opportunity in Australian Education.
Lamb, S., Jackson, J., Walstab, A. & Huo, S. (2015). Educational opportunity in Australia 2015: Who succeeds and who misses out. *Australian Policy Online.* Accessed via http://apo.org.au/node/58167
[68] Ibid.
[69] Belfield, C. R., Levin, H. M., & Rosen, R. (2012). The Economic Value of Opportunity Youth. *Corporation for National and Community Service.*
[70] Swahn, M.H. & R.M Bossarte (2009). Assessing and quantifying high risk: Comparing risky behaviours by youth in an urban, disadvantaged community with nationally representative youth. *Public Health Reports, 124.*
[71] Belfield, C. R., Levin, H. M., & Rosen, R. (2012). The Economic Value of Opportunity Youth. *Corporation for National and Community Service.*
[72] This is discussed further in the 'benefits' section above.

5. Options

5.1 National or State/Territory based approach

This section addresses the key threshold question: *Should an assessment tool be designed, developed and managed at the National or State and Territory level?*

Key points

- Adopting a national approach to developing an assessment tool would present several benefits, including economies of scale relating to the development costs, providing all teachers in Australia with the opportunity to draw on best practice approaches while improving consistency in practice, and enabling a nation-wide view of performance in order to facilitate decision making and policy design.
- In adopting a national approach, the balance between standardisation at a national level and tailoring of content to specific State and Territory contexts, as well as between the benefits of teacher autonomy versus those related to establishing a means for comparability, will need to be considered.
- In developing the tool, intergovernmental relations and how best to achieve consensus at the national level will also need to be considered. State and Territory governments will necessarily play a critical role in the successful uptake of the tool, both within States and Territories and at the national level.

This section provides a discussion on the merits of the development of a tool at the national level as opposed to separate tools developed by individual State and Territory governments.

State and Territory governments will play a critical role in ensuring the success of the tool and, as such, their role needs to be considered in relation to the points listed below. In particular, State and Territory governments will be required to contribute to the development of the tool (in terms of providing in-depth information about curricula and content related to the subjects selected for inclusion in the tool) in order to ensure that standardised items are relevant and applicable across jurisdictions. Their assistance in socialising the tool and working with the education system participants at a State and Territory level will also be critical to its successful uptake and use by teachers and school leaders.

Benefits of a National Approach

- **Will enable economies of scale regarding the cost of development and implementation**

  Taking a national approach to the development of a tool is likely to provide a proportionate saving in costs, gained by efficiencies in the development, hosting, support and ongoing maintenance across jurisdictions rather than in duplication.

- **Will provide all teachers with the opportunity to draw on best practice approaches**

  Ensuring that all schools have access to best practice in assessment approaches and international research will ensure that students across all jurisdictions, regardless of location, will benefit from the latest contemporary research regarding effective feedback and assessment practices in the classroom. This will provide policy makers with the opportunity to see a large scale shift in performance across all sectors simultaneously.

- **Will support improving consistency in teaching practice across Australia**

  As detailed in Section 3.2 - the Case for Change, research suggests that teachers are not always equipped with the necessary tools and skills to undertake high-quality, formative assessment in the classroom. Application of a more consistent approach across States and Territories will ensure that students' experience is comparable and lift teacher practice across Australia. This ensures that Australia's approach to teaching practice is aligned and supports increased student outcomes across all jurisdictions.

- **Will enable a more granular, state/territory-wide and nation-wide views of performance**

  The development of a nationally comparable data set would strengthen understanding of the effects of specific interventions and student learning in particular contexts. Noting that the tool will not be mandated and it will be necessary to aggregate school-level data, it would be necessary to ensure that the data set is as large as possible to enable effective analysis and comparisons at the state/territory and national levels and to generate more intelligence data to inform the 'next steps' component of the tool. This would allow teachers, school leaders and policy makers to better target deficiencies and strengthen student performance.

Considerations when applying a National approach

- **Less ability to tailor the design to specific State and Territory government contexts**

  Whilst comparability across States and Territories throughout Australia is critical, a national approach would likely limit the tool's ability to be tailored to support specific State and Territory contextual differences. This may result in less uptake with teachers and schools if components do not align with the curriculum priorities of State and Territory governments.

- **Balance of comparability and quality vs teacher autonomy**

  In the development of a national approach, it will be critical to consider how much autonomy teachers have in tailoring the assessments to fit their unique student cohort to ensure that inherent bias or assumptions are not able to impact the results and the quality of items is maintained. The validation of assessment items across multiple assessment regimes will be critical to counter teacher bias.

- **Will require consensus at a national level**

  The development of the national tool will require the consensus/agreement of objectives and design features at a national level. This would require some consensus between all Australian governments (as the likely funding/approval body will be the COAG Education Council) and peak bodies to agree on a tool and support a large investment. A key consideration will be the appropriate arrangements and forums to do this.

- **Intergovernmental considerations**

  Intergovernmental relationships are complex in the education sector in Australia and often fraught with conflicting politics and ideologies. National bodies are limited in their ability to influence State and Territory governments and non-government schools to participate in reforms, and are unable to mandate use of a tool. The success of the proposed assessment tool will be dependent on uptake by teachers, driven by the support of school leaders and governments. It would be useful

to build some incentives into the design of governance arrangements and intergovernmental agreements with State and Territory governments to try to influence uptake across jurisdictions.

5.2 Project Roles, Responsibilities and Governance Arrangements

This section addresses the key threshold question: *Which organisations should be responsible for planning, developing, and ongoing management/ operation of the tool?*

Key points

- AITSL, ESA, and ACARA have agreed to partner on this project, and each organisation brings a diverse set of strengths, experience, expertise, and capability which should be capitalised on in the design, development, implementation, and management of the tool. A collaborative development approach that draws on the strengths of all three organisations will therefore enable the tool to be developed more efficiently and with greater likelihood of success.
- Planning, developing and operating a well-designed and effective assessment tool will require a unique combination of expert skills, capabilities and experience. The three partner organisations play a significant role in the educational infrastructure landscape for Australia, and the development of any large scale national reform project would require input from each organisation. This would ensure that critical insights, specialist expertise and strong sector relationships held by these organisations are utilised.
- The design and approach to implementing the tool should also draw on inputs from key stakeholders including teachers, school leaders, State and Territory governments, peak bodies and education associations to ensure the tool is relevant, useful and effective in meeting its objectives.
- A preliminary assessment indicates that there are several critical capabilities that the project lead for this tool will need to demonstrate to support the tool's success. These include: prior experience in the development of similar assessment tools, strong relationships with the sector and the appropriate expertise to develop reporting and guidance for teachers. Whilst appointing a single project lead will best support a strong governance model, it will be critical that ACARA, ESA and AITSL all play key roles related to the development of the tool throughout all phases of the project.
- An independent governance group or committee could be formed to guide the project, including assignment of project leaders and delegation of responsibilities in the first instance.

Designing a strong governance framework will be critical to the success of this project. In assigning clear roles and responsibilities, the COAG Education Council will need to be assured that accountability is clear, logical and robust. It is also critical that these arrangements are defined at a sufficiently granular level, to account for the various roles that would be associated with the development and delivery of such a complex initiative. One potential approach could be the establishment of an independent governance group or committee to guide the project, including assignment of project leaders and delegation of responsibilities in the first instance.

It should also be noted that the roles in respect of the design, development and implementation of the tool will be more clearly defined once the ability to leverage existing technology to deliver the tool is further established (see the discussion of technology development options below).

Project Partners

As national sector leaders in education reform, AITSL, ESA and ACARA have agreed to partner on this project. Mandated under the direction of the COAG Education Council, the three organisations play a significant role in the educational infrastructure landscape for Australia, and the development of any large-scale, national reform project would require input from each organisation to ensure that critical insights, specialist expertise and strong sector relationships are utilised.

This section describes the strengths and capabilities of each of the proposed partners for the development of an assessment tool. This understanding of the key strengths of each organisation and their current role in the education sector has informed the roles and responsibilities this business case proposes each partner adopts in the development of the tool.

AITSL

AITSL has been mandated by the Australian Government to provide national leadership in promoting excellence in school teaching and leadership, and their work program is established by the Minister for Education and Training. AITSL is driven to 'support and advance the quality of teaching and school leadership in Australian school and other education setting'.

The strengths that AITSL would bring to the development of an assessment tool include:

- **Demonstrated success in developing online resources to support teachers and school leaders:** AITSL has demonstrated their ability to develop high quality resources, to support teacher quality. AITSL's successful development and delivery of the *Teacher Self-Assessment Tool* and the *School Leaders Self-assessment Tool*, demonstrates AITSL's ability to support government schools and teachers across the country to deliver on national goals and objectives agreed upon by COAG (NEA). Development of the *School Leaders Self-Assessment Tool* has given AITSL strong expertise in the development and delivery of an information technology solution specifically designed for the education sector.
- **A strong reputation and relationship with the sector:** The success of AITSL's development, roll out and take up of the Australian Professional Standards for Teachers (Teacher Standards), in collaboration with the profession, is testimony to the strong reputation of AITSL in schools and with State and Territory governments.

  AITSL's reputation as a 'partner' to educational organisations, supporting improvement in teaching via the provision of quality tools and resources, will be critical to the uptake and success of the tool.

- **The required expertise in contemporary academic research in teacher quality and formative assessment:** A strong focus in AITSL's activity is on undertaking research and evaluation to create high-quality research publications to guide the practical resources developed by AITSL to support teachers and school leaders. This strong expertise in international best practice will be critical in the design of the tool and is critical to the tool's success and uptake.
- **Experience developing guidance material for teachers and exposure in interacting directly with users:** AITSL provide much-needed guidance to schools and teachers in the areas of initial teacher education, school leadership and successful teaching with a mission to help guide and promote excellence in the teaching profession. The project would benefit from AITSL's strong

reputation and impressive track record "in delivering important national education reforms and providing national leadership for the teaching profession".[73]

ACARA

ACARA is an independent statutory authority whose strategic directions are set by its Charter and any other written instructions from COAG Education Council. ACARA's primary functions include the development of national assessments and associated reporting on schooling in Australia and the administration of the national curriculum.

Whilst ACARA's products are focused on assessment and reporting, rather than teacher professional development, the functionality of ACARA's tools and content development expertise will provide valuable insights and opportunities for the development of the tool.

ACARA's key capabilities include:

- **Experience with development and administration of large-scale, national assessment programs:** ACARA develops and administers the National Assessment Program at the direction of the COAG Education Council. This includes national Literacy and Numeracy (NAPLAN) testing, the three-yearly sample assessments in science literacy, civics and citizenship, and information and communication technology (ICT) literacy, and participation in international sample assessments. ACARA is involved in all stages of development of these assessments and has critical capabilities and experience in item development, equating (placing assessment items on common measurement scales), psychometric analysis and reporting.
- **Alignment with the Australian Curriculum:** The Australian Curriculum is currently being led by ACARA. As a national product 'setting the expectations for what all young Australian's school be taught, regardless of where they live in Australia or their background'[74] ACARA leads national collaboration to produce the Foundations to Year 12 curriculum for 43 learning areas and subjects which have been developed and published online. It is critical that the proposed assessment tool align with the content of the Australian Curriculum and take into consideration best practice in curriculum design and delivery of the national program and ongoing updates and improvements in the curriculum landscape as a result of feedback and academic research.
- **Experience developing and administrating education based technology in partnership with ESA** (see description of ESA below).

ESA

ESA has been established by the Australian Government to support delivery of national priorities and initiatives in the schools, training and Higher Education sectors. ESA's primary objectives include advancing key nationally-agreed education initiatives as established and mandated by the Education Council. ESA's strong experience in the delivery of information technology tools in an educational setting will provide essential resources for the delivery of this project.

In the development of an assessment tool, ESA would bring **experience developing and administrating education based technology.** Specifically, ACARA has partnered with ESA to develop, design and implement the National Assessment Platform – an initiative that provides opportunities for assessment across Australia including the development of more precise results, faster turnaround of results and will support more engaging assessment practices. Schools have already been piloted and training and support in schools is underway.

[73] Article, *Education Matters Mag,* accessed on 10 May 2017 at http://educationmattersmag.com.au/lisa-rodgers-new-aitsl-ceo/
[74] http://www.acara.edu.au/curriculum

Project governance, roles and responsibilities

As project partners, AITSL, ACARA and the ESA would be expected to collectively apply their expertise and capabilities across the broad range of roles and responsibilities required to design, develop and implement the proposed assessment tool. A collaborative development approach that draws on the strengths of all three organisations will therefore enable the tool to be developed more efficiently and with greater likelihood of success.

Project governance should include a single point of accountability and appropriate management and decision making activities assigned according to organisational skills and strengths.

On balance, given the required capabilities and roles that will determine the ultimate success of the tool, KPMG's preliminary assessment is that the organisation best positioned to lead and be responsible for ongoing management of the tool should demonstrate a strong, current reputation and relationship with the sector and have experience developing expert guidance material for teachers. Whilst having a single point of leadership for the development and maintenance will be critical, all three organisations (AITSL, ESA and ACARA) have demonstrated key required skills that will support the development of the tool and should have strong input throughout all phases of the project.

An assessment of which organisation is best placed to lead the project would be best validated by a consultation process with key partners and stakeholders.

The table below lists various roles and responsibilities that are likely to be necessary to develop and deliver the proposed assessment tool. The table highlights which of the project partners or broader project stakeholders would be best placed to lead and contribute towards each role/responsibility, based on a high-level understanding of each organisation's strengths and capabilities, as noted above.

Table 3: Key project roles and responsibilities

	Role/responsibility	AITSL	ACARA	ESA
Scoping and planning the design of the tool	Defining the scope of functionality and features of the tool, based on an understanding of teacher and student needs and in consultation with stakeholders throughout the education sector	X	X	X
	Developing detailed business requirements and other scope parameters for development of the technology to support the tool	X	X	X
	Articulation and scoping of key supporting processes, including for ongoing maintenance of content	X	X	X
	Detailed approach for implementation of the tool, including communications and development of training materials and promotional activities	X	X	X
Development of content and the technology	Development of the underlying technology, methodologies and functionalities	X	X	
	Procurement or development of the assessment content	X	X	
	Development of supporting advice and guidance content provided through reporting	X	X	
	Validation of assessment content and supporting advice and guidance	X	X	

	Role/responsibility	AITSL	ACARA	ESA
	Development of supporting content, including training and implementation support materials	X		X
On-going management and operation of the tool	Maintenance and further development of assessment items	X	X	
	End-user support and maintenance of the tool			X
	Outreach across the teaching profession to support and advocate for adoption of the tool.	X		

Throughout the design and development of the tool, it will be critical to maintain ongoing engagement with education sector stakeholders to ensure the tool is effective in supporting teachers and school leaders, as well as understood and accepted by the sector. It will be particularly important to engage teachers during the design of the tool so that is understood by teachers and provides information that is relevant and actionable.

Stakeholders that will be critical to the success of the project include:

- Commonwealth, State and territory education departments;
- Teachers;
- School leaders;
- Students;
- Government, catholic and independent schools and school associations;
- Key educational academics;
- Australian Children's Education and Care Quality Authority (ACECQA);
- Parent peak bodies;
- The Australian Education Union; and
- The Independent Education Union.

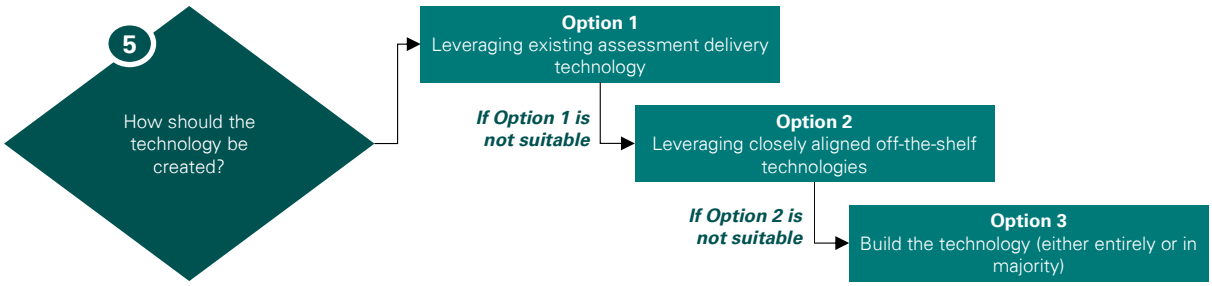
5.3 Tool Development Options

This section begins to consider how the technology that supports the tool could be created.

Key points

- Preliminary analysis suggests **Option 1 – leveraging existing technology,** such as ONAP, New Zealand's e-asTTle Platform or the Victorian Insights Platform may be the preferred option, as it is likely to deliver a more efficient, effective and context-specific tool due to the lower cost and reduced complexity for the tool build.
- It is critical that these current platforms be further investigated to determine if they are able to support the specific features needed for the proposed assessment tool.

This section considers options for the development of the technology that supports the delivery of the tool. Three options are considered as presented below, with the primary preference being to leverage existing platforms and/or technologies where possible in the development of the tool.



It is important to note that the detailed functional requirements and features of the tool are yet to be agreed in a final form. As a result, the discussion of options below assumes that the requirements of the tool are those that are described in Section 4 above. These include key functionalities such as customisable assessment generation, English and math curriculum content, ongoing item bank development, and professional support and feedback development to support 'what's next' reporting.

5.3.1 Discussion of tool development options

As documented in the COAG National STEM School Education Strategy, Australian governments have collectively articulated the preference for the development of an online formative assessment tool to utilise the nationally agreed and supported online assessment platform.[75] Whist leveraging ONAP or other current tools, such as the New Zealand's e-asTTle Platform or the Victorian Insights Platform, could provide clear opportunities for efficiencies in both cost and delivery, it is critical that the platform

75

http://www.educationcouncil.edu.au/site/DefaultSite/filesystem/documents/National%20STEM%20School%20Education%20Strategy.pdf

used to support the proposed assessment tool is able to provide the key functionality identified above.

One additional aspect of the tool which AITSL and its partners may seek to consider is its potential to link with other online adaptive assessment tools currently being used by schools in Australia. For example, the assessment tool could serve as a platform that provides a feature through which teachers could compare evidence regarding student learning obtained through the tool with evidence obtained through other tools, such as the Progressive Achievement Test (PAT) provided by ACER, of which more than 2.5 million have been delivered online every year.[76]

The options below describe critical considerations in relation to the technology component of the tool, with further technical research and consultation required to formulate a strong understanding of each of the options should the business case be successful.

Option 1 - Leveraging existing technology

Summary

KPMG'S preliminary assessment is that leveraging current technology such as ONAP, the New Zealand Platform or the Victorian Insights Platform is likely to be the most efficient and effective way to develop the tool. Detailed below is an initial analysis regarding how the development of the proposed assessment tool might align with ONAP. However, it is important to consider that a far more detailed analysis of each of the current options is required to assess functionality alignment with the unique capability requirements for the proposed assessment tool.

Potential alignment with ONAP

Based on a literature review, the ONAP appears to include core capabilities that would allow it to support the proposed assessment tool.

The grant agreement in relation to development of the ONAP stipulates that the assessment delivery system will support a range of assessments including the National Assessment Program, as well as a broader set of systemic and classroom assessments. This primary functional requirement should ensure that ONAP is developed to allow for maintenance assessment framework and an ability to generate customisable assessments from the common assessment framework.

Any additional alignment between the functionalities of the ONAP and those of the proposed assessment tool strengthen the case for use of the ONAP as the base platform for the tool. Generally, the greater the alignment between the two, the lower the cost and complexity of development for the proposed assessment tool.

The grant agreement in relation to the development of the ONAP outlines the following business requirements that align with those proposed for the proposed assessment tool:

- An assessment creation and management system which enables creation and management of items and assessments and their related workflows;
- As assessment delivery system for the management of the entire assessment delivery lifecycle, including delivery of assessments to students and managing the logistics of assigning students to assessments;
- Capability to link to content in existing learning repositories and applications such as the Australian Curriculum, Scootle and other content sources;[77]
- Components for providing reports and data extracts related to assessment events conducted within the assessment delivery system;

[76] https://www.acer.org/pat

[77] The extent to which the tool could be linked to ACER's Progressive Achievement Test (PAT) – particularly in relation to enabling teachers to triangulate evidence obtained through each tool, could also be explored.

- An assessment marking system that includes the capability for automated scoring of responses in addition to human scoring;
- A longitudinal data store that works as a data warehouse for storing assessment responses; and
- A registration and access system for creating users, storing identifiers and ensuring correct user access to various components.

Key considerations

- Does the ONAP allow for the new features required to be built thereby limiting the anticipated benefit of using an existing solution?
- Would the existing commercial and support agreements be viable or suitable to AITSL's needs?
- Does the Insights Platform allow for the new features required to be built?
- Can the New Zealand Platform be bought and utilised in the Australian context?
- Can the New Zealand Platform incorporate the additional features required for this Australian Tool?
- Will the current platform provide the design features needed to differentiate the tool from the NAPLAN program (e.g. look at feel)?

Option 2 - Leveraging closely aligned off-the-shelf technologies

Summary

Whilst it is a preference for the tool to be built using current Australian platforms, there may be some off-the-shelf solution that can be utilised. This would be akin to adopting a platform-based approach where an underlying solution is able to provide the required core functionality that can then be further enhanced or configured to meet the unique requirements for the proposed assessment tool.

The viability of this option is based on the premise that most of the key functional requirements for the envisaged online formative assessment tool can be found in existing platforms such as that of eLearning or Learning Management Systems. Examples of this include:

- *Course administration* – ability to create, assign and manage courses that serves a grouping for enrolment, communication and course management.
- *Assessment administration* – providing an assessment engine that allows for the creation, previewing and maintenance of assessments from existing question banks that are aligned to learning paths or courses. This includes the scoring and grading of the assessments based on configurable rules and methods.
- *User administration* – creating and managing users, assigning roles and accessing and handling of user login and authentication.
- *Course calendar management* – management of the course calendar that enables enrolment, notification and alerts.
- *Workflow management* – standard workflow process to manage the authoring, previewing and publishing of both the assessment content and process of taking the assessments.
- *Messaging and notification* – Automated system notifications on course allocation, modification, completion and an in-built helpdesk.
- *Integration* – ability to integrate with third party tools and datasets.
- *Tracking and reporting* – provide standard reports as well as a custom report generator that can be viewed, exported and integrated with another toolset.

There are numerous off-the-shelf offerings that are able to provide the basic functionality described above covering a variety cloud-based, open source and commercial options. A few example products include: Drupal, Adobe Captivate Prime, Docebo LMS, Talent LMS, the Academy LMS, and Administrate.

Key considerations

- Do the functional requirements of the proposed assessment tool closely align to the standard service functionality provided by an existing online platform?
- To what extent does the introduction of the new platform further complicate the current technology landscape relating to assessments in some form or another?
- What support agreements would be required for the ongoing maintenance and support of the platform?
- If so, which implementation partner would support the initial setup and configuration of the platform to meet the requirements set out for the proposed assessment tool?

Option 3 – Build a bespoke technology product

Summary

This option would encompass the development of a tailored solution to support the functionality required by the technology needed for the proposed assessment tool. This would involve developing the core functionality as described in Option 2 from the ground up. This would be the preferred option only if the online functionality required by the proposed assessment tool is seen as significantly unique or if there is material benefit to additional effort of developing a bespoke product (e.g. often organisations choose this option where they believe the product is a key differentiator in their business model and they are willing to accept or mitigate the additional risk, cost and effort inherent to this option).

Based on the information gathered at this stage, this is unlikely to be the preferred option, primarily based on:

- There are existing systems that provide similar functionality to what is required by the proposed assessment tool (e.g. ONAP, the New Zealand Platform or the Victorian Insights Platform).
- The known high level functional requirements appear to be sufficiently aligned to capabilities available in existing solutions as referenced in Option 2.

Key considerations

- To what degree is the functionality required by the online formative assessment tool unique and cannot be provided by an existing product or platform?
- Is AITSL or the envisaged owners of the proposed assessment tool willing to invest the required resources for the development and maintenance of a bespoke product?

Cost

While it is not possible at this stage to reliably estimate the costs to establish and operate the tool, the required investment is likely to increase across options, with Option 3 representing the highest cost as it involves building the tool from the ground up, rather than leveraging an existing platform or off-the-shelf technologies.

The most relevant cost benchmark for consideration provided to KPMG was a high-level estimate of the costs associated with the New Zealand tool (comparable to Option 3). KPMG was advised that the development cost of this model was approximately $28 million, and $1 million per annum for its operation. It should be noted that costs are likely to have increased significantly since that time, and there is a view that the funding provided for ongoing support is not sufficient. More detailed costings would need to be developed as part of further investigation of each option.

This cost should be considered in the context of expected rate of take up of the tool by Australian schools, and the potential for those schools to re-allocate resources currently assigned to other formative assessment approaches implemented at the school level (e.g. FTE time and software

procurement). For example, were 10 per cent of Australian schools to use the tool, the estimated development cost (based on the New Zealand estimate noted above) would be approximately $30,000 per school, and this figure would decrease as more schools take up use of the tool.

5.3.2 Advantages and disadvantages of the tool development options

The table below provides a high level overview of the key potential advantages and disadvantages of the three different tool development options that have been considered:

Option	Advantage	Disadvantage
Leveraging existing technology	• Opportunity to leverage already working and assessment tool in the Australian context. • Lessons learnt and initial investment on setup and configuration can be leveraged. • Existing support agreements and commercial contracts may be able leveraged. • Staff and knowledge could expedite the time to launch.	• Ability to tailor the solution for potential unique requirements may be limited. • Support agreements and upgrade path may be tied to the clients/tenants. • Re-use is dependent on the degree to which the solution has not already been customised.
Leveraging closely aligned off-the-shelf technologies	• Standard functionality provided may already meet most of the requirements. • New cloud-based offerings limit the need to manage infrastructure or applications. • Not directly tied into other client specific requirements or roadmaps.	• Changes required may result in a move towards customisation rather than configuration. • Resources (product specialists, implementation partner) would be required initially and potentially ongoing.
Build a bespoke technology product	• Opportunity to provide a tailored solution matching the requirements more closely.	• Run the risk of re-creating an already proven technology product. • Cost and effort of development as well as a significantly longer lead time to launch. • Complex support and maintenance agreement. • Required initial and ongoing resources (e.g. developers, testers). • Upgrade path would be difficult to manage.

5.4 Key project risks and mitigation strategies

This section identifies key project risks, their causes and proposed mitigation strategies for consideration by AITSL, ESA and ACARA.

This risk assessment has been undertaken using high level analysis and documents provided by AITSL. Table 4 below list provides a summary only of the key high level issues for consideration. If the AITSL, ACARA and ESA decide to proceed with the development of a detailed business case to seek endorsement and funding from COAG Education Council,[78] a risk workshop would be appropriate to seek views on the risks associated with a more detailed project plan from key stakeholder groups.

The table below summaries the project risks, describes their causes and outlines potential consequences and mitigation strategies.

Table 4: Key project risks and mitigation strategies

Risk	Causes	Consequences	Mitigation Strategies
Lack of consensus regarding the development of the tool between key stakeholders (AITSL, ACARA and ESA)	• Resource constraints / competing priorities • Unable to see value of the tool • Lack of consensus around governance arrangements	• Failure to develop strong business case • Delay to establishment of the tool • Inability to establish the tool • Failure to lift student outcomes • Failure to lift teacher quality	• These risks can be managed through the development of a strong business case with robust cost/benefit logic mapping and a rigorous consultation plan to ensure early management of issues. • These risks can also be managed by establishing a level of authority, or lever for AITSL to direct and/or influence States and Territories to invest and utilise the tool.
Education Council resistance to the establishment of the tool	• Resource constraints / competing priorities • Unable to see value of the tool • Strength of the business case	• Failure to progress project and design and implement tool • Failure to lift student outcomes • Failure to lift teacher quality	
Sector (school leaders / teachers) misunderstanding / resistance to establishment of the tool	• Privacy concerns associated with the data set • Inadequate communication strategy • Inadequate professional development/teacher training for use of the tool	• Failure to lift student outcomes • Diminished benefits of the tool • Delays to tool establishment • Failure to lift student outcomes	• These risks can be managed by the effective communication of the function of the tool and the benefits to students and teachers. This should include providing strong messaging around the role of data privacy and the tool's relationship

[78] A risk workshop will also be critical in the event that additional sources of non-government funding are sought by AITSL and its partners for the development of the tool.

Risk	Causes	Consequences	Mitigation Strategies
		• Failure to lift teacher quality	to/differences with the national testing regime. • It will be critical to ensure appropriate data controls are put in place to ensure detailed student, class and school level data is only available to certain stakeholders. It is likely to be necessary to aggregate and de-identify data provided to researchers and policy makers.
Public misunderstanding / resistance to the establishment of the tool	• Privacy concerns associated with the data set • Poor communication regarding the rationale for the tool	• Difficult for schools to implement which may cause low uptake	
Lack of consensus regarding the use of the tool's data (e.g. within schools and between schools)	• Lack of consensus around governance arrangements • Lack of consensus around purpose of the tool	• Delays to tool establishment • Diminished benefits of the tool • Failure to progress project and design and implement tool	• This risk can be managed through the development of a strong business case with clear deliverables and governance structures.
Lack of clear governance / ownership of the tool	• Timeframes create urgency for decision-making • Lack of consensus regarding the use of the tool (e.g. data for interschool comparison) • Poor / inadequate project planning	• Delays to tool establishment • Diminished benefits of the tool	• Ensure the detailed project plan includes a strong governance structure with clear delineation of roles and responsibilities for each stage of the project
Difficulty in accessing specialist capabilities in required timeframe	• Specialist capability required • Short timeframes	• Delays to tool establishment • Failure to achieve timely results	• This risk can be mitigated by an effective procurement strategy, an open architecture approach and appropriate project management to allow for timelines.
Lack of consensus between state and federal approach	• Failure to engage in / influence concurrent state and territory approaches	• Diminished benefits of the tool • Negative reputational impact • Low take up of the tool	• This risk can be mitigated by an effective communications approach regarding the tool, AITSL's role and its compliance with legislative obligations relating to Privacy etc.

Risk	Causes	Consequences	Mitigation Strategies
Inability to leverage existing ONAP platform	• Timeframes create urgency for decision-making • Financial constraints • Stakeholder negotiations	• Increased cost to change • Analytics and function ability compromised • Low take up of tool	• This risk can be managed through early, robust research in the project design phase and by an effective procurement strategy and an open architecture approach to establishing the required functionality in the tool.
Unclear or unexpected change in focus / priorities for the tool	• Change in Government priories driven by a new high profile incident or other factors • Lack of consensus regarding the use of the tool (e.g. data for interschool comparison)	• Development of the tool and timeframes for implementation are compromised • Failure to achieve timely results may result in non-recurrent funding • Loss of credibility with sector • Negative reputational impact • Low take up of the tool • Failure to lift student outcomes	• These risks can be managed by a strong governance structure for the project (incorporating all relevant stakeholders), communication of clear and realistic milestones for the establishment of the tool and strong project management to ensure these timeframes are met.
Expected timeframes are unrealistic	• Unexpected implementation challenges arise due to legislation, public policy changes, public expectations, stakeholder negotiations etc.	• Development of the tool and timeframes for implementation are compromised • Failure to achieve timely results may result in non-recurrent funding • Low take up of tool • Negative reputational impact • Limited data to ensure strength of tool • Failure to lift student outcomes	
Expectations of the tool are unrealistic	• Misunderstanding of the role of the tool • Poor communication of the role of the tool	• The tool and AITSL as project lead do not meet stakeholder expectations • Loss of credibility with sector	

Risk	Causes	Consequences	Mitigation Strategies
	• Inability to secure the required level of funding	• Negative reputational impact • Failure to lift student outcomes	
IT Infrastructure not ready in schools	• Short timeframes • Resource constraints / competing priorities • Inadequate technology in schools	• Delays to tool establishment • Loss of credibility with sector • The tool and AITSL as project lead do not meet stakeholder expectations • Low take up of tool • Negative reputational impact • Failure to lift student outcomes	• This risk can be mitigated through an effective procurement strategy to ensure that the appropriate technology is built. • Another factor that will mitigate this risk is to develop a strong project implementation plan that allows enough time to test critical components before going live and develop technological workarounds if required.

6. Implementation Approach

6.1 High-level development timeline and approach

The table below provides a summary of the key activities that could be undertaken in each year to develop and deliver the tool should the AITSL, ACARA and ESA agree to proceed. The forward timeline and activity for development and implementation of the tool builds upon the assumptions that there is agreement to progress the development of the tool at a national level.

Table 5: Key proposed activities

Time Period	Phase	Activity
Two months	***Planning***	Development of business case for • clear project governance arrangements • detailed scoping of functional requirements for the development of the tool including a detailed understanding of the technical environment • processes mapping to support delivery of the tool with relevant stakeholders – this is critical to supporting a detailed costing and final business case • understanding of the subjects (one for initial focus and additional subjects for future incorporation) for inclusion in the tool • development of the procurement strategy • understanding of the assessment items that would feed into the tool • stakeholder consultation schedule
Two Months	***Initiation***	Contract initiation for the development of: • the tool methodology • algorithm and validation of the tool • development of the tool, including user-centred design • item bank and feedback development • item bank and feedback validation (including piloting) • professional learning and implementation support • recommendations regarding subjects and capabilities to be incorporated within the tool
Five Months	**Phase 1** ***Design***	• Methodology development, including user-centred solution design • algorithm development/validation • item bank and feedback development (one subject, multiple years)

Time Period	Phase	Activity
11 months	**Phase 2** ***Tool Development***	• Beta launch (one subject) and communications • validation of items/feedback • user feedback • item development – additional curriculum areas • development of professional learning for teachers (e.g. modules) and implementation supporting resources
11 months	**Phase 3** ***Implementation***	• Alpha launch (three additional subjects) and communications • validation of items/feedback • user feedback • assessment and next steps
– Ongoing	**Phase 4** ***Tool Maintenance, monitoring and evaluation***	Ongoing maintenance and support including evaluation and monitoring requirements

As shown above, the establishment of the tool within the timeframes identified would require immediate commencement of planning activities in 2017-18. This will ensure the project management and support arrangements are in place to ensure that the substantial program of work required during 2018-2020 is achievable.

Project Management Approach

To ensure the success of the project, it will be critical that the project management approach be considered when taking the business case to government. An agile methodology is the preferred model for the delivery of complex information technology projects. This style of approach ensures teams are able to respond quickly to unpredictable environments through incremental, iterative work cadences and empirical feedback. An agile approach ensures planning can be adaptive and the project can evolve continuously with the flexibility required to respond to change.

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