

Submission to the Productivity Commission

Interim Report: *Building a skilled and adaptable workforce*

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*Personal submission, not made on behalf of my employer. The views expressed in this submission are not those of The University of Queensland.

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Introduction

This submission is made in response to the Productivity Commission's interim report, *Building a skilled and adaptable workforce* . The Commission is to be commended for undertaking this inquiry into a matter of critical national importance. The central argument of this submission is that the primary determinant of a skilled and adaptable workforce in the 21st century is the capacity for individuals to regulate their own learning. This capability, referred to in the learning sciences as self -regulated learning (SRL), is the foundational skill upon which all other competencies are built and adapted in an era of rapid technological change, particularly the emergence of generative artificial intelligence (AI) and automated decision -making systems.

The submission will proceed in five parts. First, it will provide a critique of the interim report's focus on lesson planning materials as a solution to teacher workload and student outcomes, arguing that this misdiagnoses the core challenge of teaching. Second, it will make the case for self -regulated learning as the fundamental competency for the age of AI, a skill of at least equal importance to literacy and numeracy. Third, it will reframe the role of educational technology, arguing that its value lies not in content delivery but in its potential to foster the metacognitive skills that underpin SRL. Fourth, it will caution against a reliance on isolated technological 'experiments' and advocate for a systemic, multi -layered approach to educational research. Ultimately, it will be argued that building the evidence base for this transformation is a matter of national strategic importance, necessitating a sovereign research capability with investment commensurate with other national priorities.

Section 1: The misplaced focus on planning over execution: A response to Draft Recommendation 1.1

The interim report correctly identifies that "School teachers are under pressure to produce teaching materials for a wide range of student abilities" and that "workload pressures are commonly cited as reasons for teachers leaving the profession early". However, Draft Recommendation 1.1, which proposes investment in a "single online national platform that houses a comprehensive bank of high -quality, curriculum -aligned lesson planning materials," misdiagnoses the fundamental nature of the teaching challenge. This recommendation addresses the least complex and, in the age of AI, increasingly automatable component of a teacher's work.

The critical and most demanding work of a teacher is not the static design of a lesson plan but its dynamic, real -time *execution* in a complex classroom environment. The core challenges of teaching lie in managing diverse student behaviours, adapting instruction to a wide range of abilities within a single class, providing timely and effective feedback, and fostering a positive and inclusive learning environment. These are fundamentally interactive, relational, and adaptive skills. Consequently, high -quality teacher training and professional development rightly focus on enhancing these complex pedagogical capabilities rather than on the creation of lesson plan documents. While a well -structured plan is a necessary starting point, its value is exhausted at the moment of implementation, where the teacher's professional judgement and adaptive expertise become paramount.

Furthermore, the premise of a national repository is largely rendered obsolete by the rapid advancement of generative AI and automated decision -making systems. The Commission's report acknowledges the development of state -based AI chatbot tools that can assist teachers with lesson planning. These technologies can already produce serviceable, curriculum -aligned, and context -specific lesson plans on demand. By the time a national repository of vetted, static lesson plans could be developed and curated, the capabilities of generative AI will have far surpassed it in utility, flexibility, and responsiveness. Furthermore, this approach has been trialled in many other countries and has proven to be a failure. The value proposition of such a repository is therefore highly questionable and represents a significant investment in a flawed solution for a problem that technology is already solving.

The focus on a lesson plan repository is symptomatic of an underlying and outdated model of education and training, one that views learning as the simple transmission of pre -packaged content. This industrial -era paradigm, where the teacher's role is to deliver a standardised plan, is fundamentally misaligned with the stated goal of building an adaptable workforce. AI and other advanced technologies are exceptionally proficient at automating the transmission of content. This technological reality does not render teachers obsolete; instead, it elevates their

most human and professional functions. The modern teacher's role is not to be a deliverer of plans but a facilitator of learning processes, a diagnostician of student understanding, and a coach for developing the cognitive and metacognitive skills students need to learn for themselves.

The investment proposed for a national platform would be more strategically and effectively allocated to a national initiative for professional development that builds teachers' capacity for this kind of adaptive expertise and sophisticated classroom execution. The problem is not a lack of potential lesson plans; it is a lack of time and systemic support for teachers to develop and practice the advanced pedagogical skills required to meet the needs of every student.

Section 2: Self-regulated learning: The foundational skill for an adaptable workforce

To build an adaptable workforce, education and training systems must prioritise the cultivation of the foundational skill of adaptability itself: the ability to learn how to learn. In the learning sciences, this is known as self-regulated learning (SRL). SRL is the process by which learners actively monitor, direct, and regulate their cognition, motivation, and behaviour to achieve their learning goals. This is not a peripheral 'soft skill' but a core competency of equal, if not greater, importance than traditional literacy and numeracy for navigating the 21st-century economy.

In a world where knowledge is abundant and constantly evolving, and where future workers will increasingly collaborate with AI systems as peers and co-workers, the most valuable human capability is the ability to direct one's own learning journey. This involves accurately identifying knowledge gaps, setting appropriate learning goals, selecting effective strategies, monitoring progress, and adapting based on feedback. Without these SRL skills, knowledge itself becomes inert, and access to powerful digital tools becomes ineffective or even counterproductive. As my own research and extensive engagement with national and international education bodies have consistently highlighted, fostering this capacity for self-regulation is both the central challenge and the central opportunity for modern education and training.

It is essential to note that an emphasis on SRL is not a substitute for a knowledge-rich curriculum or explicit instruction. Rather, it is an essential and profoundly under-emphasised complement. SRL provides the mechanism through which students engage with, make sense of, and apply knowledge. A student with well-developed SRL skills can take a rich curriculum and turn it into deep, durable, and transferable understanding. A student without these skills may struggle to progress, regardless of the quality of the curriculum content presented to them.

In this context, the Commission's reference to Singapore's high performance in PISA rankings as a potential model warrants caution. While Singaporean students consistently excel on standardised international assessments, a significant body of analysis suggests this performance is achieved within a highly structured, examination-focused system that may not adequately foster creativity, critical thinking, or the self-directed learning skills necessary for navigating ambiguity. The system is adept at producing students who can execute a well-defined plan to arrive at a correct answer. However, the key challenge for an adaptable workforce is not merely executing existing plans but instead developing the capacity to formulate new ones in novel situations. An over-reliance on highly structured curricula, as seen in the Singaporean model, risks producing graduates who are less equipped for the adaptive problem-solving that the future economy will demand.

Section 3: Re-orienting technology towards deeper learning: A response to Draft Recommendation 1.2

Draft Recommendation 1.2, which calls for the Australian Government to "provide national leadership on edtech and AI in schools" and to "establish a framework for assessing edtech tools' quality and alignment with evidence-based practices," is a welcome and necessary step. A coordinated national approach is essential to ensure equitable access, avoid the costly duplication of effort currently underway in state-based AI tool development, and leverage the collective purchasing power of all jurisdictions. My advisory work with the Australian Government on AI in education and with TEQSA on assessment reform has consistently highlighted this need.

However, the proposed evaluative framework, as described, is insufficient. The critical question for assessing any educational technology is not simply, "Does it improve performance on a test?" but rather, "Does it make students better learners?" The current framing risks endorsing technologies that produce superficial performance gains without building the underlying cognitive and metacognitive capabilities that constitute genuine learning and adaptability.

A robust, evidence-informed framework must incorporate deeper measures of learning, chief among them being metacognitive calibration. Calibration is the measure of how accurately a student can judge their own performance and understanding. Research consistently shows that poorly calibrated learners, who are often the lowest-performing students, tend to be overconfident in their knowledge. This inaccurate self-assessment prevents them from regulating their learning effectively; they do not allocate sufficient effort or seek help because they do not recognise their own lack of understanding. An educational technology that provides performance feedback (e.g., a score on a quiz) without improving a student's calibration may fail to foster the self-awareness necessary for independent learning.

Therefore, a national assessment framework for edtech must prioritise tools that are demonstrated to improve not just performance, but also the accuracy of students' self-monitoring. AERO has already begun work towards this framework, but the work has stalled. It must continue.

This situation points to a more profound role for AI in education and training. Its true potential is not as an automated content-delivery system but as a 'co-agent' in the learning process, facilitating self- and co-regulated learning. The most promising AI tools are those that can make a student's thinking processes visible to them, prompting reflection, encouraging strategic planning, and providing feedback that helps them become more accurate judges of their own learning. This is the "evidence-based practice" that a national framework should be designed to identify and promote.

The current public and policy discourse surrounding AI in education and training is often trapped in a narrow binary of academic integrity versus administrative efficiency. This focus on preventing cheating or saving teachers time overlooks the most fundamental pedagogical question: does a given technology enhance or atrophy the learner's agency? Without an explicit and primary focus on building students' capacity for self-regulated learning, even the most sophisticated AI tools risk creating a generation of learners who become progressively more dependent on the machine to perform cognitive tasks for them. An approach to AI in education and training that prioritises SRL places the student in control, using the technology as a tool to reflect on their own understanding and make better learning decisions. This is the path to building a future-ready, adaptable workforce. An approach focused merely on efficiency risks the opposite outcome: a workforce less capable of independent thought and therefore less adaptable over the long term.

Section 4: From isolated 'experiments' to systemic research

The interim report's call to "continue to fund trials of new edtech" is well-intentioned but requires careful qualification. If "trials" is interpreted as a primary reliance on isolated, decontextualised Randomised Controlled Trials (RCTs), it risks leading to flawed and inapplicable conclusions. Educational settings are complex, adaptive systems, not sterile laboratories. The attempt to isolate a single technological variable in such an environment is fraught with methodological and practical difficulties. RCTs in education face significant limitations regarding generalisability, ethical concerns about withholding potentially beneficial interventions, and an inherent inability to account for the myriad contextual factors—such as teacher expertise, school culture, and student background—that profoundly influence learning outcomes. Determining causal factors requires research to be carried out in controlled

settings, such as those used in my lab group.

The history of education is replete with cautionary tales of how flawed, non-systemic research can lead to the widespread adoption of ineffective or harmful practices. The most prominent example is the "learning styles" edumyth—the belief that teaching to a student's preferred sensory modality (e.g., visual, auditory, kinaesthetic) improves learning. Despite being consistently and thoroughly debunked by decades of cognitive science research, this idea persists in educational practice. This myth arose from a superficial interpretation of individual preferences, not from a deep, mechanistic understanding of how learning actually occurs in the mind. A rush to implement AI based on isolated "experiments" that show superficial performance gains without a robust theoretical and mechanistic understanding risks creating the edumyths of the 21st century. The notions that young people are 'AI-natives' and that 'AI-literacy' is the core skill for the age of AI are early frontrunners.

To avoid this, Australia requires a national research strategy that is systemic, multi-layered, and sustained. Such an approach moves beyond asking "what works?" to asking "how, for whom, and under what conditions does it work?". This necessitates coordinated investment across a research pipeline that includes:

1. **Use-inspired basic research:** Investigating the fundamental cognitive, social, and affective mechanisms of learning, particularly how new technologies like AI mediate these processes.
2. **Translational research:** Systematically bridging the gap between findings from basic science and the complex realities of classroom practice, developing evidence -informed principles and prototypes.
3. **Applied research:** Evaluating interventions within authentic education and training contexts, using a range of rigorous methodologies (including but not limited to RCTs) to understand their impact and the factors that enable their success.

A commitment to isolated trials is grossly insufficient. A commitment to building a systemic, integrated, and ongoing research and development capability is essential.

Section 5: The strategic imperative for a sovereign educational research capability

The interim report's call for policies to be guided by "evidence -based research" is correct, but it leaves a critical question unanswered: where will this research come from? It is a dangerous

assumption that Australia can simply import the necessary evidence base from other nations. The development of a sovereign educational research capability, particularly in the domain of AI and learning, is a matter of urgent national strategic importance.

An examination of the international landscape reveals why reliance on others is untenable:

- **United States:** For decades, the US has been a primary source of educational research. However, the Institute of Education Sciences (IES), the main federal funding body, has faced years of funding stagnation and significant cuts, imperilling its capacity to lead global research efforts in this domain.
- **Europe:** While some nations, notably the Netherlands, are making strategic investments in AI in education, research across the continent is often constrained by the General Data Protection Regulation (GDPR). These regulations, while necessary for privacy, can limit the use of the large - scale, data-intensive methods that are essential for developing and validating AI -driven educational technologies.
- **Asia:** Nations such as China and Singapore are making massive, state -directed investments in AI in education as a core component of their national economic and strategic plans. However, this research is inextricably linked to their specific, highly structured curricula and societal goals. The resulting technologies and pedagogical models are designed for educational ecosystems that differ significantly from Australia's, making their findings and tools difficult to translate and apply effectively in our context.

This international context makes the dire state of Australian research funding in education and training deeply concerning. When compared to other national priorities, the disparity is stark.

Sector	Primary Funding Body	Indicative Annual Funding (AUD)
Health	National Health and Medical Research Council (NHMRC)	~\$900 million - \$2 Billion (including MRFF scheme)
Defence	Department of Defence	~\$32 billion (total budget, with significant R&D component)
Education	Australian Research Council (ARC) - FoR Division 13 (Education)	~\$1-2 million (estimated from total ARC grants - in a good year)

As the table illustrates, while Health and Defence receive vast, dedicated, and mission-oriented funding streams, education research must compete for a minuscule fraction of the general - purpose Australian Research Council (ARC) budget. The funding allocated to the entire Field

of Research (FoR) code for Education is orders of magnitude smaller than that for other sectors deemed critical to the national interest. It is recognised here that some education systems, state departments of education, curriculum authorities, ESA and AERO all have R&D capability. However, even including all these initiatives in calculations, education still receives orders of magnitude less funding for R&D than other, apparently critical sectors. This is not merely a funding gap; it is a profound strategic failure.

The failure to invest in a sovereign educational research capability represents a direct threat to Australia's long-term economic and cultural autonomy. The Commission's goal of an adaptable workforce necessitates a new pedagogical model for the AI era, and this model must be grounded in a robust evidence base. If Australia does not generate its own evidence base—one tailored to our unique education and training contexts, values, and national goals—it will be forced to become a passive importer of educational technologies and frameworks. These imported systems will not be neutral. They will be shaped by the strategic interests and cultural values of the nations that created them. To import an AI-driven educational system from another country is to import its model of learning, its definition of success, and its strategic objectives. This poses a long-term risk to our national sovereignty, as it shapes the cognitive capabilities and adaptability of future generations of Australians.

Conclusion and recommendations

Building a skilled and adaptable workforce for an AI-driven future requires a fundamental paradigm shift in our approach to education and training. We must move from a 20th-century model focused on content delivery to a 21st-century model focused on developing human capability. The core of this capability is self-regulated learning—the ability to learn how to learn. This requires professionalising our teaching workforce to become expert facilitators of this skill, leveraging technology not as a content dispenser but as a tool for metacognitive development, and underpinning the entire system with a sovereign, strategic, and well-funded research capability. Part of this professionalisation must also include a commitment to increased respect and compensation for teachers.

Based on the evidence and analysis presented in this submission, the following recommendations are proposed to the Commission:

1. **Revise Draft Recommendation 1.1:** The Australian Government should redirect investment from the development of a national platform for lesson planning materials towards a national initiative for **teacher professional development, focusing on evidence-informed pedagogical practices that foster self-regulated learning in students.**

2. **Refine Draft Recommendation 1.2:** The Australian Government should lead the establishment of a national framework for assessing educational technology and AI, building on the work already carried out by AERO and ESA. This framework must prioritise tools that **enhance and measure the development of students' metacognitive skills, particularly self-regulated learning and calibration** , over those that merely deliver content or measure simple task performance.
3. **New recommendation on research investment:** To secure Australia's future productivity and sovereign capability, the Australian Government should establish a **dedicated, long-term, and systemic national research program for learning in the digital age** , with funding commensurate with other national priorities such as health and defence. This program must support use -inspired basic, translational, and applied research to build a robust, contextually valid evidence base for Australian education and training .