Independent Schools Queensland
choice & diversity

spring

Briefings

Thought leadership for the independent schooling sector

VOLUME 26 ISSUE 4 | SPRING 2022

CAN WE EXPECT MORE FROM AN ALREADY EXHAUSTED WORKFORCE?

From the CEO

ISQ CEO Christopher Mountford looks at the Productivity Commission's interim report and its suggestion that more can be done to give a leg up to an education workforce under pressure.

The Productivity Commission has released its interim report as part of its five-year Productivity Inquiry as commissioned by former Treasurer Josh Frydenberg. The findings detailed within the report outline potential opportunities to improve Australia's school and tertiary education systems.

It's a given that high quality school and tertiary education systems are a fundamental element in creating a productive workforce. But when it comes to measuring just how successful these systems are in Australia, particularly the schooling system, unfortunately there are some red flags.

Deputy Chair of the Productivity Commission Dr Alex Robinson said it himself when the report was released: "While overall education outcomes are relatively good, we are seeing some concerning declines[1]."

Specifically, he's referencing "where improvements can be made to improve productivity within the productivity-enhancing sectors", and that does not mean just throwing more money at a long evolving problem.

Governments currently spend more than $100 billion a year on education in Australia and individuals spend a considerable number of years studying. Despite this, foundational skills such as writing and numeracy have stagnated. Clearly there is room for increasing the value of this investment by governments, and the interim report backs this up and offers some themes which may help.

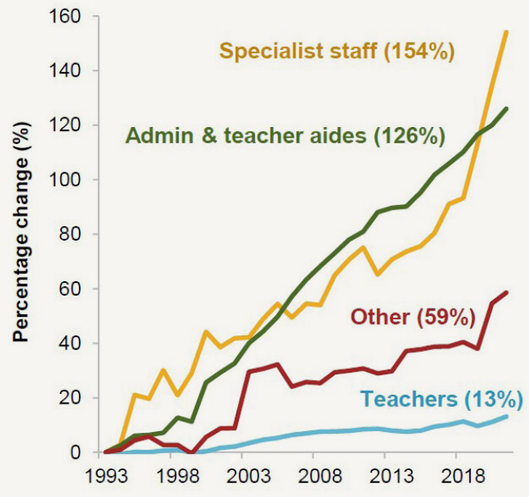
One of these themes is the use of school staff, which will be discussed in this article in more detail. Teacher recruitment is a long-standing issue. Proactive measures being developed by Federal Education Minister Jason Clare, such as the National Action Plan on Teacher Shortage and the Initial Teacher Education Quality Assessment Expert Panel headed by Professor Mark Scott, are encouraging. So too is the willingness of the new Minister to consult with all school sectors. There is, however, an emerging push for getting more from the current teaching workforce.

It's important to note that the push for getting more from the current workforce, as recommended in the report, does not mean just piling on more work and longer hours.

1. Available at https://grattan.edu.au/act-now-to-end-the-school-lesson-lottery/

CAN WE EXPECT MORE FROM AN ALREADY EXHAUSTED WORKFORCE?

Figure 1.Change in staff to student ratio between 1993 and 2021



Source: *5-year Productivity Inquiry: From learning to growth* Interim report (2022)

The idea set out in the interim report is to "explore new ways for giving teachers more time to spend in the classroom, through the use of technology, or exploring new ways of schooling to meet the needs of staff and students." Basically, finding ways to allow teachers to focus on the way they teach, not necessarily what they teach, the latter of which is taking up significant amounts of teachers' time at present.

Another report recently released by the Grattan Institute - *Ending the lesson lottery: How to improve curriculum planning in schools*[2] - also offered recommendations on the matter.

Surveying more than 2,200 teachers and school leaders across Australia, the report found that only 15 percent of teachers have access to a common bank of high-quality curriculum materials for all their classes. Even more concerning was the finding that teachers in disadvantaged schools were only half as likely to have access to a common bank of materials.

A key recommendation from the Grattan Institute report was that governments should invest in high-quality, comprehensive curriculum materials, and make them available for all teachers, whether in government, Catholic, or independent schools.

Considering 90 percent of teachers surveyed in the report said they "always" or "frequently" felt like they do not have enough time for high-quality lesson planning, this could have some potential to help alleviate the problem. Flexibility would need to be built in and plenty of consultation is a must. The last thing teachers need, especially in the independent sector, is a one size fits all approach.

From a productivity standpoint, a high school teacher responsible for four different classes to plan their lessons from scratch would require roughly 2,000 hours, or a year of full-time work. According to the Grattan report, across all Australian teachers, that's about 20 million hours a year that could be saved and would be 200 times more cost effective than the current model.

Whether you agree with a central pool of resources and lesson sequences for schools or not, those figures can't be ignored in the current education workforce climate. It has certainly caught the attention of Minister Clare, who indicated his intention to explore and discuss the report's findings further when he meets with his State and Territory counterparts in December [3].

Further to identifying potential productivity gains in the teaching workforce, the interim report also explores the non-teaching workforce, specifically the increased use of teacher aides.

Citing research by the OECD[4], the interim report highlights using non-teaching staff, particularly teaching assistants, to free up teachers for more core teaching time.

Outside of the classroom, there is also real potential for administrative staff to help reduce the workload of teachers. Often teachers are handling significant amounts of administrative tasks, such as processing permission slips, which also takes away from core teaching time.

Basically, finding ways to allow teachers to focus on the way they teach, not necessarily what they teach, the latter of which is taking up significant amounts of teachers' time at present.

Interestingly, over the past 30 years, all categories of non-teaching staff (relative to students) have grown considerably, while the growth in teaching staff has been somewhat lower (Figure 1). This increase in school staff has been occurring at the same time as pressure on the teaching workforce intensifies[5].

Independent schools are fortunate to have significant autonomy over their workforce and how it operates, and this has proved fruitful for many of the sector's schools when it comes to their individual productivity. However, with such diversity across the sector, the resources afforded to schools both in human and financial capital varies considerably.

Reports such as the Productivity Commission's are useful in assisting governments make informed decisions around funding and policy. At the school level, especially within the independent sector, schools are already embracing innovation and exploring flexible options to get the best from their workforce. This body of work is taking place at an opportune time, with the new Minister indicating as recently as the independent school roundtable held in Canberra on 17 October, that he is ready to listen to ideas from schools themselves to address the key challenges facing the education sector.

CHRISTOPHER MOUNTFORD
Chief Executive Officer
Independent Schools Queensland

2 Available at https://grattan.edu.au/report/ending-the-lesson-lottery-how-to-improve-curriculum-planning-in-schools/
3. Available at https://www.abc.net.au/news/2022-10-17/teachers-overworked-as-leson-planning-demands-bite/101536544
4. Available at https://www.oecd-ilibrary.org/education/not-enough-hours-in-the-day_15990b42-en
5. Available at https://www.pc.gov.au/inquiries/current/productivity/interim5-learning/productivity-interim5-learning.pdf

HOW DO WE LEARN? THE PIVOTAL ROLE OF SCHOOLS IN INITIAL AND ONGOING TEACHER LEARNING

NATASHA MAYNE
Manager (Teaching & Learning)

Research support
LOUISE BRAUER
Education Services Advisor

A principal once asked the author of this paper the following question: How do we learn? It is an excellent question, and one that every educator should be able to answer. Yet, this educator struggled; she mentioned scaffolding and relationships, but these are things to do with enhancing learning. She could not answer the actual question about the mechanism of learning—what happens in the mind—and she probably should have been able to do so with some confidence. Her teacher training days were well behind her, and she was already advancing up the career ladder by that point. That question, and its profound implications, have remained with her.

It seems that we are not very good at creating effective teachers

While much has changed in education in the intervening years, it seems that it is still, unfortunately, a question that too few educators can answer. This is not the fault of teachers. According to the recent Next Steps: Report of the Quality Initial Teacher Education Review, commissioned by Education Ministers, the Accreditation Standards for Initial Teacher Education (ITE) courses "do not provide specific detail about the kind of content that should be included in ITE programs. Nor do they reference long-standing empirical evidence about learning from cognitive science and elsewhere" (Elliott et al., 2022, p. 38). Seven years ago, the Teacher Educational Ministerial Advisory Group's report, Action Now: Classroom Ready Teachers, found "[e]vidence of poor practice in a number of programs—[n]ot all initial teacher education programs are equipping graduates with the content knowledge, evidence-based teaching strategies and skills they need" (Beswick et al., 2015, p. xi). More recently, the Productivity Commission's interim report into the review of the National School Reform Agreement, found a similar need to strengthen ITE in Australia (Brennan et al., 2022, pp. 139, 158-159). This appears to be an ongoing issue. It is particularly problematic given that Standard 1.2 of AITSL's Australian Professional Standards for Teachers (APST) requires teachers to demonstrate understanding of the research into how students learn and the implications for teaching across all career stages.

Some Australian universities are undoubtedly trying to address the issue and are including cognitive science in their ITE courses, such as La Trobe University, which cites the science of learning as a key component of its ITE courses. However, it appears that this is still not the norm, and many ITE courses do not seem to involve anything explicit or comprehensive about the science of how humans learn. Emeritus Professor John Sweller draws a powerful analogy, remarking that the current approach to teacher education in Australia, more broadly, is a bit like taking the view that medical practitioners do not need to know any biology; they just need to know how to heal patients. Or, that engineers do not need to know any physics or chemistry; they just need to know how to build bridges (Duggan, 2022, p. 2).

What is being done?

Concerns about the evidence base in teacher training prompted the U.K. in 2019 to develop its Initial Teacher Training (ITT): Core Content Framework. The Framework details in some specificity the content to be taught in accredited courses and the evidence base underpinning the content, which has been endorsed by the Education Endowment Foundation.

This Framework has garnered interest in Australia, with Recommendation Seven of the Next Steps Report stating that ***the Accreditation of Initial Teacher Education Programs in Australia: Standards and Procedures be made more specific in a manner similar to the United Kingdom's Initial Teacher Training (ITT): Core Content Framework, so ITE students better understand what is being asked of them. (Elliott, 2022, p. iv)***

However, even if Australia agreed to adopt something like the U.K.'s ITT: Core Content Framework, full implementation could be years away, and it may be some time before any real improvements in the knowledge bases of graduate teachers are evident in classrooms. In August this year, in response to the Next Steps Report, Australian Education Ministers convened the Teacher Education Expert Panel. It is charged with amending the accreditation requirements of ITE programs in Australia "to ensure ITE graduates are taught sufficient evidence-based practices to meet the Australian Professional Standards for Teachers." The panel's report is due by June 2023.

Independent schools seek their own solutions

While this is hopefully a step in the right direction, teachers and school leaders practising right now probably cannot wait for ITE to improve in Australia; there is too much at stake. Indeed, according to Professor Pamela Snow and Associate Professor Tanya Serry, there appears to be "a revolution occurring from the ground up in schools across Australia, as educators keen to be effective evidence-informed professionals take matters into their own hands" (Serry & Snow, 2022, p. 2). ISQ member schools are no exception to this. One of the great strengths of the independent schooling sector is that its relative autonomy often allows schools to seek out their own solutions to problems, and ISQ plays a role in supporting member schools in these endeavours.

For example, Canterbury College's plenary presentation at ISQ's Big Ideas Summit in July this year focused on the College's early successes with techniques underpinned by solid evidence bases from cognitive science. In February this year, the University of Queensland published a research report into the Science of Learning Research Centre's (SLRC) partnership with Canterbury College and another ISQ member school, the Anglican Church Grammar School. This research partnership analysed both schools' use of techniques informed by cognitive science and found that "the nuanced translation of the science of learning can significantly improve its impact on both teachers and students across a range of educational contexts and settings" (Adamson et al., 2022, p. 33). Both schools used the cognitive science principles of dual coding and spaced and interleaved retrieval practice in their research work (see the Knowledge Organiser below for explanations).

Figure 1: Excerpt from the U.K's ITT: Core Content Framework

How Pupils Learn (Standard 2 - 'Promote good Progress')	
Learn that...	Learn how to...
1. Learning involves a lasting change in pupils' capabilities or understanding. 2. Prior knowledge plays an important role in how pupils learn; committing some key facts to their long-term memory is likely to help pupils learn more complex ideas. 3. An important factor in learning is memory, which can be thought of as comprising two elements: working memory and long-term memory. 4. Working memory is where information that is being actively processed is held, but its capacity is limited and can be overloaded. 5. Long-term memory can be considered as a store of knowledge that changes as pupils learn by integrating new ideas with existing knowledge. 6. Where prior knowledge is weak, pupils are more likely to develop misconceptions, particularly if new ideas are introduced too quickly.	Avoid overloading working memory by: • Receiving clear, consistent and effective mentoring in how to take into account pupils' prior knowledge when planning how much new information to introduce. • Discussing and analysing with expert colleagues how to reduce distractions that take attention away from what is being taught (e.g. keeping the complexity of a task to a minimum, so that attention is focused on the content). And - following expert input - by taking opportunities to practise, receive feedback and improve at: • Breaking complex material into smaller steps (e.g. using partially completed examples to focus pupils on the specific steps). Build on pupils' prior knowledge, by: • Discussing and analysing with expert colleagues how to sequence lessons so that pupils secure foundational knowledge before encountering more complex content. • Discussing and analysing with expert colleagues how to identify possible misconceptions and plan how to prevent these forming. And - following expert input - by taking opportunities to practise, receive feedback and improve at: • Encouraging pupils to share emerging understanding and points of confusion so that misconceptions can be addressed.

HOW DO WE LEARN? THE PIVOTAL ROLE OF SCHOOLS IN INITIAL AND ONGOING TEACHER LEARNING

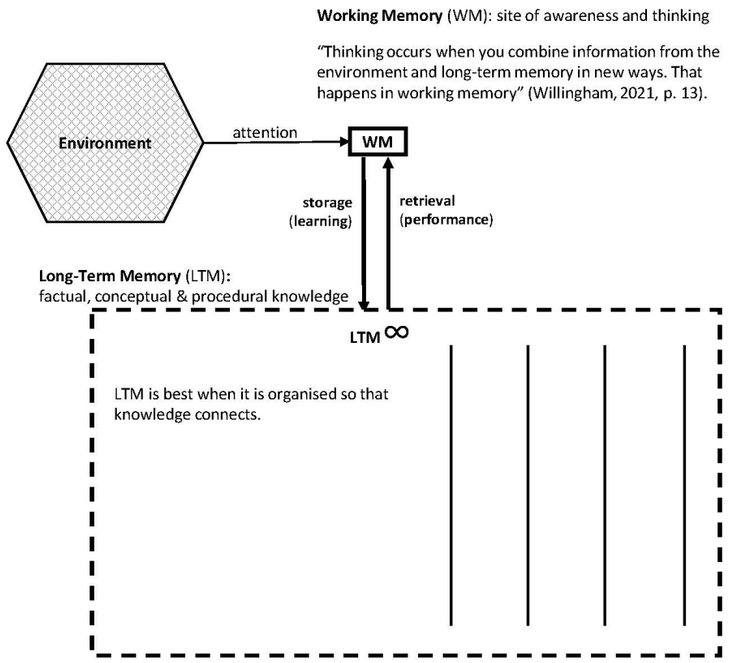
Member schools involved in the UQ SLRC's partner program with ISQ—Effective Student Feedback—have also experienced the benefit of exploring techniques underpinned by the science of learning. Similarly, schools involved in ISQ's Cognitive Science in Education, Formative Assessment, Literacy, Numeracy, and Teacher Growth and Development Programs have had similar opportunities to explore practices underpinned by robust evidence from cognitive science. There is significant interest in the sector for this kind of learning.

To this end, ISQ's 2023 professional learning offerings in Teaching and Learning will continue to serve members in this important area. In particular, the 2023 Teacher Growth and Development Program (TGD), and its associated Self-Paced Suite and Literacy and Numeracy Masterclasses (included as part of ISQ membership), will strengthen ISQ's support to schools via a comprehensive range of resources to help schools translate the science of learning into the classroom and improve student and teacher outcomes. An example of such a resource is the Science of Learning Knowledge Organiser detailed here, which outlines some core science of learning principles for educators.

A little cognitive science goes a long way

Science of Learning Knowledge Organiser: APST 1.2—Understand how students learn

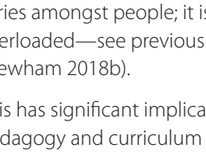
Figure 2: Overview: A basic model of the mind—based on Bjork 2019, Lemov 2021, Willingham 2021



Ten Science of Learning Principles for Educators

1. The human brain is not really designed for thinking. Much of its capacity is needed to coordinate the acts of seeing and moving in the complex field of the environment, which means there is not much capacity left over for thinking (see 2 and 3).

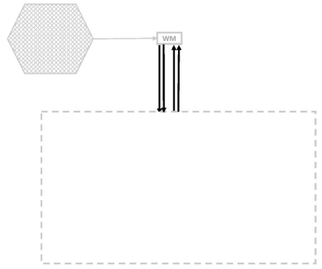
Figure 3: Environment



2. Thinking is effortful, which means we often avoid it when we can get away with it (see 1).

Nonetheless, the more you think about something, the more likely you are to remember it (see 5, 7 and 8).

Figure 4: Thinking is effortful

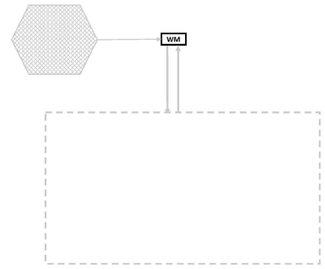


3. Unfortunately, **Working Memory capacity is limited** (+/- 3-4 memory units for 10-15s for most people) and fixed (unlike intelligence), but precise capacity varies amongst people; it is easily overloaded—see previous Briefing (Newham 2018b).

This has significant implications for pedagogy and curriculum design.

Thankfully, WM capacity constraints are highly hackable, due in part to the dividends of dual coding (see 4) and deliberate practice (see 5), the possibly infinite capacity of LTM and its chunking superpower (see 6 and 7), and the wonders of a little forgetting (see 8).

Figure 5: Working memory capacity is limited

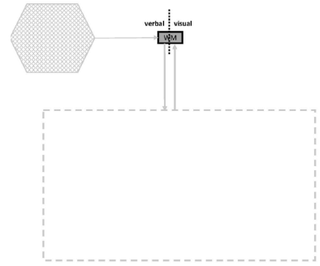


4. Memory Hack: Dual Coding

This is the process of combining visual and verbal (spoken or written) information to share cognitive load between the verbal and visual short-term memory components of WM, which each have their own capacities. It works best when one mode of verbal information (written or spoken, but not both) is used to complement visual information.

This Knowledge Organiser attempts to use elements of Dual Coding Theory.

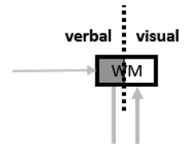
Figure 6: Dual coding



Dual Coding, as part of Cognitive Load Theory, has also been discussed in a previous Briefing (Newham, 2018b)

An example of verbal overload is when presenters read out PowerPoint text while the audience is also trying to read it silently in their heads (= 2 competing voices). This is an example of split attention.

Figure 7: Verbal overload



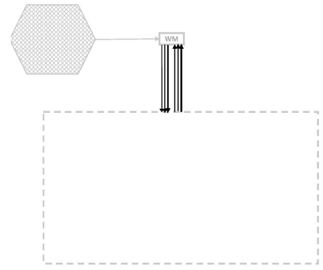
5. Memory Hack: Deliberate Practice

This involves selecting one small element of new, complex knowledge for practice (because of WM limitations), receiving feedback for improvement on this element, correcting errors before they become strongly encoded in LTM, trying new things, and adding the next element into the process to incrementally build up proficiency with more complex elements. Deliberate practice works because it is effortful (see 2).

Not to be confused with rote memorisation (repetition with little understanding).

Core, foundational or routinely used knowledge can be deliberately practised to achieve fluency or automaticity, and this kind of knowledge takes up little space in WM (see 7). This has implications for both pedagogy and curriculum design; however, not all knowledge needs to be learned to this level.

Figure 8: Deliberate Practice



HOW DO WE LEARN? THE PIVOTAL ROLE OF SCHOOLS IN INITIAL AND ONGOING TEACHER LEARNING

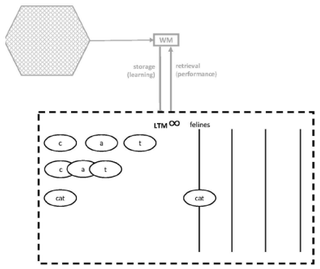
6. Memory Hack: Chunking

This is the process of combining smaller units of knowledge into one integrated, meaningful unit.

Chunking saves space in WM and can improve thinking efficiency and effectiveness.

This has implications for both pedagogy and curriculum design.

Figure 9: Chunking

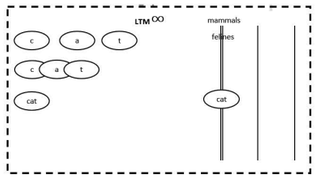


7. Memory Hack: Knowledge schemata in LTM

Chunking also helps to organise and connect knowledge schemata (networks) in LTM.

Well-developed and connected schemata also take up very little space when retrieved into WM.

Figure 10: Knowledge schemata



Learning involves changes to LTM over time. Highly organised schemata take years to build (because of WM limitations), and experts (Figure 10) have more, and better organised, knowledge schemata in their area of expertise than novices (Figure 11).

Figure 11: Highly organised schemata

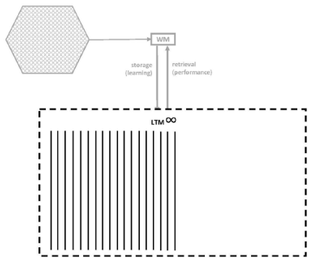
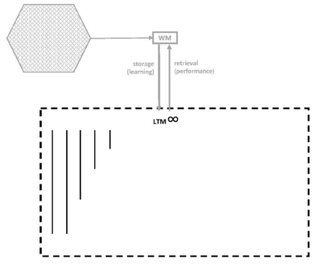


Figure 12: Novice schemata



This has implications for both pedagogy and curriculum design.

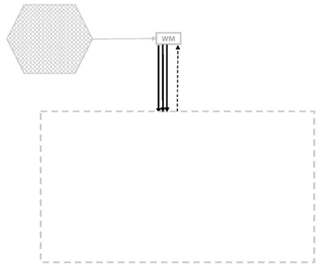
However, the time involved in developing highly organised knowledge schemata in LTM is worth it because knowledge begets knowledge: the more you have the more you can get (the Matthew Effect). LTM very likely has an infinite capacity to develop and house knowledge schemata over a human lifetime. Herein lies the truly transformative capacity of a good education.

Creativity, critical thinking, problem solving, and innovation are all powered by the ability to use and combine knowledge from well-developed and evolving schemata in LTM.

8. Memory Hack: Forgetting as a friend of learning

a) The Spacing Effect.
Allowing a little reduction in retrieval strength—forgetting—to occur over progressively increasing intervals between practice sessions may, counterintuitively, produce the most learning over the long term (Figure 14). The effort required to think again about partially forgotten knowledge is known as a "desirable difficulty."

Figure 13: Forgetting and learning

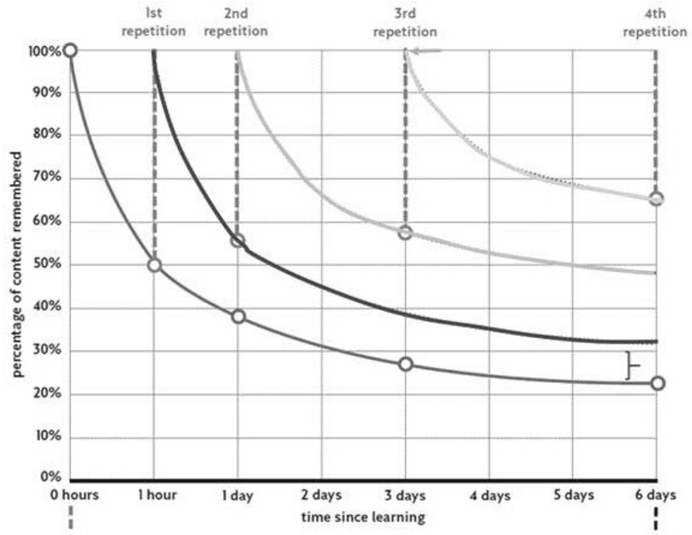


Approximately 140 years of research evidence indicates that progressively lengthening the intervals between practice sessions can both increase forgetting but enhance learning (Bjork, 2019).

A cursory glance at the Forgetting Curve (Figure 14) makes it clear that just because students can retrieve knowledge shortly after first practising it, does not mean they have learned it. Deliberate practice is vital for learning that sticks over the long term.

Despite this, performance at a point-in-time is often confused with learning regardless of the fact that further practice is required to generate long-lasting learning. This is why cramming, or massed practice, is so seductive for many students—it is perfectly possible to achieve reasonable performance levels on a task completed shortly after a cramming session. However, without further practice, that performance is unlikely to be maintained.

Figure 14: Ebbinghaus' 1880s Forgetting Curve, adapted by Lemov, 2021



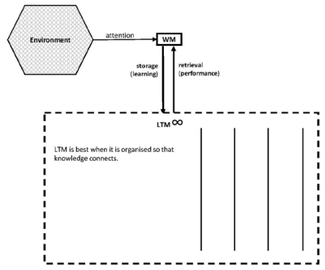
b) Interleaving
This involves the mixing of topics or subjects in a spaced study schedule. Interleaving creates another form of desirable difficulty and its own kind of spacing effect. Pragmatically, it can be effective for preparing for cumulative exams, but its real strength is that it fosters long-term learning.

All of this has implications for both pedagogy and curriculum design.

9. People are more alike than different in terms of how they think and learn.

For example, scientists are yet to discover a human who can get knowledge into LTM without thinking about it first in WM.

Figure 2: A basic model of the mind



10. And finally: "The same principles that explain learning among students can also be used to explain learning among teachers"

(Shulman, 2004 in AITSL, 2014, p.9).

A little cognitive science does, indeed, go a long way. Educators who understand these principles, and the relationship between the environment and memory and learning, are more likely to be able to adjust evidence-informed techniques in ways that improve outcomes for their students while still retaining fidelity to the principle that made the techniques so effective in the first place. This kind of innovation-in-the-classroom is really empowering, and Doug Lemov's book, Teach Like a Champion 3.0, is full of adaptations generated by teachers who understand the underlying science.

Understanding the science can also help educators to spot neuromyths and edumyths, such as Learning Styles. As discussed in a previous ISQ Briefings article (Newham, 2018a), there is little research evidence to support the main idea of learning styles, which is that people learn best when permitted to learn in their preferred mode (visual, auditory, kinaesthetic). Understanding a little cognitive science can make the problem with this theory readily apparent. For example, Dual Coding Theory (see 4) makes it clear that combining verbal and visual information allows working memory to operate more efficiently than using just one of these modes (even if it is supposedly a "preferred mode" for a learner) in the initial presentation of knowledge prior to practical demonstrations and practice. In any case, the science is clear that people are more alike than different when it comes to the cognitive architecture of thinking and learning (see 9).

Understanding the science can also help grasp the limitations of Growth Mindset Theory. As discussed in previous Briefings articles, issues have plagued Growth Mindset research, especially concerning the replicability of its findings (Newham 2018c, 2022). Perhaps, cognitive science can offer some insights as to why this might be the case. For example, understanding even some basic science of learning principles makes it clear that no amount of Growth Mindset training

HOW DO WE LEARN? THE PIVOTAL ROLE OF SCHOOLS IN INITIAL AND ONGOING TEACHER LEARNING

can compensate for a student's lack of the background knowledge required in long-term memory to be successful in a learning task. However, addressing any gaps in prior learning before teaching required new knowledge, and allowing lots of deliberate practice so that the chances of learning success are increased, are likely to be more reliable ways of increasing motivation than mindset training. Dylan Wiliam sums up the situation as follows: ***the idea that high levels of motivation result in higher levels of achievement does not seem to fit the evidence very well. In fact, the evidence, such as it is, suggests that cause is running in the opposite direction. Motivation is not a cause but a consequence of achievement.*** (Wiliam, 2018, p. 176)

Knowledge begets knowledge; long-term memory is a veritable "motivation motor" and "mindset modifier."

Importantly, understanding the science of learning can also help to create coherence across all learning endeavours in a school (student and teacher alike—see 9 and 10). ISQ's Teaching and Learning Team supports schools to build learning coherence across their organisations in effective and efficient ways, for example, by using the same evidence-informed principles to underpin curriculum planning, teaching, and teacher learning. This approach aligns with AITSL's Charter for Professional Learning which states that, ***[e]ffective professional learning seeks to develop teachers and school leaders who are adaptable and able to deal with new and unexpected challenges. It exposes teachers to new and emerging practices and the theories that underpin them. It should focus not simply on improving existing practice, but also on assisting teachers and school leaders to understand the theory behind what practices work in different situations and when and how to apply a broad range of repertoires and strategies***. (AITSL, 2018, p. 5)

Conclusion

Providing ongoing teacher learning has always been core business for schools, but the current reality in Australia is that schools are often left having to address significant gaps in foundational knowledge for their teachers. This is not the fault of teachers or their leaders, but it does have significant implications for an already-overloaded profession. ISQ's Teaching and Learning Team has refined its 2023 offerings to ensure that it continues to provide vital support to the independent sector in evidence-informed pedagogy and curriculum practices and the leadership of teacher learning to efficiently sustain improved outcomes for all learners

References

Adamson, R., Byers., T., Krzensk, A., Leggett, J., Leighton, V., MacMahon, S., & Pollock, C. (2022, February 2). The impact of a preparatory science of learning intervention in secondary schools contexts in Australia. Review of Education. DOI: 10.1002/rev3.3340

Australian Government Department of Education. (2022). Teacher Education Expert Panel. https://www.education.gov.au/quality-initial-teacher-education-review/teacher-education-expert-panel-0

Australian Institute for Teaching and School Leadership (AITSL). (2011). Australian Professional Standards for Teachers. https://www.aitsl.edu.au/standards

---. (2014). Looking at Classroom Practice. https://www.aitsl.edu.au/docs/default-source/default-document-library/looking-at-classroom-practice.pdf?sfvrsn=f645e23c_0

---. (2018). Australian Charter for the Professional Learning of Teachers and School Leaders. https://www.aitsl.edu.au/tools-resources/resource/australian-charter-for-the-professional-learning-of-teachers-and-school-leaders

Beswick, K., Craven, G., Fleming, J., Fletcher, T., Green, M., Jensen, B., Leionen, E., & Rickards, F. (2015). Action Now, Classroom Ready Teachers Report. https://www.education.gov.au/teaching-and-school-leadership/resources/action-now-classroom-ready-teachers-report

Bjork, A., Bjork E. (2019). Forgetting as the Friend of Learning: implications for teaching and self-regulated learning. Advances in Physiological Education, 43, 164-167.doi:10.1152/advan.00001.2019

Brennan, M., Roberts, M., & Siegel-Brown, N. (2022). Review of the National School Reform Agreement: Interim Report. Australian Government Productivity Commission. https://www.pc.gov.au/inquiries/current/school-agreement/interim

Duggan, S. (2022, September 21). There's simply nothing there: 21st century skills an empty slogan, expert says. Education HQ.

Elliott, M., Louden, B., Paul, L., & Scott, D. (2022). Next Steps: Report of the Quality Initial Teacher Education Review. https://www.education.gov.au/quality-initial-teacher-education-review/resources/next-steps-report-quality-initial-teacher-education-review

ITT Core Content Framework. (2019). https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/974307/ITT_core_content_framework_.pdf

La Trobe University. https://www.latrobe.edu.au/courses/study-education-teaching

Lemov, D. (2021). Teach Like a Champion 3.0: 63 Techniques that Put Students on the Path to College. Jossey-Bass.

Marzano, R., & Kendall, J. (2007). The New Taxonomy of Educational Objectives. Hawker Brownlow Education.

Newham, M. (2018a). Briefings: Busting the neuromyths in teaching. Independent Schools Queensland, 22(4), 4-7. https://www.isq.qld.edu.au/media/haoodqnu/isq-briefings-22-4.pdf

---. (2018b). Briefings: Accommodating the learning limit of students. Independent Schools Queensland, 22(5), 4-8. https://www.isq.qld.edu.au/media/qxzntmlp/isq-briefings-22-5.pdf

---. (2018c). Briefings: Has the hype around growth mindset outpaced the evidence? Independent Schools Queensland, 22(7), 4-7. https://www.isq.qld.edu.au/media/vyxhnquw/isq-briefings-22-7.pdf

---. (2022). Briefings: Trust the science? Independent Schools Queensland, 26(1), 4-7. https://www.isq.qld.edu.au/media/iydpdtcg/briefings_26_1.pdf

Serry, T., & Snow, P. (2022, August 30). Address our teachers' knowledge crisis. Latrobe University News. https://www.latrobe.edu.au/news/articles/2022/opinion/address-our-teachers-knowledge-crisis

Wiliam, D. (2018). Embedded Formative Assessment. Hawker Brownlow Education.

Willingham, D. (2021). Why Don't Students Like School? A Cognitive Scientist Answers Questions About How the Mind Works and What It Means for the Classroom. Jossey-Bass.

ISQ thanks its 2022 Alliance Partners

Platinum Alliance

ngs Super

Your fund. Your wealth. Your future.

Gold Plus Alliance

CommonwealthBank

Gold Alliance

tes

Silver Alliance

FUJIFILM
Value from Innovation

Bronze Alliance

Willis Towers Watson

Disclaimer:
The information contained in this publication is to the best of our knowledge and belief correct at the date of publication. However, no warranty or guarantee is or can be given by Independent Schools Queensland or any member of its staff, and no liability is or can be accepted for any loss or damage resulting from any person relying on or using the information contained in this publication.

Licensed under NEALS

Independent Schools Queensland Ltd
ACN 614 893 140 **ABN** 88 662 995 577

Independent Schools Queensland
choice & diversity

Head Office
Level 1, 96 Warren Street, Spring Hill Q 4000
PO Box 957, Spring Hill Q 4004
P (07) 3228 1515 **E** office@isq.qld.edu.au

Professional Learning Centre
Level 5, 500 Queen Street, Brisbane Q 4000
P (07) 3228 1507 **E** events@isq.qld.edu.au

www.isq.qld.edu.au