Linking Research to the Practice of Education





Linking Research to the Practice of Education is a publication of the School of Education (SoE), UNE, for all educators: early childhood, primary and secondary. It introduces research, conducted by SoE staff, applicable to educational settings.

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- 1. More Australian families are choosing private schools we need to understand why (2-3)
- 2. Teaching visual arts in Bhutan: reflections and practical tools for educators (4-6)
- 3. Professional development to support gender equity in STEM education in Australia and Saudi Arabia (7-8)
- 4. Opportunities and challenges posed by Artificial Intelligence to teachers and students (9-10)
- 5. UNE Pathways student, Charlotte Hall (11-12)
- 6. Linking emotional intelligence and educators' feeling overwhelmed and burned out (13-14)
- 7. Feedback, feedforward and "next time" the art of being constructive (15-16)
- 8. Improving students' numeracy skills with *QuickSmart* (17-19)
- 9. Supporting gifted and talented students in the secondary Geography classroom (20)
- 10. The effect of prior knowledge on learning complex linear equations (21-22)
- Let's collaborate breaking the 'island' mentality (23-24)

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Editorial

In our first edition for the year, we start with an article by Dr Sally Larsen about the increase in Australian children attending private schools. In the second article, Trish Donald provides visual arts lesson plans that she used with educators in Bhutan, along with reflecting on her teaching there. In our third article, Dr Somayeh Ba Aklagh and Associate Professor Marianne Knaus explore ways to improve gender equity in STEM education in Australia and Saudi Arabia. Our fourth article, written by our Academic Integrity Officer, Dr Mutuota Kigotho, explores the use of AI in education. In the fifth article, Hannah Collett interviews one of our education students who followed a supported journey to university via the UNE Pathways system. In the sixth article, our Higher Degree Research student, Elle Phillips, and her supervisors discuss the link between educators' feelings of burnout and being overwhelmed, with emotional intelligence. The seventh article, by Dr Stoo Sepp, explores how to provide students with more meaningful and useful feedback. In the eighth article, Dr Maree Lake explains tried and tested ways to improve numeracy in the middle years of school. In the ninth article, Jeffrey Styles, explores ways we can support gifted and talented students in Geography. In the tenth article, Associate Professor Bing Ngu and Professor Huy Phan explore ways to reduce the challenges of solving complex equations by reducing the cognitive load. The last article, Sarah Oluk and Katy Walsh reflect on the benefits, challenges and fears surrounding group work.

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More Australian families are choosing private schools – we need to understand why

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The shape of Australia's school system is undergoing a significant change. Enrolments in independent schools are growing, while fewer students are going to public schools.

Why are more families choosing an independent or Catholic school, when they could send their children to a free public option?

And what does this mean for the system overall?

More families choosing private

Due to a growing population, the past two decades have seen increasing numbers of <u>students in Australian</u> schools overall.

But the number of students attending independent schools has grown faster than the number attending public schools, <u>particularly in high school</u>.

In 2006, around 13% of Australian students were enrolled in independent schools. In 2023 this proportion had increased to 16%.

Enrolments at Catholic schools have remained at just under 20%, although absolute numbers have increased from 680,000 in 2006 to 806,000 in 2023.

According to 2023 data, public schools still enrol the majority of students in primary (around 1.5 million students) and secondary (slightly more than one million students). Despite this, the proportion of students in public schools has been steadily declining. In 1996, 74% of primary students were in public schools, declining to 71% in 2006, and 69% in 2023. For high schools, the proportion of students in public schools has declined more quickly from <u>66% in 1996</u>, <u>to 62% in 2006 and 58% in 2023</u>.

Across the same time period, the proportion of students attending independent high schools jumped from 13.5% to 20%.

Why are we seeing these shifts?

There is very little current research looking at why more families are choosing private schools. But there are several clues.

One reason may be <u>policy changes</u> that allowed the establishment of new independent schools in Australia. In the 1990s, the Howard government changed a policy to allow funding for the establishment of new schools, even in areas that already had adequate capacity in existing schools.

There were <u>131 more independent schools in 2023</u> compared with 2006, and 90 fewer public schools.

New independent schools tend to charge lower fees than established elite schools, making them more accessible to middle-income families. According to <u>Independent Schools Australia</u>, the largest growth in enrolments is in schools charging fees of around A\$5,000 per year.

In some cases, state governments have also been slow to build new schools in growing metropolitan suburbs.

New South Wales Education Minister Prue Car has

spoken about this issue for her own son, who attends an independent primary school:

we were in one of the suburbs where the government didn't build a school.

Prue Car, NSW Minister for Education and Early Learning

While <u>evidence shows</u> private schools do not necessarily mean students do better academically, there is a public perception they are better for a students' grades. This may not be helped by <u>frequent headlines</u> about academic and behavioural problems in the public system.

More than one reason

It is also important to recognise school decisions can be influenced by multiple factors.

A 2016 Australian Institute of Family Studies <u>report on</u> <u>primary school choice</u> found parents consider local knowledge about schools in their area, opinions of family and friends, their own school experiences, and the interests and needs of their children.

Parents may also <u>emphasise different things</u> for primary and high school. For example, they might choose their local primary school for convenience, but choose a high school for its academic reputation or extracurricular offerings.

Twenty years ago, the Australian Council for Educational Research conducted a <u>small study of 609 families</u> asking "Why parents choose public or private schools?".

A key finding was parents chose schools that aligned with their values. There was also a perception (right or wrong) that values differed between schools in different sectors. For example, parents with children in public schools valued the social and cultural security of the school as well as proximity to their home. Parents with children in independent schools valued discipline, religious values and school traditions.

THE CONVERSATION

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You can read the <u>original article here</u>.



Why is this an issue?

Compared to other countries, Australian schools have a high level of "<u>socioeconomic segregation</u>". This means different types of schools tend to have students from different socioeconomic backgrounds.

The increase in students going to fee-paying private schools (even when the fees are not at the eye-watering level <u>often publicised in the media</u>), means we are seeing increasing segregation in our school system.

Public schools <u>continue to educate</u> the majority of children in regional and remote locations, those with high needs, learning disabilities and children from disadvantaged backgrounds. Independent schools enrol increasing proportions of students from the most advantaged socioeconomic backgrounds.

We still have questions

We are seeing a significant shift in the way our school system is working. But we need more research to tell us why.

This includes whether the reasons for choosing an independent, Catholic or public school for a child have changed in the last two decades.

And if we are seeing more middle and lower income families send their children to private schools.

Parents will naturally choose what they perceive to be the best school for their children. But of course not all families have a choice. This may be because there is only one school in their area, or they cannot afford the fees for a private school.

Meanwhile, these trends in enrolments raise bigger questions about how equitable our school system is, and what might be done to ensure all Australian children can access educational opportunities that allow them to succeed.





Teaching visual arts in Bhutan: reflections and practical tools for educators

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In the previous edition (Issue 8, No.2), I shared the lessons I delivered as part of the *Artist in Residence Education Program* at Paro College of Education, Royal University of Bhutan. In this article, I a) provide free, downloadable resources I developed for educators to use, then b) reflect on my time there as a visiting teacher.

a) Teaching resources

The purpose of these resources is to complement theory by providing creative, project-based activities that provide an alternative to traditional teacher-focused learning, such as rote learning that has been used in Bhutan in the past.

The resources are engaging and have proven to be enjoyable and memorable for students as they create opportunities for rich multi-sensory learning. Learning through the arts has been shown to be <u>deeper and easier</u> to remember. These resources require minimal materials, making them ideal for settings with few resources.

Lesson Plans

The comprehensive <u>lesson plans</u> include scaffolded, step-by-step instructions and examples, allowing educators to explore various activities and techniques. The feedback on the following page is from the Bachelor of Education (Primary) students who I taught. They now have the experience, confidence and guidance to implement these activities.

Lesson sequence and title	Learning objectives
Lesson 1 Understanding the Role of Illustrators	 Identify and describe how ideas are represented in literature Identify visual devices used in storytelling
Lesson 2 Creating Characters	 Experimentation, creativity and imagination Collaboration
Lesson 3 Exploring Genre and Story Development	 Exploring genre and audience Developing narrative
Lesson 4 Creating a Picture Book	 Observation and expression Exploring visual elements and design principles to support text Writing, expression, and comprehension
Lesson 5 Mask Making and Performance	Oral and written communicationConfidence and self-expression
Lesson 6 Expanding Stories and Learning Through Games	 Critical thinking Exploring the power of play in learning Growing a love of learning



Feedback about the lessons from students at Paro College included:

Sometimes we feel that we are not creative, but by doing these activities, I realised, through our imagination, we can come up with different ideas, and we discover creativity is within us.

What I take away from these activities, is that as a teacher, they will give us a lot of resources in the classrooms.

We can create a print rich classroom, we can hang our masks, and put stories on the walls so students can read them.

Creating masks are one way of expressing one's feelings. For example, if someone is very emotionally sad, they might be experiencing their feelings through the character.

eBook – Illustrating Tissywoo and the Worry Monsters

While teaching at Paro College, I discovered that most of the 100 students could not access computers in the classroom. The internet was slow and unreliable, but mobile phones had good reception, making WhatsApp a popular and effective communication tool for sharing resources. I also found that, like many students in Australia, Paro students had a limited understanding of the work involved in illustrating a picture book. Also, their access to picture books was limited.

With this in mind, I created the eBook <u>Illustrating</u> <u>Tissywoo and the Worry Monsters</u>, accessible on phones. It demonstrates the process of illustrating a picture book and my role in visual storytelling using my first published book. I've expanded this resource by adding reflection questions at the end of the eBook based on themes in the story. This helps educators deepen students' understanding of the text and improve their visual literacy skills.

One of the teacher educators said:

"Teachers and students are going to find this eBook very useful. It is friendly – the content, remarks, and assembled roughs leading to the final illustrations are absolutely wonderful and very, very encouraging. And, I can view it very well on my phone." (Sangay Biddha, Lecturer English language and literacy [Primary Education]).

Preparing for life in Bhutan

<u>This linked interview</u> briefly covers how I prepared for my teaching exchange in Bhutan, including the challenges and surprises. I also found being immersed in a different culture can be helpful when you return home.

b) Reflections on teaching in Bhutan

Happy Teachers Day

The respect Bhutanese people have for education and educators is strong. Whenever I mentioned I was teaching, shopkeepers and locals expressed gratitude for my contribution to their students and educators. On my second day in Paro, I was a special guest at the *Happy Teacher Day* celebrations, which included student performances, songs, prayers, speeches, and beautiful rosettes. The campus courtyard was decorated with student-created banners including *"Teachers: the architects of dreams, sculptors of minds, and guardians of possibilities."* I deeply appreciated the community's respect and the way they showed their gratitude to educators.



Figure 1: Students dressed in costume performing traditional dance on Happy Teachers Day

Buddhism and culture

The respect and kindness from students, educators, and the community were evident throughout my time in Bhutan, a country deeply rooted in Buddhism and tradition. Buddhist practices, such as stupas, prayer wheels, flags, murals, and statues, were visible on campus. These created constant reminders to act with kindness and create positive merit, values supported by <u>Bhutan's Gross National Happiness Index</u>. By being immersed in these compassionate symbols and visiting monasteries (Dzongs) and museums, I gained a deeper understanding of how central both Buddhist principles and the 13 traditional arts and crafts are to Bhutan.



Figure 2: Stupa and prayer flags on campus at Paro College for Education



Figure 4: Flags on campus follow the river with a view of Paro Dzong (Monastery)



Figure 3: Prayer wheel on campus at Paro College of Education



Figure 5: Trish dressed in traditional clothing in front of the bridge to Punakha Dzong (Monastery)

A treasured experience

My time in Bhutan had a profound impact on me. I feel deeply satisfied and continue to cherish the connections I made. I highly recommend teaching abroad and immersing yourself in another culture. It enriches your teaching and your life and benefits those around you.





ECTs from local schools

Professional development to support gender equity in STEM education in Australia and Saudi Arabia

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STEM plays a pivotal role in human cognition and is part of goal five of <u>the United Nations 2030 Agenda</u> for Sustainable Development of gender equity. Despite this, females worldwide continue to face inequalities in their education and job opportunities in these fields. Our project developed and delivered practical workshops to actively engage Early Childhood (EC) teachers in Saudi Arabia, fostering gender equity in the implementation of STEM education.

The project was funded by the Council of Australian-Arab Relations (CAAR) within the Australian Department of Foreign Affairs and Trade. Following the 2024 workshops, collaborative research was conducted, studying the <u>impact of the professional development</u> on early childhood teachers' STEM teaching practices.

Research Background

STEM (Science, Technology, Engineering, and Mathematics) learning is a pedagogical method of the 21st century, improving cognitive skills, such as creativity, problem-solving, scientific inquiry, and critical thinking. Within the Arabian Peninsula, there is a pressing need to promote inclusive practices in STEM education to address gender disparities. <u>Research</u> uncovered myths among Saudi early childhood teachers (ECTs) regarding <u>the importance of gender equity</u> in STEM education. Despite global recognition of the importance of women in STEM fields, significant gender inequality persists in STEM careers. The STEM Equity Monitor (2024) reports that women account for only 37% of university STEM enrolments and represent a mere 15% of the workforce in STEM jobs in Australia. These statistics highlight a crucial area for intervention, beginning in the early years of education.

Early childhood teachers <u>are instrumental</u> in generating and supporting children's interest and confidence in STEM from a young age. Their perceptions and teaching practices significantly <u>influence whether girls develop</u> <u>positive attitudes</u> toward STEM subjects. Recognising this pivotal role, researchers designed a study to investigate the impact of professional development on Saudi Early Childhood Teachers toward gender equity in early childhood STEM education.

Designing Professional Development Workshops

The research involved professional development workshops offered to 150 ECTs in each of two Saudi Arabian cities. Online surveys used open and close ended questions before and after the workshops to explore ECTs knowledge about STEM education, including:

- 1. Their preparation and confidence in teaching STEM;
- 2. Perceptions of gender equity; and
- 3. Challenges in integrating STEM into their curricula.

Participants in the workshops and surveys were also offered the opportunity to engage in an interview at a later date and time.



Teachers from local schools

Findings and Implications

The two surveys revealed significant improvements in their confidence in the teaching of STEM, indicating the effectiveness of the workshops in equipping teachers with the tools to support inclusive practices in STEM education. The themes that emerged include:

- improved teacher confidence;
- improved planning and integration of STEM into everyday curricula; and
- a deeper understanding of the importance of gender equity in STEM education.

Participants reported significant improvements in their ability to plan and implement STEM activities that encourage gender equity. The early results underline the value of hands-on, practical professional development in addressing gender disparities in STEM education. ECTs gained knowledge and developed strategies to overcome challenges and foster a more inclusive learning environment.

Conclusion

STEM education holds great potential to shape the learning ability of young children, fostering creativity, problem-solving, and critical thinking. However, gender inequalities in STEM fields remain a <u>pressing issue</u> around the globe.

ECTs play a crucial role in addressing these differences by inspiring interest and confidence in STEM subjects among girls from an early age. The findings of this study highlight the effectiveness of targeted professional development workshops in promoting inclusive practices and improving teachers' capabilities in STEM education.

Therefore, it is essential to provide this type of initiative to reach both pre and in-service educators in diverse settings and continue advocating for changes to promote gender equity in STEM. By doing so, societies can ensure that all children, regardless of gender, have the opportunity to explore and excel in STEM fields, paving the way for a more equitable and innovative future.

We would like to acknowledge our collaborators, Associate Prof Maryam Jamal Alharthi, Mrs Asma Aljohani from Taibah University, Dr Nouf Albadi, and Professor Nahla Mahmoud Gahwaji from King Abdulaziz University.



'Workplace Wellbeing' resources for early childhood professionals

In response to the educator shortages and <u>attrition cycles</u> in the early childhood education and care sector, the NSW Department of Education's Early Childhood Outcomes team have co-created research-based resources. These free, online '<u>Workplace Wellbeing</u>' resources are for educators, directors and management in the sector. They were co-created with educators, directors, management, mental health service providers, peak bodies and researchers. These include <u>videos</u>, webinars, <u>case studies</u> and other resources. They can be used for professional development and a springboard for reflection and discussions during staff meetings.





Opportunities and challenges posed by Artificial Intelligence to teachers and students

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Diversity in the classroom is to be celebrated. In the last few years, Artificial Intelligence (AI) has become a significant feature in technology and education, <u>including at university</u>. In this article, we will explain what AI is and then establish how the technology works, examine the benefits to educators and students, and outline the opportunities and challenges AI poses to the education community.

Definition

The Oxford Languages Dictionary defines AI as a technology in which computers are trained to utilise large language models 'to perform tasks normally requiring human intelligence, such as visual perception, speech recognition, decision making and translation between languages'. Google explains that:

Artificial intelligence is a <u>field of science or</u> <u>engineering</u> concerned with building computers and machines that can reason, learn and act in such a way that would normally require human intelligence or that involves data whose scale exceeds what humans can analyze.

We begin by explaining some of the popular terms and tools used in navigating Al. One such term <u>is ChatGPT</u> that refers to the helpful hand provided by way of a Generative Pre-Trained Transformer, which refers to how ChatGPT processes requests and formulates responses. This is a computer trained program that uses many language models to collect and quickly disseminate information. Consider the ways in which we use a web-based search engine to look for information. ChatGPT uses a similar model, only that it uses a larger data base and works many times faster. It is a tool that lets users enter prompts to receive human-like images, text, or videos created by Al.

Common questions in education

Educators might be curious to understand how Al is used to advance our understanding of some concepts. Also, they may have many questions about the challenges that Al introduces to the field. These questions might include:

- What aspects of AI benefit teachers?
- How can teachers use AI in <u>planning and</u> programming?
- In what ways would students use content provided by AI and present it as their own work?
- What <u>ethical considerations</u> does AI pose to both teachers and students?
- In what ways can knowledge gained through AI be misused?
- How has AI been used to spread disinformation?
- What disciplines are more vulnerable in the face of AI?

The challenges related to differentiating students' original work and work that is AI-generated poses problems for students. We should ponder whether AI encourages research or creative work. Also, are some disciplines more vulnerable than others? How would some disciplines, such as visual and performing arts, respond to content produced by AI?

Usefulness

Al technology is useful because it processes and disseminates information in record time. Al can be used to empower humans through technology. Advances in medicine have led to the cure of debilitating diseases, including some forms of cancer. New medicine has been introduced and released in record time. Processes that took nearly ten years before only take months when creating new medicines. These advances have perhaps given humanity more faith in science.

There are gains to be made using AI in education. Teachers can research information about topics they need for their teaching and get faster responses without spending days looking for content. This means less time is spent on planning and programming. Al makes their work more manageable. Students can also research assignments and use AI to get a head start on their work. Al should not be expected to complete all student assignments. However, ideas initiated by AI can be developed and shaped by students if they also acknowledge that they have used AI in preparing the initial concepts of their work. This would save them from being found to have breached academic integrity in preparing their work. Students can be guided so that they do not cut and paste content and then present the work as their own.

Risks

Subjects such as Creative Arts including drama, (script writing) and music (composing) are possibly the ones most vulnerable in the age of AI. Creative Artists have protested that machines could be used to replace them in their trade. Teachers and students of creative arts should respond to such challenges so that they retain creativity and authenticity. Art needs to be used to help us communicate with each other about human experience.

However, in the wrong hands, the technology can also be misused. In politics, for instance, voice technology has been used to fake voices of people and mislead entire populations about characters in the political arena. Young people are particularly vulnerable as the tech giants are seen to be influencing the lives of our youth. As a tool, social media has been used to influence the younger generation who may be social media users. Therefore, it becomes necessary to have safeguards along the way. Teachers and students should learn to identify instances where misinformation is presented as truth.

Ways to use AI with students

For teachers and students, it is necessary to get a clear picture of how best to use this new technology. For instance, teachers need to prepare their lessons, which takes time. Al uses tools where new technology assists teachers in accessing content quickly. Lesson plans can be prepared within a span of eight minutes. South Australia's Department of Education suggests several ways <u>teachers can use Al tools</u>. Al tools can be used to reword information so that students at different stages of learning understand it. It can also be used for inspiration on topics, to create or prompt questions as the basis for conversations or assessments for students and to tailor a task to support engagement.

<u>Students may use Al tools</u> in their learning in various ways. A child can use Al to answer simple questions on a topic, start creative tasks like stories or poems or explain information in different ways to help their understanding. Parents and caregivers consider privacy, security concerns, and students' learning needs.

Academic integrity matters should also to be considered. Schools can encourage students to use Al to support their original thinking rather than replace it. Chatbots can present work that is very close to what human beings produce, even without the aid of computers. Telling the <u>difference in texts</u> can be very challenging.

Conclusion

Within educational systems all over the world, Al brings benefits and risks. The ways in which teachers and students respond to issues related to the use of Al for academic purposes can be both a challenge and an opportunity. Educators can learn to use Al to assist with teaching but also guard against the misuse of this new and emerging technology.

The use of AI represents the shifting nature of educational technology. Teachers and students cannot escape the challenges and opportunities presented by this technology.



UNE Pathways student, Charlotte Hall

Hannah Collett | Communication and Engagement Officer, Faculty of Humanities, Arts, Social Sciences and Education

There are many ways to gain entry to study a degree at UNE.

The option you choose will depend on your prior study and experience, and the degree you wish to study. Our Pathways and TRACKS programs provide an alternative way to begin your learning journey at UNE, with flexible options that are aligned to your interests, home environment and lifestyle without being overwhelming.

By profiling past Pathways and TRACKS students, we hope that you may gain a better understanding of alternative entry into university and which course is right for you.

Charlotte Hall, Pathways graduate

What is your background and what brought you to study at UNE?

I was born in Brisbane, Queensland, but have spent my teenage years to now living right here, in Armidale, NSW! I love spending time with my friends and family, and keeping myself busy with study and sport.

How did you feel starting the Pathways program?

I started Pathways in Trimester 1, 2024. I was determined to get into my dream degree of primary teaching, but did not have the required ATAR to do so straight away. Pathways was the perfect option for me!

What did your family and friends think about you returning to study?

My family and friends were very supportive of my decision to begin studying. By surrounding myself with friends that were also studying at university and/or completing bridging courses, I found that we were able to relate to each other and support each other when needed.



Throughout my study, I continued to work full-time and participate in sports and volunteer work in my community. At times I felt challenged by balancing these commitments, but I felt accomplished at the end of the day.

Were there any moments that made you doubt your ability to succeed? How did you handle these and stay motivated?

Throughout some health and family challenges, I had many moments where I felt discouraged or unmotivated in regards to succeeding with my studies. In order to overcome these obstacles, I kept telling myself that whilst I may be struggling now, it will all be worth it in the end.

What support people or systems have helped you the most during your studies?

I would say that I have been my own biggest support during my studies. Whenever I begin to feel overwhelmed or start doubting myself, I am always able to get myself back on track and succeed in my studies.





Do you think your life experience gave you a unique perspective or helped you succeed at uni?

I definitely believe that by taking a year between leaving high school and commencing my studies with UNE, I was able to recognise my interests and passions, and develop a mature approach to life post-high-school.

Which achievements during your studies do you feel most proud of?

I am proud of both completing my Pathways Enabling course and undertaking study whilst working full-time.

What's next for you?

After completion of my Pathways course in October 2024, I received offers to study both the Bachelor of Education (K-6 Teaching) and the Bachelor of Education (K-12 Teaching) with UNE, with the K-6 course being my first preference. Being a primary school teacher has always been a career that I can see myself doing and loving forever, so I look forward to undertaking future studies within this course, particularly the placement aspects.

I am currently working full-time and, whilst putting my studies on hold momentarily, I look forward to what my future holds as a UNE student. I am excited to experience the ups and downs of a degree, and achieve my end goal of graduating and pursuing primary teaching.

What advice would you give to someone in a similar situation who's thinking about going to uni?

Just do it! The benefits of these courses are absolutely fantastic for students and to top it off - they are cost-free! I would recommend Pathways/TRACKS to anyone who is hesitant to begin their university journey.









Linking emotional intelligence to educators' feeling overwhelmed and burned out

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Early childhood educators' work and workload can lead to feelings of overwhelm and burnout. This stress is exacerbated by <u>attrition cycles</u> and the shortage of EC educators across the sector; it is estimated an extra 21,000 more educators are needed. It is essential that the wellbeing of those educators remaining in the sector is supported. Therefore, my study focuses on educators' work and wellbeing to understand what drives educator burnout and what supports might prevent it.

What is emotional intelligence?

Emotional intelligence (EI) is a theory of intelligence and can be described as an individual's ability to monitor their own and others' feelings and emotions, differentiate between emotions, and use this information to guide their own thinking and actions. There are two models of El within the research.

- 1. The ability model which proposes emotions can be intellectually analysed and based on cognitive (thinking) ability.
- 2. The mixed ability model views EI as a personality trait that influences a person's general wellbeing.

A four-branch model interprets El as a cognitive ability and presents four levels through which an individual can become emotionally intelligent. An individual with high El is adept at solving emotional problems, perceiving emotions, understanding the meaning of emotions and managing emotions better than others.



Figure 1: Four branch model of emotional intelligence (adapted from Salovey and Mayer [1990]).

Links to workplace flourishing and wellbeing

In the workplace, <u>effective emotional regulation</u> is associated with better cognitive and social functioning and improved wellbeing, all outcomes benefiting both employee and employer. <u>El</u> plays a vital role in promoting wellbeing by empowering individuals to effectively manage their emotions, navigate social relationships and cope with stress, all of which positively influence their overall health and happiness. Individuals with higher levels of El are more likely to experience better psychological wellbeing due to the positive relationship between El and self-esteem and El and life satisfaction.

Research highlights El's vital role in promoting workplace flourishing, with studies demonstrating its positive impact on wellbeing, job satisfaction and workplace performance. <u>A study</u> surveyed 319 working adults to ascertain a connection between El and workplace flourishing. It was concluded that higher El was related to better mental health, and an increase in job satisfaction. While El contributes to workplace flourishing, it also has a role in reducing burnout and feelings of being overwhelmed which is equally as critical.

Another study conducted into the relationship between burnout and EI in healthcare professionals found that EI acted as a protector against burnout and even assisted with reducing it. Through an individual's ability to use EI skills, such as emotional regulation, they can effectively deal with workplace challenges, cope with higher demands and maintain their own wellbeing. In turn, this can reduce the likelihood of burnout. However, those individuals with lower EI may struggle to manage and regulate negative emotions and stress leading to burnout over time.

Unlike other professions, educators are in a caregiving role that requires continuous emotional engagement and being in tune with others, putting them at high risk for burnout. The emotional labour of educators, over time, can lead to anxiety and exhaustion. This is particularly true for educators with lower levels of EI as they are not fully able to regulate their own emotions or seek out adequate support.

It is found when educators have higher EI they are more likely to experience job satisfaction, better motivate children within their learning environments, and structure learning based on child-centred approaches. Despite the importance of EI, there is limited research into educators' understanding of EI and the impact EI skills have on their job satisfaction, burnout and being overwhelmed. One study was conducted which examined 15 preschool teachers' views on EI and how this was used to support children in the development of their emotional skills. The study concluded that preschool teachers' awareness and skills of EI are limited, with most of the teachers' definitions of EI was only thought to be about understanding emotions.

This supports the idea of the limited understanding or shared language educators have of El skills. This can impact their professional and personal lives.



Educators' emotional load

Educators have the enormous responsibility of using their emotional, mental and physical resources to care for young children. Additionally, educators are responsible for the health, wellbeing and educational outcomes of young children and need to support their families.

Further, the expectations of parents often make it easy for educators to neglect their own <u>emotional and</u> <u>mental health</u>. Adding to this is the impact of chronic staff shortages. The wellbeing of educators is essential for quality education, yet the research suggests a lack of practical applications available for organisations to support educators' emotional wellbeing.

My proposed study

My Master of Education research project will use an online survey of 40 educators to explore their understanding of El and how it links to their feelings of overwhelm and burnout. We will also gather their preferences for professional development. Ultimately, we aim to use this information to create an El intervention program to benefit educators and assist them in reducing the emotional burden that the sector can impose.

New, free, online research-based '<u>Workplace Wellbeing</u>' resources for early childhood professionals are available from the NSW Department of Education. These include <u>videos</u>, webinars, <u>case studies</u> and other resources. (See page 8).





Feedback, feedforward and "next time" – the art of being constructive

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After completing my PhD 5 years ago, I thought I was finished with university. However, circumstances led me to enrol in a Master of Teaching offered online. Being a student at this level again is an interesting experience, and it has me thinking about the foundational nature of learning and how educators tend to assess learning and build capacity through assessment practices.

Essays and written feedback

Despite what generative AI has forced in terms of conversations around the validity of assessment, written work such as essays are still a common way to assess learning. I am enrolled in an education degree, so much of the assessment is lesson and learning sequence design. Essays are also used as a way to justify my choices in terms of learning activities, with links to the Australian and NSW curricula.

I am amazed given the technology available to us in 2024, why the style of feedback I'm getting is still largely standard through a plagiarism checker – that is, pre-written small chunks of information pasted all over my written work, such as 'expand here' and 'well done', which aren't very formative for future work.

For example, why should I expand here? Why was this section praised while others were not? Other comments I get are linked to APA referencing (something that was not taught in any class), yet I am still marked on it.

What's largely missing is a formative means for me to improve as a student. This is because I am receiving feedback – that is, what I did in the past and judgments about what I got right and what I got wrong, with no mention of what I could do better next time.

Feedforward

This is where feedforward comes in. While you could argue that this is just feedback under a different name, the philosophy and approach to providing comments are different. Instead of simply commenting on work done in the past, instructors, or those doing the marking, need to include phrasing that could help students improve in the future.

When we consider how we learn outside of formal education settings, it is generally by failing miserably and learning from those failures. When we touch a hotplate on the stove as a child, we are burned, and the memory of that pain tells us we should not do that again. We have both feedback (pain) and feedforward (the realisation that we don't want to be burned again).

If I make a mistake in explaining something in my essay, I want my teachers to tell me I made a mistake but also tell me how I can do it better next time. Therefore, "next time" is an easy way to embed feedforward into assessment practice. By saying those magic words and letting the student know what they can improve upon "next time", students will find this comment much more actionable because it gives them something to do, not just something to regret.

Assessment design and feedforward

This approach may have implications for learning design, and it may not. If assessments are designed to be iterative, like having a draft version followed by a final version, or a first submission, with a revised submission following the first, then this makes it easy and intuitive for feedforward to be included, but it is not required. By



using the phrase "next time" while providing comments on a student's work, feedforward can be used for more generic skills in academic writing or any other means of expressing learning.

Just as an example, I don't give any point value for correct APA writing in any of my assessments. My first class on assessment many years ago taught me that if a class doesn't teach something, the students should never be assessed on it; but as it is important for moving on in different programs and degrees, I still provide feedforward on it. This doesn't take the form of me 'redlining' each incorrect reference or citation; it just means using voice feedback to say, "Look out for your APA style – for next time, or check out <u>Perdue's OWL</u> (Online Writing Lab) or other APA guides to help you". This is actionable and speaks to how the student can improve, but it's still missing a key piece – the 'why' of it all.

When I'm told as a student through those little standard comments such as "expand here", I never know how or why. One generic comment would be helpful, it would build my motivation and help me understand the specific ways 'expanding here' would help my argumentation and writing.

Originally posted on the <u>author's personal website</u> @stoosepp.bsky.social Experience as a guest editor of a journal and reviewer of journal articles has been a great validating experience after finishing my PhD. I attended a conference workshop about reviewing for journals, and a key lesson was that 'we want to support our authors improve their work, so their readership goes up and their work is more widely shared'. This is also the mantra we should use as markers and assessors.

Feedback through generic comments with no elaboration on how to improve is really good for assigning a number value, filling out a rubric, and completing the act of summative assessment as we are required to do. However, it is not the best approach for building students' skills for future work. For that, feedforward is the way forward.



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Improving students' numeracy skills with QuickSmart

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There has been <u>substantial commentary</u> regarding Australian students' capabilities in numeracy and literacy. The <u>NAPLAN results in 2024</u> once again found that approximately one in three Australian students do not meet the proficiency standards in numeracy. Regardless of the <u>sensationalism in reporting these results</u>, for a nation such as Australia, this is of significant concern. The focus for educators is therefore on how to assist students to improve their skills in numeracy and meet these proficiency expectations. The *QuickSmart* Numeracy intervention program can help learners to develop these essential numeracy skills, which can open up future <u>education, employment and life opportunities</u>.



Figure 1: National Numeracy NAPLAN Results 2024

The QuickSmart programs

It has been 24 years since Professors John Pegg and Lorraine Graham first developed QuickSmart for students experiencing persistent difficulties in numeracy or literacy in their middle years of schooling. QuickSmart has been implemented in over 1,650 Australian schools, with more than 72,000 students benefitting from the program, since 2001.

The *QuickSmart* programs target students in Years 4 to 9 whose numeracy or literacy skills are below the national proficiency standards. This article focuses on the Numeracy program, which offers students a second chance to develop potentially life-changing numeracy skills and become confident and active learners.

The numeracy intervention



Figure 2: Games used during the QuickSmart Numeracy program

The <u>QuickSmart Numeracy program</u> is a small group intervention program with an instructor working with a pair of students for three 30-minute lessons a week for around 30 weeks. The Numeracy program is designed to assist students in developing their skills with basic number facts and their ability to apply and use their knowledge with greater efficiency and success. These two aspects could be considered to be "quick" and "smart", hence the name *QuickSmart*.

The Numeracy lessons have a consistent structure, with six 5-minute components. They involve high levels of engagement where students are on-task. The components have a <u>mix of modes</u>, with both verbal and written responses, using physical resources, computerbased resources, and a group activity, as each lesson concludes with an engaging maths game.

Assessment is embedded within the lessons, allowing each student's progress to be monitored, so that every student has <u>immediate feedback</u> and an individualised program, enabling <u>deliberate practice</u> on their specific areas of need. The lessons have a specific focus for each learner, with clear goals and targets for progression, enabling students to experience genuine success and see evidence of their ongoing achievement. The lessons encourage students to use their thinking to access prior knowledge, understanding and effective strategies. It offers a highly supportive and motivational learning environment.

QuickSmart is based on neuroscience and educational research on <u>how students learn</u>. The Numeracy program involves developing <u>automaticity</u> with basic number facts, which is the ability to give the correct answer instantly without conscious thought. This frees up the <u>working memory</u>, which is the <u>bottleneck of learning</u>, enabling more cognitive resources to undertake higher-order processes such as application and problem solving. Automaticity with the basic number facts is vitally important in mathematics education, <u>increasing</u> <u>confidence</u>, <u>understanding and achievement</u>.



Figure 3: The role of the working memory in learning



Figure 4: PAT-M results pre- and post-intervention

Results and impact

Students improve substantially in their recall of basic number facts during the Numeracy program, with learning gains in the order of 2-3 years of schooling in one year. This is established by comparing student results before and after the program and calculating the <u>gains</u> <u>and effect sizes</u>, with a range of 0.2-0.4 typical for a student in a classroom based on <u>John Hattie's research</u> into influences on student achievement.

The students' more wide ranging improvements in mathematics from participating in the *QuickSmart* Numeracy program are assessed using the <u>Progressive</u> <u>Achievement Tests</u> in Maths (PAT-M) by the Australian Council of Educational Research (ACER). The <u>results</u> <u>from 2009 to 2022</u> below show consistent improvements in student achievement, with effect sizes in the range of 0.6 to 0.75 each year.

Students also obtain a wide range of qualitative benefits from the program, generally displaying enhanced confidence, self-esteem and positive learning behaviours, that are transferred to other classroom learning environments.

Aside from improved student outcomes, schools also benefit from *QuickSmart* with the wide range of physical and digital resources provided. Additionally, six days of professional development training is provided throughout the year for instructors as ongoing support. Professional development expands instructors' knowledge regarding how students learn and improves teaching practice, as well as the ability to deliver interventions to support student growth and development. *QuickSmart* has been recognised with a number of awards, including by The <u>Australian Research Council</u> in 2018 for its impact on addressing the needs of at-risk learners. It also won the HTB Harris Memorial Award in 2020 for a significant educational program that successfully fulfilled an educational need over time.

Program evolution

The QuickSmart programs are long-term research programs, which involve continuous evaluation and improvements to ensure the ongoing quality and effectiveness. QuickSmart has adapted to the technological changes over the last two decades, with new online tools for educators to access digital resources, conduct student assessments and track student progress. In addition, the professional development training provided for school staff is now offered in an online format.

Schools interested in implementing the *QuickSmart* programs to assist their students can find out more by visiting the *QuickSmart* website or emailing quicksmart@une.edu.au

Acknowledgements

The author would like to acknowledge Professor John Pegg and Professor Lorraine Graham, who originally co-developed the *QuickSmart* programs, and the <u>entire *QuickSmart* team</u> for their dedication to supporting student learning.

Supporting gifted and talented students in the secondary Geography classroom

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Last year during a "check-in" conversation with my head teacher, the point was raised that the behaviours of some of my Year 7 students may be partly due to the need for 'extension activities'. In this article, I reflect on the challenges faced by secondary geography teachers looking to extend gifted and high-ability students and offer reflections on how these challenges may be overcome. After the conversation, I quickly realised that I rarely explicitly considered the specific learning needs in the classroom of students who would be identified as being 'high ability' or 'gifted and talented'. This caused me to reevaluate my overall teaching approach in the classroom and consider what needed to be done.

Gifted and talented students are given provisions in the secondary Geography syllabuses. The <u>Geography K-10</u> <u>Syllabus</u> recognises the specific learning needs of gifted and talented students. I referred to these students' specific curriculum requirements and characteristics, which further prompted me to consider why I had overlooked them. I spent considerable time focusing on students facing difficulties in their learning and those 'behind' their peers. There are several reasons for this, such as a lack of planning on the part of schools and teachers for students at the high-ability end of the scale.

In my teaching, I cannot recall being given instruction or professional development regarding how to cater to the needs of this cohort of students. While I have provided a few 'extension questions' for students who were high achievers, I have not set out to specifically devise specialty activities for these students or students who have been identified as gifted and talented.

I realised that Geography, as with other Key Learning Areas (KLAs), has a significant knowledge base that could be considered a 'specialty'. This means the teacher needs a robust level of expertise – this is important given the number of out-of-field teachers in the profession. As observed by <u>Caldis (2022)</u>

while 40% of Australian teachers of students aged 12 to 16 teach geography out-of-field, the proportion of teachers who have geography as a specialism but do not teach the subject is even higher.



without the specialist knowledge have to also support the learning of gifted and talented students. How can teachers respond to this challenge?

Professional development

For out-of-field Geography teachers, the best approach to supporting this cohort involves providing many meaningful professional development and training opportunities. These opportunities should illustrate a variety of tools and applications available to the geography classroom. These tools and applications are essential because they are often the elements that can bring the course to life and generate enthusiasm in the class. Effective and worthwhile professional development involves stimulating tools and applications with teachers, explaining how to effectively use them with students. Given the mandated practical fieldwork in the course, practical tools are critical in the Geography curriculum.

Attention should be given to critical thinking and problem-solving through <u>inquiry and project-based</u> <u>learning</u> related to human and cultural geography. Facilitating project-based learning and inquiry can be made easier through learning opportunities for teachers. These critical thinking and problem-solving aspects have great potential to stimulate and encourage these students and enable them to reach new heights. Critical thinking and problem-solving could be central themes to any 'extension activities' the teacher creates for identified students.

Helping Geography thrive

For the Geography field to thrive, it needs to capture the imagination of secondary students and retain healthy numbers of enrolments into senior Geography and beyond. This is particularly true for gifted and talented students as they have great potential to advance the field into the 21st century and advance it with fresh ideas, innovations and approaches. This begins with having teachers throughout secondary Geography who nurture gifted students and confidently lead activities that promote advanced thinking, as they themselves have received the best possible training and professional development.

Therefore, a significant number of teachers in the field



The effect of prior knowledge on learning complex linear equations

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Cognitive load theory has evolved to be an important instructional theory since its development over 40 years ago. In this article, we provide a brief overview of <u>Cognitive load theory: Research that teachers</u> <u>really need to understand</u> and propose a framework for designing instruction to help students learn to solve complex linear equations, guided by the design principles of cognitive load theory.

The Australian Government's Department of Education has actively encouraged educators to apply the principles of cognitive load theory when designing curricula for primary and secondary education. More recently, the <u>"Strong Beginnings: Report of the Teacher</u> <u>Education Expert Panel</u>" recommended that the core content curricula for Initial Teacher Education (ITE) programs line up with the structure of human cognitive architecture. This was outlined by cognitive load theory.

How does cognitive load theory work?

Cognitive load theory tries to align the design of instructions with the structure of human cognitive

architecture. It has a <u>limited working memory</u> where information processing occurs. Successful processing of information in working memory will then be stored in the long-term memory in the form of <u>schemas</u> for later use.

Owing to the limitation of working memory, it can only process a limited number of elements at a given time. <u>An element</u> is anything that requires learning. However, when processing a schema that can be retrieved from the long-term memory, the limitation of the working memory disappears. The working memory can process a schema as a single element, imposing minimal cognitive load.

So, from an instructional design perspective, how should we design instruction to support the learning of linear equations with a hierarchical level of complexity? We will describe the solution procedure of linear equations. Then, we will propose a lesson to assist students in learning how to solve complex linear equations.

	One-step equation	Two-step equation
Line 1	3x = 9 (×3 becomes ÷3)	Line 1 $2x + 7 = 11$ (+7 becomes
Line 2	$x = 9 \div 3$	Line 2 $2x = 11 - 7$
Line 3 $x = 3$	Line 3 $2x = 4$ (×2 becomes	
	Line 4 $x = 4 \div 2$	
		Line 5 $x = 4$

Table 1: One-step and two-step equations

In the table, you can see that lines 1, 2, and 3 in the one-step equation are similar to Lines 3, 4 and 5 in the two-step equation.

Solution procedure of linear equations

Our previous research about linear equations has led us to propose the use of both relational line and operational line to describe the solution procedure. Consider a one-step equation in Table 1: a relational line refers to the quantitative relation between elements where the left side of the equation equals its right side (i.e., Line 1 and Line 3).

An operational line, in contrast, refers to the application of a mathematical operation, such as an inverse operation (i.e., treat ×3 as the inverse of \div 3) that would alter the state of the equation, and this procedural step would preserve the equality of the equation (i.e., Line 2). Importantly, the <u>concept of inverse operation</u> in the context of linear equations is grounded in students' basic numeracy skills (e.g., 2 + 5 = 7 is the same as 2 = 7 - 5).

The design of a lesson

A mathematics teacher plans to teach two-step linear equations to 8th grade students who have already learned one-step equations. The teacher introduces two-step equations by capitalising on students' prior knowledge of one-step linear equations, which reduces the working memory load. Our proposed lesson would consist of two phases: (i) a teaching phase (~15 min) and (ii) a learning phase (~25 min).

Teaching phase

Consider the two-step equation: 2x + 7 = 11 (Table 1). Serving as a mastery model, the teacher would attempt to link this two-step linear equation (complex linear equation) to another one-step linear equation (simpler linear equation), such as 3x = 9. The teacher then undertakes the following:

- i. Review the solution procedure of the simpler linear equation, 3x = 9.
- ii. Explain the solution procedure of the complex linear equation, 2x + 7 = 11
- iii. Draw students' attention to similar operational and relational lines of Lines 3, 4, and 5 of 2x + 7 = 11 and Lines 1, 2, and 3 of 3x = 9
- iv. Emphasize that the complex linear equation has two more solution steps (such as Lines 1 and 2) than the simpler linear equation

Reviewing the simpler linear equation, 3x = 9, to strengthen a student's prior knowledge of the simpler linear equation can reduce the intrinsic cognitive load that the complex linear equation imposes. This would allow the student to use the schema of the simpler linear equation (3x = 9) to help understand the more complex linear equation (2x + 7 = 11), which would then reduce the working memory load.

Learning phase

There is a volume of research that supports the use of worked examples to enhance learning. Studying worked examples directs learners' attention to the problem states and problem-solving operators, which imposes a low cognitive load.

In line with <u>prior research</u>, we recommend that a student works individually to complete multiple worked example-practice equation pairs to acquire schema for the complex linear equation. For each pair, the student studies a worked example of a complex linear equation and then solves a practice equation that shares a similar problem structure.

Conclusion

From the perspective of cognitive load, once students have learned a lower-level schema for simpler linear equations, such as 3x = 9 (Table 1), they can retrieve this schema from the long-term memory and process it in working memory as a single element. A complex linear equation such as 2x + 7 = 11 shares a subset of solution steps (i.e., Lines 3, 4 and 5) as the simpler linear equation such as 3x = 9 (Lines 1, 2 and 3).

Therefore, having learned schema for the simpler linear equation, the learning of the complex linear equation would entail the learning of Lines 1 and 2 only, therefore, reducing cognitive load. We urge mathematics educators to consider our proposition to innovate the quality teaching of linear equations as well as other topics in secondary mathematics education. Also, we encourage mathematics educators to <u>access our</u> <u>work</u> that details the design of instruction for learning complex linear equations based on cognitive load theory and learning by analogy.

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Let's collaborate - breaking the 'island' mentality

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Despite the common nervousness and dread that group work and collaboration can bring, teachers have long extolled the virtues of collaboration for our students, early career teachers and colleagues. As educators who have worked in primary, secondary and university contexts, we write from our experiences as researchers and active participants in collaborative practices, and facilitators of collaborative learning.

How, as educators, can we best facilitate collaborative practice in education contexts?

Lights, camera, action!

'Get into groups', announces the teacher, and instantly, there is a scramble from all corners of the classroom: students clinging to a familiar arm and defying anyone to separate them. The remaining ungrouped bodies stand frozen in terror, some feigning invisibility, others seeking permission to find bags and extract a book (or phone), wishing to be left alone to avoid the horrendous injustice of wading through every minute of this seemingly tortuous task. No matter what they are called (group work, working parties, team up, collaborative practice), such phrases are not music to everyone's ears.

For some students and teachers, the very thought of being forced to engage in group activities, let alone group work, is close to a near-death experience. By group work, we mean the process of working together with other people towards a common goal or purpose. As educators, we have all participated in staff development days, meetings, and professional workshops. In the interests of being inclusive and open to ideas, these events employ group work to build connections, collectively problem-solve, and create *something* that recognises our impact as a staff member and that contributes to the school as a whole. In this context, staff meetings that begin with: 'Today we are going to form groups ...' frequently invite a collective *teacher-sigh*.

As researchers who champion collaborative practice, we ask: 'Why is this so?' There is <u>substantial evidence</u> that highlights the importance of collaborative decisionmaking not only for individual participants, but for the outcomes of the <u>group collaboration</u>. We suggest that there are good reasons for a collaborative approach to school decision-making, and as educators, we generally like to have a voice.

Yet for both students and teachers alike, the invitation to create, teach or problemsolve as a group is frequently met with reluctance. Just like broccoli or brussels sprouts, we know brassicas are good for us; we just don't always like them.

That said, it is <u>well-researched</u> that active and reflective collaboration is vital to building successful learning communities, improving student outcomes, and

strengthening professional relationships. Schools are highly collaborative environments and professionally, our collaborative skills draw high praise from students, colleagues and the wider school community. For our students, they are mandated within the General Capabilities in the Australian Curriculum, Assessment and Reporting Authority curriculum. Studies have identified skill sets in education contexts that are ideal for achieving outcomes, and that work for the good of each member as part of the collaborative process. However, research also tells us that collaborative learning is an elusive skill for many teachers and pre-service educators. If collaboration is integral to social interactions between staff and students, the question becomes 'how do we help educators embrace collaborative practices?' We must place a toolkit into the hands of the main players.

As reflective educators, we focus on our own successful and unsuccessful group experiences to equip our future teachers with the tools needed for their careers in education. Collaboration is not just a tool in school classrooms - it's an essential strategy for all educators, whatever the context. Collaboration introduces group actions and processes set into a sociocultural model, where, in essence, we learn ways to collaborate and engage in group work through praxis. Ironically, through collaboration, we use intuition to build the skills to negotiate the complex skills needed to work closely and successfully with other people. For teachers, our personal and <u>professional identities</u> are developed through cycles of collaboration, action and reflection. We recognise that by the time we become competent, the kinds of challenges we encountered in our younger years have been strengthened by the successful collaborative experiences we have gained along the way.

School leaders have expressed the benefits of ongoing professional collaboration within their school communities to build and reflect on their teachers' understanding of the need for nuanced knowledge and improved teaching practices. Teachers are wellaccustomed to dealing with the complexities of the modern classroom; they navigate collaborative learning to respond to diverse student needs while maintaining motivation and enthusiasm. Educators must work together in schools to develop appropriate methods of teaching that suit their context. Additionally, they need to build growth-based teaching and learning cycles, therefore making collaboration a highly effective professional development activity.

Overall, the innovative potential of the collective mind is captured by developmental psychologist, <u>Keith Sawyer</u> in his book entitled 'Group Genius'. Indeed, the genius of 'collaboration' is in the process and the product – it is the opportunity to create a multi-informed, groundbreaking, bright shiny new thing.... together.





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Artwork: Warwick Keen "Always was, always will be" 2008. Gifted by the artist to UNE in 2008

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