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INTO THE 2030s
THE BIG EDUCATION
CHALLENGES OF OUR TIMES

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Introduction

This publication presents 10 provocative essays on some of the most pressing challenges facing education over the next decade and beyond. It showcases the work of academic researchers from across Monash University's Faculty of Education.

These 10 pieces highlight a wide range of issues that are impacting education – from climate change and geopolitical security to mental health and the rise of artificial intelligence.

Our authors are all leading experts in the areas that they write about. Their pieces raise difficult questions that education policymakers, professionals and the public need to be actively engaging with over the next few years.

These are all complex discussion points; there are no easy fixes or one-size-fits-all recommendations. Nevertheless, these essays all point to tangible ways forward that should provide inspiration to teachers, education leaders, policymakers and everyone else with a stake in education.

These are significant issues that will play a large part in shaping the future of education as we know it. We look forward to continuing the conversations in the months and years to come.

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MONASH EDUCATION

The role of schools in promoting mental health and wellbeing

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How might schools respond to the mental health crisis experienced by children and young people? What effective practices can schools engage in that will move the field forward?

Compared to pre-pandemic estimates, the prevalence of depression and anxiety symptoms in young people during COVID-19 has doubled (Racine et al., 2021). Simultaneously, psychologists and other mental health professionals are in high demand, and young people face long wait lists before they are able to see someone.

The universal nature of schooling, which most children participate in from an early age, provides an important opportunity to promote young people's mental health. In this paper, we not only outline best practice, we strongly advocate for this to be the next practice for schools.

▶ EMBEDDING WELLBEING IN EVERYDAY PRACTICES AND SYSTEMS

Schools embed wellbeing into daily practices and routines in several ways. Teachers might promote wellbeing in how they teach and relate to students, such as through positive student–educator and peer-to-peer relationships (Phan, 2017). Some schools explicitly teach social and emotional competencies such as emotional regulation, friendship and coping skills. Teachers who use differentiated instruction and mastery goals in the classroom also build student wellbeing (Baudoin & Galand, 2022).

The school culture plays a role in student and staff wellbeing, including clear behavioural expectations that help students feel safe and comfortable, intercultural practices, and cultural congruency between a student's school and home and where student and staff belonging is nurtured (Allen et al., 2018). Likewise, wellbeing needs to be embedded in school vision and policy statements. Staff wellbeing is a critical component of embedding wellbeing in schools, by ensuring that school staff have adequate resources and supports (Hine et al., 2022).

▶ THE NEXUS BETWEEN LEARNING AND MENTAL HEALTH

There is a perception that approaches to building student wellbeing take time and attention that could otherwise be directed to academic learning. However, how students feel about themselves will impact their learning, and conversely, how students perform at school will impact their mental health.

There are many factors related to the child, family, school and community that impact children's wellbeing and learning. Developmental cascade models show how problems in one domain can ripple into other areas of functioning. For instance, learning problems in the early years of school can lead to behavioural problems in the middle years of primary school and then to mental health issues such as anxiety in high school (Wigglesworth et al., 2017). Simultaneously, early competence will impact later development in positive ways; as Masten and Cicchetti (2010) argued, 'Success in earlier tasks build skills for success in later tasks' (p. 493).

Developmental cascade models not only highlight the need for early intervention, they also conclusively demonstrate the intertwined relationship between mental health and learning, and how interventions to support one domain will have a spillover effect on the other. Efforts to support learning also need to support mental health and wellbeing – the two are inseparable.

▶ A COLLABORATIVE APPROACH

Schools cannot do this work alone as it's neither sustainable nor effective and cannot address the broader social factors, including family and community, that impact young people's mental health. Collaborating with others ensures students' functioning across the school, home and the community can be targeted. An intersectoral approach to student mental health and wellbeing allows for coordinating resources and staff time, reduces costs and helps families navigate the various systems surrounding them. Strong leadership, well-defined and transparent decision-making and communication processes, and sensitivity to context are critical characteristics of successful partnerships. In these partnerships, we need to attend to processes (how we will work together) as much as outcomes (what we will work together on) (Reupert, 2020).

Partnerships with families are critical. Schools tend to engage well with those parents/caregivers who are already engaged in school life, but are less successful at engaging with disengaged parents/caregivers. Valuing their input, understanding why some families might be discouraged or disinterested in working with schools and offering multiple and flexible communication opportunities and mediums (to and from families) are all strategies that can be employed to promote successful partnerships between schools and families (Reupert, 2020).

▶ ONLINE MENTAL HEALTH SERVICES

During COVID-19 lockdowns, the strategies employed by school staff highlighted the utility of different digital platforms for identifying and responding to students' mental health concerns (Reupert et al., 2022). Teachers used a variety of ways of checking in with students and their wellbeing, such as asking students to identify an emoji at the start of every day that best captured their mood, and followed up as required. School psychologists suggested that providing counselling online would offer students and themselves greater flexibility around the timing of appointments and remove the stigma associated with seeing a counsellor. Additionally, school psychologists reported an increase in engaging parents and the wider school community through the provision of online mental health resources such as webinars. We need further evaluations to ascertain the effectiveness of such practices, but emerging evidence suggests that such practices should continue to be offered following COVID-19.

## ▶ CHILDREN AND YOUNG PEOPLE ARE AT THE CENTRE OF EVERYTHING WE DO

Children and young people need to be at the centre of everything we do. School staff and parents should actively elicit student voice and agency: first, by giving them multiple and varied opportunities to provide their input; and second, through listening with intent and respect and responding accordingly. When we cannot accommodate their preferences, they need to be informed of why this is the case. All children should be involved – not only those who are student body leaders or sit on school committees. Often, the students who are the most disengaged are those we need to listen to most, as they offer us insights into what is working and, just as importantly, what we need to improve.

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Mobilising participation of women and girls in STEM

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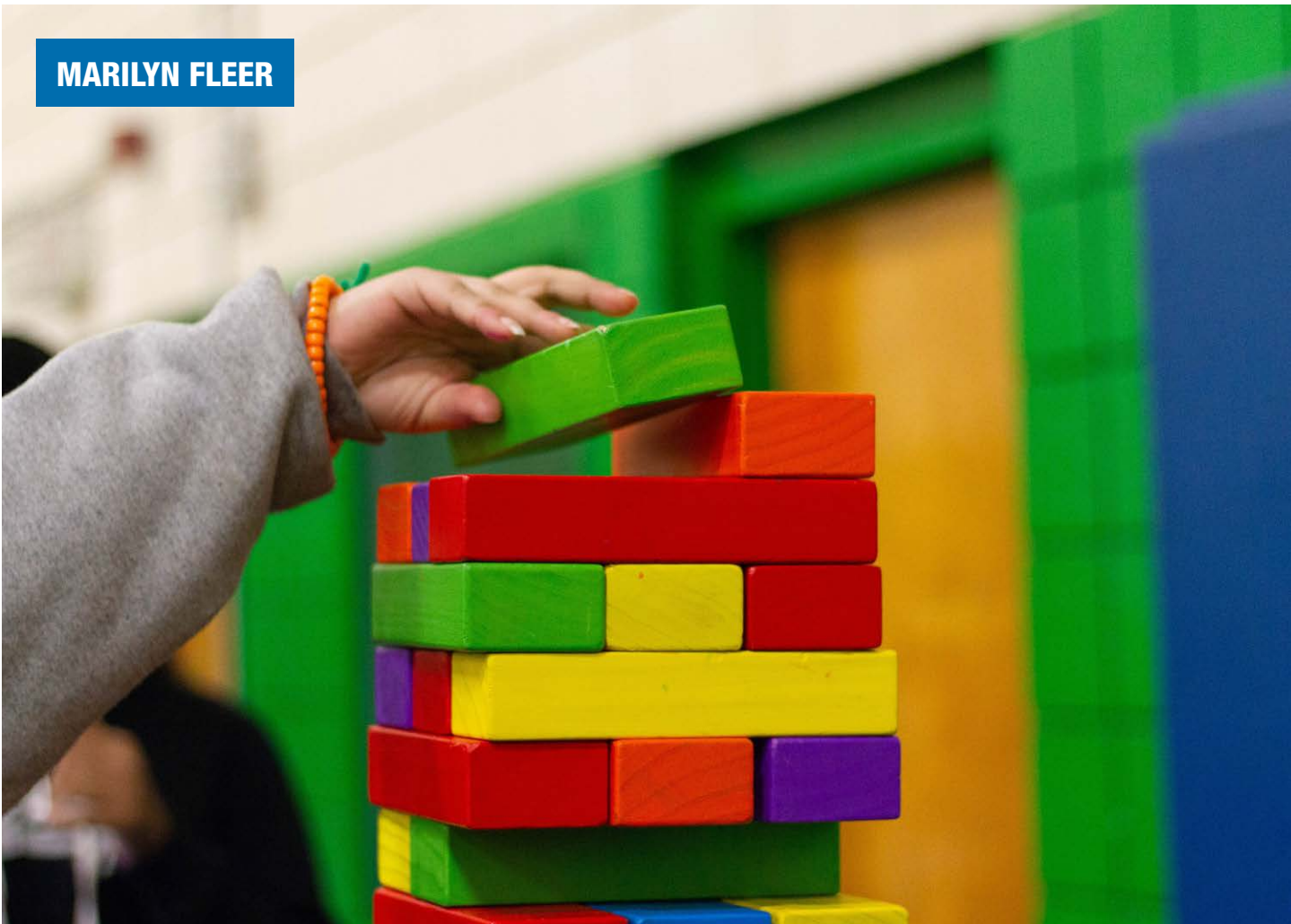
Why is it that, in 2023, girls still don't get a go in STEM?

Ask any parent about their aspirations for their girls, and most will say they want their daughters to be in highly paid positions. They want their children to reach their potential. But is there a darker side to this story?

Four-year-old Rita is super excited. Her preschool teacher is encouraging all the children to participate in block play today. They are going to build bridges. Rita keenly moves towards the teacher who is standing next to a table that she has placed in the block area. Rita sees that this is the space where all the action is happening, and she nestles up behind the boys who are all crowded around the teacher. Rita stretches her neck as high as possible to see over the boys so she can be part of what is happening. Her friends join in, but they cannot see either.

The teacher announces, 'The 3 billy goats want to cross the river' – she is pointing to some blue fabric that represents a river, which Rita and her friends cannot see – 'and we are going to build a bridge for them.' Rita jumps up and down, excited as a puppy. Some real engineering, and some real possibilities to use and challenge her already advanced problem-solving skills. Her friends clap with joy. It's going to be a good day.

At an early age, Rita and her friends are showing a keen interest in STEM – despite struggling to be close to the action. Her experience mirrors longstanding research that shows girls as young as 4 years have fewer opportunities for STEM learning (Hallström et al., 2015).

An Australian Government report published in 2017 found 'a weakness of Australia's Innovation Science and Research system is that, despite substantial improvements in recent decades, it remains part of a gender-unequal society. Yet there is growing evidence that gender and ethnic diversity is important for innovation performance' (Innovation and Science Australia, 2017, pp. 55–56).

Could this be why the government is investing in a Women in STEM ambassador like Lisa Harvey-Smith to encourage girls into STEM? On her website, it reads: 'In her role as Women in STEM ambassador, Professor Harvey-Smith is responsible for mobilising Australia's business leaders, educators and policymakers to increase the participation of women and girls in Science, Technology, Engineering and Mathematics (STEM) studies and careers' (Women in STEM Ambassador, n.d., para. 1).

It is not surprising that the government is seeking to make a step change. The Australian Academy of Science (2019) found that of the 47.5% of women in the workforce, only 16% are employed in STEM skilled professions. Even worse is the statistic that of those employed in the STEM workforce, women earn 23.7% less than men – despite having similar qualifications. Yet the Office of the Chief Scientist (2016) declared that a 'strong performance in STEM is also critical to our education sector – now Australia's fourth largest export industry' (p. 3). However, 'The gender distribution of people with STEM qualifications was highly skewed, with males making up 84 per cent of the total' (p. 10).

While the figures change slightly across the STEM professions and the various government reports published, as a nation, we have not changed the outcome. When girls grow up, they simply don't go into the STEM professions in the same numbers as boys. Fewer girls choose to study STEM subjects. The Australian Academy of Science (2019) reported that Australia has the lowest percentage of girls electing to take subjects in STEM in the Asia-Pacific region.

The outcome for Rita and her friends, who repeatedly tried to get close to the STEM action, fits with the statistics. Rita and her friends eventually gave up trying to be part of block building.

It was a lost opportunity for Rita and her friends to develop competence in STEM. If girls don't get a go, how can they develop STEM skills? What Rita is learning is that STEM is not something expected of her. If girls are not expected to be involved in STEM at such an early age, how could they imagine a future in the STEM professions?

Many argue that role models in STEM can help (Australian Academy of Science, 2019), but the numbers are not yet there to make a difference. Longstanding research has tried to fix the problem by offering compensation classes or interventions to build girls' STEM skills in schools, thereby seeking to positively generate interest in STEM and the STEM professions. But this fix blames the victim, and these programs have not significantly changed the statistics. Direct intervention is needed (Martin-Gámez & Fernández-Oliveras, 2022; National Academies of Sciences, Engineering, and Medicine, 2020).

Monash Education's Conceptual PlayLab is working on this problem. What have we found?

▶ BEGIN EARLY

STEM programs should begin in early childhood. We can't wait until these children start school – it is just too late. Our evidence-based model for supporting teachers and educators to plan and implement innovative and engaging STEM programs for infants, toddlers and preschoolers is making a difference to girls like Rita (Fleer, 2021b). It is called a Conceptual PlayWorld.

▶ THE LEARNING ENVIRONMENT NEEDS TO CHANGE

Early childhood centres were designed more than 100 years ago around traditional areas such as a block construction area, a home corner, an arts and crafts area, an outdoor area, and so on. Longstanding research shows that these areas have become gendered (Hallström et al., 2015). For example, boys do the building and use the floor space in the block area, and girls are allowed in if they pass the blocks to the boys. But when teachers set up new kinds of spaces, the gendered dynamics change (Fleer, 2021c).

Our research shows that when teachers implement a Conceptual PlayWorld for their children, it changes the interactions and how girls and boys use the play spaces. In a Conceptual PlayWorld, the whole centre becomes the story, such as the fairy tale of the 3 Billy Goats Gruff, and the traditional areas no longer exist. Changing the spaces changes the interactions and encourages equal opportunity (Stephenson, Fleer, & Fragkiadaki, 2021).

▶ BEGIN WITH A SOCIAL PROBLEM THAT MOTIVATES GIRLS INTO STEM LEARNING

In a Conceptual PlayWorld, the drama of the story creates STEM engagement for all the children and teachers, but especially for girls (Fleer, 2021a). Using a dramatic story helps children become emotionally engaged in STEM because they build empathy for the characters who need help – how to cross the river. Our research shows that when children jump into the story and become the characters, they live the problems and want to use STEM concepts to help with solving the problem. Girls become motivated to learn STEM when the context is personally meaningful, and this opens possibilities for imagining themselves as being competent in STEM (Stephenson et al., 2021).

▶ BECOME PART OF THE CHANGE THAT IS NEEDED FOR GIRLS IN STEM

Monash Education's Conceptual PlayLab is funded by the Australian Research Council (FL180100161) and offers free self-paced online professional learning to teachers and families to learn how to design a Conceptual PlayWorld using their own storybook.

We would like parents, educators and policy-makers to advocate for all the girls in our early childhood centres and classrooms. By using the research to build new ways of bringing STEM to girls, we can help all the Ritas to grow their STEM competence and build their confidence to become STEM champions in Australia.
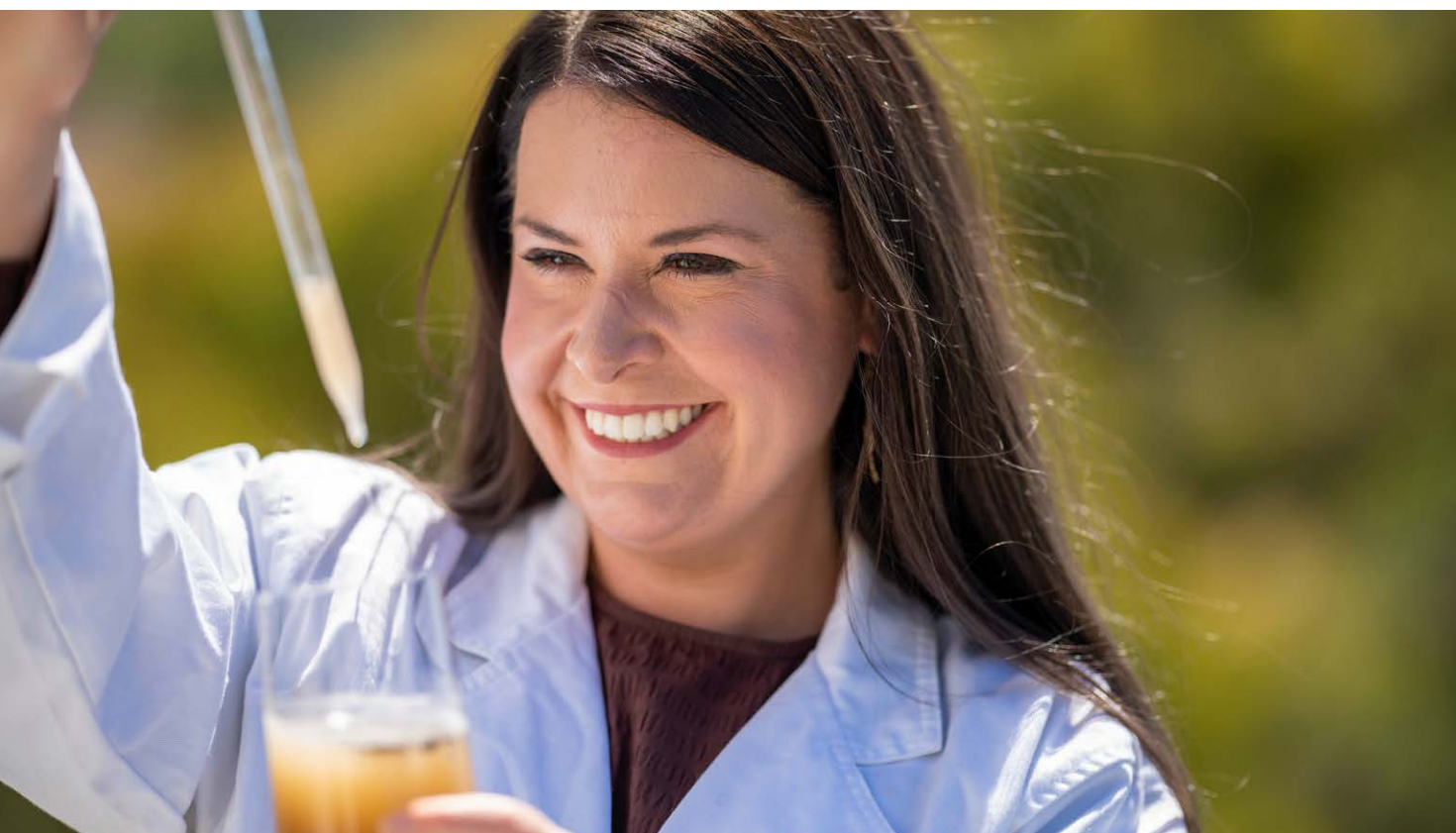
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Principals' emotional labour in volatile times

JANE WILKINSON

'You've got to really tell them, show them what it is to be a community and a family and care about each other.' (School principal)

Principals are facing intensified emotional labour due to greater societal fragmentation. Until the advent of the COVID-19 pandemic, the important nature of principals' emotional management work had remained largely invisible. What are the implications for students, schools, education systems and society more broadly when it comes to this crucial aspect of principals' work?

▶ PRINCIPALS' EMOTIONAL LABOUR: A LARGELY INVISIBLE BUT CRUCIAL ASPECT OF THEIR WORK

Emotional labour – managing one's own emotions and the emotions of others – is a crucial aspect of 21st century principalship (Berkovich & Eyal, 2015). The demands of this aspect of principals' work have intensified in recent times. Increasingly diverse and often volatile school settings and communities demand new emotional capacities, as principals negotiate tensions arising from issues associated with identity, difference, privilege and marginality in areas such as sexism, racism, homophobia, gendered exclusions, Islamophobia and radicalisation (Howie et al., 2020; Keddie et al., 2018; Wilkinson et al., 2018). The pandemic has exacerbated the emotional demands on principals when it comes to this work, with record levels of mental health issues for children and youth (Brennan et al., 2021) and rising levels of poverty (Davidson, 2022).

School principals can play a key role in fostering more socially cohesive school communities in more socially volatile times (Wilkinson et al., 2018). This calls on less visible, but crucial, skills: trauma-informed leadership, community building and the emotional management capacities to connect across diverse demographics in holistic and socially just ways (Wilkinson et al., 2020). It is indispensable in creating the kinds of conditions needed for students, schools and communities to thrive (Walsh et al., 2020). However, it remained a largely unheralded aspect of principals' labour in education policies, leadership standards and workforce development until the COVID-19 pandemic (Longmuir, 2021). It is less easily quantified and tends to 'fly under the radar', particularly when it is done well.

What is becoming more apparent is that the combined impacts of workload intensification and the emotional demands of the principalship are impacting leaders' health and wellbeing. Typical symptoms include chronic stress, feelings of burnout and lowered job satisfaction levels (Heffernan & Pierpoint, 2021). Moreover, the emotional labour of the role may take a particularly heavy toll on specific groups. For example, women are often viewed as skilled emotional managers (Blackmore, 1996) and are overrepresented in challenging, hard-to-staff public schools where these emotional capacities are indispensable (MacDonald et al., 2021).

▶ WHAT ARE THE IMPACTS OF PRINCIPALS' INTENSIFIED EMOTIONAL LOAD ON SCHOOLS, EDUCATION SYSTEMS AND SOCIETY?

The role of the principal in improving the educational, social, emotional and physical outcomes of students and building bridges between diverse communities is critical. However, quality schooling systems require strong, capable and well-supported principals. Thriving communities require school leaders with the emotional capacities to connect increasingly polarised and disadvantaged communities. Currently, Australian schools are facing a principal recruitment and retention crisis (Riley, Rahimi, et al., 2021). One in three Australian principals' health and wellbeing is deemed to be at serious risk (See et al., 2022), a pattern echoed in England (Thomson et al., 2021), New Zealand (Riley, See, et al., 2021) and Ireland (Riley, 2015). The pandemic has exacerbated this stress, with the highest ever recorded levels of burnout and cognitive stress among school leaders (See et al., 2022).

High principal turnover due to stress and burnout has severe consequences for student outcomes, as well as impacting teacher retention and school–community engagement and incurring significant costs, estimated between $45,000 and $75,000 per principal (Boyce & Bowers, 2016; Snodgrass Rangel, 2018). Rapid turnover is particularly devastating for vulnerable students and schools in terms of academic outcomes and social cohesiveness, for it is they and their communities that disproportionately suffer the consequences of unstable leadership (Beausaert et al., 2016). Equally, hard-to-staff school communities and diminished system support pose a severe occupational hazard for new principals, leading to their untimely exit from the workforce (Riley, See, et al., 2021).

▶ WHAT CAN BE DONE?

Quality schooling systems require strong, capable and well-supported principals. Thriving communities require school leaders with the emotional capacities to connect increasingly polarised and disadvantaged communities. The demands of the role require much-needed structural reforms (Heffernan & Pierpoint, 2020; Riley, See, et al., 2021). However, they also require a far greater understanding of the emotional dimensions of principals' work and its crucial impact on building more socially cohesive school communities – something that, currently, policies and principal standards have been largely silent on. Finally, they also require challenging socially unjust practices, such as inequitable funding arrangements and recognising that fostering thriving students and school communities is a collective social responsibility, not one for individual schools and their leaders alone.

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Careers education is failing our students

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JOANNE GLEESON

BEATRIZ GALLO CORDOBA

Despite changes to the contemporary workforce, careers education is not adequately supporting school students. What's going on?

One of school education's many purposes is to prepare young people to pursue and gain desirable work. But careers education in schools is not working (National Youth Commission Australia [NYCA], 2022; Walsh & Gleeson 2022).

Careers education is outmoded and has not kept pace with changes in contemporary workforces. It continues to be offered at the periphery of schooling and focuses on postschool student destination outcomes rather than offering greater and more relevant knowledge, skills and resources. What needs to happen for students, parents and broader school communities alike to be acknowledged as deserving of more holistic, up-to-date and informed career development?

Our study of 1,339 female Victorian secondary school students sheds light on why careers education is not working and what needs to be done. It provides a window to the current experiences of young women when choosing their work destinations in school.

► AMBITIOUS BUT ANXIOUS

Australian teenagers, particularly girls, are more ambitious compared with their peers in other countries (Berger et al., 2020; Mann et al., 2020). In our study, young women were confident about their futures, with 60% feeling sure that their studies would lead to a future career. At the same time, our survey showed there were feelings of anxiety, uncertainty and confusion. Students were stressed, and their choices were potentially disconnected from the realities of contemporary job markets (Gleeson et al., 2022).

One-third of young women in our study did not know what careers best suited them. A similar percentage were studying and taking on activities without any sense

of purpose or career direction. A third expressed a high degree of career stress. Many were overwhelmed by the career information and choices with which they were faced. Nearly 40% were concerned about ever achieving a real career. A similar proportion felt unemployable (Gleeson et al., 2022).

Young women are told that they have options – perhaps now more so than ever – but their ability to understand and navigate such choices is complex, considering wider change in contemporary labour markets and the advice they are getting in their teenage years.

► CAREER CHOICES ARE NARROW

Young women who have possible careers in mind continue to nominate careers within a narrow band of occupational fields (such as a nurse, doctor or teacher), despite massive changes to employment brought about by factors such as the growth of the digital economy.

The implications of them having such career aspirations raise significant questions. For example, do young women choose traditional careers them because they resemble a linear trajectory, one that is easier to comprehend and more secure? To what extent are students aware that their postschool journeys are going to be less linear than the career pathways experienced by the people who typically advise them, such as family and teachers?

Our data suggests that young women understand that, in pursuing what they perceive to be a real career, they have a restricted set of choices beyond which lies uncertainty. This might go some way to explaining the stress and lack of confidence when choosing a career – particularly when it goes against the advice and expectations of the other significant people in their lives.

► CAREER CHOICES ARE SHAPED BY OTHERS

Career choices are profoundly shaped by others and not always to the benefit of students. Just under half the young women in our study made choices based on the expectations of others, such as parents and carers. Over half were concerned that others would not approve of their choices and were making choices to please others.

Challenges to improving careers education

Students need more opportunities to experience and understand the worlds of post-schooling and what they look like because young people can't be what they can't see. The same applies to their parents. Teachers are understandably reluctant to intrude upon private family life.

► ATTITUDES TO CAREERS AND CAREERS EDUCATION NEED TO MOVE INTO THE 21ST CENTURY

Careers educators, students and their parents/carers might be struggling to keep up with changes to the workforce (Mann et al., 2020). Nevertheless, some young women genuinely feel as though they have taken future jobs into consideration. This raises the questions of whether they understand the nature of emergent occupations or their motivations around picking jobs within the same narrow occupational fields. They might be nominating these fields because of their associations with social status and security. They are certainly choosing these jobs because they can see them.

► CAREERS EDUCATION NEEDS TO MOVE BEYOND THE CLASSROOM

Developing better ways of informing parents and carers should not be the exclusive responsibility of schools. It should be done in concert with other policies, government departments, jurisdictions and people seeking to work with families.

While some good resources have been developed (e.g. Australian Government Department of Education, 2022), there is still a long way to go in improving students' knowledge and attitudes as well as the knowledge and practices of front-line school-based careers advisors.

Careers education needs a rethink, not only to keep pace with workforce changes, but also to move beyond traditional schools to encompass parents and carers who are major influencers of young women's thinking and choices. Governments and employers have a key role to play, too.

We need to expand careers education beyond the classroom.
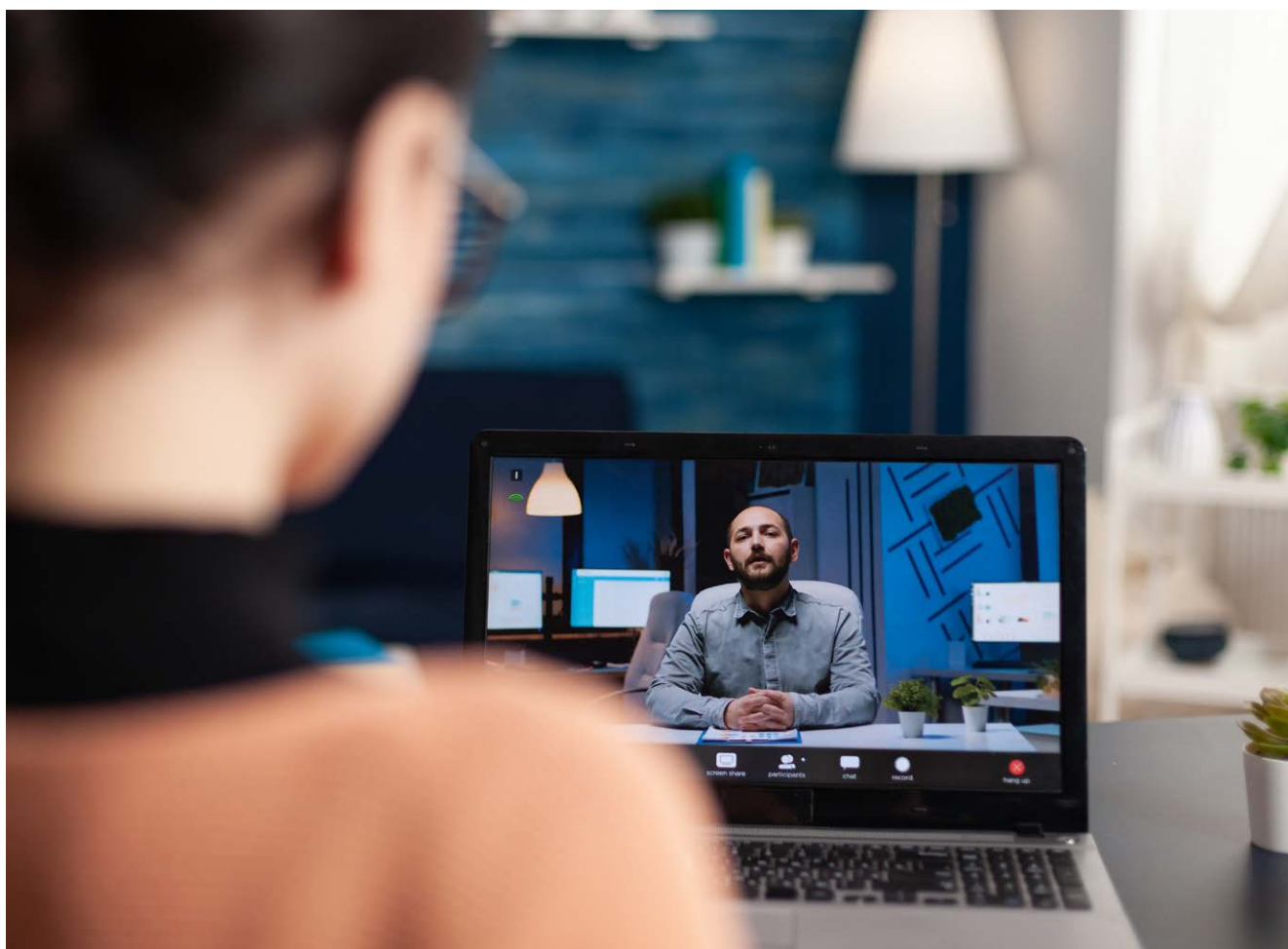
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Teaching in the age of artificial intelligence

NEIL SELWYN

Despite promises of relieving teachers from boring repetitive tasks, to what extent will artificial intelligence actually lead to additional classroom constraints and worse teaching conditions?

Artificial intelligence (AI) tools, algorithmic systems and other forms of digital automation are now steadily creeping into classrooms and schools. This is not unique to education – most technology users are now well-accustomed to being assisted by autocomplete functions, recommended playlists and other helpful features built into apps, websites and software.

Nevertheless, automated technologies in education are increasingly taking on tasks that previously would have been left to teachers. Many schools are now using software that can grade written assignments, curate different students' personalised learning and even judge the extent to which a class is working diligently or not.

To date, these types of classroom technologies have not been seen as particularly worrisome. If anything, AI and other digital automations are welcomed as providing much-needed support for teachers, relieving busy professionals of repetitive administrative and reporting tasks and freeing them up for higher level pedagogical work. However, as these technologies move into more aspects of the school day, we need to question the extent to which teachers' work – and what it means to be a teacher – is being fundamentally altered.

How AI and automation is changing the nature of teaching

▶ TEACHERS ARE NOW HAVING TO DO DIFFERENT THINGS BECAUSE OF AI TECHNOLOGIES

We are seeing reports of teachers now having to act in ways that are machine-readable – what has been described as 'adapting to the algorithmic adaptivity' (Høvsgaard, 2019, p. 78). This might involve a teacher having to speak in a manner that can be easily parsed by voice recognition software or designing an assessment task to produce data that a system can easily process.

▶ TEACHERS ARE HAVING TO DO MORE THINGS BECAUSE OF AI TECHNOLOGIES

Discussions around AI and education rarely acknowledge the additional work that these systems demand of teachers. However, these technologies often require regular trouble-shooting and behind-the-scenes work in order to keep functioning. Our own research has shown the hidden labour required for teachers to successfully work with text-generation software and other supposedly intelligent systems (Perrotta et al., 2022).

▶ TEACHERS ARE NOW NOT DOING THINGS THAT THEY SHOULD BE

Many of the so-called drudge tasks that AI promises to relieve teachers of, such as taking a class register or providing feedback on an essay, can actually be important elements in sustaining the social relations of a classroom (Selwyn, 2022).

▶ AI LEADS TO A REDUCTION OF 'WHAT COUNTS' IN THE CLASSROOM

These technologies are data-driven, meaning that they struggle to recognise aspects of teaching and learning that are not easily captured in data form. For example, to what extent can a machine discern, let alone quantify, a student's frustration or joy? Key here is the difference between straightforward tasks of 'reckoning' and more complex forms of 'judgement' – the latter requiring human reasoning, reflection, empathy and expertise (Selwyn, 2019).

▶ AI-DRIVEN EDUCATION IS COMMERCIALISED EDUCATION

The implementation of these systems in schools devolves important decisions over instruction and pedagogy to software developers and big tech corporations. As a result, most teachers have little idea of the extent to which classroom actions are being recorded and where else this data is being circulated (Selwyn et al., 2023). Recent high-profile controversies over data breaches and sale of classroom data to third parties show how digital education is closely implicated in the data economy.

## The need for greater educational voice in shaping classroom automation

While there are many reasons to remain enthusiastic about the ways in which AI might be used in education, there are clearly reasons to push back against the wholesale acceptance of these technologies. For example, we need to call out instances where these technologies are leading to worse work rather than less work for teachers. We need clarity over who is accountable for the consequences of automated decisions now being made in classrooms and more transparency around how and why these automated decisions are being reached. While there are many ways that AI could be used in education, the key question that we now need to ask is how should AI be used in education?

One of the big challenges for the education profession over the next decade or so will be to ensure that these technologies are developed and adopted in ways that genuinely augment and enrich classrooms. Rather than being resigned to the inevitable imposition of all these systems, educators and school leaders need to gain confidence in pushing back against the AI technologies that clearly do not improve the quality of teaching work. At the same time, educators need to be vocal in pointing out other technologies that might be of genuine benefit.

Technology is not something that should be imposed on educators without their input or consent. The need for greater educational input in the design, development and deployment of classroom AI technologies starts here!

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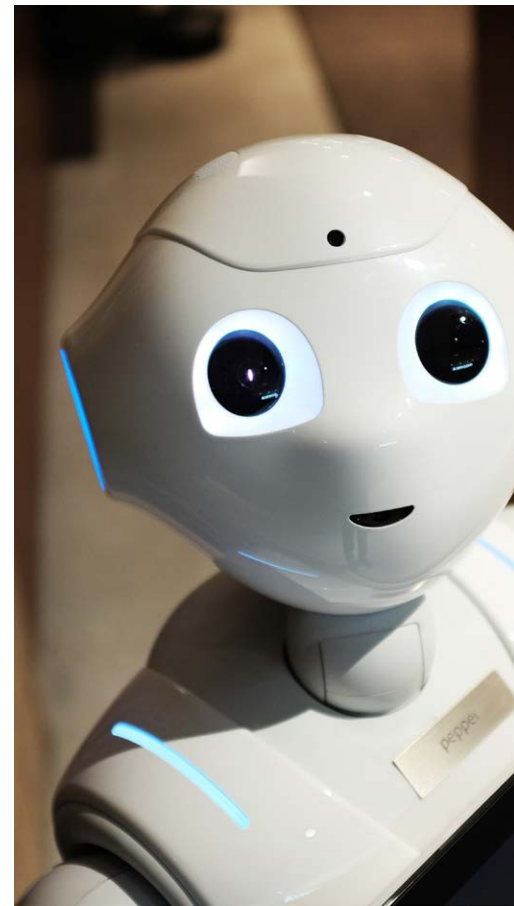
Moving beyond the one-size-fits-all approach to the education of autistic students

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ANA MANTILLA

BETHANY DEVENISH

CHLOE EMONSON

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NICOLE PAPADOPOULOS

To improve the poor educational outcomes of autistic students, we must engage autistic students and their families in designing strengths-based educational programs.

▶ **ISSUE 1: AUTISM IS A COMPLEX, HIGHLY COMORBID NEURODEVELOPMENTAL CONDITION THAT STRADDLES THE NEUROLOGICAL AND PSYCHIATRIC SPECTRUM**

'Students with a disability need to be included in programs from which they will best benefit' (John Mooney, Principal of Emerson School, founding Senior Educational Consultant, Krongold).

Autism affects more than 1 in 100 individuals – the key term being individuals. Autism is a heterogeneous condition, meaning there is considerable diversity in the presentation, strengths and abilities of each individual on the autism spectrum. Our recent meta-analysis found considerable diversity in the strengths of autistic individuals, with two key strengths for some autistic youth found in intuitive physics and metaphor generation (Devenish et al., 2022). Up to 80% of autistic students experience sleep and motor impairment that impacts their ability to learn and cope at school (Papadopoulos et al., 2012; Papadopoulos et al., 2022). Autistic individuals also frequently present with other highly prevalent and often underdiagnosed conditions, such as attention-deficit/hyperactivity disorder (co-presenting in approximately 40% of autistic individuals; Rong et al., 2021). Therefore, the one-size-fits-all approach to supporting autistic students in our schools and broader community is inappropriate and unhelpful (Whelan, 2021). For real inclusion to occur – in which autistic students are able to achieve their individual education aspirations – approaches to educational support and placement need to involve autistic students and their families in planning and decision-making processes and account for their personal strengths, alongside diverse levels of autistic traits and phenotypic presentations. Taking this approach together with a developmental theoretical lens directs our thinking to the individual student who stands before us. Furthermore, recognition that the experience of profoundly disabled autistic students will differ from the experience of autistic students who are not profoundly disabled is important (Lord et al., 2022). Language, too, is important in recognising the diverse preferences of individual students and their families:

Although it is regrettable that some people are triggered by reasonable terminology, no one should have the power to censor language to exclude the observable realities of autism. Scientists and advocates need a full semantic toolbox to describe what is happening in the real world. Pretending people with profound autism don't exist by eliminating language to describe their symptoms is itself ableist. (Alison Singer, parent of a profoundly autistic girl, 2022).

Singer notes that reasonable terminology includes terms such as 'disability' and 'intervention'.

▶ ISSUE 2: AUTISTIC STUDENTS HAVE INDIVIDUAL SUPPORT NEEDS AND PREFERENCES FOR SUPPORT DURING THE TRANSITION TO SECONDARY SCHOOL

The transition to secondary school is an educational milestone that can impact social, academic and wellbeing trajectories. It is of particular consequence for autistic students who report lower quality of life, poorer mental health and lower levels of school connectedness at primary school that persist as they transition to secondary school (Hebron, 2018; Mandy et al., 2016; Whelan et al., 2021). According to life course theory (Elder, 1998), the impact of this transition is dependent on the student's individual characteristics, resources and experiences in addition to the ecological context in which the transition occurs (Benner, 2011). Our recent research supports this contention, finding that the successfulness of transition was dependent on student characteristics, most notably the student's level of anxiety. Thus, interventions to support autistic students with high levels of anxiety may lead to improved outcomes. Past experiences were also crucial. Experiences of social isolation and bullying at primary school created a sense of secondary school providing a 'fresh slate' and a chance to reinvent themselves. Ecological supports were also important to transition success, but a key finding was that these supports needed to be guided by the student's individual support needs and preferences for support. Best practice transition supports (such as 'safe havens'; Goodall, 2020) were often rejected by students due to highlighting their difference, whereas more generalised supports such as access to the

library at recess and lunch were welcomed by students. The key role of communication between families and schools was also highlighted, as it facilitated collaboration on strategies to support the student's success. Most importantly, it provided a safe space in which the student could voice their own needs and preferences for support.

▶ ISSUE 3: AUTISTIC GIRLS ARE UNDERREPRESENTED IN THE EDUCATIONAL RESEARCH LITERATURE

Research informing our understanding of the educational experiences of autistic students largely involves male samples.

We know little about the unique experiences of female students at school, hindering our ability to provide tailored approaches to inclusion and intervention.

Autistic females have consistently shown a greater propensity to developing anxiety (McLean et al., 2011), and this vulnerability is exacerbated by psychosocial stressors (Hallers-Haalboom et al., 2020). The transition to secondary school is one such stressor, which can involve the loss of support from close relationships formed at primary school and the need to establish new friendships and support networks (Symonds & Galton, 2014). Evidence shows that female autistic students use camouflaging strategies to fit in (Dean et al., 2017). While this may have social benefits, it can also negatively impact wellbeing (Tierney et al., 2016).

The way forward

To address this big educational challenge of our time, we need to ask the right questions and collaborate across education, sociology, psychology and medical research. Taking a life course theory perspective encourages us to question the interconnected physical, cognitive, learning and psychological developmental pathways that unfold to determine educational outcomes. We must keep a gender lens in this endeavour. So, what do the right questions look like? They tap into the autistic student's strengths and abilities and require diverse approaches to inclusion that adapt to each new stage of a student's educational journey. This includes involving autistic students and their families in the planning, goal setting and decisions that affect them and paying particular attention to critical times such as the transition to secondary school. More research is needed to understand why some autistic students do better than others in their transition to secondary school – this may hold the key to early intervention approaches for reducing unemployment rates, which are almost eight times greater for autistic individuals compared to people without disability (Australian Bureau of Statistics, 2019). Furthermore, autistic people are almost three times more likely to die prematurely compared to the general population, with sedentary behaviour and social isolation among the top causes of mortality (Lord et al., 2022). How we create more opportunities during the protective school years for autistic students to form social networks, increase their mental and physical health and create pathways to employment is the next big educational challenge of our time.

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School as a place to learn more about Australian public services

STEVEN ROBERTS

BEN LYALL

Can and should schools be a space for teaching young people more about rights and responsibilities with regard to Australian public services?

Similar to other advanced democracies, Australia has a longstanding interest in young people receiving some form of school-based civics education, beginning in the early 1900s.

After losing policy relevance in the middle third of the century, attention to civics education returned with utmost vigour in the 1970s and 1980s (McAllister, 2001). Since then, an abundance of national and international research scholarship – both theoretical and empirical – has put the process and purpose of such education under the microscope. While there are varying specifics in delivery, many educational systems around the world have leaned heavily into the idea that schools should be a site for developing well-informed and democratically engaged citizens (Heggart & Flowers, 2019). Ostensibly, as McAllister (2001) described over 20 years ago, this form of education has the 'laudable goal of increasing political awareness and knowledge about a country's history, national identity and political institutions' (p. 12).

Laudable as such an agenda may be, there are many critiques, including:

- fundamental concerns that increased political knowledge does not necessarily improve rates of formal political participation (Reichert & Print, 2018)

- the foundational assumption that the main subjects of education, young people, are less politically engaged; this is premised on a traditional and unhelpfully narrow conceptualisation of civic engagement (Vromen, 2011)

- how the instruments of civics education often work to erase Indigenous citizenship, nationhood and sovereignty (Sabzalian, 2019)

- the limited ability of this type of education to simultaneously increase functional understandings of existing government and political systems and encourage critical consciousness for 'unmasking domination and subordination and working to engender positive social change in communities and more globally' (Heggart & Flowers, 2019, p. 4).

Adding to these very useful critiques, we want to focus our attention on something much more practical – even prosaic – but, in our estimation, equally vital. That is, in addition to what civics education offers in terms of illuminating political and civil rights and responsibilities, what might it provide young people in respect of their 'social rights'? Here we refer to those rights that the pre-eminent citizenship scholar, T H Marshall (1950), suggested would underpin 'a modicum of economic welfare and security' (p. 10). More specifically, what role might civics education have for helping young people understand and navigate Australian public services in their attempts to achieve this security?

▶ WHY THIS QUESTION, AND WHY NOW?

Compared to previous postwar generations, young people already experience greater 'churn': repeated cycles through insecure employment, periodic underemployment, delayed departure and increasingly, returns to living with parents and other unstable living arrangements. In keeping with other crises with economic implications such as the 2008 global financial crisis, the COVID-19 pandemic has also disproportionately affected young people's lives (Robards et al., 2020). The public services that the welfare state provides, while differing wildly across nations (e.g. Antonucci et al., 2014), can be an essential resource in managing lives and livelihoods, especially in times of economic upheaval. But young people need to know what these are and how to navigate them.

▶ WHAT DO YOUNG PEOPLE HAVE TO SAY?

Following other Australian researchers who have called for a radical overhaul of the contemporary citizenship curriculum premised on a genuine commitment to codesign with young people (Bessant et al., 2016), we present a few key messages from focus groups with 155 young adults in Australia, data that is part of our larger study of young adults' experiences of public services (see Robards et al., 2020).

The first key message is that young adults were unambiguously clear that they wanted to learn more about public services so that they are better prepared to engage with them. And while they shared a range of practical suggestions to learn about services now (in their twenties), they cast their mind back to their school days. School-based intervention was deemed necessary because they recalled feeling ill-prepared to engage with public services and were unsure of their rights and responsibilities:

> I don't think I learnt anything like this in school, I had to figure it all out myself or through other people. I think we should have learnt about what kind of services are available … what taxes are and how that works. I still haven't figured that out … I think that should be taught in high school. (VIC, F, 24)

This point was consolidated further through comparison to what was deemed relatively spurious information about risk and danger, like fire safety in primary school or hard drug awareness in high school. Yet they were not informed about the more mundane but crucial role the Australian Public Service plays in the lives of all Australians:

> [We are told] what being on meth looks like. But there's nothing about Centrelink. There's nothing about Youth Allowance. There's nothing about how you deal with HECS, you know? I think that it should be integrated into the education system, giving us more of a chance to learn these things through trusted sources. Instead of asking, you know, any old uncle, 'Hey, how do you set up a Centrelink account? What's myGov?' (QLD, F, 21)

A lack of preparedness in such matters can exacerbate inequalities, with some young people in our research reporting experiencing economic disadvantage as a result of simply not knowing about how public services could support them. Relative opportunities for informal learning (based on demographic status) introduce another series of inequalities: in our study, young women reported being more likely than young men to find it difficult to navigate and access services and to understand their eligibility for services; young adults who have no more than a Year 12 education are more likely to find government support harder to access and navigate than those with a degree; young people from migrant backgrounds feel discouraged from accessing services and carry the burden of interacting with services on behalf of their parents. Some young people become experts through personal exposure to services, while others amass varying levels of tacit knowledge from family and peers.

▶ THE BOTTOM LINE: A PRACTICAL IMPERATIVE

Amid concerns about a crowded curriculum (Hickey, 2021), how such content would fit into and alongside what is taught is a significant question and, indeed, a challenge. But we should be reminded that (a) the composition of the curriculum itself is a political question, and (b) for decades critical pedagogy scholars have evidenced the capacity and desire of students to shape curriculum rather than have it determined for them (Heggart & Flowers, 2019).

Our argument here, reflecting on the voices of young people in our research, is that teaching civic rights and responsibilities requires more than instilling democratic values and teaching about the political process. In addition, and arguably prior, to the crucial ambition of cultivating a critical consciousness that underpins activism and social change, civic education also necessitates attention to the more concrete and timely matters.

Giving young people the knowledge and confidence of how to engage with various agencies and services that ostensibly exist, to support them at the moments they are most in need, is essential.
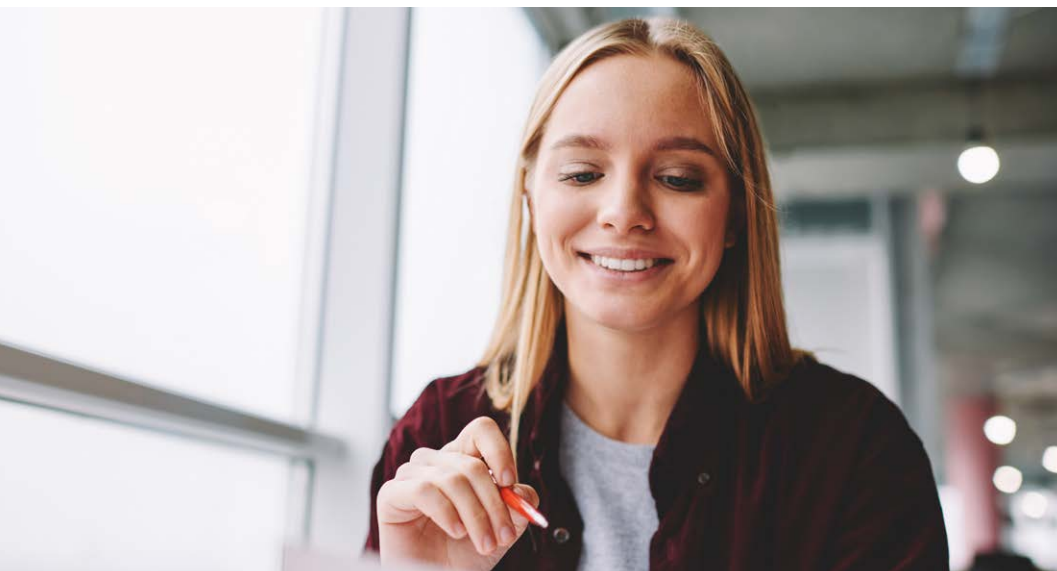
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The state and teacher education: thinking beyond the charismatic edu-preneur

VIV ELLIS

One of the big challenges for the education community over the next few years is to re-engage seriously with the role of the state in teacher education.

Over the past decade, we have seen debates around teacher education become understandably concerned with questions of privatisation and marketisation. There is rising concern over the increased role of private providers, 'edu-preneurs' and other arriviste nonstate actors who seek to disrupt the status quo primarily to profit from it.

However, we should not lose sight of the concept of the state itself. Perhaps the most important questions to be asking are: what is 'the state' and how should it work to shape the teaching workforce for the schools it funds?

▶ THE REFORMATION OF STATE EDUCATION IN THE AFTERMATH OF THE GLOBAL FINANCIAL CRISIS

The aftermath of the global financial crisis (GFC) in 2008 saw the emergence of various reformations of the welfare state, as countries decided how, or whether, to balance economic and fiscal management with the needs of the most vulnerable in society. This led to vastly differing responses around the world – from the austerity-driven education reforms in England to national capacity building reforms in Norway.

The political theorist Andrew Gamble foresaw how this financial crisis would have many twists and turns, which have played out over the subsequent years, producing conflicts that are 'political, ideological, social and cultural [emphasis added]' as well as economic (Gamble, 2010, p. 704). Following this lead, perhaps the best approach to making sense of the post-GFC shifts in education is from a critical political economy perspective, an approach that seeks to analyse the 'interaction of political ideas and economic processes within … [the] cultural context' (Ellis et al., 2020, p. 605) and that recognises this interaction as embedded within 'the social formations in which it is materialised' (Clarke & Newman, 2010, p, 713).

This critical political economy approach pushes us to turn our attention away from the sometimes colourful, charismatic or curious edu-preneur, to instead think seriously about what we mean by the state and come to an understanding of its meaning beyond it being one pole on a continuum of public–private activities and interests. It requires thinking beyond the state as synonymous with government, beyond what Abrams (1988) calls a reified entity that disinterestedly represents the public interest. Bob Jessop (2016), a leading theorist of the state, argues we should reject such accounts and instead uncover the 'inevitable disunity of the actually existing state system as a fragmentary and fragile arrangement of institutionalized political power' (p. 18).
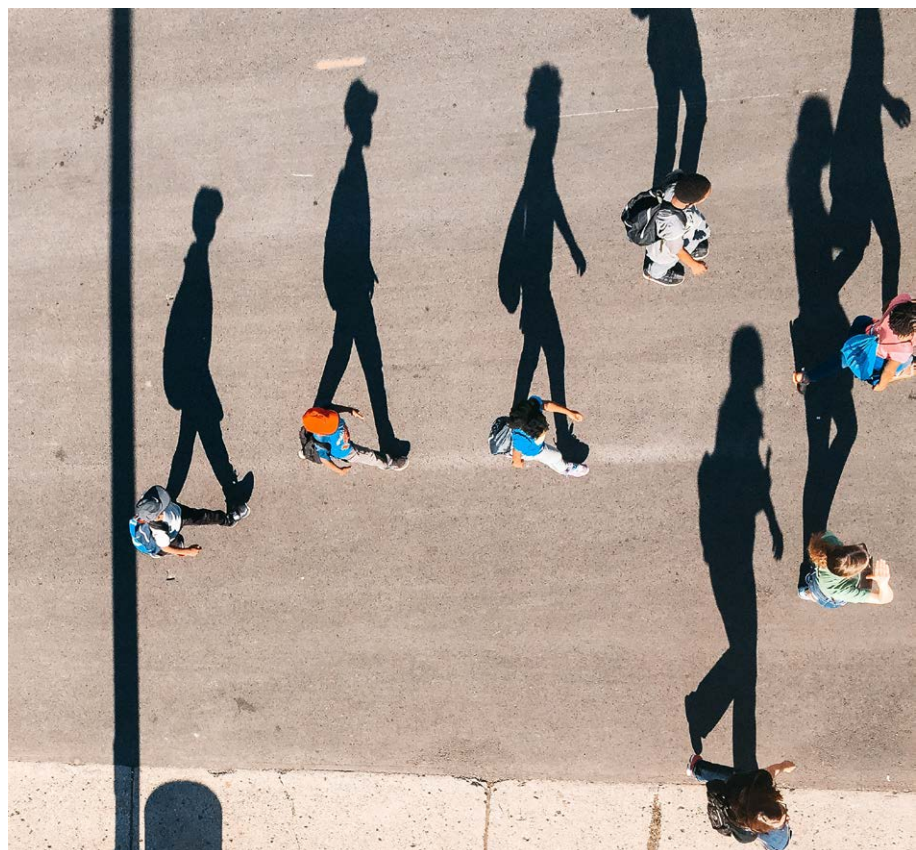
▶ TAKING A COMPARATIVE APPROACH: WHAT CAN BE LEARNT FROM OTHER COUNTRIES?

With colleagues overseas, my own current research is taking an historical and comparative stance on how existing state systems in the United States, England and Norway have responded to the GFC of 2008 with respect to teacher education (see Ellis et al., in press). Each has responded to the GFC in profoundly different ways.

For example, all countries emphasise the importance of teaching quality (or teacher quality, most often defined as a teacher's capacity to produce good attainment data for the classes they teach) in relation to national economic measures such as gross domestic product or productivity.

In some jurisdictions, explicit statistical links are made between teaching quality and the health of the economy: a recent New South Wales Productivity Commission (2021) report is one example. In others, such as England (one of the four nations of the devolved UK), teacher education policy interventions are seen as primary tools of economic regeneration, particularly in areas identified as disadvantaged or lacking in opportunity or, perhaps more accurately, underfunded and exploited (in terms of low wages or limited access to health care, for example; Steadman & Ellis, 2021).

Another common theme is the idea that 'the market' may be able to play a role in enhancing teacher quality. However, here, it is very clear that different countries have taken very different approaches to these issues. Indeed, while the rhetoric of the market – promoting the power of positive change through competition – is ubiquitous, the actual policies in each country differ markedly in the freedom given to the operation of a genuine market or even a quasimarket.

Cases here range from the relative openness of the United States, where private/for profit and philanthropically endowed nonprofits have been part of the teacher education landscape for some time (Saltman, 2014), to Norway, where the marketised 'Oslo school

experiment' (Malkenes, 2014) and Teach First Norway are somewhat strange anomalies in their links to the nationalised oil industry and local concerns over declining science expertise.

England is an interesting case that offers a warning for the curious in terms of the role of the state in shaping the teacher workforce. In our research, my colleagues and I have drawn on Wolch's (1990) concept of the 'shadow state' to show how, over the best part of a decade, democratically accountable state infrastructure (such as statutory curriculum authorities and teacher regulatory bodies) was selectively dismantled, with central government then assuming responsibility for all aspects of the education service. They then created what we describe as a shadow state structure of different types of organisations (including individual sole traders), which were funded at relatively low levels to deliver services previously delivered by the more democratically accountable, now dismantled, state structure.

At the same time as it has offloaded its historical responsibilities to the shadow state structure, the education state in England has become increasingly authoritarian. This can be seen in the recent promotion of 'traditional' cultural values, a canon of 'the best that has been thought and said', the notion of 'core knowledge' and attacks on universities as elite, out of touch, self-interested 'experts'.

So in England, we see a radical development of the conservative free market/strong state policies associated with Margaret Thatcher into something more like 'the market will not decide' when it comes to questions of societal norms and cultural values. That is why we now see teacher education

in England so tightly controlled by central government and the preferred providers of teacher education being new and untested organisations that are parsimoniously funded but given huge responsibilities for preparing and developing teachers nationally.

These twin preoccupations with teacher quality and the role of the market will continue to dominate policy debates over the possible futures of education systems. This points to the need for much more expansive discussions around what is meant by teaching quality and how teaching quality articulates with a country's economic performance. More importantly, we need to identify the noneconomic benefits that come with enhancing teaching quality. Similarly, we need to examine how the idea of a market has been applied over the past decade and what alternative market forms might be more beneficial or desirable.

Finally, there is a clear need for teacher education researchers over the next 10 years to engage with the concept of the state in their analyses of policy and address the fundamental questions of what 'the state' is and what the state is doing. The antics of the colourful, charismatic and curious edu-preneurs and their networks can be something of a distraction when it comes to understanding how institutional power, privilege and resources are being redistributed and how regressive cultural values are promoted in the name of the public interest. And that has implications for democratic politics as well as teacher education.

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Towards carbon neutral schools

ALAN REID

Is the social contract between communities and schools on the purpose of educational provision still fit for purpose? If the 2015 Paris Agreement in response to the climate emergency is to be taken seriously, we have to conclude a resounding, 'No!'

▶ ACTION FOR CLIMATE EMPOWERMENT

Sessions on education and youth at the annual UN Climate Change Conference of the Parties (COP) meetings repeatedly call for the schools sector to take concrete action in addressing emissions and the growing injustices for communities at the sharp end of the climate crisis. COP's key message, as outlined in the Glasgow Work Programme on Action for Climate Empowerment (UNFCCC, 2022), can be boiled down to: Schools have to show they are playing their part in curbing climate emissions, primarily through redirecting what their students learn about, and what their staff expect and model as what it means to be educated in the 21st century.

The Glasgow Work Programme's view of success isn't unexpected: it emphases policy coherence in education, coordinated action, tools and support, and monitoring, evaluation and reporting. Similar points are made in UNESCO's Futures of Education report (UNESCO, 2021), which recommends:

> Schools should model the futures we aspire to by ensuring human rights and becoming exemplars of sustainability and carbon neutrality (p. 103).

To realise the 'tremendous potential' of bringing 'education to carbon-neutrality', UNESCO states 'Schools must break with the rigid, uniform organizational models that have characterized a large part of their history over the past two centuries' (UNESCO, 2021, p. 98).

However, the Glasgow Work Programme and Futures of Education reports can be founding wanting in terms of the strategies and tactics required to challenge (a) the 'climate footprint' of the educational estate in the short to medium term, and (b) the vested interests, sunk resources and policy priorities associated with the status quo of schooling that mitigate against such principles of success (Monash University, n.d.).

In short, proportionally very few schools in the world's building stock for education are on the journey to net zero, let alone approaching being carbon positive (Odell et al., 2020).

According to recent estimates, the urgency is clear. Australia's school buildings form part of the fifth largest emissions segment of carbon dioxide and equivalent (CO_2e) in energy terms alone (Ritchie et al., 2020). Meanwhile, Australia's Clean Energy Council estimates that, on average, school classrooms use around 3800 kWh of electricity per year (Clean Energy Council, 2019). This is roughly half the consumption of an average Australian household, with the majority of sources for that energy still coming from the largest sector emitter, fossil fuel-based energy production, unless the school has switched to a renewables supplier or has its own microgrid.

In simple budget terms, as Rob Breur, CEO of Solar Schools, puts it:

> Australians spend $876M a year on 'standby' energy, which contributes to 2.4M tonnes of CO_2e. If ONE school turned their appliances off at the wall every night it would save, on average, $2,225 per school per month. If the 9,500 schools in Australia did that, it would reduce costs by $21M a month or $235M per annum (quoted in Zero Positive for Schools, 2022).

Or expressed in Paris Agreement and 'towards net zero' terms, 'If all Australian schools and 50% of their communities reach energy carbon neutral, we will make significant steps towards our 2030 national target' (Zero Positive for Schools, 2022).

Schools have to be future proof, funded properly and renewed. Victoria's state schools have the Greener Government School Buildings Program and Resource Smart Schools Program (State Government of Victoria, n.d.) among other programs and initiatives available to support them in that and address their climate plans (Reid, 2021). Looking further afield, Diane O'Shea from Kinsale Community School, Ireland, noted that a recent Cork County Council climate initiative 'provided the students with the knowledge to enable them to make informed and responsible decisions with regard to actions that may affect our climate' (Kinsale Advertiser, 2023).

But it is one thing to teach about climate change without having that backed up by an institutional-embedded response to that in its day-to-day practices, as recommended by 'Whole School Approaches' that emphasise that everyone has a role to play (UNESCO, 2016).

Recent studies of student experience and voice in Australia and Aetoeroa New Zealand show the repeated absence of whole school approaches to the climate challenge. They also relay the depressing theme of students noting hypocrisy and greenwashing in schooling (e.g. Bright & Eames, 2022). Equally, those familiar with the school climate strikes hear many rejecting the contradictions of mainstream schooling provision and inertia in the renewal of curriculum with the stark question: 'What's the point of education if we have no future?' (Jackson, 2022, p. 1). If schooling and the climate crisis can't be shown to matter to children, communities and politicians, then the opportunities for schools to express 'constructive hope' in the curriculum as well as in school buildings and school leadership will be sorely missing (Ojala, 2012; Stevenson et al., 2019; Monroe et al., 2019). Unless schools adopt a coherent whole-school approach to climate neutrality, we risk further entrenching climate illiteracy rather than climate literacy.

▶ SO, WHAT OF THE SOCIAL CONTRACT?

The philosopher of education, Gert Biesta, notes three familiar domains of the functions of education: qualification, socialisation and subjectification (Reid, 2019). To become climate literate requires action in each domain. Schools have to increase children's knowledge of climate change (qualification); facilitate their critical awareness of social practices related to climate neutrality (socialisation); and expand their capacity to act in response to the challenges of living in climate-friendly ways (subjectification).

For schools to engage with climate neutrality in alignment with a commitment to climate literacy, provision for climate literacy can't be boxed into the occasional lesson either, or left to the purview of activists claiming to be on either side of the scientific consensus. Climate literacy then, eschews piecemealism and demands 'reimagining our futures together', as UNESCO (2021) puts it throughout their report on the Future of Education. And, as a consequence

of that, it will have to displace and dissolve some schools' current priorities, including what the school builds in concrete terms, and what it energizes, so to speak.

Only then will the prospect of a 'climate smart' or 'climate clever' educational estate become a possible reality, and the children and grandchildren of today's students will be able to look back on today's climate crisis as something for the history books.

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The platformisation of education

CARLO PERROTTA

How can we ensure digital education platforms transform education in a way that is equitable and ethical?

Digital platforms can be described as software environments that establish connections between supply and demand.

This rather broad definition can be applied to different entities – social media platforms like Facebook and Twitter, content creation platforms like YouTube, ride-share platforms like Uber and, of course, explicitly educational platforms, such as Khan Academy and Google Classroom – where, in very different ways but according to some shared principles, educators, learners and developers of educational content can interact seamlessly and become empowered.

Digital educational platforms can be analysed as case studies, showing how specific services and activities are streamlined and automated. For example, Google Classroom operates as a platform by providing a flexible environment that can be personalised and extended by schools, developers and teachers, enabling small efficiencies (coordinating homework through simple file sharing) and prompting more complex instructional and administrative integrations such as intelligent tutoring systems, behaviour management systems, antiplagiarism tools and so forth (Perrotta et al., 2020).

A related, arguably more interesting, exercise will involve the analysis of the underlying logics and ideas, which have transcended individual software environments to become aspects of a broad 'sociotechnical' template, with multiple ramifications in terms of educational governance and practice. The three key logics of this template are as follows:

a. **An intermediation logic;** which promises mutually beneficial connections between people, data and contexts: the platform is an interface that creates communicative and transactional links.

b. **A bypassing logic;** where complex relational and contractual arrangements – the types of things that require gatekeepers, guarantors, legal protocols and tacit rituals – are erased in the name of speed, efficiency and personal gain: just plug yourself in and play.

c. **A network logic;** where functionalities, affordances and even other platforms can interoperate, which means that platformisation is more about ecologies of platforms or distributed infrastructures than individual software environments.

These logics, and the overall template they underpin, deserve our attention because their impacts on education as we know it can be significant.

Our key argument is that platformisation is making advances not because it improves education (e.g. by making it more equitable at a systemic level, more effective for learners and less labour intensive for teachers). Indeed, evidence about learning in platforms is mixed at best (Kizilcec et al., 2020; Reich, 2020), and labour-saving efficiencies enabled by automation are often offset by new requirements placed on users who must learn how to coordinate effectively with multiple digital systems that increase the overall administrative burden (Thomson & Hillman, 2019).

The main reason platforms are colonising education has to do with speed, efficiency and standardisation. These goals are often wrapped in a rhetoric of educational empowerment that becomes a reality only in some fortunate circumstances, such as when institutions and users (learners and teachers) are already privileged and have access to pre-existing forms of support and cultural capital. These success stories hide a more problematic vision: in most cases platformisation is about turning education into a leaner, faster, more automated, more surveyable and eventually more profitable version of its former self.

Furthermore, the platformisation template in education relies on a global digital infrastructure mostly controlled by a small monopoly of large technology companies with chequered (at best) track records of protecting privacy and autonomy. Recent critical scholarship and commentary have highlighted multiple issues associated with the 'datafication' of society facilitated by immensely influential technology corporations: disinformation, radicalisation, manipulation, exploitation of natural resources and tangible harms among vulnerable groups (Noble, 2018; Zuboff, 2019).

In conclusion, platformisation is a powerful template imported in education from other economic and cultural sectors. It is making inroads by creating a marketplace, where technology companies and nimble start-ups can transact with government agencies or directly with schools and universities, within specific segments (e.g. remote tutoring, personalised provision, automated grading). This is paving the way for various forms of networked governance, where educational responsibility becomes blurry as many decisions are offloaded onto black-boxed and proprietary algorithmic systems, leading to dependencies between education systems and proprietary infrastructures. The challenge over the next decade will be not only to document how these changes are taking place in education, but also to engage with stakeholders to identify more consensual paradigms. We should not dismiss the opportunities of platformisation out of hand, as the data-based personalisation and the efficiencies enabled by digital technology have a role to play in contemporary education, but we should strive for the development of ethical frameworks that include alternative design languages and provisions for rigorous oversight and regulation.

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