RETRAINING AND RETAINING STEM PROFESSIONALS: WHAT WORKS TO ADDRESS TEACHER SHORTAGES

A literature review summary report prepared for NSW Department of Education.

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Centre for Social Impact

The Centre for Social Impact (CSI) is a national research and education centre dedicated to catalysing social change for a better world. CSI is built on the foundation of four of Australia's leading universities: UNSW Sydney, The University of Western Australia, Swinburne University of Technology and Flinders University. Our **research** develops and brings together knowledge to understand current social challenges and opportunities; our postgraduate and undergraduate **education** develops social impact leaders; and we aim to **catalyse change** by drawing on these foundations and translating knowledge, creating leaders, developing usable resources, and reaching across traditional divides to facilitate collaborations.

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Australian students deserve to be taught by qualified and experienced teachers. We need a multi-faceted systemic approach to ensure equitable education, address teacher shortages in STEM and diversify the teaching profession. Industry professionals with real world experience can be part of the solution in empowering students to be change makers towards solving global problems. This document summarises how to attract and retain industry professionals to classroom teaching.

THE PROBLEM

Australia and the State of NSW faces a **teacher shortage crisis**. We have insufficient teachers to meet increasing student demand. Fewer than 25 percent of Australian Year 7 to 10 students have a qualified mathematics teacher[1]. Fewer qualified STEM teachers are a likely cause and an effect of declining student performance and a diminishing uptake of STEM in education and career pathways. There exists a persistent shortage of high-quality STEM specialised teachers in less advantaged schools, impacting on students' education and their future[2].

The all-pervasive nature of digitisation, recent health and climate crises combined with the push to remain competitive internationally have made **STEM literacy a priority**. Prioritising a strong STEM qualified teacher workforce has societal and global benefits. Shifting just one per cent of the workforce into STEM roles would add $57.4 billion to Australia's GDP[3]. The provision of high-quality teaching is also an inescapable responsibility and reality for governments if they are to pursue equity as a fundamental way to achieve progress.

HOW CAN INDUSTRY PROFESSIONALS FROM STEM BACKGROUNDS HELP SOLVE THE PROBLEM

STEM industry professionals can help fill the gap towards fulfilling the responsibility of providing each student with qualified STEM teachers. Those who have had prior careers in STEM bring an **understanding of theory practice connections, linking science and mathematics subjects to their real-world diverse applications. They act as role models capable of inspiring and engaging students to develop an appreciation and interest in STEM[4]**. 'Career-changers' typically bring a strong work ethic, maturity, a range of organisational skills, vocational and life experience, including professional networks, to their classrooms and staffrooms. They contribute to building a diversified teacher workforce that align with student demographics, matching learning and workforce needs, and policy priorities.

WHAT WORKS TO ATTRACT, ENGAGE AND RETAIN STEM INDUSTRY PROFESSIONALS IN CLASSROOMS?

Literature illuminates several means by which STEM professionals can be attracted to, and supported and retained in, teaching.

Most fundamental of these is **raising the standing of the profession** in the eyes of the public and prospective career-changers. Specific ways to achieve this are:

- **Increase in salary[5]** recognising teachers' expertise, leading to attitudinal changes among students, parents and community;
- Provide additional monetary and non-monetary incentives for educators in hard-to-staff schools;
- **Recognise and credential[6]** prior STEM experience and expertise during entry to teaching;
- Embed **flexibility and tailored support** in career development pathways from STEM career to student teacher to classroom teacher and beyond;
- Provide necessary **resources and infrastructure** for industry professionals to curate a 'practice-based' creative classroom learning environment;
- Improve working conditions by **reducing administrative workload** and promoting a team culture.

INITIAL RECOMMENDATIONS: WHERE TO FROM HERE?

- Design **flexible or tailored teacher education pathways** that cater to the unique characteristics and needs of career change STEM professionals
- Reward STEM expertise and experience through salary increases and career development opportunities
- Develop **targeted recruitment campaigns** to (1) attract STEM women and Indigenous professionals into teaching, (2) attract STEM professionals from rural industry to teach in rural and hard-to-staff schools (3) align school and curriculum contexts with relevant industry (s) that holds the greatest promise of transition to teaching
- Leverage current teachers' knowledge and existing **school-industry networks and partnerships** to attract and retain attract STEM industry professionals
- Develop a **multi-faceted, sustained and systemic approach**, that goes beyond one mechanism, to address long-term teacher shortages and diversify the teaching profession.

THE TIME IS NOW

A strong STEM skilled workforce is both an economic and a social imperative. We need to ensure every student has access to qualified science and mathematics teachers who can engage, inspire, and ignite an entrepreneurial mindset and empower students to own their future. Attracting and retaining industry professionals in classrooms can be a key mechanism to meet student and future workforce needs. We need to build on current work, for example, the NSW Department of Education's strategy to recruit more qualified and experienced teachers through the 'Mid-Career Transition to Teaching Program' and Teacher Supply Strategy[7,8]. Government, schools, education jurisdictions, and policy makers must prioritise strategic and systemic approaches to address teacher demand and supply issues and to ensure equity in our education system[9].

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