



Economics

+ Maths

Financial Capability

Research Report, November 2022

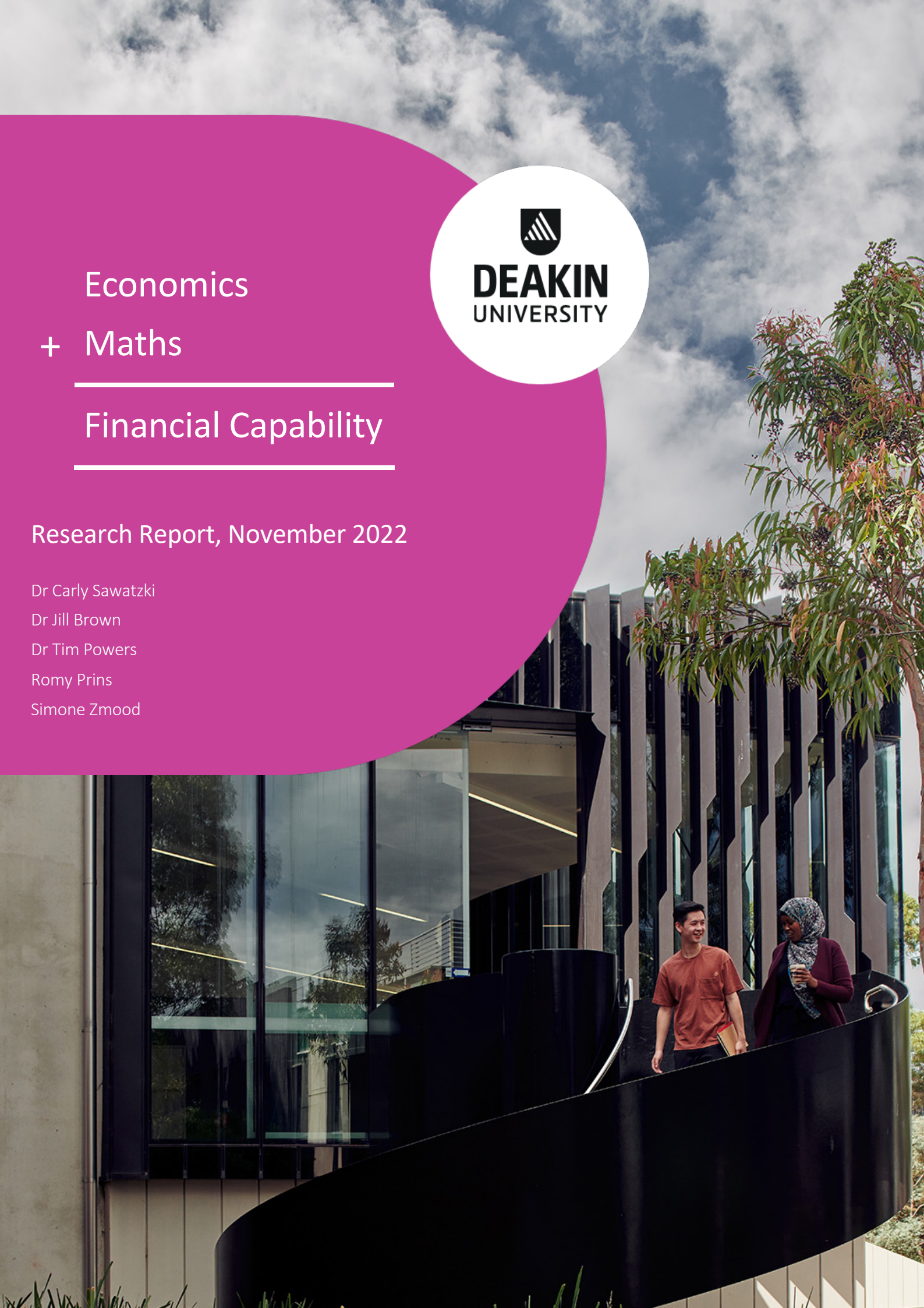
Dr Carly Sawatzki

Dr Jill Brown

Dr Tim Powers

Romy Prins

Simone Zmood



Economics + Maths = Financial Capability Research Report

Prepared by Carly Sawatzki, Jill Brown, Tim Powers, Romy Prins, and Simone Zmood

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Enquiries: media@deakin.edu.au or carly.sawatzki@deakin.edu.au

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75 Pigdons Rd

Waurun Ponds

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The COVID-19 pandemic has produced a challenging research environment. Access to schools, teachers, and students to conduct research has been limited. These factors have affected the methodology and methods adopted for this study.

Contents

About the researchers.....	iv
Acknowledgements.....	vi
Executive Summary.....	1
1. Insights from educational research.....	4
1.1 Insights into Australian 15-year-olds’ finance-related learning experiences.....	4
1.2 The Australian Curriculum (current and revised).....	4
1.3 Finance-related curriculum enactment.....	5
1.4 Calls for a more holistic and modern approach.....	6
1.5 Why focus on Economics + Maths?.....	6
1.6 Why call it Financial Capability?.....	7
1.7 Why teachers feel out of their comfort zone.....	7
1.8 The case for investing in teacher knowledge and practice.....	8
2. Project design.....	10
2.1 Overview of engagement and research activities.....	10
2.2 Research participants.....	10
2.3 Theoretical guidance.....	13
2.4 Research methodology.....	14
2.5 The Economics + Maths = Financial Capability course.....	14
3. What we learned from education professionals.....	16
3.1 Without quality financial education, young people are vulnerable.....	16
3.2 The Australian Curriculum does not prioritise financial education.....	16
3.3 School leaders and teachers need expert guidance and education.....	17
4. What we learned from secondary school teachers.....	20
4.1 Who completed the Economics + Maths = Financial Capability course?.....	20
4.2 Teachers recognise students’ diverse access points.....	21
4.3 Teachers want help making connections.....	22
4.4 Strengths and limitations of the course.....	25
5. What we learned from secondary school students.....	29
5.1 Students are learning about money outside school.....	29
5.2 Students want and need financial education that helps them make connections.....	31
6. A plan for real change.....	33
Articles arising from the research.....	36
References.....	37

About the researchers

Led by Dr Carly Sawatzki and Dr Jill Brown, the research team consists of thinkers with extensive experience in educational research and teacher education.



Dr Carly Sawatzki is a teacher educator and educational researcher in the School of Education. She has more than 15 years' experience working with preservice and practising teachers (including out-of-field and non-specialist teachers of mathematics) across primary and secondary courses. Carly's work is distinctly "real world" and aims to gently influence the way teachers think about educating young people for active and informed citizenship. She is internationally recognised for her classroom research which explores how young people develop numeracy and financial capability within families, communities, and schools. Carly has found that when teaching and learning practices recognise and value students' diverse social and cultural funds of knowledge, those students will share sophisticated insights into their financial realities and worldviews. She works collaboratively with teachers and students to design interdisciplinary learning tasks situated in contemporary financial contexts that prepare students to apply mathematics to make sense of emerging financial risks and decisions, including those that present invisibly via digital platforms. Carly has published in prestigious international journals and led research and curriculum consultancies for Australian, State and Territory education authorities. She is regularly engaged by teacher associations and schools, being recognised as a thought-provoking presenter who draws on research to challenge thinking, promote critical conversation, and inspire innovation. Find out more at www.carlyawatzki.com



Dr Jill Brown is a teacher educator and educational researcher in the School of Education. Jill has more than 20 years' experience in higher education, where she has focused on mathematics and mathematics education for preservice and practising teachers (including out-of-field teachers) in early childhood, primary, and secondary settings. She is the Course Director of Deakin's Graduate Certificate Secondary Mathematics for out-of-field teachers. Jill's research in the field of mathematical modelling, the teaching and learning of functions, and the use of digital technologies by teachers and students is internationally recognised. She is an elected member on the International Executive of the International Community of Teachers of Mathematical Modelling and Applications (ICTMA), a member of the expert panel for the International Mathematical Modelling Challenge (IMMC), and a member of the Australian IMMC advisory team and judging panel.



Dr Tim Powers is an early career researcher associated with Deakin University, Monash University, and the University of Sydney. Tim has 17 years' experience as an industry consultant delivering national, state, and regional labour market research, and workforce development and analysis services, including program reviews and strategic plan development. He has worked with an extensive range of organisations, including businesses, industry associations, community groups, not-for-profits, and federal, state, and local government agencies.



Romy Prins is a chartered accountant, certified practising accountant, and research assistant in the School of Education. Romy brings professional and practical insight and experience to the team. Romy's passion for financial education in school, community, and adult education settings, has led her to frontline financial capability work for Good Shepherd Australia New Zealand. Romy has also worked in professional accounting education at CPA Australia, and at Monash and Deakin universities.



Simone Zmood is an early career researcher and teaching associate in mathematics and numeracy affiliated with Deakin University and Monash University. She has contributed to financial capability curriculum and research consultancies for Australian government agencies. Simone brings two decades of experience in the business world, specialising in financial and strategic analysis, corporate strategy, and performance management.



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Dr Carly Sawatzki and Dr Jill Brown are members of Deakin University's strategic research and innovation centre in education, Research for Educational Impact (REDI). REDI is at the forefront of connections with national education stakeholders and communities. In the Australian Research Council's (ARC) most recent national Excellence in Research for Australia (ERA) assessment, Deakin University achieved a score of 4 out of 5 ('Above World Standard'). The capacity, reputation and impact of Deakin University's educational researchers is illustrated by REDI's success: REDI is currently a partner in the ARC Centre of Excellence for the Digital Child, and hosts four ARC Discovery projects, two ARC Linkage projects, and four ARC DECRA projects.

The **Economics + Maths = Financial Capability** course was offered through the PLEdHub@Deakin. The PLEdHub@Deakin offers unique and innovative professional learning for educators and teachers, designed and delivered by Deakin's nationally and internationally recognised experts in teaching and learning. Each year, there is an exciting program of webinars, panel conversations, and courses that deepen knowledge for teaching, inform best classroom practice, and improve education outcomes for children, young people, and adults. The course included the option to be assessed for the award of a DeakinCo. Professional Practice Credential. As the corporate learning arm of Deakin University, DeakinCo. provides an outcome-based Professional Practice micro-credentialing assessment model amongst its offerings. Whilst there are many micro-credentialing models in use, our Professional Practice Credentials are a unique, market leading form of micro-credentialing that uses a robust experiential assessment mechanism to measure the capability individuals have built through a combination of learning and, importantly, professional experience. The Professional Practice Credential framework provides standards at four levels aligned to the Australian Qualifications Framework (AQF 6, 7, 8 & 9) for capability assessment in key human-centred, leadership and technical skills that are at the core of the most critical skills for the future of work. All frameworks that underpin Deakin's Credential suite can be mapped to organisational frameworks and industry standards, including the Australian Professional Standards for Teachers. Deakin Professional Practice Credentials are fully recognised by Deakin University, managed within a governance framework and can be used for credit in Deakin postgraduate courses when achieved at the appropriate level.

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Australian Association of Mathematics Teachers	Allan Dougan Chief Executive Officer
Business Educators Australasia	Christine Reid [past] Executive Director
	Anthony Kuc President
Ecstra Foundation	Caroline Stewart Chief Executive Officer
	Kate Crowhurst National Financial Education Manager
The Mathematical Association of Victoria	Peter Saffin Chief Executive Officer
	Jen Bowden Education Consultant
Victorian Commercial Teachers Association	Michelle Humphreys [past] Executive Officer

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Finally, to the education professionals and secondary school teachers and students who contributed to this project while navigating the impact of the COVID-19 pandemic on their lives – it was our privilege to work with you and compile your insights.

Executive Summary

Australia has two longstanding Educational Goals for Young Australians (Education Council, 2019; 2008), and these are intended to unite governments, government bodies, school sectors, individual schools, and teachers in their work towards educating students. They are:

Goal 1 - Australian schooling promotes equity and excellence;

Goal 2 - All young Australians become: successful learners; confident and creative individuals; and active and informed citizens.

If these goals are to be achieved, young Australians must have access to teachers who have the knowledge and confidence to teach them well. Yet, a persistent question mark hangs over whether schooling is achieving its purpose when it comes to teaching about finance. Despite significant investments by the Australian government and the finance industry since the 2008 global financial crisis, 15-year-olds still report that their access to financial education at school varies (Thomson et al., 2020).

The problem is getting away from us. While some States and Territories have banned bank-branded programs and indicated a preference for school-led alternatives, a growing number of new market entrants are offering quick fixes that are not necessarily informed by educational research, delivered by qualified teachers, or rigorously evaluated.

Educational researchers in Australia and overseas argue that current educational responses are out of touch and failing to prepare young people for an increasingly complex and digitised financial world. School students need a more holistic and modern financial education that goes beyond personal money management. Consider the events of the past five years alone: the Financial Services Royal Commission revealed widespread misconduct; the COVID-19 pandemic produced significant financial loss and hardship; and we now have an economic and financial crisis of unprecedented magnitude. Meanwhile, financial technology or “fintech” forges ahead. There are slick apps for everything from sports betting, to buy now pay later, to crypto platforms that bring new forms of financial risk and deception. In this financial landscape, marginalised communities are particularly vulnerable and need sensitive and respectfully tailored financial education.

So, what can be done differently to ensure Australian students receive the financial education that they deserve?

This report shares the findings of the **Economics + Maths = Financial Capability** project, a first-of-its-kind initiative designed to explore the affordances of an alternative vision, and to help policymakers and education authorities understand what they can do to effect real change.

We examined how opportunities for teaching and learning about finance are framed within the current and new versions of the Australian Curriculum. We critically reviewed relevant educational research to understand the complex factors that limit students’ access to quality financial education at school, as well as strategies that hold merit. Over the course of the project, we interacted with stakeholders across the education community via national symposia, teacher conferences, and media activity. New insights were generated through surveys and interviews with education professionals¹ and secondary school teachers and students (parents and caregivers were beyond the scope of this project). Drawing on these insights, we designed, tested, and studied the **Economics + Maths = Financial Capability** course. Our goal was to strengthen secondary school teachers’ knowledge of, and ability to deliver finance-related curriculum, content, and concepts, as well as their knowledge of contemporary financial contexts.

Through these engagement and research activities, we made the following findings:

1. **Secondary school students vary in their access to financial education within their families and communities.** The educational research literature highlighted, and education professionals and secondary school teachers expressed concern, that the current approach to financial education at school is leaving many inadequately prepared and vulnerable. While we found that most students were financially active and reported having a family member or friend they trust to ask for advice about money, one in five did not have access to conversations about money matters at home. They rely on school leaders and teachers to understand their circumstances and meet their learning needs and interests. School leaders and teachers need education and expert support to do this work.
2. **Secondary school students want finance-related lessons that connect with their present and are useful to their future.** In the educational research literature and the data we collected, we found a clear rationale for a more holistic and modern financial education that better connects with the contemporary financial contexts young people want to learn about. Around half of students aged 15+ earn money via a casual or part-time job or ‘side hustle’. They report that their families

¹ People working to influence quality financial education at school via roles within government agencies, universities, not-for-profit organisations, and professional teacher associations.

and communities are encouraging them to plan their financial behaviour and delay gratification by saving and investing. They want their schooling to provide the practical financial skills to follow through on this advice, so that they can achieve financial independence and wellbeing.

3. **Financial education is typically viewed and enacted as a niche curriculum.** The Australian Curriculum specifies opportunities to teach and learn about finance and encourages cross-curriculum connections to be made. However, education professionals and secondary school teachers and students expressed concern that the curriculum is not being brought to life in ways that realise its full potential. The out-of-field teaching problem, whereby teachers are assigned to teach subjects outside their qualification or expertise, is complicating matters. So too, is the entrenched practice of relying on outsiders to deliver this teaching and learning.
4. **Teachers want to be shown how to design and implement better programs and lessons.** In the educational research literature, and the data we collected, teacher education is identified as an urgent priority deserving of strategic and sustained investment. The **Economics + Maths = Financial Capability** course was successful in exciting teachers about new possibilities for a holistic and modern financial education at school, and in preparing them to influence improvements to their school's existing programs. Reported benefits included an enhanced knowledge of student learning needs and interests and strengthened classroom teaching. The distinctive features of the course design that resonated with teachers included expert modelling of interdisciplinary learning tasks and intentional pedagogies, which incorporated the use of interactive digital technologies. The idea of teachers of Humanities and Social Sciences (HaSS, where Economics & Business is taught and learned) and Mathematics lending expertise and supporting each other's work as interdisciplinary financial educators was well-received. Collegial practice of this nature relies on the availability of opportunities and time for teachers with complementary knowledge to form relationships and join forces to strengthen existing programs and lessons, and even design new offerings.
5. **The discipline of mathematics, and mathematics teachers and teaching, matter.** Because mathematics is core learning, mathematics teachers can reach and teach more students. There is a significant opportunity to teach economic and mathematical concepts together. For example, the capacity to reason proportionally is a critically important learning outcome that contributes to financial capability. Students develop this capacity to make comparisons between quantities through the development of many interconnected mathematical ideas and strategies over the course of the middle years of schooling (Years 5-8). This learning prepares them to apply mathematical concepts such as ratio, proportion, rate, and percentage to a range of financial contexts (including interest, inflation, wage growth, taxation, loan products, superannuation, and investments).

Unified action is needed. We make the following two recommendations to Commonwealth Treasury, together with Australian, State and Territory education Ministers. These recommendations are tied to the Australian Professional Standards for Teachers (Australian Institute for Teaching and School Leadership (AITSL), 2017):

Recommendation 1: Establish a shared, research-informed vision for a more holistic and modern financial education at school and communicate it clearly.

Associated action:

- a. Establish a national taskforce of education experts to guide and inform finance-related education policy and action.

Recommendation 2: Help school leaders and teachers to enact the finance-related aspects of the Australian Curriculum v9.0 well.

Associated actions:

- a. Support school leaders and teachers to know how students are learning about finance within their families and communities.
- b. Support school leaders and teachers to know the finance-related content and how to teach it.
- c. Support school leaders and teachers to plan for and implement effective finance-related teaching and learning.

These recommendations and associated actions are explained in greater detail in Section 6. Further, key organisations and the steps they can take across three domains - research activities, resource development activities, and relational activities – are identified. The aim of these interrelated activities is to help school leaders and teachers to connect economic and mathematical content and concepts with contemporary financial contexts, and to optimise the use of knowledge networks across the education sector. Relational activities seek not only to build knowledge, but also to build a community and culture of change. Our recommendations and actions value the expertise and untapped potential that exists within key organisations and networks across the education sector, including schools.

This report is presented in six sections. Section 1 examines curriculum and research insights to build a case for reimagining what it means to be financially capable and for preparing teachers to pursue this vision through quality professional learning. Section 2 presents an overview of the project design, including the research methodology and methods. Sections 3-5 present what we learned from education professionals, secondary school teachers, and students about how financial education at school can be improved. Section 6 outlines a plan for real change.

1. Insights from educational research

Overview...

We examined recent reports by Australian 15-year-olds about their opportunities to learn about money at home and at school (reported as part of the Organisation for Economic Co-operation and Development's Programme for International Student Assessment (OECD PISA)). We also examined the Australian Curriculum v8.4 and v9.0, and educational research exploring finance-related curriculum enactment. In this section, we offer a critical synthesis of the landscape and the research evidence.

1.1 Insights into Australian 15-year-olds' finance-related learning experiences

While Australian students generally perform well on the OECD PISA financial literacy assessment, there has been little improvement over the past decade (Thomson & de Bortoli, 2017; Thomson et al., 2020). Australia has a high proportion of students achieving below Level 2 (2015: 20%, 2018: 16%), which is the baseline level of proficiency (Thomson & de Bortoli, 2017; Thomson et al., 2020). Low performers have limited skills and are not yet able to apply their knowledge to real-life situations involving financial issues and decisions (Thomson et al., 2020). The high correlation between mathematical and financial literacy scores (2018: 0.87) suggests the importance of access to mathematics teachers who have the knowledge and confidence to prepare students to apply their mathematical knowledge and skills to financial contexts (Thomson et al., 2020).

As well as test items, the OECD PISA financial literacy assessment includes questions about students' opportunities to acquire money-related knowledge at home, through personal experience, and at school. Many Australian 15-year-olds who completed the test reported that they are developing financial knowledge outside their school, mostly from their parents, other adult family members, and the Internet (Thomson et al., 2020). Students who reported receiving information about money management from their parents were up to three-quarters of a year ahead in their financial literacy learning (Thomson et al., 2020). This finding is consistent with studies arguing the important contributions to financial knowledge of family and community, life experience, and information accessed via employment and training settings (see Salignac et al., 2020). As they become adults, young people's family and social networks remain trusted advisers, even when the quality of advice may be low (Marchant & Harrison, 2020). While family, community, and social networks are inevitably influential in shaping what young people come to know about money, their social foundations and access to factual and trustworthy information vary. That's why financial education at school is so important.

1.2 The Australian Curriculum (current and revised)

The Australian Curriculum provides a clear, three-dimensional framework for teaching and learning. The three dimensions are Learning Areas, General Capabilities, and Cross-Curriculum Priorities (see Table 1).

Table 1. Overview of the Australian Curriculum

Learning Areas	General Capabilities	Cross-Curriculum Priorities
English	Literacy	Aboriginal and Torres Strait Islander Histories and Cultures
Mathematics	Numeracy	Asia and Australia's Engagement with Asia
Science	Information and Communication (ICT) Capability*	Sustainability
Humanities and Social Sciences	Critical and Creative Thinking	
The Arts	Personal and Social Capability	
Technologies	Ethical Understanding	
Health and Physical Education	Intercultural Understanding	
Languages		
Work Studies (optional)		

* To be reconceptualised as Digital Literacy

The Australian Curriculum v8.4² frames opportunities for students to learn about finance within HaSS (where Economics & Business is taught and learned, and ‘Consumer and financial literacy’ is one of the key ideas) and Mathematics (where the ‘Number and algebra’ strand includes ‘Money and financial mathematics’ as a sub-strand). This disciplinary framing reflects the importance of economic knowledge and skills (Amagir et al., 2018; Retzmann & Seeber, 2016) and the strong correlation between mathematical and financial literacies (Thomson et al., 2020).

The Australian Curriculum v9.0 (released 9 May 2022 for implementation beginning in 2023) brings revised requirements. HaSS Economics & Business (HaSS E&B) is offered in Years 5-10 and retains a focus on ‘Consumer and financial literacy’ in Years 7-10. However, the subject may be offered as an elective in Years 9-10 (Australian Curriculum, Assessment and Reporting Authority (ACARA), 2022c). We argue that this advice devalues the importance of HaSS E&B at a critical age and stage (15-16 years of age) when students are entering the workforce and increasing their financial activity towards independence. In Mathematics, ‘Money and financial mathematics’ is no longer a sub-strand, but the expectation that students will learn about finance is made explicit in other ways. For example, the Mathematics curriculum emphasises “the importance of students learning how to apply mathematics to authentic real-world contexts” (see ACARA, 2022b) and makes explicit reference to teaching and learning about money and financial contexts within Achievement Standards from Years 2-10. The curriculum also specifies that students will learn to use mathematical modelling to solve practical and applied problems, including in financial contexts, when studying number, algebra, and measurement. We note that while it is possible to explore economics and finance when teaching statistics and probability, such opportunities have not been explicitly signposted and so may not be obvious to teachers.

In both versions of the Australian Curriculum, numeracy (referred to as mathematical literacy overseas) is positioned as a general capability. The general capabilities are intended to help students to recognise the interconnected nature of knowledge as it is drawn upon and applied in the real world. All teachers are encouraged to identify the numeracy demands that exist across the curriculum and give students opportunities to transfer and use their mathematical knowledge and skills outside the mathematics classroom. The Australian Curriculum v9.0 specifies the key connections that exist between disciplinary learning areas and general capabilities. For example, the overview of HaSS specifies that “Humanities and Social Sciences and Mathematics share a focus on consumer and financial literacy, including understanding the principles of financial management to make informed consumer, financial and business decisions” and “students use numeracy to understand the principles of financial management, and to make informed consumer, financial and business decisions” (ACARA, 2022c). Such statements confirm the expectation that HaSS teachers will take on the role of non-specialist teachers of mathematics (Goos et al., 2019).

State and Territory education and curriculum authorities and non-government sectors and schools determine the approach to curriculum implementation. ACARA’s implementation advice specifies that:

The Australian Curriculum can be used flexibly by schools according to jurisdictional and system policies and schedules, to develop programs that meet the educational needs and interests of their students as well as ensuring that schools extend and challenge students. Schools implement the Australian Curriculum in ways that value teachers’ professional knowledge, reflect local contexts and take into account individual students’ family, cultural and community backgrounds.

Schools develop teaching and learning programs that meet the needs of their students either directly from the Australian Curriculum in some States and Territories, or from curriculum websites incorporating the Australian Curriculum in others. (ACARA, 2022a)

Consequently, school leaders and teachers are largely left with the responsibility for defining and interpreting what it means to be financially capable and how financial education at school can best prepare young people. Given these responsibilities, it seems reasonable that they would require professional learning and support to imagine and design local programs that are tailored to effectively address diverse and dynamically changing student learning needs and interests.

1.3 Finance-related curriculum enactment

HaSS E&B is a core learning area from Year 5 - 8. Mathematics is a core learning area from Foundation - Year 10. HaSS E&B and Mathematics both specify finance-related content and concepts that are critically important to active and informed citizenship. However, curriculum enactment varies across States and Territories and from school to school. Some schools address finance-related curriculum within HaSS E&B and Mathematics, while others offer interdisciplinary or thematic programs dedicated to teaching and learning about finance. OECD PISA financial literacy reports indicate that 55% of Australian 15-year-olds are accessing this learning as part of subjects like HaSS E&B and Mathematics, and 48% take a subject specifically about managing

² This is the version of the curriculum referred to by educational professionals and teachers in this study.

money (Thomson et al., 2020). Sawatzki et al. (2017) found that 30% of Victorian schools were teaching the finance-related curriculum within HaSS E&B and Mathematics in Years 7-10. “Standalone” elective financial education programs were more common (46% of schools). A more recent analysis of school websites and publicly available school curriculum handbooks by Walker et al. (2022) found that only half (49%) of schools were teaching the required HaSS E&B curriculum in Years 7-10. Sawatzki et al. (2017) and Walker et al. (2022) have argued that because financial education tends to be enacted as a niche curriculum, some students miss out. While compulsory “standalone” courses have been suggested as ideal (see de Zwaan and West (2022)), these rely on teachers with the knowledge and confidence to design programs and lessons and teach them effectively. Walker et al. (2022) have explained that because a shortage of staff with the necessary expertise is the reality in many schools, students receive an inadequate grounding in economics and finance to inform a decision on whether to include these studies in their elective subject selection. The past three decades have seen a decline in Year 12 Economics enrolments of around 70% (Livermore & Major, 2021). Livermore and Major (2021) surveyed Australian senior secondary school students to uncover reasons for the trend and found that high socioeconomic males attending metropolitan schools (particularly boys’ schools) were more likely to choose Economics. This trend speaks to a need for teaching and learning that endears the discipline to students from a more representative range of socioeconomic and cultural backgrounds.

The Australian Curriculum Assessment and Reporting Authority (ACARA) has reported that there has been little change in the number of students choosing Mathematics since 2010 (ACARA, 2020). However, a recent Report by the Australian Mathematical Sciences Institute (AMSI) indicated a complex and evolving story. In 2020, the proportion of students choosing to study one or more mathematics subjects dropped below 70% for the first time in a decade (Wienk, 2022). Noting that two-thirds of students (66%) are still choosing to study one or more mathematics subjects, AMSI expressed concern about the decline in the proportion taking what they describe as intermediate or higher levels of mathematics involving calculus (i.e., Mathematical Methods and Specialist Mathematics, which offer preparation for university degrees, “especially degrees with a mathematical component such as science, engineering and commerce”, (Wienk, 2022, p. 3)). In fact, the number of students choosing what AMSI describes as elementary mathematics (i.e., Essential Mathematics and General Mathematics) has increased. Since these subjects are more likely to focus on finance topics, we interpret this trend as students voting with their feet for mathematics learning that they see as having obvious applications in the real world. In New South Wales and Victoria, curriculum reforms aimed at retaining students in mathematics to the end of secondary school emphasise the real-world application of mathematical knowledge and skills and the development of student financial numeracy. The Numeracy Stage 6 Syllabus in New South Wales and VCE Foundation Mathematics in Victoria are good examples of this emphasis and are proving popular among students.

1.4 Calls for a more holistic and modern approach

Internationally, educational researchers argue for a more holistic and modern approach to financial education that goes beyond personal money management and involves students in critiquing financial risk, protection, and regulation. In Canada, Green (2009) has argued that there is scope for teaching and learning about economics and finance to productively nurture ethical bearings that might contribute to finding more equitable and sustainable solutions to the problems humanity is confronting. In Sweden, Björklund & Johan (2020) and Björklund & Sandahl (2021) found that students become stifled when they are only asked to relate financial concepts to their own lives, and that this approach encourages only instrumental understanding focused mainly on compliance within the current financial system. Examining what kind of teaching is required to enable students to critically review economic and financial issues in ways that strike a chord with the broad goals of citizenship education, both sets of authors argued that financial education that is limited to personal money management does not prepare students to make future-focused financial decisions. Further, this limited approach to financial education is often disconnected from, if not insensitive to, the social and cultural norms and everyday financial realities of marginalised communities, including First Nations communities (see Blue, 2019; Blue & Pinto, 2017; Blue & Pinto, 2022), culturally and linguistically diverse communities (Zuhair et al., 2015), high-poverty schools (see Arthur, 2014; Bills et al., 2021; Hunter & Sawatzki, 2019; Sawatzki & Goos, 2018), and people with disabilities (Hopkins & O’Donovan, 2021). Marginalised communities are more likely to rely on government support like Centrelink, Medicare, and the National Disability Insurance Scheme, but are also more vulnerable to unethical and predatory practices. Students from these communities need sensitive and respectfully tailored financial education.

1.5 Why focus on Economics + Maths?

Economic, mathematical, and financial literacies are interwoven, and they consist of factual and conceptual dimensions that individuals need to learn about (Chytilova, 2018). Savard (2015) and Savard and Cavalcante (2021) have argued that, in Canada, mathematical knowledge and skills underpin financial decisions involving risk, ranging from gambling, to credit, to investments. Mathematics prepares students to make financial estimations and predictions. Peters et al. (2019) reported a secondary analysis of financial outcomes in a large and diverse United States dataset (the Understanding America Study). Respondents completed measures of positive financial outcomes (i.e., has investments, does not have a credit card), objective numeracy (fluency),

numeric confidence, and financial knowledge. Objective numeracy was found to interact with numeric confidence to predict (self-reported) financial outcomes, meaning that both fluency in and confidence with mathematics matter. Those with high objective numeracy and high numeric confidence had the best outcomes. Individuals fared worst when they lacked objective numeracy but had high numeric confidence, presumably because they persisted in making mistakes with mathematical tasks that were critical to their finances, while their numeracy difficulties went unnoticed. This finding is consistent with studies arguing that while confidence is an important fragment of financial literacy, misguided self-belief without actual knowledge can lead to negative consequences (see Asaad, 2015; Filbeck et al., 2020; Kruger et al., 1999). de Bruin & Slovic (2021) presented a secondary analysis of the 2019 Lloyd's Register Foundation World Risk Poll, which assessed the basic numeracy skills of more than 150,000 participants in 141 low- to high-income countries. They found that people who were unable to make simple numerical conversions (involving, for example, proportional scenarios that require an understanding that 1 in 10 is equivalent to 10%) tended to be among the poorest in their country. We note that proportional reasoning underpins the percentage calculations needed to understand and manage a range of financial contexts, including interest, inflation, wage growth, taxation, loan products, superannuation, and investments. In addition to low numeracy, low levels of education were independently associated with participants reporting low income and difficulty living on that income.

Given that international studies demonstrate the importance of mathematical knowledge and skills to financial outcomes, the decade of decline in Australian 15-year-old students' mathematical literacy and the up to 3-year learning gap between low and high socioeconomic students (e.g., Thomson et al., 2017; Thomson et al., 2020) are of significant concern. Peters et al. (2019) and de Bruin & Slovic (2021) have argued that improved opportunities to learn mathematics and develop numeracy at school are needed to reduce poverty and increase financial security. Programs that teach mathematical concepts through financial contexts have been found to yield promising results. Filbeck et al. (2020) found that relatable financial education, involving high-school appropriate financial contexts, bridged the gap between students' perceived and objective financial knowledge and contributed to saving behaviours, particularly among students with higher poverty experience. Sawatzki et al. (2019) found that students as young as 10-12 years of age were able to use ratios and proportions in financial contexts before being explicitly taught these concepts as part of the school curriculum.

1.6 Why call it Financial Capability?

Modern life is characterised by a "proliferation of literacies" (Pangrazio & Sefton-Green, 2021, p.20): data, digital, economic, financial, health, mathematical, media, scientific, statistical, and so on. In the case of financial literacy, education scholars have raised concerns that the term casts individuals as ultimately responsible for their own financial reality and education, with discourses leaning towards blaming poor socioeconomic outcomes on a lack of knowledge (Blue & Pinto, 2022; Davies, 2015). Australian policy narratives have gradually shifted in the use of terms, with financial literacy being replaced by financial capability (we note that the term financial capability has always been used in New Zealand). Australia has a National Financial Capability Strategy (Australian Government, 2022), which was previously overseen by the Australian Securities and Investments Commission (the financial regulator) and is now overseen by the Australian Government Treasury (the ministerial department responsible for providing the government with economic analysis and policy advice). The term financial capability is more respectful of diverse social and cultural realities, values, and practices (see Finley, 2021; Hunter & Sawatzki, 2019) and places a stronger emphasis on preparing individuals to critique the role of governments and organisations within economies and financial systems (Sherraden & Ansong, 2016; Swalwell, 2021). Also, the term financial capability resonates more with Australian teachers, who are required to develop a range of capabilities across the Australian Curriculum.

1.7 Why teachers feel out of their comfort zone

In Australia, financial education at school typically rests with teachers of HaSS and Mathematics. However, Sawatzki et al. (2017) found that some of the most qualified and knowledgeable financial educators are not available to Year 7-10 students, with around one-third of commerce teachers being assigned to teach Year 11-12 exclusively. In Australia and overseas, staffing difficulties are necessitating out-of-field teaching assignments (Caldis, 2017; Erikson, 2021; Walker et al., 2022).

Out-of-field teaching occurs when teachers are required to teach subjects outside their main area of expertise (Ingersoll, 2019). Internationally, out-of-field teaching assignments are being reported as a significant issue affecting the teaching and learning experience across a range of subjects. Weldon (2016) drew on the 2013 Staff in Australia's Schools (SiAS) survey to profile the phenomenon of out-of-field teaching in Australian secondary schools. Looking at Year 7-10 HaSS and Mathematics (our focus in this project), out-of-field teaching occurred in 40% of geography classes, 28% of history classes and 21% of mathematics classes (Weldon, 2016). A recent analysis of the 2018 Trends in International Mathematics and Science Study (TIMSS) found that around one in four (23%) Year 8 students were being taught by out-of-field teachers of mathematics (Thomson et al., 2021, p. 47). These figures indicate that out-of-field teaching is common within the subjects where 'consumer and financial literacy' and 'money and financial mathematics' are to be taught. Not only does out-of-field teaching disrupt the integrity of a subject, but it also inevitably

results in reduced student engagement, lower than anticipated student achievement, and an increasing lack of confidence among teachers in their ability to teach effectively (Caldis, 2017)³. Put simply, the out-of-field teaching problem is limiting students' access to financial education at school.

HaSS teachers are considered non-specialist teachers of mathematics, as the Australian Curriculum requires them to recognise and exploit the numeracy demands that exist within their subjects (Goos et al., 2019). While teachers have not been well-supported to embed numeracy across the curriculum, or to make decisions about pedagogies that support numeracy learning (Goos et al., 2013), studies by Bennison (2015, 2022) have provided useful theoretical and practical insights into how teacher professional learning can develop teachers as embedders-of-numeracy across the curriculum, and they were informative for the design of the **Economics + Maths = Financial Capability** course.

1.8 The case for investing in teacher knowledge and practice

The Australian Government's *Through Growth to Achievement* report identifies the need to value and support the teaching profession, including through professional learning that enables tailored teaching (Commonwealth of Australia, 2018). Fisher and Webb (2006) have argued that specialised knowledge of the curriculum and how to teach it explains the difference between generic and inspirational lessons and affects the extent to which students can achieve deep understanding. An excellent teacher can account for up to 30 per cent of the difference in achievement between students; so, what teachers "know, do, and care about" (Hattie, 2003, p.2) matters.

It is our experience, working with hundreds of Australian preservice and practising teachers each year, that teachers believe that financial education is important. This is a consistent finding when teachers are surveyed for their thoughts (see McNair yellowSquares, 2022; Walker et al., 2022). However, Australian and overseas research repeatedly shows that teachers do not feel well-prepared or confident in the role of financial educator. Even experienced teachers tend to draw on knowledge and insights gained via their family members, social networks, and the Internet (Sel & Sözer, 2020), as well as their personal financial activities (Björklund, 2019). Sel & Sözer (2020) have argued that teachers' financial activities may be very different to the ways and means by which young people transact, and that teachers may be unfamiliar with the sorts of contemporary financial contexts that might be meaningfully explored in the classroom.

While the Australian government's investments in teaching resources and online content have sought to help, they have not been matched with investments in teacher professional learning. Yet, we know that quality teacher professional learning produces real benefits for students. For example, in the United States, Urban et al. (2018) explored the effect of extensive and continuous teacher professional learning, additional certification incentives, and student testing, and found that when teachers were appropriately supported, students' credit outcomes as young adults improved (as measured by loan defaults and credit scores). In response to this finding, new legislation in Ohio requires teachers to hold an "educator licence validation in financial literacy" to provide financial education, with the cost of meeting this requirement covered by the Ohio Department of Education (Hancock, 2021). Furthermore, high school students must pass at least one finance-focused course, either an elective or mathematics course, to qualify for graduation. While well-intentioned, efforts to standardise and mandate financial education in other jurisdictions have been critiqued as "riddled with complexities" (Erikson, 2021, p.201) and without meaningful results (Hite et al., 2011).

Educational researchers have begun to explore how best to develop and support teachers' knowledge and confidence as financial educators. In Australia, primary school teachers involved in Sawatzki and Sullivan's (2017) study distinguished between their personal financial literacy and having the curriculum, conceptual, and contextual expertise to develop students' financial literacy. While more than 75% of the teacher participants in that study agreed or strongly agreed that they were financially literate, only around half were confident to develop students' financial literacy. Subsequently, Sawatzki et al. (2017) found that secondary school commerce teachers tend to teach mathematical knowledge and skills, including: how to calculate cost per unit; how to read and interpret financial information presented in tables, charts, and graphs; how to calculate simple and compound interest; and how to make sense of a payslip, including calculating taxation and superannuation payments. However, these teachers struggled to imagine opportunities for students to explore economic and mathematical concepts in more meaningful and contemporary financial contexts, such as fintech innovation and scams. Sawatzki et al. (2017) argued that this lack of knowledge and confidence likely contributes to teachers taking a somewhat simplistic focus on dry finance topics relating to personal money management, such as budgeting, understanding and managing debt, and creating personal wealth through investing.

International scholars have identified similar challenges. Björklund (2019) found that Swedish secondary school social studies teachers varied in their level of comfort with financial questions they deemed to be mathematical, offering commentary on both

³ A recent report led by Deakin University provides a comprehensive analysis of the phenomenon and offers recommendations and actions to inform policy, practice, and research (see Hobbs et al., 2022).

their students' and their own uncertainty and struggles with numbers and calculations. Makonye (2020) found that South African preservice teachers viewed and experienced money simply as an instrument for exchange when buying goods and services. Lecturers who prepared preservice teachers to teach financial mathematics within Mathematics and Business courses reported that students lacked mastery of basic arithmetic skills, particularly on the topics of ratio, proportion, rate, and percentage. These mathematical concepts underpin an understanding of interest, inflation, wage growth, taxation, loan products, superannuation, and investments. Furthermore, Makonye (2020) argued that many learners come from cultures that do not hold a time-value-of-money construct and that they do not readily learn textbook financial mathematics because it is not attuned to their home background and cultural values. The need for backgrounding of home mathematical concepts, together with culturally relevant and sustaining teaching strategies, has also been argued by Bills et al. (2021), and by Hunter and Sawatzki (2019), based on their work with Pāsifika communities in New Zealand.

2. Project design

Overview...

The project consisted of two activity streams - engagement activities and research activities – targeting education professionals and secondary school teachers and students. This section describes our approach to reaching people, impacting their thinking, and generating insights from them through these activity streams. We explain the educational design research methodology and methods we applied and the education theory that guided data collection and analysis.

2.1 Overview of engagement and research activities

Engagement activities involve the exchange of knowledge and ideas. Table 2 describes our engagement activities: who we targeted, the nature of the interaction, and the reach we achieved. In this project, engagement activities provided a mechanism to recruit research participants.

Research activities involve the generation of new knowledge and ideas.

The COVID-19 pandemic has produced a challenging research environment. Access to schools, teachers, and students to conduct research has been limited. These factors affected the methodology and methods adopted for this study. Table 3 provides an overview of the research aims, questions, and activities. Deakin University Human Research Ethics Committee Approval was granted (Reference: HAE-21-043). This report uses pseudonyms to refer to all research participants and their schools.

2.2 Research participants

Education professionals Fifteen education professionals participated in a 30-minute interview, during which they were asked for insights into their experiences working to influence improvements in curriculum, teacher knowledge and practice, and student learning about finance. The participants were able to draw on career experiences across various education settings and professional roles. Ten of these participants were qualified and experienced teachers of HaSS (including commerce), Mathematics and/or Science who were pursuing career opportunities outside schools. The remaining participants worked closely with schools and teachers via education projects and outreach programs. The range of professional activities that the participants described included: commissioning or undertaking research; contributing to policy and curriculum think-tanks; developing curriculum and teaching resources; teacher education activities (for preservice and practising teachers); and the delivery of financial education programs to students.

Secondary school teachers Of the 55 people who completed the **Economics + Maths = Financial Capability** course, 24 (44%) completed an evaluation survey. Of the 24, 15 also agreed to participate in a 30-minute interview focusing on their perceptions of financial education at school (both generally and specific to teachers' school settings), the factors motivating them to enrol in the professional learning series, and their reactions to elements of the course design. Teacher interviews were conducted online via Zoom by the third author after Seminar 3. Table 4 describes the professional characteristics of these teachers, together with information about their school sourced from the *myschool* website (<https://www.myschool.edu.au>). The Index of Community Socio-Educational Advantage (ICSEA), created by ACARA, was used to understand the socioeconomic profile of each teacher's school community. An ICSEA value below the Australian average of 1,000 is somewhat indicative of socio-educational disadvantage. Note that Cara, Keli, Claudette, and Carson were teaching in high-poverty schools.

Secondary school students We facilitated a virtual Student Summit, where we interacted with 124 secondary school students (15-16 years of age) to find out what they want and need from their financial education at school. Students completed a Mentimeter (interactive presentation and polling tool), which provided anonymous data about their financial activities and learning within families, communities, and schools. Snapshots of the Mentimeter results were used as a stimulus to engage students in discussion. The intention of the activity was to facilitate the exchange of knowledge between researchers and students. All the students had a teacher who had completed the **Economics + Maths = Financial Capability** course. Table 5 consists of *myschool* data that describes the diverse school communities from which we were able to collect insights (socioeconomic, cultural, and language background).

Table 2. Summary of Engagement Activities and their Reach

Who	The nature of the interaction	Reach
Education professionals	<p>Two free national symposia</p> <ul style="list-style-type: none"> • Financial capability: Questions of what and how and who (October 2021) • Influencing a more inclusive approach to financial education (March 2022) <p>Presentations by scholars of international influence, including First Nations colleagues</p>	<ul style="list-style-type: none"> • More than 80 invited • More than 30 attended each event • National reach achieved
Secondary school teachers	<p>Two iterations of the Economics + Maths = Financial Capability course</p> <p>Teacher conferences and webinars</p> <ul style="list-style-type: none"> • Australian Association of Mathematics Teachers (AAMT) • ACT Education Directorate • NSW Education Standards Authority (NESA) • The Mathematical Association of Victoria (MAV) • The Victorian Commercial Teachers Association (VCTA) <p>Contributions to teacher journals, including articles for <i>The Australian Mathematics Education Journal</i>, <i>Common Denominator</i>, and <i>Redress</i></p>	<ul style="list-style-type: none"> • 47 secondary school teachers across 35 Australian schools • 8 education professionals • National reach achieved • Hundreds of teachers attended our presentations live • Recordings were made available • Thousands of secondary school teachers
The broader community	<p>Media activity, including articles published in <i>The Age</i> and <i>Teacher Magazine</i></p>	<ul style="list-style-type: none"> • Tens of thousands of students and teachers

Table 3. Summary of Research Aims, Questions, and Activities

Research aims	Research questions	Participants	Data source
a. To discover and document the diverse perspectives and priorities of education professionals who want to improve financial education in Australian schools.	1. What can be done to better support school leaders and teachers in this area?	Education professionals working to influence quality financial education at school via roles within government agencies, universities, not-for-profit organisations, and professional teacher associations	1 x online interview via Zoom
b. To explore secondary school teachers' views about the current and future approaches to developing young people's financial capability at school.	2. How do teachers describe their professional learning needs as financial educators? 3. What professional learning opportunities and resources are most useful to teachers?	Year 7-10 teachers	1 x online survey 1 x online interview via Zoom
c. To find out what secondary school students want and need from their financial education at school.	4. What financial activities and experiences do secondary school students bring to the classroom? 5. What finance-related issues and topics matter most according to young people?	Secondary school students (15-16 years of age)	1 x Mentimeter presentation and polling tool
d. To formulate recommendations to improve financial education in Australian schools.	6. How can these insights shape future directions and investments in financial education in Australian schools?		Holistic analysis of all data sources

Table 4. Teachers Interviewed and their School Community

Teacher (pseudonym)	Years Teaching Experience	Sector	Regionality	School ICSEA	Indigenous Students	LBOTE
Cara	5	Government	Regional	911	1%	90%
Stella	10	Independent	Metro	1,137	0%	9%
Keli	11	Government	Metro	938	2%	63%
Claudette	12	Government	Metro	955	1%	70%
Nerida	15	Independent	Metro	1,046	1%	40%
Rosa	17	Government	Regional	1,037	3%	6%
Alice	6	Catholic	Metro	1,158	1%	18%
Ruby	27	Independent	Metro	1,098	1%	9%
Anna	18	Independent	Metro	1,044	1%	33%
Rebekah ^a	23	Government	Metro	1,140	2%	34%
Owen ^a	5	Government	Metro	1,140	2%	34%
Carson	31	Government	Regional	941	12%	29%
Penelope	20	Government	Regional	999	3%	9%
Theresa	20	Independent	Metro	1,177	0%	52%
Skylar	-	University	Metro	n/a	n/a	n/a

Note. ICSEA = Index of Community Socio-Educational Advantage; LBOTE = Language background other than English.

^a Teachers at the same school.

Table 5. Virtual Student Summit Participants

School	Sector	Regionality	School ICSEA	Indigenous Students	LBOTE	No. Students
A	Independent	Metro	1,098	1%	9%	36
B	Independent	Metro	1,127	2%	14%	21
C	Government	Metro	955	1%	70%	19
D	Independent	Metro	1,177	0%	32%	28
E	Government	Regional	999	3%	9%	20

Note. ICSEA = Index of Community Socio-Educational Advantage; LBOTE = Language background other than English.

2.3 Theoretical guidance

The project was informed by Shulman's (1986; 1987) seminal thinking about teachers' professional knowledge, which distinguishes between curricular knowledge, content knowledge, and pedagogical content knowledge.

Curricular knowledge refers to the requirements for teaching particular subjects and topics at a given level, the variety of instructional materials available to resource those programs, and the criteria that guide teachers in selecting these materials. Curricular knowledge is both lateral and vertical. Lateral curriculum knowledge prepares teachers to relate the content of a given lesson to topics and concepts being explored in other classes, such as where synergies exist between economics and mathematics. Vertical curriculum knowledge refers to familiarity with the topics and concepts that have been and will be taught in the same subject area during the preceding and later years in school, and that constitute the overall learning progression.

Content knowledge refers to the amount and organisation of subject matter knowledge in the teacher's mind. Teachers must be capable of defining and explaining not only content and concepts to students, but also why this knowledge is worth knowing and how it relates to other knowledge both within and outside the discipline. The Australian Curriculum's content descriptions articulate learning area content and concepts to be taught and learned.

Pedagogical content knowledge includes knowledge of the most regularly taught topics in one's subject area, the most useful forms of representation of those ideas, and the most powerful analogies, illustrations, examples, explanations, and demonstrations. Pedagogical content knowledge includes what Goos et al. (2012, 2014) and Savard & Cavalcante (2021) describe as the contextual dimension of learning. For example, knowledge of contemporary financial trends, issues, problems, and practices (termed financial contexts) can make learning more accessible and meaningful for young people. The Australian Curriculum's elaborations suggest possible contexts for teaching and learning.

This framework acknowledges that teachers' professional knowledge and work are highly specialised and constantly developing.

2.4 Research methodology

Educational design research methodology (also referred to as design-based research methodology) was applied. Anderson and Shattuck (2012) explain how this practical research methodology:

- Involves collaborative partnership between researchers and teachers;
- Is situated in real educational settings;
- Focuses on the iterative design and testing of a significant intervention;
- Involves the collection and analysis of quantitative and qualitative data; and
- Generates design principles that impact teaching practice.

Put simply, educational design researchers study persistent problems in education and design innovative responses, which they also study. This methodology is highly regarded for its ability to turn research into sustained improvements in teaching and learning.

2.5 The Economics + Maths = Financial Capability course

The intervention we designed and tested was a course designed to boost teachers' curricular, content, and pedagogical content knowledge for teaching students about finance in Years 7-10.

To pursue this objective, we reimagined what it means to be financially capable and what we want to educate young people to value, know, and do about money within their families and communities as follows:

A financially capable young person is **literate** and **numerate**, able to read, interpret and make decisions about economic and financial data in various forms, from the everyday (payslips) to the more complex (financial market reports). They are **organised** in how they keep track of money and maintain financial records. They are **sceptical** and **critical** thinkers, able to discern fact from fiction when engaging with such things as business marketing, government policy, and media reporting. They are **digitally astute** in how they use fintech, keeping their personal data safe, and creating a financial advantage. They understand that people from different backgrounds view and experience money differently. They possess an **ethics of care** in financial interactions, looking out for those who may be vulnerable and/or in financial trouble, directing them to seek trustworthy help from reputable sources without stigma. They are **future-focused** and oriented to make spending and investment choices that reduce their social and environmental footprint to enhance not only their personal financial position, but the broader challenges humanity is facing. Importantly, they are able to apply fundamental economic and mathematical knowledge and skills to the financial problems and decisions they face.

Based on this ambitious imagining, we began to design the sorts of finance-related learning experiences students would require over the course of their schooling. We brought these learning experiences to teachers, so that they could experience our vision and consider how they might meaningfully tailor it within their schools.

The **Economics + Maths = Financial Capability** course was offered through the PLEdHub@Deakin (see p.v) and consisted of 6 x 90-minute seminars exploring economic and mathematical concepts within contemporary financial contexts. The number and selection of topics were guided by the project Steering Committee and Co-Design Panel (see p.vi) and comprised:

1. Curriculum and pedagogy for developing financial capability;
2. Teenage tap n go;
3. All fun and games? A focus on music, entertainment, and gaming subscriptions;
4. The real cost of buying now and paying later;
5. Climate-conscious consumption: A focus on renewable energy; and
6. Climate-conscious consumption: A focus on new fashion trends.

Contemporary financial contexts were central to the course design. From pocket money apps to gaming platforms, we introduced teachers to new ways in which young people are learning about money within their families and communities. Because the financial landscape is dynamically changing, it is important to note that a different selection of topics would likely be made today (only 18 months later), and the initial learning materials would need to be updated. The tasks we designed exploited key connections between HaSS E&B and Mathematics, as well as the general capabilities.

For example, the Mathematics curriculum specifies that Year 9 students learn to solve problems involving simple interest (ACMNA211). Typical textbook problems ask students to apply the simple interest formula to scenarios – i.e., “\$1,000 is invested for 2 years at 5% simple interest. What is the total interest earned?”

The cost structure of buy now pay later (BNPL) services resembles simple interest and is highly relevant to young people. We created a *Real cost of buying now and paying later* investigation that also addressed the HaSS E&B requirement that students learn about the nature of innovation and how and why businesses seek to create and maintain a competitive advantage in the market, including the global market (ACHEK041).

The task outlined BNPL's terms and conditions of use in language that is accessible to Year 9 students (Figure 1). The following scenario was then put forward: "Kim needs your advice. She used BNPL to buy a reconditioned PlayStation for \$265. Determine all possible scenarios and amounts that Kim might pay, depending on whether her payments are made on time. For each scenario, what is the effective interest rate?"

BNPL is a buy now pay later service provider created by Australian entrepreneurs (website: <https://www.BNPL.com/en-AU>). BNPL allows customers to split the total cost of a purchase over four equal instalments. The first time you use BNPL, the first payment is deducted at the point of purchase, with three further payments fortnightly thereafter. Next time you use BNPL, you get your goods straight away, but the first payment is not deducted until a fortnight after your purchase.

Payments are expected to be made on or before the due date. BNPL's key marketing messages include "no fees when you pay on time" and "never pay interest". However, customers need to read the fine print to understand what happens if they are late in making a payment (via the Terms of Service page). If you miss a payment, you will be prevented from using BNPL for any new purchases until your payments are up-to-date. If you don't have enough money in your nominated debit or credit account to cover the automatic payment and your payment is declined, you have 24 hours to log into your account and pay before BNPL charges you a \$10 late fee. The late fee varies depending on the cost of your purchase. Caps (maximum fees) were introduced in 2018, meaning that the total you can be charged in late fees for any one purchase is 25% of your original order.

Some scenarios are outlined below:

- If your purchase was less than \$40, you can only be charged a maximum of one \$10 late fee for that order.
- If your purchase was between \$40 and \$272, an additional \$7 late fee will be charged if the payment remains unpaid seven days after the due date.
- If your purchase was more than \$272, the maximum late fee is \$68 (i.e., $4 \times (\$10 + \$7)$).

Figure 1. *BNPL Terms and Conditions*

By modelling the use of tasks like this one, together with intentional pedagogies, teachers were able to experience how they might teach their students how to do such things as: mentally keeping track of cashless income and spending; reading, interpreting, and creating comparison tables, spreadsheets, and graphs to make sense of financial information; and undertaking mathematical and statistical investigations to better understand financial choices. As educational researchers and teacher educators with complementary expertise in economics and mathematics, we spoke explicitly about our ways of working together and we encouraged teachers to think about how they might draw on our example to innovate and influence the programs and lessons being offered within their schools.

The course benefits marketed to teachers included: that the course was research-informed and designed by education experts; that teachers could study online via Zoom with independent, live, and small-group activities together with colleagues from across Australia, all from the comfort of their home or school; and that teachers would gain access to a secure course website containing readings, videos, podcasts, and presenter slides with the interdisciplinary learning tasks.

The course design aligned with the Australian Curriculum and Australian Professional Standards for Teachers (AITSL, 2017). Ecstra Foundation funding enabled the course to be offered at \$350, with a further 15% discount for partner teacher association members. This price is below market rates for similar university short courses. Teachers were offered the option to be assessed without cost for the award of a Deakin Professional Practice Credential⁴ (see p.v).

⁴ The usual fee is \$495.

3. What we learned from education professionals

Overview...

We aimed to discover and document the diverse perspectives and priorities of education professionals who want to improve financial education in Australian schools. We wanted to know what they thought could be done to better support school leaders and teachers in this area. The education professionals we met expressed concern that the current approach to financial education at school is leaving many students inadequately prepared and vulnerable. They believed in the potential for financial education at school to make a difference to students' life outcomes and saw teacher education in this area as an urgent priority. This section explores their insights.

3.1 Without quality financial education, young people are vulnerable

The vast majority of participants reported that their interest in financial education had evolved from their own childhood experiences of financial hardship, or their adult experiences of financial loss and/or hardship. They described wanting to be financially capable, and to help educate young people. For example, Tara explained:

I've always felt the importance of it, because I've seen in my own family, the impact of not being financially literate ... This affects almost every aspect of students' lives, and it's changing, it's increasingly complex. That's partly what motivated me ... because I'm like, I'm not going to make those mistakes. I'm going to know what I'm doing.

Likewise, Maeve reflected:

There's been times when life was a struggle. You know, financially. My husband was farming through a drought and things were pretty grim. I lost my job. But we managed because we had an education behind us.

Like Maeve, participants tended to express the view that education offers protection against financial risk. Anecdotes, like this one by Jane, were used to convey why financial education at school is important:

My partner employs kids that have just finished high school. Some don't have a bank account. They don't know about tax. They might have come from another hospitality venue where they haven't been paid superannuation - and they don't understand why that's an issue. Just recently, a friend's 17-year-old daughter answered the phone to someone dodgy, pressed a button and her whole bank account got wiped out. And you know, these sorts of scams are happening that kids need to be educated about.

Related to this view, participants spoke of the need for schooling to extend upon learning taking place within families and communities, with a view to addressing equity goals in education. Val explained:

Not all students have the advantage of being born into a situation where a parent or a family or a community can give them that [financial] education. It's simply not the case.

Melanie shared this view, saying:

I think if we just left things totally to parents, then we'd actually be doing a disservice to a whole group of students who may not otherwise have access to this, this sort of knowledge and skills, at home.

3.2 The Australian Curriculum does not prioritise financial education

Participants were asked to reflect on the Australian Curriculum v8.4 (see p.4-5), and whether it has been effective in providing opportunities for young people to become financially capable at school. Participants expressed differing views on whether the importance of financial education had been effectively conveyed to teachers, and whether teachers had been supported to know the content and how to teach it. Dan explained:

What they did with the first version of the Australian Curriculum [Mathematics], they added some dot points and called it money. Doesn't make much difference. Teachers might throw in a couple of money things in order to tick off those content descriptions.

Edwina agreed, saying:

I don't think one content description per year level has been enough to make it meaningful... What we actually need is a good, decent progression of knowledge... What's the progression for our students that will get them where we need them to be?

Several participants spoke about the need to elevate the status and importance of financial education by making finance a cross-curriculum priority or financial capability a general capability. Val explained:

I say this with the utmost respect for curriculum writers... [the current curriculum] has not been successful at all. It's not a [cross-curriculum] priority. And therefore, teachers don't teach it... Yet this is a necessary skill. Everyone needs to be financially capable... Most teachers don't teach this stuff. It just doesn't happen.

Edwina agreed, saying:

A lot of people see this as a 'like to have' at this point in time, instead of a 'have to have'. I really think it's a 'have to have'. This is something that can positively influence the lives of our students. That should make it a 'have to have'.

Patrick suggested raising the profile of finance education to better signal its importance to schools' leaders and teachers:

The fact is, it's a lot, right? So, how do you integrate it into the curriculum? There's no way you can do it in just one learning area. A big barrier is getting it done across the curriculum, where it's relevant... It would be good to see the importance raised by setting it as a [cross-curriculum] priority or a general capability. Somewhere at that level... because that would raise its profile, and then it would have to be built into schools' curriculum design.

Revisions to the Australian Curriculum announced since education professionals were interviewed do not include any new cross-curriculum priorities or general capabilities.

3.3 School leaders and teachers need expert guidance and education

In contrast to the above critical perspectives, other participants believed the curriculum to be adequate, albeit they identified a lack of genuine support for school leaders and teachers to assume local ownership and get creative in how they interpret and enact the possibilities. Melanie explained:

I don't see the curriculum as the problem. Not the written curriculum. I think it's the implemented curriculum that's more of the problem. So, the extent to which it's actually being taught... I mean, all the curriculum documentation does is provide an outline... taking the curriculum and making it into a course - that's what schools and teachers do.

Adam seemed to agree:

I think there are opportunities there and I think they have been intentionally crafted... We can dissect the curriculum content all day long and never agree on it... Do teachers have the skills to maximise those opportunities? I don't believe so. I think that there is a disconnect between what we write into the curriculum and what students' learning experience is. Opportunities are there. Teachers don't necessarily have the tools to maximise those opportunities... Whose responsibility is it? That's the thing. You talk to teachers and school leaders, and you ask them that question, 'Who's responsible for financial literacy education in your school?' and you get a blank look.

Exploring what support might be most useful to schools and teachers, participants referred to the range of financial education programs and lessons available. Many acknowledged the federal government's investment in teaching resources hosted online, including *MoneySmart* and *Tax, Super + You*. However, questions were raised about the growing number of new commercial entrants and outsourced solutions. Dom explained:

There are some really great resources that have real value and worth. They're in it for the right reasons and on-board to drive this sort of agenda of change... but there's a lot of players who try and sort of crowbar their way into this space for the wrong reasons.

Patrick observed that parties with a commercial interest in financial education in schools are stepping into the space created by the [forced] exit of bank-branded programs in some States and Territories, despite the intention of the ban being that school-led programs would prevail:

I'm seeing an increase in discussion, recognition, and resource development from various places, but more recently, from commercial providers. It all seems to be happening pretty fast. It's like this groundswell of [commercial solutions] that could basically overwhelm the good work that others are trying to do in terms of getting teachers educated.

A related concern was whether outsourced solutions are respectful and sensitive to the diverse financial realities and cultural perspectives that exist within Australian schools. For example, Helen explained that some students' families see money "as a taboo topic that they are not comfortable talking about". She went on to explain:

Students are growing up with different money stories, so we need to be inclusive and think about what money means in different cultures, to different people.

Lydia also spoke about the tension between financial education that is standardised or "off the shelf" and financial education that is tailored to local circumstances, learning needs and interests, saying:

I don't think we're particularly good at [connecting with] local communities. And I think that work probably best sits with schools and teachers – to work out how it should sit within their community, how they can best serve their community.

Comments regarding the need for unified action at every level of the education system were pervasive and pressing. Education professionals wanted to see research-informed change initiated by education authorities, including strategic support for school leaders and teachers to access expert guidance. Val explained:

I just hope that this research can inform our strategies, that there is a moment of change... that it really drives change and influences government policy. I think there's a responsibility at the government level. And there's a responsibility at the school level.

On this point, Patrick spoke of the need to upskill teachers. He problematised traditional, textbook-driven teaching in Mathematics as one reason why more innovative programs and lessons don't prevail:

Teachers are doing their discipline-based work teaching the curriculum they need to teach. Got a textbook. In most schools, they're ticking off the [curriculum] content descriptions... I don't think it's top of mind for most teachers. Would they have financial literacy on a list as a priority? We need to upskill teachers in their ability to teach about finance, while teaching the mathematics they need to teach, so they feel like they're not [being asked to do] something extra or outside the curriculum.

Melanie also identified teacher professional learning as critical to effective curriculum enactment:

One of the challenges is the expertise and confidence of teachers... If you could wave a magic wand, you'd have all these teachers who are trained, engaged, committed to teaching these concepts.

Other participants spoke of the need to value the collective wisdom that resides within schools, together with teachers' professional expertise and agency, and to support local innovation. Dom explained:

Curriculum reform moves at a glacial pace... and you have different implementation between each State and Territory... while I think it's brilliant that reforms happen, the most important thing is what can be done at the coalface.

When asked to identify the most urgent priority, most participants agreed that the education of school leaders and teachers via quality professional learning initiatives is crucial. Dan was adamant:

We're only ever going to improve education in Australia if we improve the quality of teaching. And that means teaching teachers. So, it's about teacher education, teacher professional learning. It's not about tokenistic content descriptions in an already overcrowded curriculum... How can we be creative in embedding this in our teaching practice?

Melanie explained the real changes needed to make this happen, from school leader buy-in to teacher professional learning:

I don't know if it's as simple as one priority. I think the most urgent priority is probably having school leaders on board. Having school leadership understand where this fits in. But also building the confidence of those out-of-field teachers who end up teaching this area.

Maeve agreed. She suggested that teachers would need expert guidance and education to imagine the possibilities for enacting the revised Mathematics curriculum:

Probably upskilling the teachers. I'm not having a go at out-of-field teachers - you know, they're doing their best. But they're teaching quite procedurally, and that's not real financial education. With the financial maths, you've got to understand the context and all the other things that are an important part of it. The new maths curriculum has removed the money and financial mathematics sub-strand of Number and Algebra. So, will teachers necessarily use

financial contexts? Can they see how much maths they can achieve through financial contexts? If they're out-of-field?

Dan concurred. He explained the importance of intentional pedagogy: that is, explicit teaching of mathematical concepts together with teaching that prepares students to apply mathematics in the real world:

I think the problem in a lot of secondary maths classrooms is that we assume this will happen by osmosis... you probably need to teach it explicitly. You know, it's that connection, that transferability, how some of the maths you learn gets used in the real world... We teach maths in this abstract way with this formal language, but how does that relate to how we use it?

Jane acknowledged the importance of mathematics teachers, but also interdisciplinary action:

My work is about building teacher capacity in mathematics and numeracy. So, I see financial capability as being embedded in that. But as much as I think financial capability is related to maths and numeracy, obviously, I can also see possibilities across the curriculum.

While Lydia seemed to agree, she pointed to teacher education and professional learning as the key to realising these possibilities:

If you're not trained adequately, it's just a blind spot... in the humanities, unless you're trained to pick it up, you're not going to see that it's something that you should be thinking about.

4. What we learned from secondary school teachers

Overview...

We set out to explore secondary school teachers' views about current and future approaches to developing young people's financial capability at school. Like education professionals, the teachers we worked with expressed concern that the current approach to financial education at school is leaving many young people inadequately prepared and vulnerable. Teachers wanted help making connections, namely: support to connect economic and mathematical content and concepts with contemporary financial contexts; and support to tap into knowledge networks within their schools. We designed the **Economics + Maths = Financial Capability** course to help teachers make these connections and to find out what professional learning opportunities and resources are most useful. The course was successful in exciting teachers about new possibilities for a holistic and modern financial education at school and preparing them to influence improvements to their school's existing programs. Reported benefits included enhanced knowledge of student learning needs and interests and strengthened classroom teaching. The distinctive features of the course design that resonated with teachers included expert modelling of interdisciplinary learning tasks and intentional pedagogies, which included the use of interactive digital technologies. We provide three case studies to demonstrate that valuing teachers' professional expertise and agency through system and school level funding and support (including time release) were important conditions for success.

4.1 Who completed the Economics + Maths = Financial Capability course?

During the twelve months from June 2021 to May 2022, two iterations of the **Economics + Maths = Financial Capability** course described in Section 3 were delivered: Cohort A between June and September 2021; and Cohort B between February and May 2022. Fifty-five educators (47 secondary school teachers and 8 education professionals) completed the course. National reach was achieved, with teachers and education professionals from all Australian States and Territories participating (Figure 2). Thirty-five schools across sectors and locations were represented (Figure 3, note that some teachers attended with a colleague or colleagues from their school). While we intended to recruit teachers of HaSS and Mathematics, the varied and often out-of-field nature of teachers' workloads meant that teachers of English, Science, and the Arts also enrolled. Figure 4 presents the teaching load described by the 47 teachers.

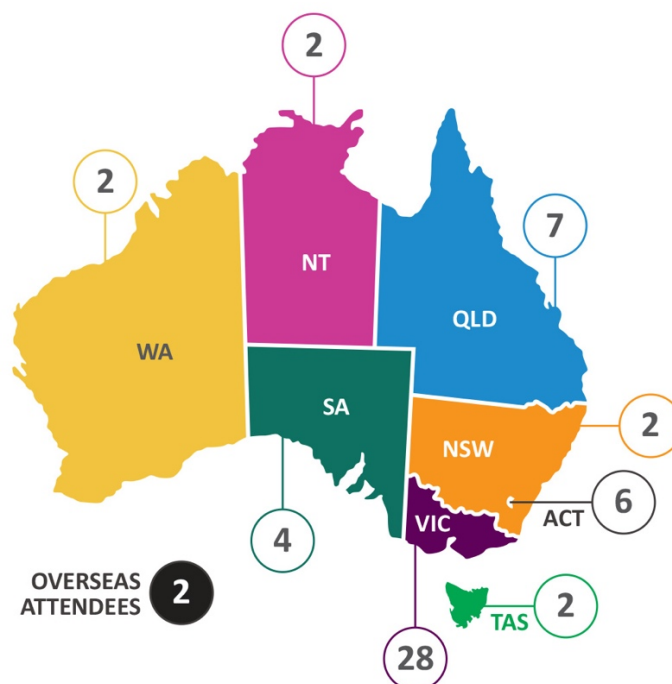


Figure 2. Course Enrolments by State and Territory (n=55)

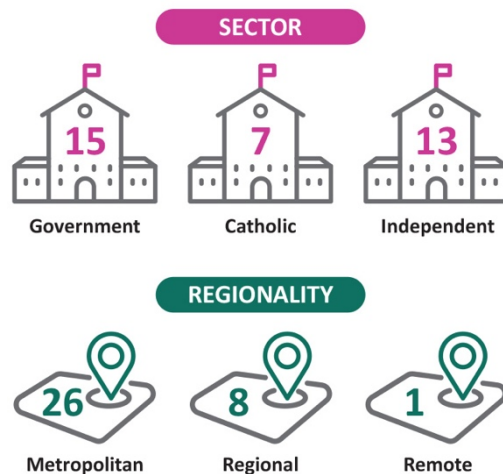


Figure 3. Sector and Regionality of Schools Represented (n=35)

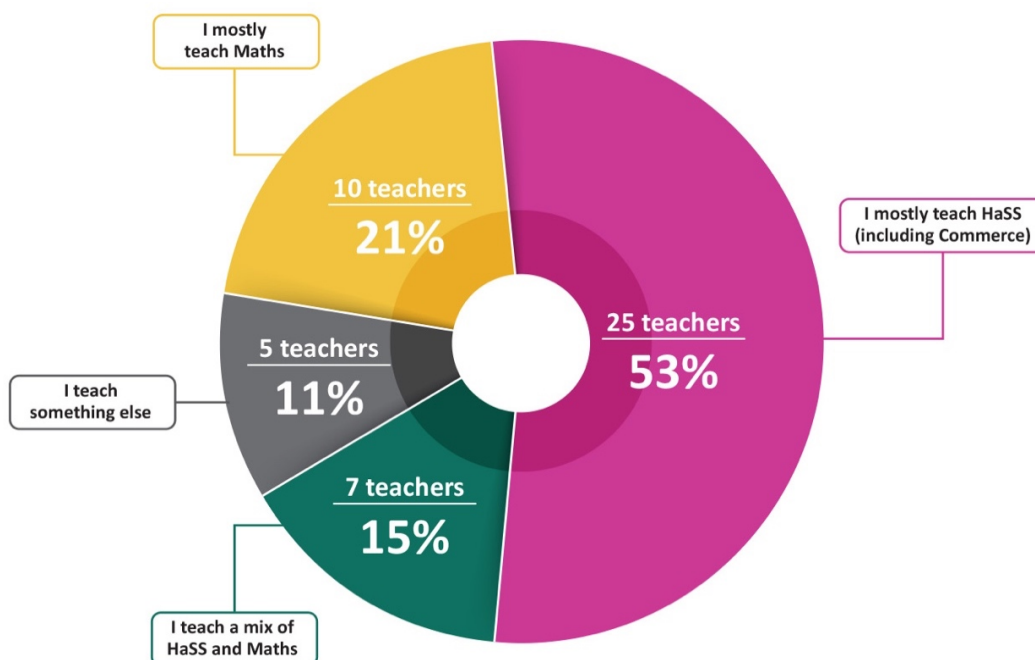


Figure 4. Teaching Load Described by the Teachers (n=47)

Twenty-four teachers (44%) completed an evaluation survey. Of the 24, 15 also agreed to participate in a 30-minute interview focusing on their perceptions of financial education at school (both generally and specific to teachers' school settings), the factors motivating them to enrol in the professional learning series, and their reactions to elements of the course design. Next, we discuss insights from these data sources.

4.2 Teachers recognise students' diverse access points

Like education professionals, secondary school teachers believed in the potential of financial education at school to be a protective factor against financial vulnerability. For example, Cara, a teacher of English, Humanities and Commerce, explained that prior to becoming a teacher, she worked in the finance industry; a career experience that contributed to her valuing financial education and feeling somewhat confident to teach commerce lessons. Cara brought a nuanced understanding of the diverse and inequitable Australian school experience and contrasted her experience teaching students in an aspirational multicultural community in suburban Melbourne with her current role in a high-poverty regional school:

In my previous school, the students were really culturally diverse. But they knew someone who was in business and knew that being in business ... [was part] of being in charge of their financial future, was something that was going to get them out of where they are. I think [my current school] community is very different, and I think it is because of the general level of poverty, intergenerational poverty, unemployment, and some of the trauma that we have here.

When describing the importance of financial education at school, Anna, an Economics teacher, also spoke of the range of experiences with money present in Australian classrooms. She conveyed the need for financial education that is sensitive and respectfully tailored to diverse access points:

There are some students whose parents have been proactive, and have taught them about money, and have, you know, if they do have a job, they're encouraging them to save 80% of what they're earning, and they can spend the other 20% how they wish. So, in some families, that is happening. In other families from very low socioeconomic backgrounds, there's not a lot of room to move there. And those kids are very quiet, they don't share their money struggles... So, you know, [there's] a whole range of students.

4.3 Teachers want help making connections

Teachers made clear statements about their preferred learning area/s and their level of comfort with developing student financial capability. Their statements revealed the strengths they perceived in terms of their own knowledge and practice, as well as their professional learning needs. Throughout their interviews, teachers described wanting help connecting economic and mathematical content and concepts with contemporary financial contexts, along with support to tap into knowledge networks within their schools.

4.3.1 Teachers want help connecting economic and mathematical content and concepts with contemporary financial contexts

Keli, a Commerce and [out-of-field] Mathematics teacher who had also worked in the finance industry, understood that content at the intersection of economics, finance, and mathematics might be explored across learning areas, but questioned whether these connections were being exploited:

So, does a maths teacher who's teaching simple interest understand [they're] actually teaching financial literacy? Or [do they] think [they're] teaching a calculation?

The issue of teacher knowledge and confidence was also highlighted by Cara, who expressed a familiarity with economics, but uncertainly around mathematics:

I'm actually not a maths person. And I have to say, I really feel that when we discuss the maths in the [Seminars] that we do. But I understand business, and I understand economics... I can't really speak to what's taught in the maths faculty at school.

Stella, a teacher of Humanities and Commerce, conveyed her sense that students struggle to identify a reason to learn about finance because teachers lack the knowledge and confidence to present it to them in more authentic ways:

Well, I think students just think it's boring. And it's just almost like a bit of maths. Do you know what I mean? So, if you're not into maths, then students aren't going to find that really appealing.

Stella's comment seems to imply that a lack of contextualisation contributes to the disconnection of students' learning in mathematics classrooms (in particular) from their real world. Penelope, a Commerce teacher, seemed to agree, and offered similar reflections about Economics:

So, we have about 1800 Year 11 and 12 students. For only 18 of them to be choosing Economics, to me, you know that says a lot about what they think economics is about... It needs to be more relevant and more high impact... And this is why I joined the course, because I think there's a lack of really good current resources.

Just as in our conversations with education professionals, textbooks were depicted as both a help and a hindrance to the extent that teachers come to depend on them for curricular direction and content knowledge. Claudette, a teacher of Science and [out-of-field] Mathematics, brought greater specificity to this issue, speaking about the typical approach to teaching Mathematics: "I feel like we're very limited to what's in the textbook, and we kind of follow what's in the textbook." Claudette went on to describe trying to make her mathematics lessons more practically relevant for students, and that doing so prompted her to feel concerned about students' readiness for even simple financial tasks:

Well, I teach maths. So, it's very much focused on teaching them how to do the skills, not life skills... So, we did this activity where they had to estimate how much it would cost them before they actually calculated the cost [at the canteen]. They had no idea how much change they'd be getting. And it's like, what?! You know, it's really scary, don't you think? Because then they're so vulnerable...

Claudette later explained being motivated to design programs and lessons that are as realistic and authentic as possible, citing the ideas and resources provided through the course:

I really like the examples they've been giving [in the course] where they've been using, you know, the currencies that exist in [Xbox and PlayStation] games. Because the kids are familiar with that.

Consistent with education professionals, secondary school teachers also spoke of the need for support tailoring their programs and lessons to students' family, cultural, and community backgrounds, as well as their ever-changing learning needs and interests. Carson was a highly experienced Humanities teacher working in a different high-poverty regional school to Cara. When asked about the challenges he confronts in teaching students about finance, Carson echoed a view shared by many study participants, that standardised or "off the shelf" resources lack currency:

I think where, where the biggest issue is at the moment, is keeping up with current trends and technologies. And I guess personally, that's where I have a difficulty with textbooks, because textbooks can become quickly outdated within, you know, 12 months. And it was interesting in the last session, looking at all the tap n go type of things that are happening in this world. And I think as teachers, unless we actually use those sorts of products, we're pretty much in the dark. So, it takes a lot of work for teachers to come up to speed on what those are, what the new technologies are... I would like to see a resource package that's up to date that people can go in and get in real-time. Do you know what I mean? So, there's sort of like a bit of an attitude that well, we'll put something up on the website could be anything from a government perspective - or wherever, an organisation - but it remains stagnant. You know what I mean? It doesn't deal with real-time issues.

This issue challenges resource developers across a range of topical foci that the curriculum seeks to address, from climate change to consent. Keli also saw connecting content, concepts, and contexts as the key to developing students' financial capability:

If you don't give any of these calculations a context, the student is not financially literate. They just know how to calculate simple interest. That has no bearing on a decision later in life... For me, it's a frustration I've had, in my ten years of teaching, how little the students know coming into my Year 11 Economics class... They cannot apply the maths they've learned to an economic situation. So, I'll give you a really, really simple example. In economics, we learn very quickly, you know, concepts like marginal utility, or what's another, elasticity. These are Year 7 maths calculations and the kids can't do them. So, I have to re-teach the maths, because when the maths was taught to them, it didn't have a context... This is just a percentage change calculation, but there's no registering there of what I mean by that... And I've got some of the smartest kids in the school in my Year 11 Economics class.

Here, Keli recognises that teachers' knowledge underpins their capacity to connect with and develop students. Ruby, an Economics and [out-of-field] Mathematics teacher, also reflected on the shortfalls of the traditional approach to teaching mathematics, compared with what we were presenting and modelling in the course:

I just love the way the course is touching on so many highly relevant things in kids' lives and connecting them to the curriculum. Now, the joke in maths is you always have questions like, 'Someone's got 63 watermelons...'. No one would ever have 63 watermelons! The questions that we're discussing in this course are just more relevant and related to the real-life experiences of kids.

Penelope agreed and confirmed the powerful possibilities for her and her students in extending her teaching practice into mathematics and numeracy:

The way they teach about financial capability is interesting because it links with numeracy. And I've never really considered it linking with numeracy. I'd only really thought about it from an economics or a business angle. But looking at it from a numeracy angle, there was so much cross-curricular there, that it sparked my interest.

The need for support to develop teachers' knowledge and practice was also identified by Nerida, a Commerce and [in-field] Mathematics teacher, who recognised the potential to contextualise her mathematics lessons to make them more interesting and useful, but wanted to be shown how to do this:

There's a segment in maths as well, that is useful in real life, to bring it alive, and this can be done ... introduce projects and things like that ... but I do not know *how* this could be done.

Commenting on the interdisciplinary connections between Economics & Business and Mathematics highlighted through the course, Theresa, a Commerce teacher, explained:

Actually, it has been a little bit less mathsy than I was expecting. But I think maybe that's because I forget that what I'm doing in my classroom, there's already quite a lot of maths in it. See, I don't see things like a ratio or the downward slope or the demand curve as maths. I think that's economics. But I forget, it's actually maths too!

In the case of our course, interdisciplinary learning tasks, together with pedagogies modelled by more knowledgeable others, helped teachers to experience effective approaches that they might adopt, as evidenced by this comment by Anna, an Economics teacher:

Using activities that put the teachers in the students' shoes is excellent, as opposed to giving us information and saying, "Well, go away and try it!" Yeah, so really worthwhile. Absolutely.

4.3.2 Teachers want support to tap into knowledge networks within their schools

The idea of teachers with complementary knowledge forming relationships and joining forces to strengthen financial education at school was well-received. Alice, a teacher of the Arts, reflected on her previous experience working with more knowledgeable colleagues in related disciplines to make learning more realistic and authentic for students:

I remember I had a really interesting Head of Arts at one of my schools. We actually started up a little shop for their arts project, so they could sell their t-shirts and they could sell their artwork... they had to find a target audience and they had to write about that audience. They had to budget like, what each item was going to cost and what they were going to sell it for... So, we found when we actually made it a bit more like a business pitch, and they could actually make some money out of it, we got far better quality student reflections, because it was authentic. Like, there was a purpose to it.

Other teachers reflected on the challenges of knowing the expansiveness of the school curriculum and the work of colleagues in other disciplines, while conceding that it would be useful to develop their curriculum knowledge. Rosa, a Commerce teacher, explained:

Obviously, they're teaching financial mathematics over in the maths department. But there's not a lot of cross-fertilisation going on between the departments. So, it's really hard to know what they're teaching... I can't speak from a mathematical point of view, to be honest, I don't know their curriculum very well. I probably should, but I don't...

Claudette echoed this insight, and signalled her interest in working with colleagues in complementary learning areas to develop interdisciplinary teaching programs and practices:

When you teach a subject, you don't really see what other subjects do. So, you've got a very limited view about what actually goes on in the school... Yeah, I think there is kind of the view it's in somebody else's domain... The kids are very interested, though. They'll ask questions about it... But then [this course] is really thinking about what's actually current in the kids' worlds... And maybe there should be communication between, you know, humanities and maths.

So, I share a staff room with the maths faculty... So, we have lunch together... So, we sit there and discuss, "How can we do this better?" ... I was actually surprised how many people from humanities... have been in the course that I've met in the breakout groups. And I'm thinking, well, maybe we should be working together more?

While education professionals and teachers agreed that interdisciplinary approaches hold promise, teachers reported mixed success in connecting with colleagues with complementary knowledge within their schools. While Rebekah and Owen provided a leading example (see p.27), Theresa reported struggling to gain traction with her Mathematics counterparts:

I told a couple of maths teachers at my school that I was doing this financial capability course and that it was about bringing economics and maths together and, you know, improving financial capability. And they just sort of looked at me like, ... "What?!?" [laughter] But I told the other financial literacy teacher, and she got very excited. And so, we're doing it together. But we couldn't get the maths teachers to do it. And I have spoken to the maths teachers about the course a couple of times in passing, but they're a bit uninspired.

Consistent with her previous experience collaborating with more knowledgeable colleagues in related disciplines, Alice reported having already shared her professional learning:

So, I've just forwarded pretty much all the readings and all of the resources [to the finance teacher]. Then one of the maths teachers. He really liked the [gaming task] which I think was quite cool, too. So, I think he's used that... He was like, "I'll use this!"

This account of Alice's professional agency confirms the potential and importance of a collegial culture to activate interdisciplinary knowledge networks within schools.

4.4 Strengths and limitations of the course

Asked what they would say to a colleague considering enrolling in the course, teachers conveyed the strengths they perceived in their learning experience. The below testimonials by Cara and Keli confirm the unique nature of the course, as well as its impact on their thinking:

- Cara:** Carly and Jill have done the hard yards, and what they're doing is evidence-based. They've reminded me that there are things that our students are interested in and doing that I don't know about. It's been a bit mind-blowing, really. They've come up with some really great ideas - things that I've never thought about before.
- Keli:** I've not seen anything like this offered before. So, I was curious. I didn't know what I didn't know! This course has given me some of the financial vocabulary and some of the context that I've been missing. There are so many new products and services that are vital for students to understand now. Thanks for your engaging presentations and original ideas. I think this is an incredible initiative!

Figure 5 presents how teachers evaluated aspects of the course design, including the Seminar format, the learning materials, and the impact on their knowledge. Due to rounding, some items in some Figures in this section do not sum to exactly 100%.

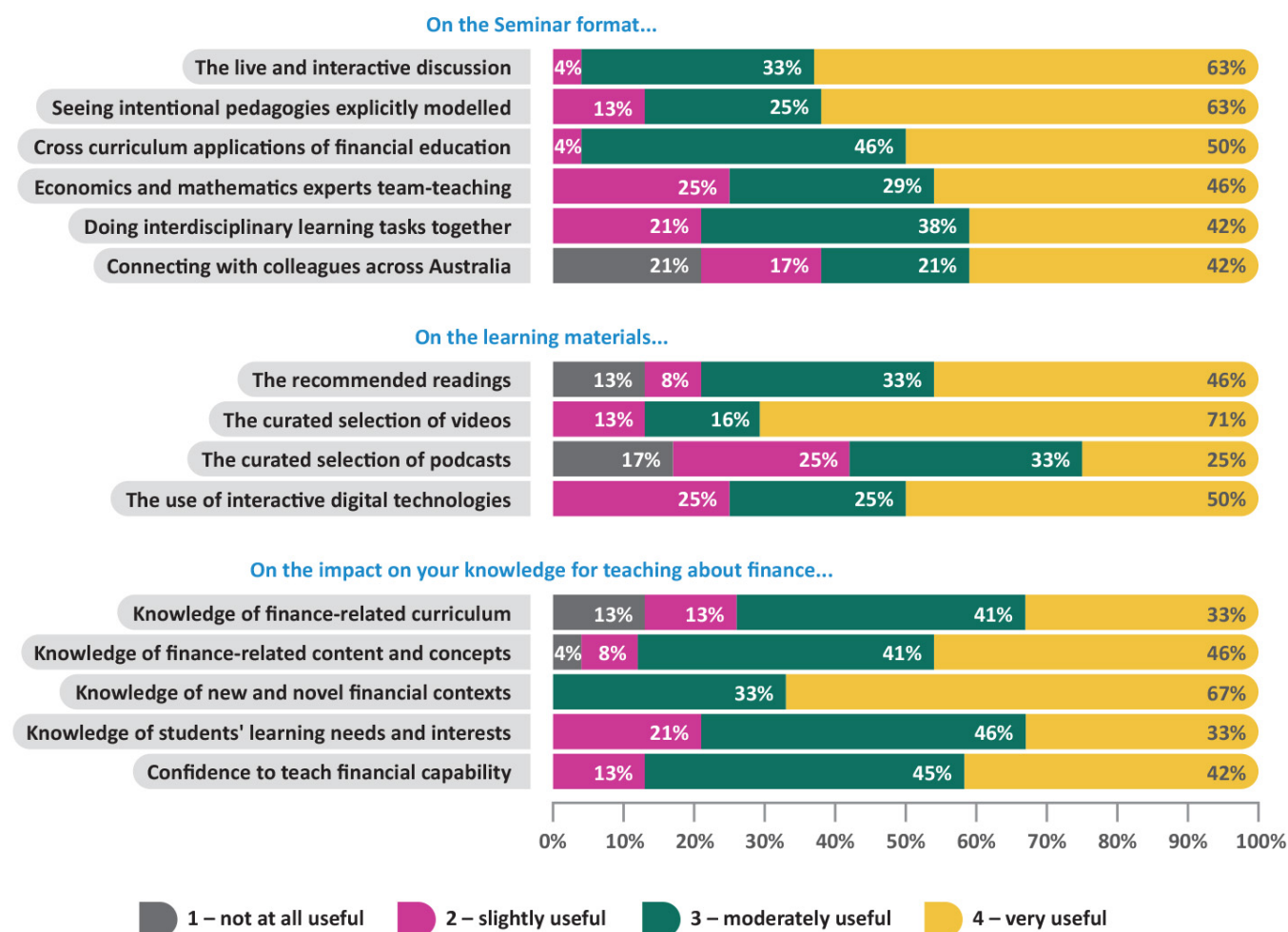


Figure 5. Teachers' Evaluations of the Course Design (n=24)

While the live and interactive seminar format, cross-curriculum applications of financial education, and the opportunity to see intentional pedagogies explicitly modelled were well-received, teachers varied in their use of the curated course resources. They valued videos that could be used in the classroom, such as a Four Corners program on gaming, as well as interactive digital technologies such as Google Sheets, Jamboard and Mentimeter. Quick readings and podcasts had less uptake. Interviewees appreciated having access to readings but struggled to find time to read. The quotes below capture just two of the participants' experiences of finding time to read. We note that neither was afforded time release to participate in the course.

Anna: I think reading the articles that they have published, and that we have access to through this, I think that all of those make you think about what we could be doing, or what we should be doing. So, I think that, you know, there's a benefit in just reading those. And all of the other articles, you know, all that sort of stuff from the Four Corners documentaries, and all that, it's like, "Wow!" If I had time, I could do so much with those. You know, so it's not necessarily one thing. I just think that all of them. All of them just make you think that little bit more about, about the situations people find themselves in, and what we could be doing in the classroom.

Stella: I'll be very honest with you, I have not read the readings. It's not that I don't want to. It is that my job is so crazy. I actually hope that I will get time, because financial education is a top priority for me, because I really think it's important. So, if I was to read anything, that's what I would read.

In terms of the extent to which the course achieved its aim of contributing to teachers' knowledge and confidence, the feedback from teachers indicates success. These results were achieved in a relatively short period of time (i.e., 6 x 90-minute sessions over a 12-week period). These results give cause for reflection on what might be achieved with greater system and school-level support in terms of funding, time release, and other important conditions for teacher learning, such as autonomy, agency, and collegiality.

Figure 6 presents teachers' reports on the impact of the program on their school and their students.

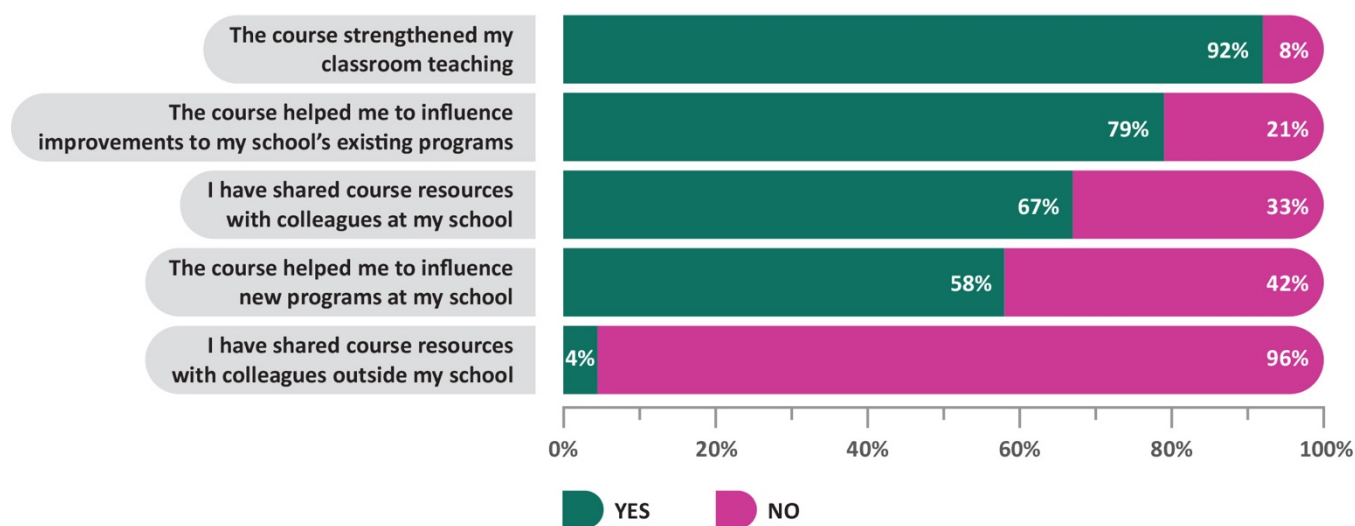


Figure 6. Indicators of Teacher Learning and Agency as a Result of the Course (n=24)

The vast majority of responding teachers indicated that the course strengthened their classroom teaching and prepared them to influence improvements to their school's existing programs. Around two-thirds of respondents reported sharing course resources with colleagues within their school (albeit, sharing course resources with colleagues outside their school was rare). More than half reported that the course helped them to influence new programs at their school, but that doing so would take time. Plans for next Semester and/or next year were often signalled. On p.27-28, we present three case studies of teachers as innovators and influencers. While experimenting with and sharing course resources are things that we explicitly encouraged teachers to do, these outcomes confirm that when teachers have expert mentoring and professional autonomy and agency, they can be powerful in their collegiality and change-making. A community and culture of change across the education system and within schools matters.

Of course, there were challenges. The course was offered at the height of the COVID-19 pandemic, around half of the teachers self-funded their attendance, and most gave their personal time to engage with learning opportunities. These factors made recruitment highly challenging and contributed to absences and apologies. All teachers who enrolled already identified as financial educators and saw teaching about finance as an important aspect of their work. We did not manage to recruit teachers who were not already teaching about finance in a meaningful way. While Mathematics teacher associations advertised the course, Mathematics teachers proved hard to recruit. Thirty-four educators (62%) attended four or more seminars, but many reported feeling torn between after school meetings and the Seminar timeslot, which was chosen to accommodate a national audience and different time zones. In this context, the option to be assessed for the award of a Deakin Professional Practice Credential was also a hard sell. Across the two cohorts, 18 participants attended assessment briefings to find out about the process, and 7 later registered. System and/or school level support (affording teachers not only funding, but also time to learn, innovate, and compile evidence of their professional practice) contributes to the success of credential uptake.

Case Study 1: Optimal conditions for professional learning yield positive outcomes

Rebekah (Commerce) & Owen (Mathematics), teachers at a public high school in the Australian Capital Territory, show what can be achieved with system and school-level support to make connections

As part of strategic support initiatives intended to strengthen numeracy and financial education across ACT schools, Rebekah and Owen were encouraged to enrol in the Economics + Maths = Financial Capability course by senior leaders within the ACT Education Directorate. Rebekah leads the Humanities department, and Owen is a leading teacher of Mathematics. Their school received financial support for four teachers to undertake professional learning and access time release, so they could work together to review and revise Year 9 and 10 offerings. All Year 9 students complete a 10-week work and financial education course, and Year 10 students have the option to undertake a business studies elective. Both programs are taught by humanities teachers.

Rebekah and Owen came to the course ambitious to enhance the numeracy learning available to students and looking for research insights and practical lesson ideas. Their combined experience in education and local curriculum design was substantive. Rebekah had developed financial education programs at her previous school. Owen had made a career change to teaching from industry five years earlier. They are now co-designing lessons where mathematical concepts can be explicitly taught wherever work and financial contexts are being explored within the humanities. Their goal is to better connect students' mathematical and real worlds to keep them more meaningfully engaged in learning mathematics for longer.

Rebekah and Owen identify that the success of this approach will rely on the mathematics team coaching their humanities colleagues, so that they feel confident to teach in this way. They also want to engage the school community in their planning, so that families have opportunities to contribute ideas and to learn together with their teenagers.

This case example shows the importance of system and school-level support for teacher professional learning and interdisciplinary collegial activity.

The ACT Education Directorate has plans to share and celebrate Rebekah and Owen's work as a leading example from which others can learn.

Case Study 2: Professional agency means learning is shared widely

Skylar, a teacher educator and educational researcher in a public university in New South Wales, shows that, when given generic principles to consider, teachers can transfer and adapt their learning to their workplace

Skylar oversees courses that prepare preservice teachers to teach secondary humanities, including Economics & Business. She enrolled in the **Economics + Maths = Financial Capability** course because she wanted to strengthen the focus on economics and finance in her teaching.

Skylar described sharing course readings and other resources with preservice teachers to engage them in making sense of the curriculum, concepts, and contexts available within the Human Society and its Environment (HSIE) syllabuses, which include commerce and work education. She explained teaching preservice teachers to read and interpret the syllabuses in more nuanced ways: "You know, if you can't see it [in the syllabus], you won't teach it. But you can if you know what you're looking for. Through the course, I learned what I was looking for. And then I taught my students how to see the connections too."

Reflecting on her professional learning, Skylar explained that she appreciated the opportunities to explore intersections between the humanities and mathematics: "It's been made very explicit, and that's prompted me to go back and apply what I've learned to the NSW curriculum." She continued: "I didn't anticipate how much of my learning would be transferable to my work with preservice teachers. This course is really valuable."

Case Study 3: School-level support prompts new learning for teacher and students

Alice (English and Media) shows how the support of school leadership meant she had time and space to learn how to redesign financial education at her Catholic secondary school in Western Australia

Alice made the decision to enrol in the course when her Dean of Studies asked her to redesign the school's compulsory career pathways program for students completing a vocational pathway in Years 11 and 12. The career pathways program aims to empower students with the knowledge, skills, and tools needed to enter the workforce, such as an understanding of their rights and entitlements specified under the Fair Work Act, writing a CV, preparing for a job interview, and knowledge of taxation and superannuation. Alice's initial reaction was, "I know nothing, except dry content + teenagers = disaster!" What she did know was that she wanted to create a program that was authentic and connected with her students' worldviews. The **Economics + Maths = Financial Capability** course gave Alice the resources and professional mentoring she was looking for.

Alice described taking the ideas and learning experiences she gained through the course and adapting them for use in her school. Alice embedded the tasks we designed for the course, together with other resources we suggested (i.e., Tax, Super + You), to strengthen the career pathways program. She now routinely uses digital tools like Google Sheets, Jamboards, and Bitmojis. Regarding Google Sheets, Alice explained, "The spreadsheets have been great for involving students in statistical investigations. We used them to populate and analyse data together, just like Carly and Jill modelled in the course."

Alice reported that completing the Innovation Practitioner Credential gave her the opportunity to compile evidence of her work and reflect on what it means to be innovative. For Alice, being innovative means connecting her school's strategic priorities with the new professional insights she gained through the course. Being encouraged to position herself as an "innovator and influencer" within her school led Alice to lead the curriculum redesign process with confidence. For example, she described undertaking activities that she would not usually take on, including meeting with her Dean of Studies to discuss and collect feedback on her work, and providing professional learning to her colleagues. Alice explained that the assessment process itself gave her new ideas for teaching and assessing her own students. She was particularly inspired by the video reflection tool, which she is working with the IT team at her school to replicate.

5. What we learned from secondary school students

Overview...

We aimed to find out what secondary school students want and need from their financial education at school. We wondered what financial activities and experiences they bring to the classroom and what practical financial skills matter most to them. While most students were financially active and reported having a family member or friend they trust to ask for advice about money, consistent with concerns raised by education professionals and secondary school teachers, one in five did not have access to conversations about money matters at home. We found that secondary school students want finance-related lessons that are useful to their future. Around half of students aged 15+ are earning money via a casual or part-time job or 'side hustle', and they reported that their families and communities are encouraging them to plan their financial behaviour and delay gratification by saving and investing. Secondary school students want their financial education at school to provide the practical financial skills to follow through on this advice.

5.1 Students are learning about money outside school

We wanted to find out about students' financial activities and learning across home, community, and school settings, as this information can broadly inform learning needs analysis.

Students were asked to indicate the extent to which they agreed with two statements about their financial education at home. Figure 7 presents a summary of the findings.

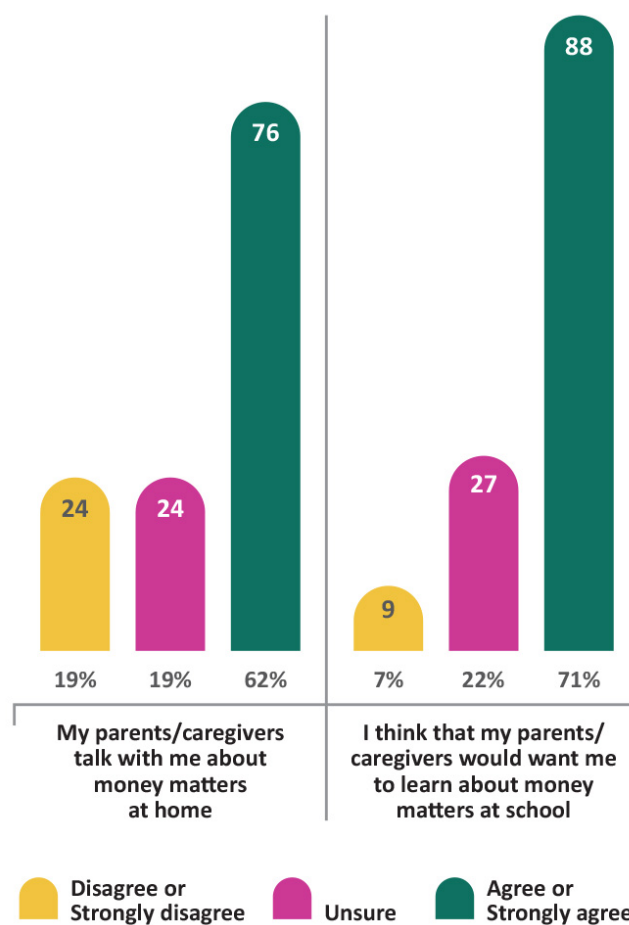


Figure 7. Students' Learning about Finance at Home (n=124)

Three in five students agreed or strongly agreed that their parents/caregivers talk with them about money matters at home, and one in five reported not having access to such conversations. This finding is consistent with concerns raised by education

professionals and secondary school teachers. Most students agreed or strongly agreed that their parents/caregivers want them to learn about money matters at school.

We also wanted to find out about students' specific financial activities (as an indicator of prior learning) through their experiences earning, spending, saving, and sharing money. Students were asked to indicate 'Yes' or 'No' to eight statements. Figure 8 presents the findings.

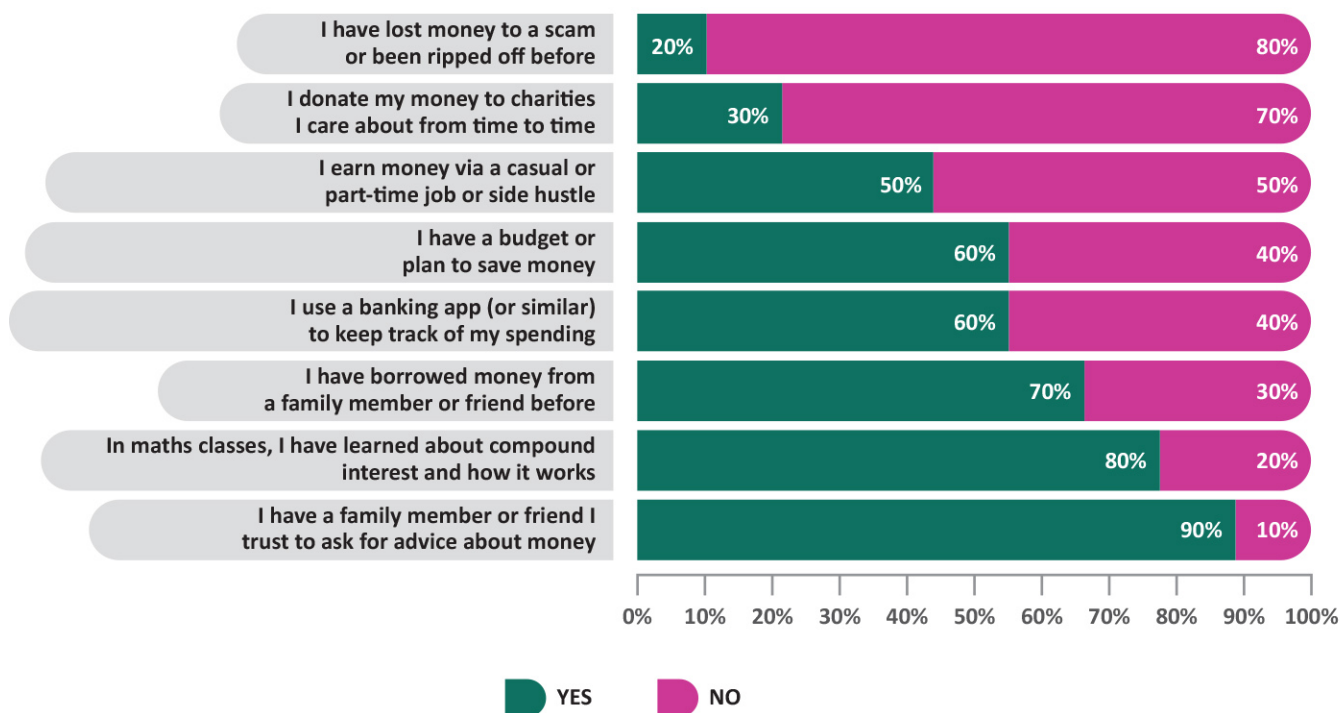


Figure 8. Students' Financial Activities (n=124)

Importantly, the vast majority reported having a family member or friend that they trust to ask for advice about money. This result is consistent with previous studies arguing the important contributions to financial knowledge of family and friends (see Salignac et al., 2020). Acknowledging that the quality of advice students have access to may vary (see Marchant & Harrison, 2020), we asked, "What is the best advice about money you've ever been given?" Students' responses indicated the emphasis families and communities place on responsible money management. The vast majority of students revealed being taught to plan their financial behaviour and delay gratification. Advice to live within their means, spend wisely, save, and invest were common themes. The following responses speak to the values and practical strategies students reported learning:

"Don't buy something if you can't afford it."

"Question yourself when you want to buy something you don't really need."

"Always have a plan of where it's going and what it's doing. The more research you do to find the best place to put it, the better."

"To have different accounts - one for saving, where you put ¾ of money earned, and one for spending the other ¼."

"Make sure that you always pay back loans, especially credit card loans, in full or as soon as possible, as, otherwise, you may end up having to pay back significantly more than you initially borrowed due to compound interest."

"Invest as soon as possible in real estate as it will only appreciate."

"Put money into super when you are younger."

Most students had learned about compound interest and how it works in their Mathematics lessons. This result is unsurprising, given that the Australian Curriculum: Mathematics specifies this learning in Year 10. More interesting is that many students had previously borrowed money from a family member or friend, and consequently that they have informal experience with debt. Three in five students reported using a banking app (or similar) to keep track of their spending and having a budget or plan to save money. Half of the students were already earning money via a casual or part-time job or side hustle. In fact, we met students working more than one job, as well as young entrepreneurs operating websites and purchasing crypto. Around one-third of students reported donating money to charities they care about from time to time. This indicates that students may be interested in learning about the financial aspects of social and environmental enterprise. One in five students had lost money to a scam or been ripped off, signalling a need to strengthen teaching and learning about financial risk and deception. While students varied in their level of financial activity and experience, the takeaway from our study is that rich knowledge and practical insights exist within this age group. These strengths and resources are the foundations upon which financial education at school must build.

5.2 Students want and need financial education that helps them make connections

We also wanted to find out about students' experiences learning about economics, mathematics, and finance. Students were asked to indicate the extent to which they agreed with three statements about the importance and connectedness they assign to their learning at school. Figure 9 presents a summary of the findings.

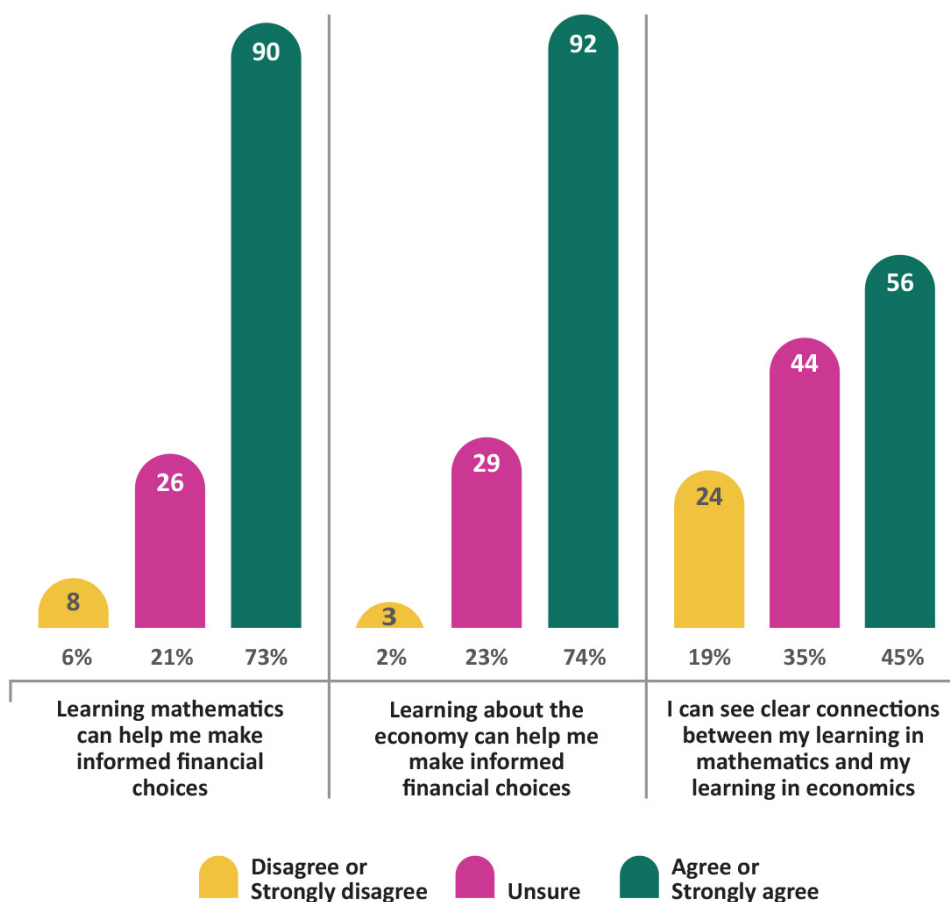


Figure 9. Students' Learning about Finance at School (n=124)

Most students agreed or strongly agreed that learning mathematics and learning about the economy can help them make informed financial choices. However, less than half agreed or strongly agreed that they could see clear connections between their learning across these disciplines. In fact, one in five could not see these connections at all. This result suggests not only that economic and financial contexts are not being used to contextualise mathematics teaching and learning, but also that mathematical knowledge and skills are not being drawn upon within HaSS E&B, as is the intention of the numeracy general capability. We note that there were students who were unsure, as well as students who disagreed or strongly disagreed with each statement.

Students were given a list of 10 practical financial skills they might learn about at school and asked to rank these in order of importance from 1, 'Most important', to 10, 'Least important'. While written simply, each item represents important learning for

students. For example, lessons on keeping track of money and keeping good financial records imply the use of digital technologies, including spreadsheets. Lessons on comparing and choosing between payment plans and investment imply equipping students with practical ways to limit spending and save money. We note that each item offers a context for teaching and learning that would draw on knowledge and skills being learned across HaSS E&B and Mathematics. Figure 10 summarises how students prioritised these learning outcomes.

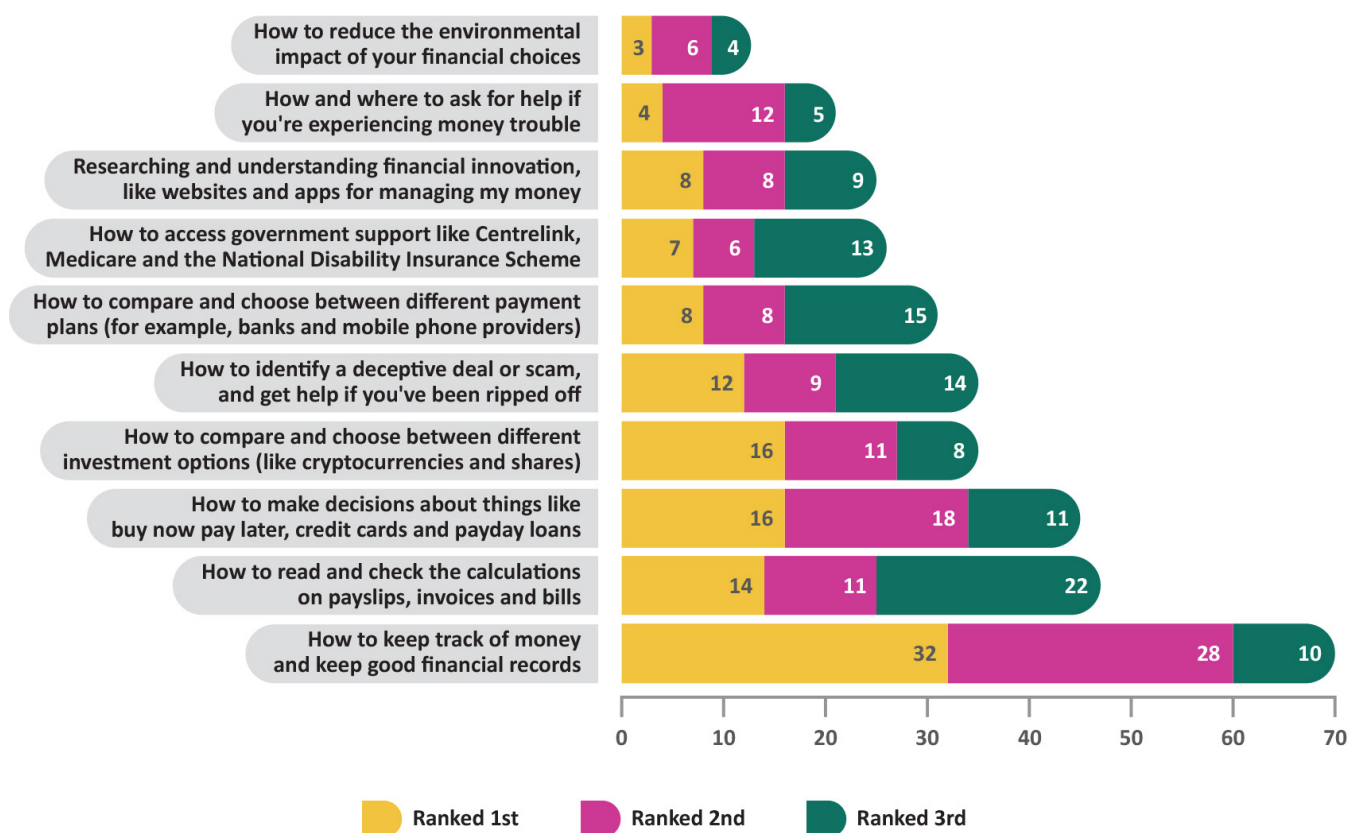


Figure 10. What Students Want to Learn About Money at School (n=124)

Students varied in their interpretation of the relative importance of these learning opportunities, evidenced by the fact that all 10 items were ranked first by some students. It is possible to identify a “Top 5”, and we note that these align with the financial values and activities students are exposed to within their families and communities. However, we argue that students deserve to learn all 10 skills during the compulsory years of secondary schooling (Years 7-10). For example, the COVID-19 pandemic has highlighted the need to destigmatise and demystify government payments by teaching students how to access government support like Centrelink, Medicare, and the National Disability Insurance Scheme, and how and where to ask for help if they are experiencing money trouble. As voters and taxpayers, it is important to know the rationale for financial regulation and government support via the taxation system (i.e., the National Debt Helpline and the Australian Financial Complaints Authority). Furthermore, while only 10% of students included learning how to reduce the environmental impact of financial choices (by choosing second-hand, green and renewable options) in their Top 3, this is crucial given the climate crisis. It also offers a way to embed teaching about finance within STEM and other programs and where the Sustainability cross-curriculum priority is being addressed. So, while students might perceive these learning outcomes as less immediate and less important, such learning coheres with calls for financial education that goes beyond compliance within the current financial system to achieve the goal of active and informed citizenship (see Björklund & Johan, 2020; Björklund & Sandahl, 2021). This finding suggests that students also need to be sold on the affordances of a more holistic and modern financial education.

6. A plan for real change

The **Economics + Maths = Financial Capability** project set out to research what can be done differently to ensure that Australian school leaders and teachers are supported to design and deliver the financial education that students need and deserve.

Our findings are clear: it's time to genuinely support school leaders and teachers to initiate a new era in financial education in Australian schools.

The Australian Curriculum v9.0 has been endorsed and already specifies opportunities to teach and learn about finance. Students are relying on Australian, State and Territory education and curriculum authorities to support school leaders and teachers to enact the curriculum well. **This is too important to leave to the free market.** There is no magic bullet, so a multifaceted approach is required.

We make two recommendations, both of which are tied to the Australian Professional Standards for Teachers (AITSL, 2017):

- Recommendation 1:** Establish a shared, research-informed vision for a more holistic and modern financial education at school and communicate it clearly.
- Recommendation 2:** Help school leaders and teachers to enact the finance-related aspects of the Australian Curriculum v9.0 well.

Table 6 identifies key organisations and the actions they can initiate to enact these recommendations across three domains: research activities, resource development activities, and relational activities. The aim of these interrelated activities is to help school leaders and teachers to connect economic and mathematical content and concepts with contemporary financial contexts, and to optimise the use of knowledge networks across the education sector. Relational activities seek to build not only knowledge, but also a community and culture of change. Our recommendations and actions value the expertise and untapped potential that exists within key organisations and networks across the education sector, including schools.

Teacher professional learning and resource development are not mutually exclusive activities. Teacher professional learning must be intelligently designed to include tasks and interactions that inspire more teachers to see themselves as financial educators. To generate change within their schools and classrooms, we must engage teachers' intellects and imaginations. The Australian Curriculum v9.0 is a living document; to see its affordances, educators require knowledge of finance-related content, concepts, and contexts. As the financial landscape is dynamically changing, teacher professional learning and resource development must also be current and ongoing. High-quality, disciplinary and interdisciplinary finance-related teaching resources are needed and will continue to be needed as our knowledge of this important area continues to evolve. As finance-related content is explicit in HaSS and Mathematics, our recommendations prioritise starting with teachers of these disciplines and supporting them well. HaSS teachers need support to develop numeracy across the curriculum, with a focus on finance. Teachers of mathematics need support to lift mathematics achievement and prepare students to connect their mathematical and real worlds, also with a focus on finance.

As initiatives to strengthen mathematics and numeracy teaching and learning are being prioritised in every State and Territory, it makes sense to embed a focus on finance within this work. Teacher associations are also critical allies. These organisations understand teachers and teaching, and teachers are drawn to them. Teacher associations should receive funding to embed a focus on finance within existing programs, as well as partner on new initiatives. For example, the Aboriginal and Torres Strait Islander Mathematics Alliance could be funded to create teaching resources that explore First Nations peoples' financial perspectives and experiences. The Australian Academy of Science could be funded to expand the [reSolve: Maths by Inquiry](#) program to include teaching resources and professional learning focused on developing proportional reasoning in financial contexts. The Australian Association of Mathematics Teachers could be funded to expand [Maths300](#) to include teaching resources focused on mathematical modelling in financial contexts, and in other contexts where money matters are touched on.

School leaders and teachers will need ongoing access to short courses, symposia, conferences, and webinars exploring the educational principles that underpin high-quality finance-related curriculum and pedagogy. Two types of research can guide and inform these offerings:

- Social research that generates knowledge of young people's ever-changing finance-related learning needs and interests. This research is needed to inform the selection of contemporary financial contexts for inclusion in programs and lessons.
- Educational research that generates and verifies (with empirical evidence) the educational principles that underpin high-quality finance-related programs and lessons. This research is needed to inform teaching practice.

Detailed models of success will need to be generated and shared. These models of success should showcase a range of tailored local approaches that go beyond personal money management and are respectful and sensitive to the diverse financial realities and cultural perspectives that exist within Australian classrooms.

The research team is available to meet with interested stakeholders to discuss in greater detail how these things can be done.

Table 6. A Plan for Real Change

Who	Associated actions	Research activities	Resource development	Relational activities	Evidence of real change
Recommendation 1: Establish a shared, research-informed vision for a more holistic and modern financial education at school and communicate it clearly.					High priority Immediate action
<ul style="list-style-type: none"> • ACARA • State and Territory education and curriculum authorities 	<p>a. Establish a national taskforce of education experts to guide and inform finance-related education policy and action.</p>	<ul style="list-style-type: none"> • Gather input from a range of sources and stakeholders. 	<ul style="list-style-type: none"> • Prepare a concise vision statement that explains the purpose of financial education at school. 	<ul style="list-style-type: none"> • Educate people working to influence quality financial education at school via roles within government agencies, universities, not-for-profit organisations, and professional teacher associations. • Host live and interactive professional learning events that initiate a community and culture of change. 	<ul style="list-style-type: none"> • Leadership within all Australian, State and Territory education and curriculum authorities can clearly articulate a detailed strategy to develop and support school leaders and teachers in their important work as financial educators.
Recommendation 2: Help school leaders and teachers to enact the finance-related aspects of the Australian Curriculum v9.0 well.					High priority Action over 6 - 36 months
<ul style="list-style-type: none"> • ACARA • AITSL • State and Territory education and curriculum authorities • Universities • Teacher associations 	<p>a. Support school leaders and teachers to know how students are learning about finance within their families and communities.</p> <p>b. Support school leaders and teachers to know the finance-related content and how to teach it.</p> <p>c. Support school leaders and teachers to plan for and implement effective finance-related teaching and learning.</p>	<ul style="list-style-type: none"> • Social research that generates knowledge of young people’s ever-changing finance-related learning needs and interests. This research is needed to inform the selection of contemporary financial contexts for inclusion in programs and lessons. • Educational research that generates and verifies (with empirical evidence) principles underpinning high-quality finance-related programs and lessons. This research is needed to inform teaching practice. 	<ul style="list-style-type: none"> • New disciplinary and interdisciplinary finance-related teaching resources. • Detailed models of success that show school leaders and teachers a range of tailored local approaches. 	<ul style="list-style-type: none"> • Short courses exploring the educational principles that underpin high-quality finance-related programs and lessons. • Host live and interactive professional learning, including conferences and webinars. 	<ul style="list-style-type: none"> • Advertisement of competitive tenders for large-scale, government-funded finance-related teacher professional learning and resource development projects, with an essential research component. To ensure transparency, independent evaluators are also appointed. • Universities and teacher associations have the funding and autonomy they need to support school leaders and teachers in their important work as financial educators through short courses, symposia, conferences, and webinars. • School leaders and teachers can explain what their school is doing to enact a more holistic and modern financial education that is tailored to local circumstances, learning needs and interests. • Students report better opportunities to learn about finance at school, and OECD PISA mathematical and financial literacy assessment results improve.

Articles arising from the research

Barkla, C., (2021, July 4). Not just about the numbers. *AEU News*.

Duggan, S. (2021, June 1). Fresh financial education approach needed. *Australian Teacher Magazine*, 45.

Jenkins, M. (2021, May 12). Dollarmites is on the way out. And this is how parents can fill the void. *The New Daily*.

Saffin, P., Sawatzki, C. & Brown, J. (2021, November 7). Time's ripe for financial literacy students can bank on. *The Age*.

Sawatzki, C., Brown, J. & Saffin, P. (2021, November 18). Strengthening your school's approach to financial education. *Teacher*.
https://www.teachermagazine.com/au_en/articles/strengthening-your-schools-approach-to-financial-education
[Republished in *Common Denominator*, 1, 2022, p.16 and *Redress*, 2022, p.13.]

Sawatzki, C., Brown, J. & Saffin, P. (2022, February 21). Fintech education: Are we meeting students' needs and interests? *Teacher*.
https://www.teachermagazine.com/au_en/articles/fintech-education-meeting-students-interests-and-needs

Sawatzki, C., Brown, J. & Saffin, P. (2022, June 9). Get crypto-cool for school: Talking about investment risks and rewards in the classroom. *Teacher*. https://www.teachermagazine.com/au_en/articles/get-crypto-cool-for-school-talking-about-investment-risks-and-rewards-in-the-classroom [Republished in *Common Denominator*, 3, 2022, p.18.]

Sawatzki, C., Brown, J. & Zmood, S. (2022). Using mathematics to drive future-focused financial capability. *The Australian Mathematics Education Journal*, 4(1), 21-26.

Sawatzki, C., Brown, J. & Powers, T. (in press). Supporting teachers to develop mathematical literacy through contemporary financial contexts. In O.H. Bolstad, S. Goodchild, & M. Goos (Eds.), *International perspectives on teaching and learning for mathematical literacy*. The Netherlands: Brill.

References

- Amagir, A., Groot, W., van den Brink, H. M., & Wilschut, A. (2018). A review of financial-literacy education programs for children and adolescents. *Citizenship, Social and Economics Education, 17*(1), 56-80.
- Anderson, T., & Shattuck, J. (2012). Design-based research: A decade of progress in education research? *Educational Researcher, 41*(1), 16-25.
- Arthur, C. (2014). The poverty of financial literacy education. *Our Schools / Our Selves, 23*(4), 35-47.
- Asaad, C. (2015). Financial literacy and financial behavior: Assessing knowledge and confidence. *Financial Services Review, 24*, 101-117.
- Australian Competition and Consumer Commission. (2022, March 18). *ACCC takes action over alleged misleading conduct by Meta for publishing scam celebrity crypto ads on Facebook*. <https://www.accc.gov.au/media-release/accc-takes-action-over-alleged-misleading-conduct-by-meta-for-publishing-scam-celebrity-crypto-ads-on-facebook>
- Australian Curriculum Assessment and Reporting Authority. (2022a). *Implementation of the Australian Curriculum*. <https://v9.australiancurriculum.edu.au/f-10-curriculum/f-10-curriculum-overview/implementation-of-the-australian-curriculum>
- Australian Curriculum Assessment and Reporting Authority. (2022b). *Revisions to the Australian Curriculum: Mathematics*. <https://v9.australiancurriculum.edu.au/resources/stories/revisions-to-the-australian-curriculum-mathematics>
- Australian Curriculum Assessment and Reporting Authority. (2022c). *Understanding this learning area: Humanities and Social Sciences*. <https://v9.australiancurriculum.edu.au/teacher-resources/understand-this-learning-area/humanities-and-social-sciences>
- Australian Curriculum Assessment and Reporting Authority. (2020). *Year 12 Subject Enrolments*. Retrieved from <https://www.acara.edu.au/reporting/national-report-on-schooling-in-australia/national-report-on-schooling-in-australia-data-portal/year-12-subject-enrolments>
- Australian Government. (2022). *National Financial Capability Strategy*. Retrieved from https://www.financialcapability.gov.au/sites/www.financialcapability.gov.au/files/2022-02/Financial-Capability-Strategy-2022_0.pdf
- Australian Institute for Teaching and School Leadership. (2017). *Australian Professional Standards for Teachers*. <https://www.aitsl.edu.au/standards>
- Bhattacharya, R., & Gill, A. (2020). Financial education and financial attitudes: Evidence from a high school experiment. *Journal of Financial Counselling and Planning, 31*(2), 251-266. <https://www.proquest.com/scholarly-journals/financial-education-attitudes-evidence-high/docview/2535285843/se-2?accountid=12528>
- Bills, T., Sawatzki, C., Hunter, J., & Miller, J. (2021). “Pākehā get more money than the other cultures”: Teaching Pāsifika students with and for a social justice orientation. In T. Lucey (Ed.), *Financialization, Financial Literacy and Social Education* (pp. 23-41). Routledge. <https://doi.org/10.4324/9781003020264>
- Björklund, M (2019). Teaching financial literacy: Competence, context and strategies among Swedish Teachers. *Journal of Social Science Education, 18*(2), 28–48. <https://doi.org/10.4119/jsse-1426>
- Björklund, M., & Sandahl, J. (2020). Financial literacy as citizenship education – a viable prospect? *Journal of Social Science Education, 19*(3), 4-20. <https://doi.org/10.4119/jsse-3230>
- Björklund, M., & Sandahl, J. (2021). Inviting students to independent judgement: Teaching financial literacy as citizenship education. *Citizenship, Social and Economics Education, 20*(2), 103–121. <https://doi.org/10.1177/20471734211029494>

- Blue, L. (2019) Financial literacy education with an Aboriginal community: Identifying critical moments for enabling praxis. *Education Sciences*, 9(1), 1-13.
- Blue, L. & Pinto, L. (2022). Disrupting the alibi: Toward a postcolonial financial literacy and entrepreneurship ideal. In T. Lucey (Ed.), *Financialization, Financial Literacy and Social Education* (pp.5-22). Routledge. <https://doi.org/10.4324/9781003020264>
- Blue, L. E. & Pinto, L. E. (2017). Other ways of being: Challenging dominant financial literacy discourses in Aboriginal context. *Australian Educational Researcher*, 44(1), 55-70. <https://doi.org/10.1007/s13384-017-0226-y>
- Caldis, S. (2017). Teaching 'out-of-field': Teachers having to know what they do not know. *Geography Bulletin*, 49(1), 13-17.
- Chytilova, H. (2018). *Economic literacy and money illusion: an experimental perspective*. Routledge. <https://doi.org/10.4324/9781315304472>
- Commonwealth of Australia. (2018). *Through Growth to Achievement: The Report of The Review to Achieve Educational Excellence in Australian Schools*. https://docs.education.gov.au/system/files/doc/other/662684_tgta_accessible_final_0.pdf
- Davies, P. (2015). Towards a framework for financial literacy in the context of democracy. *Journal of Curriculum Studies*, 47(2), 300–316. <https://doi.org/10.1080/00220272.2014.934717>
- de Bruin, W. & Slovic, P. (2021). Low numeracy is associated with poor financial well-being around the world. *PLoS ONE*, 16(11). <https://doi.org/10.1371/journal.pone.0260378>
- de Zwaan, L. & West, T. (2022). Financial literacy of young Australians: What they know, what they don't know, and what we can do to help. *Report for the Financial Basics Foundation*. <https://www.financialbasics.org.au/uploads/media/documents/BBF%20Financial%20Literacy%20of%20Young%20Australians%20March%202022.pdf>
- Education Council (previously the Ministerial Council for Education, Early Childhood Development and Youth Affairs [MCEECDYA]). (2008). *Melbourne Declaration on Educational Goals for Young Australians*. http://www.curriculum.edu.au/verve/_resources/National_Declaration_on_the_Educational_Goals_for_Young_Australians.pdf
- Education Council. (2019). *Alice Springs (Mparntwe) Education Declaration*. <https://www.dese.gov.au/download/4816/alice-springs-mparntwe-education-declaration/7180/alice-springs-mparntwe-education-declaration/pdf>
- Erikson, L. (2021). Financial socialization: Past, present, and future. In T. Lucey (Ed.), *Financialization, Financial Literacy and Social Education* (pp. 197-215). Routledge. <https://doi.org/10.4324/9781003020264>
- Esteban-Guitart, M. (2016). *Funds of identity. Connecting meaningful learning experiences in and out of school*. Cambridge University Press. <https://doi.org/10.1017/CBO9781316544884>
- Filbeck, G., Pettner, J., & Xin Zhao. (2020). Financial literacy: Profiling a successful high school outreach program. *Financial Services Review*, 28(4), 315–340.
- Finley, S.Y. (2021). Financial literacy, financial liberation: Toward a critical race approach to financial education. In T. Lucey (Ed.), *Financialization, Financial Literacy and Social Education* (pp. 113-127). Routledge. <https://doi.org/10.4324/9781003020264>
- Fisher, R., & Webb, K. (2006). Subject specialist pedagogy and initial teacher training for the learning and skills sector in England: the context, a response and some critical issues. *Journal of Further and Higher Education*, 30(4), 337–349. <http://dx.doi.org/10.1080/03098770600965367>
- Goos, M., Dole, S., & Geiger, V. (2012). Numeracy across the curriculum. *The Australian Mathematics Teacher*, 68(1), 3-7.
- Goos, M., Geiger, V., & Dole, S. (2014). Transforming professional practice in numeracy teaching. In Y. Li, E. Silver, & S. Li (Eds.), *Transforming Mathematics Instruction. Advances in Mathematics Education* (pp. 81-102). Springer. https://doi.org/10.1007/978-3-319-04993-9_6

- Green, T.L. (2009). The efficient drowning of a nation: Is economics education warping gifted minds and eroding human prospects? In D. Ambrose & T. Cross (Eds.), *Morality, ethics, and gifted minds* (pp. 89-104). Springer. <https://doi.org/10.1007/978-0-387-89368-6>
- Hancock, A. (2021, November 3). Ohio teens required to pass financial literacy under new law. *Dayton Daily News*. Retrieved from <https://www.daytondailynews.com/local/ohio-teens-required-to-pass-financial-literacy-under-new-law/OHI5ESR2AJBU5AEQEQNQIVVTKY/>
- Hattie, J. (2003, October). *Teachers make a difference: What is the research evidence?* Paper presented at the Building Teacher Quality: What does the research tell us ACER Research Conference, Melbourne, Australia. http://research.acer.edu.au/research_conference_2003/4/
- Hite., N.G., Slocombe, T.E., Railsback, B., & Miller, D. (2011). Personal financial education in recessionary times. *Journal of Education for Business*, 86(5), 253-257. <https://doi.org/10.1080/08832323.2010.511304>
- Hobbs, L., Du Plessis, A.E., Oates, G., Caldis, S., McKnight, L., Vale, C., O'Connor, M., Rochette, E., Watt, H., Weldon, R., Richardson, P., & Bateup, C. (2022). *National Summit on Teaching Out-of-field: Synthesis and Recommendations for Policy, Practice and Research*. <https://oofas-collective.squarespace.com/s/TOOF-National-Summit-Report.doc>
- Hopkins, S., & O'Donovan, R. (2021). Developing assessments for students with intellectual disability to support differentiation. *Mathematics Teacher Education and Development*. 23(3), 132-147.
- Hunter, J., & Sawatzki, C. (2019). Discovering diverse students' funds of knowledge related to finance: Pāsifika students in New Zealand. *Mathematics Education Research Journal*, 31(4), 419–439. <https://doi.org/10.1007/s13394-019-00259-0>
- Ingersoll, R.M. (2019). Measuring out-of-field teaching. In L. Hobbs & G. Törner (Eds.), *Examining the Phenomenon of "Teaching Out-of-field": International Perspectives on Teaching as a Non-specialist* (pp. 21-52). Springer. <https://doi.org/10.1007/978-981-13-3366-8>
- Kalwij, A., Alessie, R., Dinkova, M., Schonewille, G., van der Schors, A., & van der Werf, M. (2019). The effects of financial education on financial literacy and savings behavior: Evidence from a controlled field experiment in Dutch primary schools. *Journal of Consumer Affairs*, 53(3), 699–730.
- Kruger, J., & Dunning, D. (1999). Unskilled and unaware of it: How difficulties in recognizing one's own incompetence lead to inflated self-assessments. *Journal of Personality and Social Psychology*, 77, 1121–1134.
- Livermore, T., & Major, M. (2021). *Research Discussion Paper – RDP 2021-06: What Is driving participation and diversity trends in economics? A survey of high school students*. Reserve Bank of Australia. <https://doi.org/10.47688/rdp2021-06>
- Makonye, J.P. (2020). Towards a culturally embedded financial mathematics PCK framework. *Research in Mathematics Education*, 22(2), 98-116, <https://doi.org/10.1080/14794802.2020.1752788>
- Marchant, C., & Harrison, T. (2020). Emerging adults' financial capability: A financial socialization perspective. *International Journal of Consumer Studies*, 44(2), 99–110. <https://doi.org/10.1111/ijcs.12548>
- McNair yellowSquares (2022). *Financial education in schools: Survey snapshot*. Retrieved from https://static1.squarespace.com/static/5c6ce1c3bfba3e62849d77f8/t/620347e4a7d1e6346c2b3a26/1644382190938/McNair+Snapshot+Survey+results_Ecstra+Foundation_Feb2022.pdf
- Morgan, A., & Castelyn, D. (2018, Spring). Taxation education in secondary schools. *Journal of the Australasian Tax Teachers' Association*, 13(1), 307-335. <http://classic.austlii.edu.au/au/journals/JIATaxTA/2018/12.html>
- Mountain, T. P., Kim, N., Serido, J., & Shim, S. (2021). Does type of financial learning matter for young adults' objective financial knowledge and financial behaviors? A longitudinal and mediation analysis. *Journal of Family and Economic Issues*, 42(1), 113–132. <https://doi.org/10.1007/s10834-020-09689-6>

- Ministerial Council for Education, Early Childhood Development and Youth Affairs [MCEECDYA]. (2005). *National Consumer and Financial Literacy Framework* (Revised 2009). Retrieved from http://www.curriculum.edu.au/verve/_resources/National_Consumer_Financial_Literacy_Framework_FINAL.pdf
- Pangrazio, L., & Sefton-Green, J. (2021). digital rights, digital citizenship and digital literacy: What's the difference? *Journal of New Approaches in Educational Research*, 10(1), 15-27. <https://doi.org/10.7821/naer.2021.1.616>
- Peters, E., Tompkins, M. K., Knoll, M. A., Ardoin, S. P., Shoots-Reinhard, B., & Meara, A. S. (2019). Despite high objective numeracy, lower numeric confidence relates to worse financial and medical outcomes. *Proceedings of the National Academy of Sciences*, 116(39), 19386–19391.
- Retzmann, T., & Seeber, G. (2016). Financial education in general education schools: A competence model. In C. Aprea, E. Wuttke, K. Breuer, N. K. Koh, P. Davies, B. Greimel-Fuhrmann, & J. S. Lopus (Eds.), *International handbook of financial literacy* (pp. 9-23). Springer. https://doi.org/10.1007/978-981-10-0360-8_2
- Salignac, F., Hamilton, M., Noone, J., Marjolin, A., & Muir, K. (2020). Conceptualizing financial wellbeing: An ecological life-course approach. *Journal of Happiness Studies*, 21(5), 1581–1602. <https://doi.org/10.1007/s10902-019-00145-3>
- Savard, A. (2015). Making decisions about gambling: The influence of risk on children's arguments. *Mathematics Enthusiast*, 12(1–3), 226–245.
- Savard A., & Cavalcante A. (2021). Financial numeracy as part of mathematics education. In A. Savard, & A. Cavalcante (Eds.), *Financial Numeracy in Mathematics Education* (pp. 9-18). Springer. https://doi.org/10.1007/978-3-030-73588-3_2
- Sawatzki, C. (2017). Lessons in financial literacy task design: Authentic, imaginable, useful. *Mathematics Education Research Journal*, 29(1), 25-43. <https://doi.org/10.1007/s13394-016-0184-0>
- Sawatzki, C., Downton, A., & Cheeseman, J. (2019). Stimulating proportional reasoning through questions of finance and fairness. *Mathematics Education Research Journal*, 31(4), 465–484. <https://doi.org/10.1007/s13394-019-00262-5>
- Sawatzki, C., Zmood, S., Forsyth, A. & Downton, A. (2017). *Exploring secondary commerce teachers' opportunities and readiness to teach consumer, economic and financial literacy. Research Report for the Victorian Commercial Teachers Association*. Retrieved from <https://www.vcta.asn.au/documents/item/3244>
- Sawatzki, C., & Goos, M. (2018). Cost, price and profit: What influences student's decisions about fundraising? *Mathematics Education Research Journal*, 30(4), 525-544. <https://doi.org/10.1007/s13394-018-0241-y>
- Sawatzki, C.M. & Sullivan, P.A. (2017). Teachers' perceptions of financial literacy and the implications for professional learning. *Australian Journal of Teacher Education*, 42(5), 51-65. <https://doi.org/10.14221/ajte.2017v42n5.4>
- Sel, B., & Sözer, M. A. (2020). The examination of primary school teachers' financial literacy attitudes and behaviors in terms of different variables. *Ilkogretim Online*, 19(4), 1987–1997. <https://doi.org/10.17051/ilkonline.2020.763118>
- Sherraden, M. S., & Ansong, D. (2016). Financial literacy to financial capability: Building financial stability and security. In C. Aprea, E. Wuttke, K. Breuer, N. K. Koh, P. Davies, B. Greimel-Fuhrmann & J. S. Lopus (Eds.), *International handbook of financial literacy* (pp. 83-96). Springer. https://doi.org/10.1007/978-981-10-0360-8_7
- Shulman, L. (1986). Those who understand: Knowledge growth in teaching. *Educational Researcher*, 15(2), 4–14. <https://doi.org/10.3102/0013189X015002004>
- Shulman, L. (1987). Knowledge and teaching: Foundations of the new reform. *Harvard Educational Review*, 57(1), 1 – 22. <http://dx.doi.org/10.17763/haer.57.1.j463w79r56455411>
- Swalwell, K. (2021). Noticing and questioning capitalism with elementary students. In T. Lucey (Ed.), *Financialization, Financial Literacy and Social Education* (pp.42-60). Routledge. <https://doi.org/10.4324/9781003020264>
- Thomson, S., De Bortoli, L., Underwood, C., & Schmid, M. (2020). *PISA 2018: Financial Literacy in Australia*. Australian Council for Educational Research. <https://research.acer.edu.au/ozpisa/48>

- Thomson, S., Wernert, N., Buckley, S., Rodrigues, S., O'Grady, E., Schmid, M. (2021). *TIMSS 2019 Australia. Volume II: School and classroom contexts for learning*. Australian Council for Educational Research. <https://doi.org/10.37517/978-1-74286-615-4>
- Urban, C, Schmeiser, M, Collins, J. M., & Brown, A. (2020). The effects of high school personal financial education policies on financial behavior. *Economics of Education Review*, 78, 101786. <https://doi.org/10.1016/j.econedurev.2018.03.006>
- Wagner, J., & Walstad, W. B. (2019). The effects of financial education on short-term and long-term financial behaviors. *Journal of Consumer Affairs*, 53(1), 234. <https://doi.org/10.1111/joca.1221>
- Walker, D., Tong, YD, O'Keefe, S., & Cardak, B. (2022). *Report on Education for Economic and Financial Literacy in Victorian Secondary Schools, Year Levels 7-10*. LaTrobe University for the Victorian Commercial Teachers Association.
- Weldon, P. (2016). *Out-of-field teaching in secondary schools. (Policy Insight 6)*. ACER. <https://research.acer.edu.au/cgi/viewcontent.cgi?article=1005&context=policyinsights>
- Wienk, M. (2022). *Year 12 mathematics participation report card: Enrolments reach all-time low*. <https://amsi.org.au/?publications=year-12-participation-in-calculus-based-mathematics-subjects-takes-a-dive>
- Zuhair, S., Wickremasinghe, G., & Natoli, R. (2015). Migrants and self-reported financial literacy. *International Journal of Social Economics*, 42(4), 368–386. <https://doi.org/10.1108/IJSE-09-2013-0203>