University Students and Tax Literacy:
Opportunities and lessons for tax teaching[*]

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Abstract

Financial literacy is important due to the growing complexity of financial products, increases in life expectancy and reliance on self-funded retirement support.[1] Previous research has identified that aspects of tax and superannuation form part of overall financial literacy, and that there are gaps in the understanding of some of these concepts which could lead to poor financial decisions.[2] This paper reports on a recent survey of Australian university students and their perceptions of the importance of financial literacy, the extent to which they had been taught financial literacy at school, and their level of understanding of some basic tax and superannuation concepts. The results of the survey highlight the importance of taxation as a component of financial literacy, opportunities for cross-disciplinary tax teaching and insights for tax teaching and advisor training more broadly.

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[1]   OECD, *Improving Financial Literacy: Analysis of Issues and Policies* (OECD Report, 2005).

[2]   Toni Chardon, 'Taxation and Superannuation Literacy in Australia: What do people know (or think they know)?' (2014) 1 *JASSA: The Finsia Journal of Applied Finance* 42, 7.

I   INTRODUCTION

Improving the financial literacy of the Australian population is currently high on the Government's agenda. A revised National Strategy for Financial Literacy was released for the period 2014—2017, and a National Stakeholder Forum was held in November 2015.[1] The National Strategy is important in the context that:

> In today's fast-paced consumer society, financial literacy is an essential everyday life skill. It means being able to understand and negotiate the financial landscape, manage money and financial risks effectively and avoid financial pitfalls.[2]

The Australian Government has suggested that improving financial skills and providing financial education is central to economic prosperity, and that low levels of financial literacy act as a barrier to participation in the financial system.[3] In recent times, many investors and retirees have been faced with economic circumstances that have impacted on their life savings and superannuation balances. The financial literacy of consumers, financial decision making, advisor--client relationships, and the impact of all of these on increased wealth and economic prosperity is therefore an important area of research.

Previous studies of financial literacy in Australia have found that the financial knowledge of younger people tends to be lower, and they are therefore at risk for less-than-optimal financial decision making.[4] Chardon has previously argued that basic concepts of tax and superannuation literacy should form part of any measurements of overall financial literacy, and that tax literacy also tends to be lower for those in younger age groups.[5] This article reports on the tax literacy findings from a 2015 financial literacy survey of university students, specifically those participants aged 20 years or younger. The first part gives an overview of financial and tax literacy research in Australia; the second part gives an overview of financial literacy research specifically in the context of university students; the third part sets out methodology and presents the results and analysis of the current survey. The findings from this analysis are be explored to determine whether there

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[1]   Australian Securities and Investments Commission, *National Financial Literacy Strategy* (2014) 2, <www.financialliteracy.gov.au/media/546585/report-403_national-financial-literacy-strategy-2014-17.pdf>.

[2]   Ibid.

[3]   Commonwealth Department of Treasury, *The National Strategy for Consumer and Financial Literacy* <http://cfltaskforce.treasury.gov.au/content/terms.asp?NavID=2>.

[4]   ANZ, *ANZ Survey of Adult Financial Literacy in Australia* (AC Nielsen Report 2005); ANZ, *ANZ Survey of Adult Financial Literacy in Australia* (The Social Research Centre Report 2008); ANZ, *Adult Financial Literacy in Australia – Full Report of the results from the 2011 ANZ Survey* (The Social Research Centre Report 2011); Diana Beal and Sarath Delpachitra, 'Financial Literacy amount Australian university students' (2003) 22(1) *Economic Papers: a Journal of Applied Economics and Policy* 65.

[5]   Toni Chardon, 'Taxation and Superannuation Literacy in Australia: What do people know (or think they know)?' (2014) 1 *JASSA: The Finsia Journal of Applied Finance* 42.

are any impacts on the current tax teaching curriculum or further opportunities for financial and tax literacy education programs at universities.

II   FINANCIAL AND TAX LITERACY OVERVIEW

In this article, 'financial literacy' is defined as 'the ability to make informed judgements and to make effective decisions regarding the use and management of money'.[6] The importance of financial literacy lies in the potential difficulty arising from suboptimal financial decision making, as acknowledged by the Organisation for Economic Co-operation and Development (OECD) in the context of the global financial crisis:

> the lack of understanding of households on financial issues and, in particular, on credit and investment, has also a major role. As a result, individuals have accepted (sometimes unknowingly) to support more financial risk than what they could afford.[7]

The notion of financial literacy has expanded over the last decade, with greater focus on a combination of knowledge, behaviour, confidence and attitudes.[8] Internationally, 'financial capability' is a more common term used in the literature.[9] Although financial literacy is now an embedded term in Australia, given the National Strategy, this broadening of concepts has been seen in the ANZ National Surveys of Adult Financial Literacy in Australia, which have acknowledged that financial literacy 'is a complex combination of a person's skills, knowledge, attitudes and ultimately their behaviours in relation to money'.[10]

It has been argued that an increase in the availability of financial products has led to an increasingly complex market for consumers.[11] There is also an increased focus by governments on self-funded retirement, and evidence suggesting certain at-risk

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[6]   ANZ, *Adult Financial Literacy in Australia – Full Report of the results from the 2014 ANZ Survey'* (The Social Research Centre, 2015); Financial Literacy Foundation, *Financial Literacy – Australians Understanding Money* (Commonwealth Treasury, 2007).

[7]   International Network for Financial Education, *Financial Education and the Crisis – Policy Paper and Guidance* (OECD, 2009), 4.

[8]   E Kempson and S Collard and N Moore, *Measuring financial capability: an exploratory study*, Consumer Research Report 37 (Personal Finance Research Centre, 2005); Johanna Leskinen and Anu Raijas, *Consumer Financial Capability – A life cycle approach* (November 2005) <http://static.twoday.net/fes/files/FES_FinEd_Finland_lifecycleapproach.pdf>; Andrew Worthington, 'Predicting Financial Literacy in Australia' (2006) 15(1) *Financial Services Review* 59.

[9]   Jeanne M Hogarth, 'Financial literacy and family and consumer sciences' (2002) 94(1) *Journal of Family and Consumer Sciences* 14; Kempson, and Collard and Moore, above n 8.

[10]   ANZ, Adult Financial Literacy in Australia – Full Report of the results from the 2014 ANZ Survey', above n 6, 1; ANZ, Adult Financial Literacy in Australia – Full Report of the results from the 2011 ANZ Survey, above n 4, 2.

[11]   Worthington, above n 8.

groups have low levels of financial literacy particularly in relation to financial products and superannuation.[12]

The ANZ 'Survey of Adult Financial Literacy in Australia' is the most widely cited measurement of financial literacy in Australia and has been conducted over a number of years.[13] The surveys have consistently reported that Australians are broadly financially literate when it comes to basic concepts such as budgeting and saving, but that certain demographic groups -- such as females, those with less education, those not in employment, and those with lower incomes -- have lower levels of literacy, and more complex financial concepts are not as well understood or utilised by these groups.[14] Further, all population groups tend to find superannuation concepts more difficult than basic financial concepts such as banking.[15]

Previous research by Chardon has argued that financial literacy frameworks need to include an understanding of basic taxation and superannuation concepts that impact on day-to-day financial decision making, financial obligations and effective communication with advisors.[16] Taxation and superannuation are usually poorly covered in financial literacy surveys and education programs. Chardon, reporting the results of an adult survey of tax literacy in Australia, found that 19 per cent of Australians had tax literacy scores classified as either 'poor' or 'low'. Further, certain demographic groups with low financial literacy (females, younger age categories and less employment) were also likely to have lower levels of tax literacy.[17]

Recently, Australia participated in a trial of the financial literacy assessment framework as part of the OECD Programme for International Student Assessment (PISA) survey. Australian students performed relatively well (ranked 4th of 18 participating countries).[18] The OECD Financial Literacy Assessment Framework specifically recognised that the financial landscape incorporates an understanding of the 'consequences of changes in economic conditions and public policies, such as changes in interest rates, inflation, and taxation or welfare benefits'.[19] Similarly, the 2008 ANZ Adult financial literacy survey recognised the potential for tax to be a component of a financial literacy framework when it stated:

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[12] ANZ, above n 6; ANZ, *ANZ Survey of Adult Financial Literacy in Australia 2008*, above n 4; ANZ, *ANZ Survey of Adult Financial Literacy in Australia 2005,* above n 4.

[13] *ANZ, Adult Financial Literacy in Australia – Full Report of the results from the 2011 ANZ Survey,* above n 4; ANZ, *ANZ Survey of Adult Financial Literacy in Australia* (The Social Research Centre, 2008), above n 4; ANZ, *ANZ Survey of Adult Financial Literacy in Australia 2005,* above n 4; ANZ, *Adult Financial Literacy in Australia – Full Report of the results from the 2014 ANZ Survey'*, above n 6.

[14] *ANZ, Adult Financial Literacy in Australia – Full Report of the results from the 2011 ANZ Survey,* above n 4; ANZ, *ANZ Survey of Adult Financial Literacy in Australia 2008*, above n 4.

[15] *ANZ Survey of Adult Financial Literacy in Australia 2005,* above n 4, 2.

[16] Toni Chardon, 'Weathering the Storm: Tax as a Component of Financial Capability' (2011) 5(2) *Australasian Accounting Business and Finance Journal* 53.

[17] Chardon, above n 5.

[18] OECD, *PISA 2012 Results: Students and Money: Financial Literacy Skills for the 21st Century* Volume VI (OECD 2014).

[19] OECD, *PISA 2012 Financial Literacy Assessment Framework* (PISA Report) (OECD, April 2012) 18 <www.oecd.org/pisa/pisaproducts/46962580.pdf>.

> Please note that other potential aspects of adult financial literacy (eg taxation; understanding of how and why government is financed; awareness and understanding of government benefits; understanding of how fees are calculated and how to minimise them) were agreed upon as being beyond the scope of the current project, and therefore not included in the framework.[20]

As stated earlier, the most recent National Financial Literacy Strategy has a number of priorities. The strategic priorities relevant to the research presented in the present article are the first priority (educate the next generation, particularly through the formal education system) and the fifth – (improve research, measurement and evaluation).[21] Accordingly, this article proposes ways in which the next generation, particularly university students, may be better financially educated, and also provides empirical evidence that adds to the research in this field.

III   FINANCIAL LITERACY: YOUNG PEOPLE AND UNIVERSITY STUDENTS

Over the years, adult financial literacy research conducted in Australia by ANZ has consistently found that younger age groups (under 25 years) tend to have the lowest financial literacy scores. This was confirmed in the most recent survey, which also found lower scores in behavioural indicators such as planning ahead and choosing financial products.[22] Further, younger people were also the most likely group to have obtained financial information or advice from family or friends (65 per cent).[23] A 2007 Australian survey of young people between the ages of 12 and 17 found that they were less confident than adults when it came to managing money and that they were most likely to gain their information and advice from family.[24]

More recently, a survey of 207 Australian year 11 school students found there was lower financial literacy in the areas of financial risk awareness and consumer rights when compared with financial decision making.[25] The majority of participants also agreed (70 per cent) that learning more about financial management was important. The authors suggest that 'some groups of young people have lower levels of financial literacy and therefore are more vulnerable to poor decision making'.[26]

One of the most widely cited surveys of university students' financial knowledge was that of Beal and Delpachitra.[27] This survey preceded all of the international government strategies for financial literacy, yet similarly found there was evidence

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[20]   ANZ, *ANZ Survey of Adult Financial Literacy in Australia – Final Report 2003* (The Social Research Centre, 2008), above n 4, 182.

[21]   Australian Securities and Investments Commission, above n 1.

[22]   ANZ, above n 6.

[23]   Ibid.

[24]   Financial Literacy Foundation, above n 6, 57.

[25]   Paul Ali et al, 'The Financial Literacy of Young Australians: An Empirical Study and Implications for Consumer Protection and ASIC's National Financial Literacy Strategy (2014) 32(5) *Company and Securities Law Journal* 334.

[26]   Ibid 352.

[27]   Beal and Delpachitra, above n 4.

of low financial skill and knowledge among university students and recommended that comprehensive secondary and primary school education programs be developed.[28]

A 2009 survey of the financial literacy of 472 Australian university students found that there were low levels of financial literacy overall, and that this was impacted by a range of variables depending on the specific area of financial knowledge tested.[29] This survey is one of very few in Australia that has included or measured understandings of tax and superannuation. Here, the survey found that only 29.5 per cent of participants correctly understood the difference between a tax offset and a deduction, and that this was only marginally higher among business students (34.5 per cent correct).[30] The authors concluded that it cannot be 'assumed that university students, even business students are immune from financial illiteracy'.[31]

In examining financial literacy of young people in the United States, Lusardi, Mitchell and Curto argued that the increasing debt load of younger persons from either secondary school or university is of concern, particularly when coupled with financial illiteracy.[32] In the United States, financial literacy education programs in the form of general education courses within universities are more common than in Australia. Due to the style of learner, their interest and engagement, it has been argued that programs at the college (university) level have better outcomes for particular aspects of financial literacy than those in high school.[33] Crain undertook a review of 308 universities that offer financial literacy courses and found that although only 37 of the schools allowed the particular course to be taken as a general elective by all students, there was substantial support, among academic staff, for their availability.[34] The review concluded that successful implementation of financial literacy initiatives required motivated discipline leaders, nevertheless programs were often difficult to introduce due to university politics and competition among disciplines.[35] Similar arguments could be made in relation to competing disciplines in university accounting programs. It is therefore important to be able to demonstrate, with empirical evidence, that concepts such as financial literacy should be included because of their social and economic importance.

Research by Palm and Bisman has argued that introductory accounting courses at university could benefit from more constructive alignment of objectives and development of generic skills if they are to remain relevant in a modern accounting

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[28]   Ibid.

[29]   Michelle Cull and Diana Whitton, 'University Students' Financial Literacy Levels: Obstacles and Aids' (2011) 22(1) *The Economic and Labour Relations Review* 99.

[30]   Ibid.

[31]   Ibid 112.

[32]   Annamaria Lusardi, Olivia S. Mitchell and Vilsa Curto, 'Financial Literacy among the Young' (2010) 44(2) *Journal of Consumer Affairs* 358.

[33]   Tzu-ChinMartina Peng et al, 'The Impact of Personal Finance Education Delivered in High School and College Courses' (2007) 28(2) *Journal of Family and Economic Issues* 265.

[34]   Susan J. Crain, 'Are universities improving student financial literacy? A study of general education curriculum' (2013) 39(1/2) *Journal of financial education* 1.

[35]   Ibid.

environment.[36] Similarly, Freudenberg and Boccabella have argued that accounting curricula need to reflect current industry practices (specifically in relation to the popularity of trusts and SMSFs) if they are to remain relevant and useful for practitioners.[37] The present study therefore provides valuable evidence for academics designing tax, financial and accounting education courses at university level, as it provides background of the learner in the context of financial literacy as well as providing evidence useful for training students in communicating with clients.

A *Methodology*

As noted, previous financial literacy studies have found that financial literacy tends to be lower in younger age groups. This study aimed to explore levels of financial literacy among university students as well as their perception of the financial education they received in high school. Previous research has explored the financial literacy of university students at a particular university. This survey was distributed across four Australian universities as well as being shared through social media.[38] The use of social media to distribute surveys is argued to be valid notwithstanding its limitations.[39]

The survey asked both subjective and objective questions in relation to the following financial literacy concepts: general interest, inflation, investment, budgeting and saving, insurance, superannuation and taxation. In all, fourteen literacy questions went towards an overall financial literacy score. A subset of four specific tax knowledge questions are the focus of analysis in this paper. The questions were drawn from a range of existing research on financial literacy with some modifications for the age of participants and the Australian context.[40]

Previous research has highlighted the importance of confidence as a critical aspect of building financially capable populations.[41] Indeed, previous tax literacy research has found that females, those in younger age groups and those on lower incomes tend to be less confident when it comes to taxation and superannuation issues

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[36] Chrisann Palm and Jayne Bisman, 'Benchmarking Introductory Accounting Curricula: Experience from Australia' (2010) 19(1–2) *Accounting Education* 179.

[37] Brett Freudenberg and Dale Boccabella, 'Changing Use of Business Structures: Have University Business Law Teachers Failed to Reflect this in their Teaching?' (2014) 9(1) *Journal of the Australasian Tax Teachers Association* 180.

[38] Beal and Delpachitra, above n 4; Cull and Whitton, above n 29.

[39] Christine Brickman-Bhutta, 'Not by the Book: Facebook as Sampling Frame' (2012) 41(1) *Sociological Methods and Research* 57.

[40] ANZ, *ANZ Survey of Adult Financial Literacy in Australia 2008*, above n 4; Hazel Bateman et al, 'Financial Competence and Expectations Formation: Evidence from Australia*' (2012) 88(280) *Economic Record* 39; Chardon, above n 5; Annamaria Lusardi and Olivia S Mitchell, *Financial Literacy and Retirement Preparedness: Evidence and implications for financial education programs* (Michigan Retirement Research Center Research Paper No. WP 2006–144, 2006); Chrisann Palm, *Financial Literacy and Superannuation Investment Decision-making in a choice environment: An exploratory study* (PhD Thesis, Queensland University of Technology, 2014) <http://eprints.qut.edu.au/78464/>.

[41] Levon Blue and Mark Brimble, 'Reframing Expectations of Financial Literacy: Bringing Back the Reality' (2014) 1 *JASSA: The Finsia Journal of Applied Finance* 37.

specifically.[42] Acknowledging the difference between self-rating of understanding and confidence, the current survey asked participants to self-rate their understanding of particular financial concepts. The self-rating of taxation understanding by participants will therefore be analysed in this paper in the context of actual levels of understanding of taxation concepts.

B   *Descriptive Statistics*

The survey was conducted between May and July 2015. The next part presents the specific tax literacy results of the survey along with relevant statistical analysis. The sample size for participants aged 20 years or under was 297 with 165 (55.6 per cent) complete responses (over 70 per cent missed one or no questions). The analyses were conducted using SPSS22 with pairwise deletion of responses with missing data, unless indicated otherwise.

Table 1: Summary Statistics of Variables (N=297)

Variable (n)	Category	Count (% of n)
Gender (209)	Male	41 (19.6)
	Female	168 (80.4)
Employment (208)	Full time	7 (3.4)
	Part time	39 (18.8)
	Casual	89 (42.8)
	Other modes	15 (7.2)
	Not working	56 (26.9)
	Never worked	2 (1.0)
Self-rating of Tax knowledge (267)	Very low	69 (25.8)
	Low	102 (38.2)
	Fair	62 (23.2)
	High	23 (8.6)
	Very high	11 (4.1)
Question 1 (236) Taxation of Superannuation	Correct	87 (36.9)
	Incorrect	149 (63.1)
Question 2 (220) Calculating Assessable Income	Correct	44 (20.0)
	Incorrect	176 (80.0)
Question 3 (220) Calculating Tax Payable	Correct	125 (56.8)
	Incorrect	95 (43.2)
Question 4 (297) Negative Gearing Meaning	Correct	52 (17.5)
	Incorrect	245 (82.5)
Overall Tax Score (220)	0	51 (23.2)
	1	75 (34.1)
	2	60 (27.3)
	3	29 (13.2)

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[42]   Toni Chardon, *Taxation as a component of financial literacy – How literate are Australians in relation to taxation?* (PhD Thesis, Griffith University, 2014).

	4	5 (2.3)
ATAR (198)	79.7 (32, 99)	79.4 (12.2)
Quiz score (220)	1 (0, 4)	1.4 (1.1)

Table 1 presents the summary statistics. This sample is over-represented by female (80.4 per cent) and employed (72.1 per cent excluding 'not working' and 'never worked') students, which should be noted as a limitation of the research. Each participant was assigned an Australian Tertiary Admission Rank (ATAR) to enable comparison of university entry scores across states. The ATARs of this sample range from 32 to 99, with an average of 79.4 and standard deviation of 12.2.

C   *Results*

This section of the paper reports the results of the specific tax literacy questions that were posed in relation to the sample aged 20 years of age or less as summarised in Table 1 above. Comparisons of the results against the previous adult tax literacy survey by Chardon will also be made where relevant.[43] The survey also provided participants with an opportunity to add any relevant comments about their financial skills education. A thematic analysis of the responses to that question will also be presented at the end of this section.

In relation to participants self-rating of their tax knowledge, more than half of the students rated themselves low (38.2 per cent) or very low (25.8 per cent) in terms of tax knowledge. Although the previous tax literacy research by Chardon explored participants' self-rated 'confidence' as opposed to 'understanding', the results here are broadly consistent, in that participants appear to self-rate both their confidence and understanding of taxation concepts as much lower than they were for financial concepts such as budgeting and saving.[44] Interestingly, the current survey found that financial concepts such as superannuation and retirement planning also have a low level of self-rated understanding. A finding of low self-rated understanding might be expected for those areas which will be more relevant later in life, but the same cannot be said for taxation concepts, which would be relevant earlier in life -- particularly given that the current sample is over-represented by those currently in paid employment.

In relation to specific tax knowledge questions, the first question was presented as follows:

> As far as you are aware, is superannuation generally taxed at a lower,
> higher or the same rate as other investments?

As seen in Table 1, 36.9 per cent of participants answered correctly that superannuation was taxed at a lower rate than other investments. The most common alternative response was 'Do not know'. In comparing the results of this question against the adult tax literacy survey by Chardon, where 57.3 per cent of adults scored correctly for the same question, it appears that those under 20 years of age have less understanding of the taxation of superannuation.[45]

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[43]   Chardon, above n 5.

[44]   Ibid.

[45]   Chardon, above n 5.

The second tax knowledge question was in relation to the calculation of assessable income, and therefore an understanding of the difference between assessable income and taxable income. The question was posed as follows:

> If a person has total employment income of $70,000, interest from a bank account of $100, gross income from a rental property of $16,000, $4,000 in deductible salary expenses, and deductions (including interest) relating to their rental property of $14,000, what is their total assessable income? (Please use a calculator if preferred)

The correct response was $86,100 (ie the gross assessable amount excluding deductions). As seen in Table 1, only 20 per cent of participants scored correctly for this question. The most common alternative response was 'Do not know'. This demonstrates that the concept of assessable income and/or the difference between assessable income and taxable income is not well understood by university students aged 20 years and under. The adult tax literacy survey by Chardon, found 53.1 per cent of adults scored correctly. Again, those under 20 years of age appear to have much lower understanding in relation to assessable income.[46]

The third tax knowledge question explored participant's ability to calculate tax payable, given a taxable income figure and a current version of the tax tables. The question was presented as follows:

> If a person's total taxable income for the 2014/2015 tax year was $40,000, what is their total tax payable for the year (excluding medicare levy)? Use the following personal tax rates (please use a calculator if preferred)

Taxable income	Tax on this income
0 – $18,200	NIL
$18,201 – $37,000	19c for each $1 over $18,200
$37,001 – $80,000	$3,572 plus 32.5c for each $1 over $37,000
$80,001 – $180,000	$17,547 plus 37c for each $1 over $80,000
$180,001 and over	$54,547 plus 45c for each $1 over $180,000

The correct answer was therefore $4,547. The results were that 56.8 per cent of participants chose the correct answer. The most common alternate response was 'Do not know'. Previous tax literacy research found a much higher correct response rate to the same question among adults (71.5 per cent).[47]

The final tax knowledge question asked about participant's understanding of negative gearing. The question was presented as follows:

> A negatively geared investment means (select all that apply)
>
> — *The investment is likely to decrease in value over time*

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[46] Chardon, above n 42.

[47] Chardon, above n 5.

— *The interest on the loan is less than the income received from the investment*

— *There are no borrowings associated with the investment*

— *The interest on the loan is greater than the income received from the investment*

— *Negative gearing means something else*

— *Do not know*

— *Prefer not to answer*

The correct option to choose here was 'The interest on the loan is greater than the income received from the investment'. Only 17.5 per cent of participants selected the correct response. The most common alternative responses were 'Do not know' followed by 'The investment is likely to decrease in value over time'. The adult tax literacy survey found 54.1 per cent of adults selected the correct response, again signalling potentially much lower understanding in younger persons.

D *Self-rated Understanding Compared With Actual Understanding*

A total tax quiz score was computed for each participant as the number of correct answers to the four tax questions. Table 1 (above) shows that nearly 85 per cent of the students could not correctly answer more than two out of the four tax questions.

As illustrated in the clustered bar chart in Figure 1:, the sample groups of higher self-ratings tend to have higher quiz scores. Prior to answering the knowledge questions in the survey, participants were asked to rate their understanding of a range of concepts from 'Very Low' through to 'Very High'. Figure 1 shows a clustered bar chart of the self-ratings grouped by the total tax quiz score (0 – 4 questions correct), which allows a visual comparison of their self-rated and actual performance in tax literacy. As can be seen in Figure 1, a large number of participants who self-rated as either 'Very Low' or 'Low', scored either 1 or 0 correct for the tax knowledge questions. The two evaluations demonstrate a moderately positive correlation (Spearman's rank correlation coefficient = 0.325, $p < 0.001$).
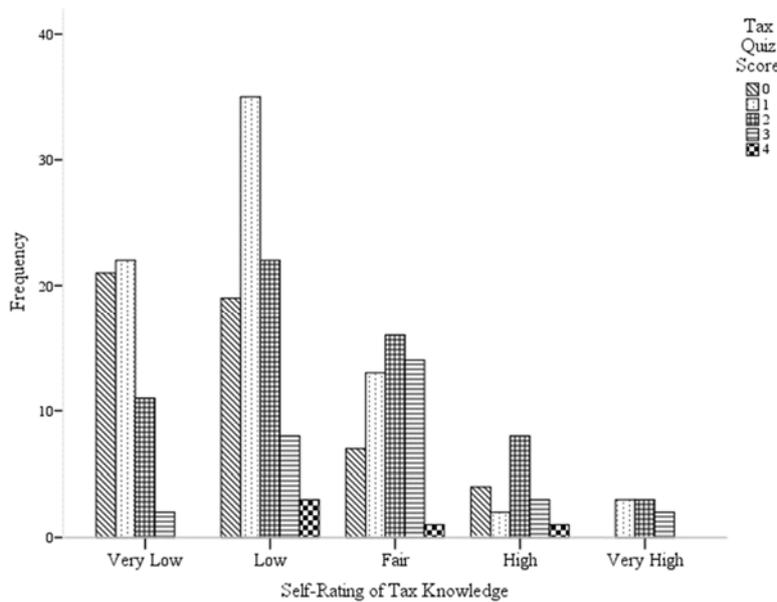
Figure 1: Clustered bar chart of tax quiz score distribution by self-rating level

Table 2 compares the distribution and the average of the individual tax quiz scores across self-rating levels. Chi-square test for linearity ($\chi^2(1) = 20.096$, $p < .001$) confirmed the linear association between the two ordinal scales. One-way ANOVA result ($F(4, 215) = 6.48$, $p < .001$) confirmed the differences in the average of tax quiz score between self-rating levels. All these support the claim of directional consistency between self-rating and question score. This result is consistent with previous research by Chardon, which found less over-confidence in relation to tax and superannuation issues broadly.[48] Though over-confidence tends to be high in financial literacy research generally,[49] it appears this is not necessarily the case for taxation concepts.

Table 2: Tax Quiz Score Distribution by self-rating levels (N=220)

Self-rating (n)	Average quiz score (%)					Quiz score Mean (SD)
	0	1	2	3	4	
Very low (56)	37.5	39.3	19.6	3.6	0.0	0.9 (0.8)
Low (87)	21.8	40.2	25.3	9.2	3.4	1.3 (1.0)
Fair (51)	13.7	25.5	31.4	27.5	2.0	1.8 (1.1)
High (18)	22.2	11.1	44.4	16.7	5.6	1.7 (1.2)
Very high (8)	0.0	37.5	37.5	25.0	0.0	1.9 (0.8)

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48   Ibid.

49   Bateman et al, above n 40; Natalie Gallery et al, 'Financial Literacy and Pension Investment Decisions' (2011) 27(3) *Financial Accountability & Management* 286.

E   Predictors of Self-Rated Understanding, Overall Tax Score and Individual Questions

To predict self-rated understanding and actual understanding respectively, an ordinal logistic regression model was estimated for each ordinal response variable using such predictors as gender (with females as reference), employment (with the employed as reference), and ATAR (see Table 3 below). Both models are overall statistically significant at the 5 per cent level and both meet the parallel line assumption for ordinal regressions. Both models also show acceptable goodness of fit, although the fit of self-rating model is marginally significant due to the small category of 'very high'.[50]

Gender and employment were found to be statistically significant predictors of self-rated understanding of tax knowledge, while ATAR was not (see Table 3).

Table 3: Results of ordinal logistic regressions of self-rating and quiz score and binary logistic regressions of questions (N=165)

Predictor	Response					
	Self-rating	Overall Tax Score	Q1 Tax and Super	**Q2** Assessable Income	Q3 Tax Payable	Q4 Negative Gearing
Male	0.816**	0.831**	1.367***	0.177	0.320	0.356
Unemployed	-0.817**	-0.080	-1.093**	-0.068	0.259	0.445
ATAR	0.012	0.020*	0.016	0.014	0.015	0.014
Model fit						
Likelihood ratio test of omnibus significance X^2(d.f.)	10.1(3)**	8.8(3)**	15.3(3)***	.819(3)	2.594(3)	3.055(3)
Parallel lines test X^2(d.f.)	3.6(9)	9.3(9)	NA	NA	NA	NA
Pearson goodness of fit test X^2(d.f.)	509.2(469)*	470.0(469)	114.5(115)	127.2(115)	130.4(115)	121.5(115)
Pseudo R^2 (Nagelkerke)	.064	.055	.121	.008	.021	.028

*** Statistically significant at 1% level; ** at 5% level; * at 10% level

The positive coefficient for 'male' means that male students tend to rate themselves higher than females for any rating level. The ratio of the odds for lower to higher self-ratings between males and females is *0.44 = exp(-β)=exp(-0.816)*, holding all

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[50]   J. Scott Long, *Regression Models for Categorical and Limited Dependent Variables* (Sage Publications, 1st ed, 1997).

other variables constant. The unemployed students tend to rate themselves lower than the employed. The ratio of the odds for lower to higher self-ratings between the unemployed and the employed is *2.26*, all else being equal.

For overall tax score, gender and ATAR were statistically significant predictors, whereas employment was not (see Table 3). Male students score higher in the tax quizzes than females. The odds for lower to higher quiz scores among males is 0.44 times (or 56 per cent) smaller than the odds among females, holding all other variables constant. Students with higher ATAR also tend to score slightly higher in the tax quizzes. For one unit increase in ATAR, the odds for lower to higher quiz scores decreases by a factor of 0.98 (or 2 per cent), holding all other variables constant. This finding is consistent with the earlier findings in relation to adult tax literacy, which found that gender and education level were significantly correlated with tax literacy score.[51] However, previously it has been found that employment hours was strongly correlated with tax literacy score.[52]

A binary logistic regression model was estimated to predict each tax question score using gender, employment, and ATAR. Considering the similar overall findings in the four tax questions, the errors terms of the logit functions might be substantially positively correlated. A multivariate probit model was estimated using State13.[53] Only the model for Question 1 (taxation of superannuation) is overall statically significant, which means that none of the three predictors affects Question 2, 3, or 4. For Question 1 (taxation of superannuation), male and employed students have a higher chance of giving the correct answer. The odds of correctly answering Question 1 among males is nearly four times larger than the odds among females, all else being equal. Among employed students, the odds of correctly answering Question 1 is almost three times larger than the odds among the unemployed, all else being equal. This finding in relation to males and the employed is consistent with the adult tax literacy survey, which found a relationship between high tax literacy scores and gender as well as employment hours.[54]

F   *Qualitative Analysis*

Participants were able to make further comments about their 'financial skills education' at the end of the survey. A thematic analysis of the responses in this section was also undertaken.[55] The most common theme was that participants identified family and/or parents as their primary source of financial knowledge to date. This is highlighted by the following comments:

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[51]   Chardon, above n 42.

[52]   Ibid.

[53]   The results were that no pair of error terms was substantially correlated (all correlation were less than 0.40). Therefore, the authors decided to interpret the results of four separate binary logistic regressions (see Table 3). Lorenzo Cappellari and Stephen P. Jenkins, 'Multivariate probit regression using simulated maximum likelihood' (2003) 3(3) *The Stata Journal* 278.

[54]   Chardon, above n 42.

[55]   Michael Huberman and Matthew B. Miles, *The Qualitative Researcher's Companion* (SAGE Publications, 2002).

'All I've learnt has been from my parents and even then I still don't know how to file tax returns or check my super or invest anything.'

'Never really had any at school. I didn't even know how to do my taxes. I had to have my mother help me the first couple of times.'

'Virtually none, other than my parents.'

This theme highlights one of the common problems of the financial literacy context. In the past, financial literacy education programs within schools were scarce. Therefore, this important financial decision making knowledge tended to come from families or close friends. Since previous surveys of adult financial and tax literacy have found significant deficiencies in financial and tax knowledge and behaviour in the adult population,[56] it is argued that misunderstandings are therefore passed on to the younger generation unless there is intervention.

Another common theme was that participants recognised the importance of financial education. The following comments highlight that within this broad theme, tax and superannuation knowledge were recognised as important aspects.

'But I have no recollections of learning anything about tax, superannuation or any of that other stuff. I like to think I am intelligent, but in this area I know nothing.'

'I believe all kids should be thought (sic) how to budget pay bills and other important life/financial skills esp (sic) super/tax and savings.'

Further, the survey found that 61.6 per cent of participants 'would prefer to learn more financial skills in university'.

Overall, the results demonstrate that there is relatively low understanding of tax and superannuation concepts among the university students surveyed. This low level of knowledge was also reflected in low levels of self-rated understanding. Gender and employment were found to be indicators of increased tax and superannuation knowledge. The qualitative analysis also suggested the importance of tax and superannuation knowledge.

IV   IMPLICATIONS AND OPPORTUNITIES FOR UNIVERSITY TEACHING

The results presented in this article add to the growing evidence that basic tax and superannuation concepts are an important aspect to be included in any financial literacy or capability framework. Previous research by Chardon, Cull and Whitton has demonstrated that there may be low levels of understanding of some important basic tax and superannuation concepts.[57] The results presented in this paper support these previous findings and further find that understandings of basic tax and superannuation concepts are generally lower in those under the age of 20 years.

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[56]   *ANZ, Adult Financial Literacy in Australia – Full Report of the results from the 2011 ANZ Survey,* above n 4; Chardon, above n 5.

[57]   Chardon, above n 5; Cull and Whitton, above n 29.

The results also demonstrate a correlation between gender, ATAR and tax knowledge outcomes.

Given the literature presented in relation to the importance of continued financial education throughout school and university, the prevalence of financial education programs in the United States and the arguments that high levels of debt and low levels of financial literacy in university students is indicative of a risk of poor financial outcomes, it is argued that the teaching of financial literacy (including tax aspects) at university should be considered as a priority. The qualitative data drawn from the survey further supports this argument.

The results also provide some important insights for tax teaching and advisor training more broadly. It is submitted that the specific evidence presented in this paper and previous financial literacy evidence should be used in the design of any program that prepares accounting, legal or tax advisors for practice. Tax compliance research has suggested that complexity of tax concepts may cause misunderstandings between a taxpayer and their tax agent.[58] This finding in the empirical research -- that there are broad misunderstandings in relation to basic aspects of taxation policy -- is important, and should be taught in taxation law courses to enable potential advisors (whether accountants, lawyers or financial advisors) to mitigate misunderstandings. Advisors need to be acutely aware of the level of financial, tax and superannuation knowledge their clients will have, which demographics are most likely to have poor levels of financial literacy (females and those with lower education levels) and strategies to explain these concepts most effectively. Understanding the levels of financial and tax literacy of clients and demographic groups will aid in ensuring our students are equipped with the knowledge they need to communicate effectively with their clients.

Enthusiastic and committed discipline leaders are key to driving the inclusion of financial education programs at the university level, whether that be stand-alone cross-disciplinary courses or embedded units in other courses.[59] As Crain argues, 'the foundations of financial knowledge and skills should be introduced in elementary schools, expanded in high schools and reinforced in colleges'.[60] In the context of competing demands from university program reviews, other disciplines and professional bodies, it is important for university academics (specifically tax teachers) to remain committed to and passionate about the importance of tax education in university programs. The evidence that there are low levels of tax literacy in the younger generation and that it is seen by them as important and worthwhile, only serves to bolster the argument for the inclusion of tax literacy education programs within schools and universities.

The continued passion for tax teaching from discipline leaders and championing of cross-disciplinary teaching opportunities serve a number of important purposes. It impacts upon national policy by furthering the National Financial Literacy Strategy

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[58] Margaret McKerchar, *The Impact of Complexity upon Unintentional Non-Compliance for Australian Personal Income Taxpayers* (PhD Thesis, UNSW, 2002).

[59] Crain, above n 34.

[60] Ibid 14.

as well as creating better tax advisors and more tax-literate consumers who are able to make more informed contributions to tax policy into the future.

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