



Certificates III and IV: earnings, sex segregation and the male/female earnings gap

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Executive Summary

We know that on average those with degrees earn considerably more than those with diplomas or certificates but we also know that there is huge variation within qualification levels. In particular, we were interested in identifying which certificates lead to higher earnings.¹ In undertaking this analysis we realised that gender plays a very large role in the certificate space, with men and women largely studying in different fields of education. This led us to consider the earnings of men and women separately – which are the most remunerative fields for men and which for women? The obvious extension to this is to look at the gender wage gap, and to decompose the gap into that generated by sex segregation and that which exists within particular fields of education. This issue is particularly pertinent to a long standing policy push to entice women into ‘non-traditional’ areas, presumably with the intention of getting women into ‘better’ jobs or at least better paid jobs.

Our analysis is based on the Census Income data and uses the Australian Standard Classification of Education (ASCED). This is a three level classification and is available at a two digit, four digit and six digit level. For the analysis we have constructed a hybrid classification combining two, four and six digit levels with the intention of obtaining as much detail as possible without allowing cell sizes to get too small. The hybrid classification allows us to identify individual trades.

The most gendered field of education is Bricklaying and Stonemasonry where men make up 99.7% of those in employment. In fact, the building and engineering fields typically have over 90% men. The story for women is a little different in the sense that there are non-trivial numbers of men in even the most female dominated fields. The field with the highest proportion of women is Veterinary Studies, with 95% women. Other fields with more than 90% women include Dental Studies, Other Education, Personal Services (hairdressing and beauty) and Nursing.

The income differentials across the fields of education are very considerable. For men, the field of education with highest average weekly income is Aerospace Engineering and Technology with an average weekly income of \$1997 (in 2021, full-time employed persons). Other high earning fields include Process and Resources Engineering, Banking, Finance and related Fields and Electrical and Electronic Engineering and Technology (a field with a very large number of persons). Even within these fields there is a wide dispersion of income. For example, over 40% of men with an Aerospace Engineering and Technology certificate had incomes over \$2000 per week. The contrast is stark with the lowest earning fields. For men, the lowest earning field was Veterinary Studies with an average weekly income of \$1155.

For women, the pattern is not dissimilar. The highest earning field was Electrical and Electronic Engineering and Technology where the average weekly income was \$1632 (full-time employed) and 20% of the women with this qualification earned over \$2000 per week. The lowest earning fields (excluding those with very small numbers of persons) included

¹ We restrict the analysis to Certificates III/IV – Certificates I/II are generally regarded as preparatory qualifications at a level lower than Year 12 of school.

Agriculture (average weekly income of \$1027 for a person full-time employed), the Rest of Society and Culture (\$1115), Food and Hospitality (\$1116) and Personal Services (\$1125). If we look at the distribution of average weekly incomes across all fields of education we can get an appreciation of the range of incomes. For men, the fields of education range from around \$1400 per week (excluding a number of fields with very small numbers) to around \$2000. Around 35% of men in full-time employment were in fields of education with average weekly incomes of less than \$1550 per week, while around 20% of men in full-time employment were in fields with average incomes of over \$1750 per week.

For women, the fields of education range from around \$1000 per week (excluding a number of fields with very small numbers) to around \$1600. For women, we see that around half of women in full-time employment were in fields of education with average weekly incomes of \$1200 per week or less. At the other end of the distribution around 10% of women had qualifications in fields where the average weekly income was \$1400 or higher per week.

Thus we see that incomes for men tend to be considerably higher than for women. At the same time there is considerable divergence in incomes across fields of education.

The variation in incomes between men and women, together with the extreme level of sex segregation, leads us to ask the question whether we should encourage women into non-traditional fields, if we wish to reduce the income gap between men and women. In order to look at this issue we undertook a decomposition to, first, isolate the impact on sex segregation on the income differential and, second, the effect of men and women earning differentially within a field of education. The findings are very clear. The overall average weekly income of men with a certificate III or IV was \$1698, for women \$1229, a difference of \$469 per week (or 38% of women's income). According to the decomposition the field of education effect was \$109 and the income effect within fields of education was \$360. That is, ending sex segregation so that we had the same distribution of men and women across fields of education would reduce the income differential by about a quarter. Thus encouraging women into non-traditional fields would make some difference to the income gap between men and women but the more important factor is the income differential within fields. Clearly there are a number of factors at play, but the very different choices men and women make in choosing their field of education suggest that there are fundamental issues of gender identity playing a role. Simply, men and women are behaving differently.

Does this have any implications for the way VET is organised? On the face of it, it is organised along gender lines. While this may not impact unduly on the male-female wage gap, we speculate that the degree of sex segregation is an issue by permitting structural change to differentially impact on men and women. The argument is that technological change is likely to be biased against 'blue collar' workers in favour of those providing personal services in areas such as health, community care and education. One response would be to encourage men into these areas. An alternative response would be to reform the VET system to overcome its rigid and narrow curriculum, so that it provided a broader education rather than focussing on technical 'industry' skills, on the basis that a broad education rather than narrow technical training provides some insurance against an unknown future. Such a change may also be beneficial in making non-traditional areas more

attractive to women and equipping men better to take advantage of the growth in areas such as health, community care and education.

1. Introduction

It is clear that qualifications on average lead to higher incomes. Typically, we look at the returns to particular levels of qualification such as degrees, diplomas and certificates. For example (Karmel 2023), based on those in full-time employment at the 2021 Census, the average weekly income of those with a higher degree was 71.5% higher than a benchmark group (persons who had no post-school qualification and had not completed year 12), those with a bachelor degree 53.1% higher, those with a diploma 28.5% higher and those with a certificate III/IV 14.6% higher. The relativities indicate that the length of the period of study matters, but these broad relativities do not take into account the huge variety of qualifications that are delivered within each level of qualification.

In this paper, we focus on certificates III and IV. These qualifications form the backbone of the VET sector –without these qualifications the VET sector would disappear. They are also the backbone of the apprenticeship and traineeship system. Our interest is in the variety of courses, their importance and the range of incomes they generate. They also underpin a story of sex segregation – men and women tend to undertake quite different types of certificates reflecting the gendered nature of the labour market.

The paper is descriptive in nature. We first present the range of certificates (defined by their field of study) and isolate those that are the most important for men, and for women. Because of the importance of sex segregation we look at how income (measured as average weekly income for full-time workers) varies across field of education separately for men and women. Finally, we bring the strands together and consider the difference between men and women's incomes. In this context we are interested in the extent to which the overall difference is due to men and women undertaking study in different fields, and the extent to which it is due to male/female income differentials within the fields of education.

2. Fields of education

Our analysis is based on the Australian Standard Classification of Education (ASCED). This is a three level classification available at a two digit, four digit and six digit level. The complete classification at a six digit level is included in Appendix 1.

Before exploring field of education in detail, we briefly look at the relationship between field of education and occupation. In Table 1 we look at each field of education (at the two digit level) and show the occupation (at the ANZSCO 1 digit level) most commonly associated with that field for persons with a certificate III or IV.

Table 1: Distribution of persons with a certificate III or IV across fields of education and occupation (2021)

Field of education (2 digit)	Number	Per cent	Most common occupation	% of Field of Ed
Natural and Physical Sciences	7573	0.3	Technicians and Trades Workers	41.3
Information Technology	26798	1.2	Professionals	24.3
Engineering and Related Technologies	706280	31.7	Technicians and Trades Workers	55.6
Architecture and Building	357797	16.1	Technicians and Trades Workers	59.9
Agriculture, Environmental and Related Studies	73047	3.3	Technicians and Trades Workers	33.2
Health	106383	4.8	Community and Personal Service Workers	40.4
Education	82307	3.7	Community and Personal Service Workers	53.8
Management and Commerce	317361	14.2	Clerical and Administrative Workers	40.1
Society and Culture	248022	11.1	Community and Personal Service Workers	57.5
Creative Arts	36106	1.6	Technicians and Trades Workers	18.9
Food, Hospitality and Personal Services	266596	12.0	Technicians and Trades Workers	36.9
Total with Field of Education	2228270	100.0		

We see that there were some 2.2 million persons in the 2021 Census with a certificate III or IV with both field of education and occupation coded.² A couple of points jump out. The first is the certificates are concentrated in a number of areas although they occur across all fields of education. The largest proportions occur in Engineering and Related Technologies, Architecture and Building (mostly Building as we see later), Management and Commerce, Food Hospitality and Personal Services and Society and Culture. There are also significant numbers in Health, Education and Agriculture, Environmental and related Studies. Certificates III and IV do occur in other fields namely, Natural and Physical Sciences, Information Technology and the Creative Arts, but numbers are relatively small.

The second point to emerge is that the certificates are clearly vocational but any concordance between field of education and occupation is loose. The highest match occurs for Architecture and Building with 59.9 % becoming Technicians and Trade Workers, Society and Culture, 57.5% becoming Community and Personal Service Workers and Engineering and Related Technologies with 55.6% becoming Technicians and Trades Workers. The loosest match is in the Creative Arts, no doubt reflecting the difficulty of obtaining a related job in this field.

The 2 digit ASCED used in Table 1 is not that helpful in giving ‘the flavour’ of what the certificates are about. To make the classification more useful we create a hybrid level classification such that there are reasonable numbers of persons (with a certificate III or IV) in each category. Our hybrid classification uses categories from each of the three levels. For example, Natural and Physical Sciences is included at the broad level because this field of education is quite small at the certificate III and IV level. By contrast, in Architecture and

² The data in this paper are derived from the Australian Bureau of Statistics, 2021 Census, TableBuilder Pro

Building we use a number of six digit fields so that we pick up individual trades (for which certificates III and IV are the signature qualification).

The complete hybrid classification (with 51 categories) is shown in Appendix Table A1, with employment numbers (full-time and part-time) for both males and females.

Here we present the most important categories for males and females separately

Table 2: Certificates III and IV- the 20 largest fields of education for men, total employment and per cent male (2021)

	Total Employment	% Male
Electrical and Electronic Engineering and Technology	180164	98.3
Mechanical and Industrial Engineering and Technology	159605	98.3
Automotive Engineering and Technology	131241	98.3
Carpentry and Joinery	108908	99.5
Food and Hospitality	153094	62.8
Engineering and Related Technologies, nfd	88410	98.0
Plumbing	73549	99.5
Building	68660	98.1
Manufacturing Engineering and Technology	56540	90.6
Business and Management	153018	25.0
Horticulture and Viticulture	39623	86.2
Painting, Decorating and Sign Writing	26244	95.1
Human Welfare Studies and Services	155458	14.2
Information Technology	25538	84.7
Sport and Recreation	41912	50.6
Sales and Marketing	47470	39.1
Other Management and Commerce	21267	83.0
Bricklaying and Stonemasonry	17326	99.7
Agriculture	23318	69.9
Teacher Education	38268	36.8

The most important fields for men are pretty much as expected, with the four largest fields being Electrical and Electronic Engineering and Technology, Mechanical and Industrial Engineering and Technology, Automotive and Engineering and Technology and Carpentry and Joinery. However, there are a number of ‘non-tradie’ fields that feature in the top 20 fields for men. For example, Business and Management at number 10.

What is very clear, though, is the gendered nature of the labour market relating to certificates III and IV. The most gendered field is Bricklaying and Stonemasonry where males make up 99.7% of persons with the qualification. Ten of the 20 most important fields for men are those where the percentage of men exceeds 90%. While the extent of sex segregation is high there are a number of fields which are important for men (ie in the largest 20) but where men make up a minority of those with the qualification: Business and Management, Human Welfare Studies and Services, Sales and Marketing and Teacher Education.

In Table 3 we present analogous data for the 20 fields which are most important for women.

Table 3: Certificates III and IV- the 20 largest fields of education for women, total employment and per cent female (2021)

	Total Employment	% Female
Human Welfare Studies and Services	155458	85.8
Business and Management	153018	75.0
Personal Services	80860	92.3
Food and Hospitality	153094	37.2
Sales and Marketing	47470	60.9
Nursing	28201	90.4
Accounting	30742	81.8
Other Education	26538	93.8
Teacher Education	38268	63.2
The rest of health	26565	79.1
Sport and Recreation	41912	49.4
Office Studies	15394	88.4
Dental Studies	13105	93.4
Banking, Finance and Related Fields	17066	67.8
Veterinary Studies	11644	94.9
Education, nfd	12308	87.8
Public Health	18612	56.0
Tourism	11105	82.8
The rest of society and culture	20821	42.4
Agriculture	23318	30.1

While the level of sex segregation for fields important for women is high, it is not at the extreme level as occurs in the fields important for men. The highest level of sex segregation occurs in Veterinary Studies, Other Education, Dental Studies, Personal Services (think Hairdressing and Beauty), and Nursing. All of these fields have 90% or more women. Other areas where 80% of more are female include Human Welfare Studies and Services, Accounting, Office Studies and Tourism. Important fields for women where they make up less than 50% of the field include Food and Hospitality, Sport and Recreation (where the split by gender is virtually 50:50) and Agriculture.

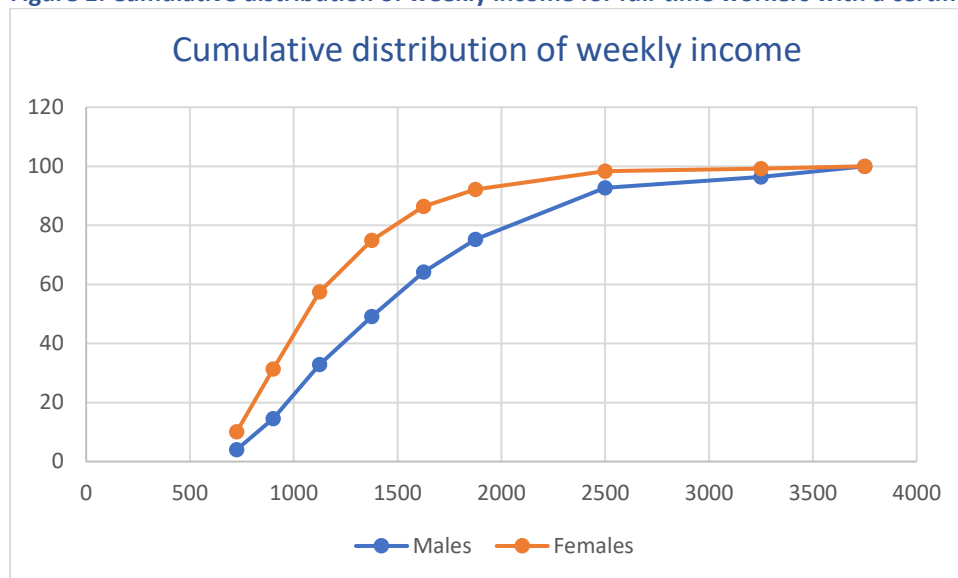
3. Income

A key area of interest is the differences in pay-off to different qualifications. From the Census we can obtain the weekly income of individuals. By focussing on those who are full-time employed, we can use weekly income as a proxy for pay rates. It is only a proxy because income can come from sources other than employment, and weekly income can depend on the number of hours worked. Nevertheless differences in weekly income will give an indication of the differences in pay rates across the various fields of education of certificates III and IV.

We first look at average weekly incomes by fields of education. We then investigate the differences in income of men and women, and the impact of sex segregation on these differences.

To begin with we present the distribution of weekly income (for those working full-time) across all fields.³

Figure 1: Cumulative distribution of weekly income for full-time workers with a certificate III or IV, 2021



The overall average was \$1637 for men and \$1308 for women. The distribution for women is clearly skewed toward lower incomes relative to that of men. For example, around 20% of women had incomes greater than \$1500 per week compared to around 45% for men, and only 8% of women had incomes greater than \$2000 compared to 20% for men.

We now consider the differences across fields of study. In the Appendix Tables A2 and A3 we present average incomes by field of education (and also the percentage of persons with incomes greater than \$1500 and \$2500), by gender.

³ We have omitted all those persons with average weekly income of less than \$650 per week, noting that the minimum weekly income in 2021 was \$772.60 per week (Hamilton 2022, page 74). See Karmel (2023) for a detailed explanation of the derivation of average weekly income.

Table 4: Fields of education with highest average weekly income, full-time employed, certificate III or IV, male, 2021

	Number	Average income	%>\$2000	%>\$1500
Aerospace Engineering and Technology	9407	1997	40	76
Process and Resources Engineering	10273	1936	39	61
Banking, Finance and Related Fields	4554	1909	35	63
Electrical and Electronic Engineering and Technology	144039	1894	37	66
Teacher Education	10931	1879	36	67
The rest of engineering and technology	10187	1868	38	64
Public Health	6388	1791	31	60
Mechanical and Industrial Engineering and Technology	130989	1769	31	58
Justice and Law Enforcement	4589	1738	25	66
Sales and Marketing	13647	1729	26	47

Note: Fields of education with highest average weekly incomes and more than 1000 persons

We see that STEM type fields are well represented in the fields with the highest incomes for men, notably Aerospace Engineering and Technology, Process and Resources Engineering, Electrical and Electronic Engineering and Technology, the Rest of Engineering and Technology, and Mechanical and Industrial Engineering and Technology. However, a number of other fields are among the high income fields, namely Banking, Finance and Related Fields, Teacher Education, Public Health, Justice and Law Enforcement and Sales and Marketing. Of course, the direction of causality is not clear. While in the STEM fields it is likely that the technical training is a prerequisite for the job, in some other areas it is more than possible that the certificates are obtained while in the position (such as Teacher Education which is likely to be the *Certificate IV in Training and Assessment*). Similarly, certificates in Banking, Finance and Related Fields and Sales and Marketing are likely to have been acquired while in jobs where the training is directly useful.

We now present analogous data for women. In Table 5 we present the fields of education with the highest average weekly incomes but this time we have included some fields with less than a thousand persons.

Table 5: Fields of education with highest average weekly income, full-time employed, female (2021)

	Number	Average income	%>\$2000	%>\$1500
Electrical and Electronic Engineering and Technology	2119	1631	26	53
Scaffolding and Rigging, Building nec and Architecture and Building nfd	57	1605	19	44
Aerospace Engineering and Technology	499	1577	19	51
Justice and Law Enforcement	3007	1554	14	52
Civil Engineering	308	1522	16	41
Banking, Finance and Related Fields	7261	1506	15	42
The rest of engineering and technology	1176	1494	26	44
Information Technology	2199	1481	16	41
Mechanical and Industrial Engineering and Technology	1740	1440	16	33
Process and Resources Engineering	1341	1438	20	39
Building	810	1420	16	41
Communication and Media Studies	1077	1391	14	37
Other Management and Commerce	2478	1390	12	35
Accounting	12556	1387	10	35

We see a number of the fields with high female income are of a STEM nature, but the numbers of women with these qualifications are very small. The largest two fields with high incomes for women are Banking, Finance and Related Fields and Accounting. If we refer to the full table in the Appendix, we see that the largest fields of education for women are not among the highest paid fields. In particular, Business and Management (65,000 women), the Rest of Society and Culture (52,000), Food and Hospitality (25,000) and Personal Services (27,000) have average incomes which range from \$1330 for Business and Management to around \$1100 for the other three fields.

To summarise this information we show the distribution across fields of education, from the field with the lowest average income to the field with the highest for, first, men and then women.

Figure 2: Cumulative distribution of average weekly incomes by Field of Education, full-time employed, men with a certificate III or IV (2021)

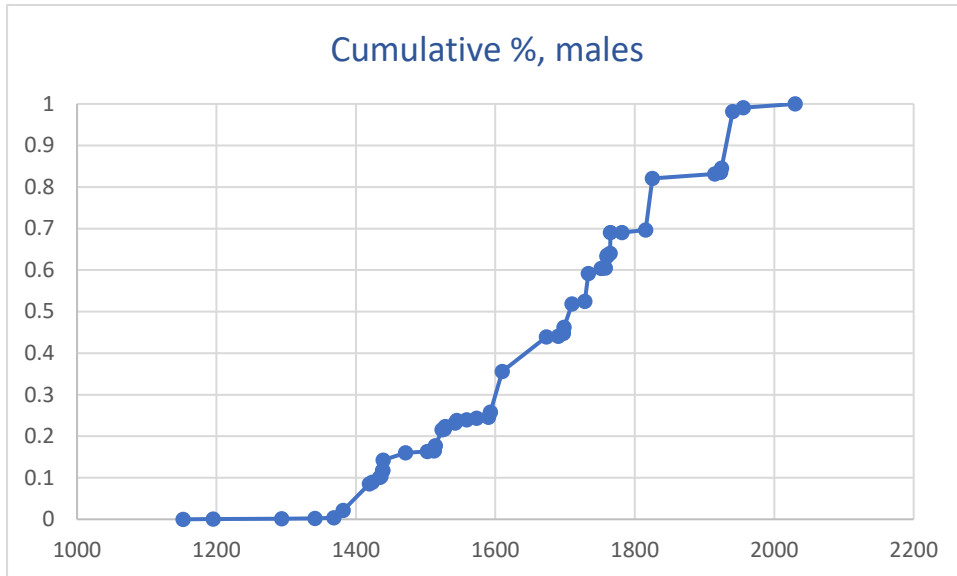
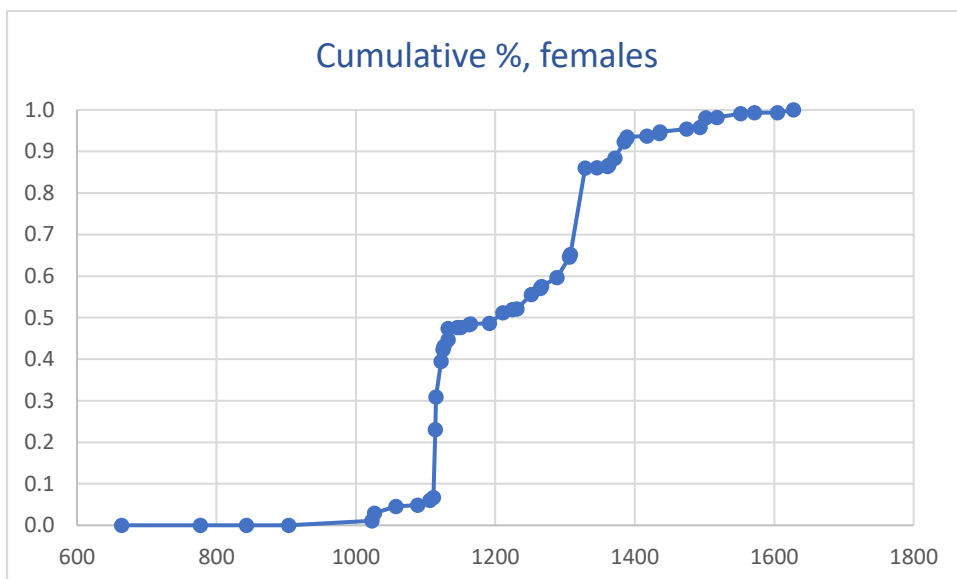


Figure 3: Cumulative distribution of average weekly incomes by Field of Education, full-time employed, women with a certificate III or IV (2021)



Each of the dots represents a field of education, so the first dot in Figure 2 is Food, Hospitality and Personal Services, nfd and the last dot is Aerospace Engineering and Technology. We see that there are a number of low paying fields, and that around 35% of men in full-time employment are in the 20 fields of education with average weekly incomes of less than \$1550 per week. At the other end of the distribution, there are 8 fields of education which represent around 20% of men in full-time employment, where average incomes for the field are over \$1750 per week.

We see that there are some extremely low paying fields of education for women (less than \$1000 per week average income) but these represent very little employment. However up

to \$1200 per week in average weekly income represents around half of women in full-time employment with a certificate III or IV (and some 18 Fields of Education). The top of the distribution for women is around \$1400 per week, with around 10% of women in 10 or so fields earning more than this. If we compare this to the distribution for men we see that around 80% of men are in fields of education with incomes higher than this. This comparison makes the differences in income between men and women (with certificate III or IV) very stark.

4. Exploring the differences between male and female income

We have already discussed the differences between the average weekly incomes of men and women. In this section, we explore the differences by focussing on the differences in the occupational distribution and the differences in incomes within fields of education. In Appendix 3, we formally derive a simple decomposition which apportions the difference in average income into a component representing the differences in the distribution across fields of education and a component representing the differences in average incomes with each field. Before we present the results of this decomposition, however, we play a couple of mind experiments.

The first is to assume that women (with a certificate III or IV) had chosen the same fields of education as men. This experiment assumes that women would still have incomes at the field of education level as we have observed.

The second is to assume the women (with a certificate III or IV) do not adopt the same distribution of fields of education as men, but (and may be this requires a feat of imagination) have the same incomes as men within each field of education.

Table 6 shows the results of these mind experiments.

Table 6: Average weekly income for women with a certificate III or IV - actual and counterfactual (\$s, 2021)

Average weekly income for women	1229
Average weekly income for women assuming that their distribution of fields of education is the same as that of men	1329
Average weekly income for assuming that women’s income is the same as that of men within each field of education	1581
Average weekly income for men	1698

Note: these averages are obtained by summing over the fields of education

These ‘mind experiments’ show that women tend to undertake the fields of education that lead to lower incomes. If women had the same distribution of fields of education as men their average weekly incomes (everything else being equal) would increase by \$100. However, the larger contributor to the difference in men and women’s incomes are the incomes received within each field of education. So if women remained in their current fields of education, but earned as much as men, their average weekly income would

increase by \$352. We conclude that differential income is more important than the extent of sex segregation.

We note that the difference between men’s and women’s (for those with a certificate III or IV) average weekly incomes is \$469, which is a little greater than the aggregate of the \$100 and \$352 obtained by the two mind experiments. The reason for this is that we have two sets of weights in play – one for men and one for women. We can tidy this up with a formal decomposition which uses both sets of weights –see Appendix 3.

If we employ this decomposition we have two components:

- A field of education structure effect which focuses on the difference in the distributions across fields of education between men and women
- An income effect which focuses on the difference between the incomes of men and women with each field of education.

The results of this decomposition is given in Table 7:

Table 7: Decomposition of the difference between average weekly income of men and women with a certificate III or IV, working full-time

Average weekly income of women	1229
Field of education structure effect	109
Income effect within fields of education	360
Average weekly income of men	1698

The decomposition gives the same sort of results as the two mind experiments, but has the advantage that it adds up nicely. It also allows us to focus on the fields of education which are contributing the most to the difference between men’s and women’s incomes. We show the fields that contribute the most to the income effect within the fields of education in the next table.

Table 8: the fields of education that contribute the most to the field of education income effect (average weekly income, 2021)

	Field of education income effect
Business and Management	50.7
Mechanical and Industrial Engineering and Technology	25.3
The rest of society and culture	24.3
Electrical and Electronic Engineering and Technology	22.4
Food and Hospitality	21.7
Carpentry and Joinery	20.3
Automotive Engineering and Technology	17.6
Teacher Education	14.9
Sales and Marketing	13.9
Personal Services	13.4
Engineering and Related Technologies, nfd	13.0
Plumbing	10.3
Building	9.2
Accounting	8.1
Manufacturing Engineering and Technology	6.9
Banking, Finance and Related Fields	5.8
Total (largest 15)	277.6
Total	360.0

The positive numbers reflect the fact the men’s incomes are larger than those of women within every field of education. For example, if men and women with certificates III/IV in the field of Business and Management received the same income then this would reduce the overall income gap (which is \$469) by \$51, without any changes to the distribution of men and women across fields of education.

Of course this analysis does not explain why men and women earn different incomes although they may have the identical qualifications. While discrimination may be a factor, it is likely that men work longer hours (in fact the average weekly hours for those working full-time and with a certificate III or IV were 45.7 hours for men and 41.6 hours for women according to the 2021 Census) and that men pursue careers more vigorously and therefore on average are in higher level positions. An important point is that choice of field of education makes a relatively small contribution to the overall difference in average incomes for those with a certificate III or IV. This implies that encouraging women into fields that are dominated by men is only going to make a substantial difference to women’s incomes if they work in the same way as men. The sex segregation across fields of education does play a part, but different work patterns within fields of education is what is driving the major differences in incomes between men and women.

5. Discussion

A stylised fact is that education (and therefore educational qualifications) are a critical component of human capital and that, in general, those with more years of education earn higher incomes. In this paper, we focused on those with a certificate III or IV – the backbone of the Vocational Education and Training sector - with the intention of showing that the incomes associated with certificates III and IV vary considerably depending on the field of education. Put bluntly, some certificates III and IV are worth a lot more than others.

In undertaking the analysis we were very mindful of the level of sex segregation among those with a certificate III or IV. The most gendered field of education is Bricklaying and Stonemasonry where men make up 99.7% of those in employment. In fact, the building and engineering fields typically have over 90% men. The story for women is a little different in the sense that there are non-trivial numbers of men in even the female dominated fields. The field with the highest proportion of women is Veterinary Studies, with 95% women. Other fields with more than 90% women include Dental Studies, Other Education, Personal Services (hairdressing and beauty) and Nursing.

The income differentials across the fields of education are very considerable. For men, the field of education with the highest average weekly income is Aerospace Engineering and Technology with an average weekly income of \$1997 (in 2021, full-time employed persons). Other high earning fields include Process and Resources Engineering, Banking, Finance and related Fields and Electrical and Electronic Engineering and Technology (a field with a very large number of persons). Even within these fields there is a wide dispersion of income. For example, over 40% of men with an Aerospace Engineering and Technology certificate had incomes over \$2000 per week. The contrast is stark with the lowest earning fields. For men, the lowest earning field was Veterinary Studies with an average weekly income of \$1155.

For women, the pattern is not dissimilar. The highest earning field was Electrical and Electronic Engineering and Technology where the average weekly income was \$1632 (full-time employed) and 20% of the women with this qualification earned over \$2000 per week. The lowest earning fields (excluding those with very small numbers of persons) included Agriculture (average weekly income of \$1027 for a person full-time employed), The Rest of Society and Culture (\$1115), Food and Hospitality (\$1116) and Personal Services (\$1125).

If we look at the distribution of average weekly incomes across all fields of education we can get an appreciation of the range of incomes. For men, the fields of education range from around \$1400 per week (excluding a number of fields with very small numbers) to around \$2000. Around 35% of men in full-time employment were in fields of education with average weekly incomes of less than \$1550 per week, while around 20% of men in full-time employment were in fields with average incomes of over \$1750 per week.

For women, the fields of education range from around \$1000 per week (excluding a number of fields with very small numbers) to around \$1600. For women, we see that around half of women in full-time employment were in fields of education with average weekly incomes of \$1200 per week or less. At the other end of the distribution around 10% of women had qualifications in fields where the average weekly income was \$1400 or higher per week.

Thus we see that incomes for men tend to be considerably higher than for women. At the same time there is considerable divergence in incomes across fields of education.

The variation in incomes between men and women, together with the extreme level of sex segregation, leads us to ask the question whether we should encourage women into non-traditional fields, if we wish to reduce the income gap between men and women. In order to look at this issue we undertook a decomposition to, first, isolate the impact on sex segregation on the income differential and, second, the effect of men and women earning differentially within a field of education. The findings are very clear. The overall average weekly income of men with a certificate III or IV was \$1698, for women \$1229, a difference of \$469 per week (or 38% of women's income). According to the decomposition the field of education effect was \$109 and the income effect within fields of education was \$360. That is, ending sex segregation so that we had the same distribution of men and women across fields of education would reduce the income differential by about a quarter. Thus encouraging women into non-traditional fields would make some difference to the income gap between men and women but the more important factor is the income differential within fields. This raises the issue as to whether the income differences between men and women within the same field of education are due to discrimination or differences in behaviour. In regard to differences in behaviour we know that men work longer hours (around 10% more hours on average for those working full-time) but the additional hours do not go very far in explaining the income differential. Clearly there are other factors at play, but the very different choices men and women make in choosing their field of education suggest that there are fundamental issues of gender identity playing a role. Simply, men and women are behaving differently, at least in respect of those undertaking certificates III or IV.

So what do we learn from this? There has been a general concern with the extent of gender segregation in the trades (also in STEM areas) for many years now (see for example, ACIL Allen 2023, Australia Department of Industry, Science and Resources 2023, Australia Workplace Gender Equality Agency 2022, Butler and Ferrier 2022-2023, Cassells and Duncan 2021, Australia Treasury 2023). Most attention has been the lack of women in male dominated occupations, although there are some exceptions such as Delfino (2021) who talks about 'pink collar' jobs. The extent of the gender wage gap has also received considerable attention (see Australia Workplace Gender Equality Agency which is responsible for publishing annual statistics on the gap).

The notion that the wage gap can be addressed, at least to some extent, by addressing occupational sex segregation, has also been explored. Duncan et al (2022) suggest that the gender wage gap would be reduced by about a third if Australia's gender pay gap could narrow by more than a third, if a more balanced gender concentration was achieved across all industries and occupations. Our findings suggest that, in that part of the labour market built on certificates III and IV, this is probably an over estimate and removal of sex segregation in this part of the labour market would have a lesser effect on the wage gap.

There is also considerable work showing that societal norms are a key factor (see Hickson and Marshan 2023, Ciminelli *et al* 2021). Our analysis certainly supports this view and indicates that the differences between the labour market behaviour of men and women go well beyond the differences in choice of field of education and occupation.

Our conclusion is that the section of the labour market that builds on certificates III and IV (which form the foundation for the Australian VET system) has three noteworthy features. The first is that field of education matters in terms of likely incomes. Certificates that lead to engineering or finance occupations are much more remunerative than those leading to personal services, for example. And we are talking about large differences in remuneration. The second feature is that gender segregation across field of education is extreme. There are virtually no women undertaking qualifications such as bricklaying and stonemasonry and few in the building trades. Similarly there are few men in areas such as dental studies and veterinary studies. The third feature is that men are earning considerably higher incomes than women (at least among the full-time workers we focused on), even after we allow for the different distributions across fields. In fact, our calculations suggest that for this group of people (those working full-time with a certificate III/IV) the total removal of gender segregation across the choice of fields of education would reduce the earning gap by less than a quarter.

This suggests that in our society there are fundamental differences between what men and women do, and that the extent of gender segregation is only a second order concern. Increasing the proportion of women in the traditional trades may be a good thing in itself but it is hardly going to alter the fact that men earn more than women among those with certificates III/IV. We should also remind ourselves that field of education is not the only choice that individuals make. In this regard it is interesting to note that women are more likely to go to university than men – may be this is not surprising given the earnings gap that exists among certificates.

The obvious conclusion from this analysis is that we should not be too worried about the extent of sex segregation in VET, at least in terms of the earnings differential between men and women.

However, there may well be other reasons to think that the high level of sex segregation is an issue. One concern is that technological change is likely to differentially impact on jobs. While its impact is difficult to predict it seems likely that the impact of technological change (specifically automation and the implementation of artificial intelligence) will fall more heavily on 'blue' collar jobs (manufacturing and building for example) and more lightly on sectors that deliver personal services such as health and community care and education. The former are male dominated while the latter tend to be female dominated. This argument would suggest that current levels of sex segregation may well make men more vulnerable to technological change, and the creation of a large disempowered group of males could have serious implications for the stability of our society. One response would be attempt to reduce the level of sex segregation. However, moves in this direction tend to encourage women in male dominated fields and there is no real push to increase the number of men in female dominated areas. Thus the current policy push of increasing the number of women in non-traditional areas may well result in increasing the vulnerability of women to the future technological change, without providing any offsetting benefits to men.

Realistically the future is largely unknown, and therefore the best insurance against the unknown may well be a broad education. The current VET system with its structure

mirroring the gender characteristics of the labour market is not well placed in this regard. Its rigid and narrow curriculum tends to reinforce gender divides. The future is more likely to reward 'softer' skills which machines cannot replicate. For VET to play a key role in building an educated workforce it will need to change so that its qualifications become broader with a greater emphasis on general education and a lesser emphasis on narrow industry training. This may also have the result of making 'non-traditional' areas more attractive to women and thus reducing the extent of sex segregation. And it would also have the benefit of equipping men better for the jobs in sectors dominated by women.

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Appendix 1: Field of Education classification according to ASCED

BROAD, NARROW AND DETAILED FIELDS

- 1 NATURAL AND PHYSICAL SCIENCES
 - 101 MATHEMATICAL SCIENCES
 - 010101 Mathematics
 - 010103 Statistics
 - 010199 Mathematical Sciences, n.e.c.
 - 103 PHYSICS AND ASTRONOMY
 - 010301 Physics
 - 010303 Astronomy
 - 105 CHEMICAL SCIENCES
 - 010501 Organic Chemistry
 - 010503 Inorganic Chemistry
 - 010599 Chemical Sciences, n.e.c.
 - 107 EARTH SCIENCES
 - 010701 Atmospheric Sciences
 - 010703 Geology
 - 010705 Geophysics
 - 010707 Geochemistry
 - 010709 Soil Science
 - 010711 Hydrology
 - 010713 Oceanography
 - 010799 Earth Sciences, n.e.c.
 - 109 BIOLOGICAL SCIENCES
 - 010901 Biochemistry and Cell Biology
 - 010903 Botany
 - 010905 Ecology and Evolution
 - 010907 Marine Science
 - 010909 Genetics
 - 010911 Microbiology
 - 010913 Human Biology
 - 010915 Zoology
 - 010999 Biological Sciences, n.e.c.
 - 199 OTHER NATURAL AND PHYSICAL SCIENCES
 - 019901 Medical Science
 - 019903 Forensic Science

- 019905 Food Science and Biotechnology
- 019907 Pharmacology
- 019909 Laboratory Technology
- 019999 Natural and Physical Sciences, n.e.c.
- 2 INFORMATION TECHNOLOGY
 - COMPUTER
 - 201 SCIENCE
 - 020101 Formal Language Theory
 - 020103 Programming
 - 020105 Computational Theory
 - 020107 Compiler Construction
 - 020109 Algorithms
 - 020111 Data Structures
 - 020113 Networks and Communications
 - 020115 Computer Graphics
 - 020117 Operating Systems
 - 020119 Artificial Intelligence
 - 020199 Computer Science, n.e.c.
 - 203 INFORMATION SYSTEMS
 - 020301 Conceptual Modelling
 - 020303 Database Management
 - 020305 Systems Analysis and Design
 - 020307 Decision Support Systems
 - 020399 Information Systems, n.e.c.
 - 299 OTHER INFORMATION TECHNOLOGY
 - 029901 Security Science
 - 029999 Information Technology, n.e.c.
- 3 ENGINEERING AND RELATED TECHNOLOGIES
 - 301 MANUFACTURING ENGINEERING AND TECHNOLOGY
 - 030101 Manufacturing Engineering
 - 030103 Printing
 - 030105 Textile Making
 - 030107 Garment Making
 - 030109 Footwear Making
 - 030111 Wood Machining and Turning
 - 030113 Cabinet Making
 - 030115 Furniture Upholstery and Renovation

- 030117 Furniture Polishing
- 030199 Manufacturing Engineering and Technology, n.e.c.
- PROCESS AND RESOURCES
- 303 ENGINEERING
 - 030301 Chemical Engineering
 - 030303 Mining Engineering
 - 030305 Materials Engineering
 - 030307 Food Processing Technology
 - 030399 Process and Resources Engineering, n.e.c.
 - 030399 Process and Resources Engineering, n.e.c.
- 305 AUTOMOTIVE ENGINEERING AND TECHNOLOGY
 - 030501 Automotive Engineering
 - 030503 Vehicle Mechanics
 - 030505 Automotive Electrics and Electronics
 - 030507 Automotive Vehicle Refinishing
 - 030509 Automotive Body Construction
 - 030511 Panel Beating
 - 030513 Upholstery and Vehicle Trimming
 - 030515 Automotive Vehicle Operations
 - 030599 Automotive Engineering and Technology, n.e.c.
- 307 MECHANICAL AND INDUSTRIAL ENGINEERING AND TECHNOLOGY
 - 030701 Mechanical Engineering
 - 030703 Industrial Engineering
 - 030705 Toolmaking
 - 030707 Metal Fitting, Turning and Machining
 - 030709 Sheetmetal Working
 - 030711 Boilermaking and Welding
 - 030713 Metal Casting and Patternmaking
 - 030715 Precision Metalworking
 - 030717 Plant and Machine Operations
 - 030799 Mechanical and Industrial Engineering and Technology, n.e.c.
- CIVIL
- 309 ENGINEERING
 - 030901 Construction Engineering

- 030903 Structural Engineering
- 030905 Building Services Engineering
- 030907 Water and Sanitary Engineering
- 030909 Transport Engineering
- 030911 Geotechnical Engineering
- 030913 Ocean Engineering
- 030999 Civil Engineering, n.e.c.
- 311 GEOMATIC ENGINEERING
 - 031101 Surveying
 - 031103 Mapping Science
 - 031199 Geomatic Engineering, n.e.c.
- 313 ELECTRICAL AND ELECTRONIC ENGINEERING AND TECHNOLOGY
 - 031301 Electrical Engineering
 - 031303 Electronic Engineering
 - 031305 Computer Engineering
 - 031307 Communications Technologies
 - 031309 Communications Equipment Installation and Maintenance
 - 031311 Powerline Installation and Maintenance
 - 031313 Electrical Fitting, Electrical Mechanics
 - 031315 Refrigeration and Air Conditioning Mechanics
 - 031317 Electronic Equipment Servicing
 - 031399 Electrical and Electronic Engineering and Technology, n.e.c.
- 315 AEROSPACE ENGINEERING AND TECHNOLOGY
 - 031501 Aerospace Engineering
 - 031503 Aircraft Maintenance Engineering
 - 031505 Aircraft Operation
 - 031507 Air Traffic Control
 - 031599 Aerospace Engineering and Technology, n.e.c.
- 317 MARITIME ENGINEERING AND TECHNOLOGY
 - 031701 Maritime Engineering
 - 031703 Marine Construction
 - 031705 Marine Craft Operation
 - 031799 Maritime Engineering and Technology, n.e.c.
- 399 OTHER ENGINEERING AND RELATED TECHNOLOGIES

- 039901 Environmental Engineering
- 039903 Biomedical Engineering
- 039905 Fire Technology
- 039907 Rail Operations
- 039909 Cleaning
- 039999 Engineering and Related Technologies, n.e.c.
- 4 ARCHITECTURE AND BUILDING
 - 401 ARCHITECTURE AND URBAN ENVIRONMENT
 - 040101 Architecture
 - 040103 Urban Design and Regional Planning
 - 040105 Landscape Architecture
 - 040107 Interior and Environmental Design
 - 040199 Architecture and Urban Environment, n.e.c.
 - 403 BUILDING
 - 040301 Building Science and Technology
 - 040303 Building Construction Management
 - 040305 Building Surveying
 - 040307 Building Construction Economics
 - 040309 Bricklaying and Stonemasonry
 - 040311 Carpentry and Joinery
 - 040313 Ceiling, Wall and Floor Fixing
 - 040315 Roof Fixing
 - 040317 Plastering
 - 040319 Furnishing Installation
 - 040321 Floor Coverings
 - 040323 Glazing
 - 040325 Painting, Decorating and Sign Writing
 - 040327 Plumbing
 - 040329 Scaffolding and Rigging
 - 040399 Building, n.e.c.
- 5 AGRICULTURE, ENVIRONMENTAL AND RELATED STUDIES
 - 501 AGRICULTURE
 - 050101 Agricultural Science
 - 050103 Wool Science
 - 050105 Animal Husbandry
 - 050199 Agriculture, n.e.c.
 - 503 HORTICULTURE AND VITICULTURE
 - 050301 Horticulture

- 050303 Viticulture
- FORESTRY
- 505 STUDIES
 - 050501 Forestry Studies
- FISHERIES
- 507 STUDIES
 - 050701
 - Aquaculture
 - 050799 Fisheries Studies, n.e.c.
- 509 ENVIRONMENTAL STUDIES
 - 050901 Land, Parks and Wildlife Management
 - 050999 Environmental Studies, n.e.c.
- 599 OTHER AGRICULTURE, ENVIRONMENTAL AND RELATED STUDIES
 - 059901 Pest and Weed Control
 - 059999 Agriculture, Environmental and Related Studies, n.e.c.

6 HEALTH

- 601 MEDICAL STUDIES
 - 060101 General Medicine
 - 060103 Surgery
 - 060105 Psychiatry
 - 060107 Obstetrics and Gynaecology
 - 060109
 - Paediatrics
 - 060111 Anaesthesiology
 - 060113 Pathology
 - 060115 Radiology
 - 060117 Internal Medicine
 - 060119 General Practice
 - 060199 Medical Studies, n.e.c.
- 603 NURSING
 - 060301 General Nursing
 - 060303 Midwifery
 - 060305 Mental Health Nursing
 - 060307 Community Nursing
 - 060309 Critical Care Nursing
 - 060311 Aged Care Nursing
 - 060313 Palliative Care Nursing
 - 060315 Mothercraft Nursing and Family and Child Health Nursing
 - 060399 Nursing, n.e.c.
- 605 PHARMACY
 - 060501 Pharmacy

- 607 DENTAL STUDIES
 - 060701 Dentistry
 - 060703 Dental Assisting
 - 060705 Dental Technology
 - 060799 Dental Studies,
n.e.c.
- 609 OPTICAL SCIENCE
 - 060901
Optometry
 - 060903 Optical Technology
 - 060999 Optical Science,
n.e.c.
- 611 VETERINARY STUDIES
 - 061101 Veterinary Science
 - 061103 Veterinary Assisting
 - 061199 Veterinary Studies, n.e.c.
- 613 PUBLIC HEALTH
 - 061301 Occupational Health and
Safety
 - 061303 Environmental
Health
 - 061305 Indigenous Health
 - 061307 Health Promotion
 - 061309 Community Health
 - 061311 Epidemiology
 - 061399 Public Health, n.e.c.
- 615 RADIOGRAPHY
 - 061501
Radiography
- 617 REHABILITATION THERAPIES
 - 061701 Physiotherapy
 - 061703 Occupational
Therapy
 - 061705 Chiropractic and Osteopathy
 - 061707 Speech Pathology
 - 061709 Audiology
 - 061711 Massage Therapy
 - 061713 Podiatry
 - 061799 Rehabilitation Therapies,
n.e.c.
- 619 COMPLEMENTARY
THERAPIES
 - 061901
Naturopathy
 - 061903 Acupuncture
 - 061905 Traditional Chinese Medicine

- 061999 Complementary Therapies,
n.e.c.
- 699 OTHER HEALTH
 - 069901 Nutrition and
Dietetics
 - 069903 Human Movement
 - 069905 Paramedical Studies
 - 069907 First Aid
 - 069999 Health, n.e.c.
- 7 EDUCATION
 - 701 TEACHER EDUCATION
 - 070101 Teacher Education: Early Childhood
 - 070103 Teacher Education: Primary
 - 070105 Teacher Education: Secondary
 - 070107 Teacher-
Librarianship
 - 070109 Teacher Education: Vocational Education and
Training
 - 070111 Teacher Education: Higher Education
 - 070113 Teacher Education: Special Education
 - 070115 English as a Second Language Teaching
 - 070117 Nursing Education Teacher Training
 - 070199 Teacher Education, n.e.c.
 - CURRICULUM AND EDUCATION
 - 703 STUDIES
 - 070301 Curriculum Studies
 - 070303 Education Studies
 - OTHER
 - 799 EDUCATION
 - 079999 Education, n.e.c.
- 8 MANAGEMENT AND COMMERCE
 - 801 ACCOUNTING
 - 080101
Accounting
 - BUSINESS AND
 - 803 MANAGEMENT
 - 080301 Business
Management
 - 080303 Human Resource
Management
 - 080305 Personal Management
Training
 - 080307 Organisation Management
 - 080309 Industrial Relations
 - 080311 International
Business

- 080313 Public and Health Care Administration
- 080315 Project Management
- 080317 Quality Management
- 080319 Hospitality Management
- 080321 Farm Management and Agribusiness
- 080323 Tourism Management
- 080399 Business and Management, n.e.c.
- 805 SALES AND MARKETING
 - 080501 Sales
 - 080503 Real Estate
 - 080505 Marketing
 - 080507 Advertising
 - 080509 Public Relations
 - 080599 Sales and Marketing, n.e.c.
- 807 TOURISM
 - 080701 Tourism
- 809 OFFICE STUDIES
 - 080901 Secretarial and Clerical Studies
 - 080903 Keyboard Skills
 - 080905 Practical Computing Skills
 - 080999 Office Studies, n.e.c.
- 811 BANKING, FINANCE AND RELATED FIELDS
 - 081101 Banking and Finance
 - 081103 Insurance and Actuarial Studies
 - 081105 Investment and Securities
 - 081199 Banking, Finance and Related Fields, n.e.c.
- 899 OTHER MANAGEMENT AND COMMERCE
 - 089901 Purchasing, Warehousing and Distribution
 - 089903 Valuation
 - 089999 Management and Commerce, n.e.c.
- 9 SOCIETY AND CULTURE
 - POLITICAL SCIENCE AND POLICY STUDIES
 - 901 STUDIES
 - 090101 Political Science

- 090103 Policy Studies
- STUDIES IN HUMAN
- 903 SOCIETY
 - 090301 Sociology
 - 090303 Anthropology
 - 090305 History
 - 090307
 - Archaeology
 - 090309 Human Geography
 - 090311 Indigenous Studies
 - 090313 Gender Specific Studies
 - 090399 Studies in Human Society,
n.e.c.
- 905 HUMAN WELFARE STUDIES AND SERVICES
 - 090501 Social
Work
 - 090503 Childrenâ€™s
Services
 - 090505 Youth
Work
 - 090507 Care for the Aged
 - 090509 Care for the
Disabled
 - 090511 Residential Client
Care
 - 090513
Counselling
 - 090515 Welfare Studies
 - 090599 Human Welfare Studies and Services,
n.e.c.
- 907 BEHAVIOURAL SCIENCE
 - 090701
Psychology
 - 090799 Behavioural Science, n.e.c.
- 909 LAW
 - 090901 Business and Commercial Law
 - 090903 Constitutional Law
 - 090905 Criminal Law
 - 090907 Family
Law
 - 090909 International Law
 - 090911 Taxation Law
 - 090913 Legal Practice
 - 090999 Law, n.e.c.
- 911 JUSTICE AND LAW ENFORCEMENT

- 091101 Justice Administration
- 091103 Legal Studies
- 091105 Police Studies
- 091199 Justice and Law Enforcement, n.e.c.
- LIBRARIANSHIP, INFORMATION MANAGEMENT AND CURATORIAL
- 913 STUDIES
 - 091301 Librarianship and Information Management
 - 091303 Curatorial Studies
- LANGUAGE AND
- 915 LITERATURE
 - 091501 English Language
 - 091503 Northern European Languages
 - 091505 Southern European Languages
 - 091507 Eastern European Languages
 - 091509 Southwest Asian and North African Languages
 - 091511 Southern Asian Languages
 - 091513 Southeast Asian Languages
 - 091515 Eastern Asian Languages
 - 091517 Australian Indigenous Languages
 - 091519 Translating and Interpreting
 - 091521 Linguistics
 - 091523 Literature
 - 091599 Language and Literature, n.e.c.
- 917 PHILOSOPHY AND RELIGIOUS STUDIES
 - 091701 Philosophy
 - 091703 Religious Studies
- 919 ECONOMICS AND ECONOMETRICS
 - 091901 Economics
 - 091903 Econometrics
- 921 SPORT AND RECREATION
 - 092101 Sport and Recreation Activities
 - 092103 Sports Coaching, Officiating and Instruction
 - 092199 Sport and Recreation, n.e.c.
- OTHER SOCIETY AND
- 999 CULTURE
 - 099901 Family and Consumer Studies
 - 099903 Criminology

099905 Security Services
099999 Society and Culture, n.e.c.

10 CREATIVE ARTS

PERFORMING

1001 ARTS

100101 Music
100103 Drama and Theatre Studies
100105 Dance
100199 Performing Arts,
n.e.c.

1003 VISUAL ARTS AND CRAFTS

100301 Fine Arts
100303 Photography
100305 Crafts
100307 Jewellery Making
100309 Floristry
100399 Visual Arts and Crafts, n.e.c.

1005 GRAPHIC AND DESIGN STUDIES

100501 Graphic Arts and Design
Studies
100503 Textile Design
100505 Fashion Design
100599 Graphic and Design Studies, n.e.c.

COMMUNICATION AND MEDIA

1007 STUDIES

100701 Audio Visual Studies
100703
Journalism
100705 Written Communication
100707 Verbal
Communication
100799 Communication and Media Studies,
n.e.c.

1099 OTHER CREATIVE ARTS

109999 Creative Arts, n.e.c.

11 FOOD, HOSPITALITY AND PERSONAL SERVICES

1101 FOOD AND HOSPITALITY

110101
Hospitality
110103 Food and Beverage Service
110105 Butchery
110107 Baking and Pastry-making
110109 Cookery
110111 Food Hygiene
110199 Food and Hospitality, n.e.c.

1103 PERSONAL SERVICES

- 110301 Beauty Therapy
- 110303
Hairdressing
- 110399 Personal Services, n.e.c.
- 12 MIXED FIELD PROGRAMMES
 - 1201 GENERAL EDUCATION PROGRAMMES
 - 120101 General Primary and Secondary Education Programmes
 - 120103 Literacy and Numeracy Programmes
 - 120105 Learning Skills Programmes
 - 120199 General Education Programmes, n.e.c.
 - SOCIAL SKILLS
 - 1203 PROGRAMMES
 - 120301 Social and Interpersonal Skills Programmes
 - 120303 Survival Skills Programmes
 - 120305 Parental Education Programmes
 - 120399 Social Skills Programmes, n.e.c.
 - 1205 EMPLOYMENT SKILLS PROGRAMMES
 - 120501 Career Development Programmes
 - 120503 Job Search Skills Programmes
 - 120505 Work Practices Programmes
 - 120599 Employment Skills Programmes, n.e.c.
 - 1299 OTHER MIXED FIELD PROGRAMMES
 - 129999 Mixed Field Programmes, n.e.c.

Source: Australian Bureau of Statistics, Broad, Narrow and Detailed Fields 2001

Appendix 2: Employment and average weekly income by field of education

Table A1: Employment by hybrid field of education, by full-time /part-time and sex (2021)

	Male, Employed, full-time	Male, Employed, part-time	Female, Employed, full-time	Female, Employed, part-time	Total Employed	% male	% PT
1 Natural and physical sciences	1825	643	2251	2304	7023	35.1	42.0
2 Information Technology	16686	4954	2307	1603	25550	84.7	25.7
Engineering and Related Technologies, nfd	74394	12289	1108	619	88410	98.0	14.6
Manufacturing Engineering and Technology	42362	8889	2617	2673	56541	90.6	20.4
Process and Resources Engineering	10517	1639	1397	643	14196	85.6	16.1
Automotive Engineering and Technology	108985	20083	1495	677	131240	98.3	15.8
Mechanical and Industrial Engineering and Technology	135911	21000	1801	893	159605	98.3	13.7
Civil Engineering	7460	1194	307	184	9145	94.6	15.1
Electrical and Electronic Engineering and Technology	148627	28419	2217	897	180160	98.3	16.3
Aerospace Engineering and Technology	9625	1901	511	301	12338	93.4	17.8
The rest of engineering and technology	10555	2335	1247	1022	15159	85.0	22.1
Building	55620	11727	862	455	68664	98.1	17.7
Bricklaying and Stonemasonry	13760	3513	39	18	17330	99.7	20.4
Carpentry and Joinery	91516	16792	392	207	108907	99.4	15.6
Ceiling, wall and floor fixing and roof fixing	7059	1697	32	19	8807	99.4	19.5
Plastering	8548	2149	21	19	10737	99.6	20.2
Furnishing installation, floor coverings, glazing	6817	1407	43	22	8289	99.2	17.2
Painting, Decorating and Sign Writing	19441	5512	772	517	26242	95.1	23.0
Plumbing	61529	11657	271	98	73555	99.5	16.0
Scaffolding, rigging, building nec,	6774	1430	56	30	8290	99.0	17.6

	Male, Employed, full-time	Male, Employed, part-time	Female, Employed, full-time	Female, Employed, part-time	Total Employed	% male	% PT
architecture and building nec							
Architecture	1891	407	602	679	3579	64.2	30.3
Agriculture	13816	2474	3841	3186	23317	69.9	24.3
Horticulture and Viticulture	27147	7023	2684	2773	39627	86.2	24.7
The rest of agriculture	3434	1056	643	624	5757	78.0	29.2
Nursing	1459	1259	9757	15732	28207	9.6	60.2
Dental Studies	594	263	5388	6852	13097	6.5	54.3
Veterinary Studies	326	258	5556	5496	11636	5.0	49.4
Public Health	6498	1699	5462	4957	18616	44.0	35.8
The rest of health	3562	1983	9053	11972	26570	20.9	52.5
Education, nfd	1002	502	3702	7107	12313	12.2	61.8
Teacher Education	11181	2893	11533	12664	38271	36.8	40.6
Other Education	741	917	6239	18640	26537	6.2	73.7
Accounting	3764	1825	13052	12108	30749	18.2	45.3
Business and Management	29972	8245	67974	46829	153020	25.0	36.0
Sales and Marketing	14145	4433	16454	12443	47475	39.1	35.5
Tourism	1321	585	4829	4369	11104	17.2	44.6
Office Studies	1414	377	6994	6614	15399	11.6	45.4
Banking, Finance and Related Fields	4650	846	7441	4125	17062	32.2	29.1
Other Management and Commerce	14595	3058	2545	1073	21271	83.0	19.4
The rest of management and commerce	454	141	1071	799	2465	24.1	38.1
Human Welfare Studies and Services	11322	10745	50934	82452	155453	14.2	60.0
Justice and Law Enforcement	4662	803	3070	1420	9955	54.9	22.3
Sport and Recreation	13196	8005	8758	11955	41914	50.6	47.6
The rest of society and culture	8584	3438	4561	4258	20841	57.7	36.9
Visual Arts and Crafts	1681	939	2581	3742	8943	29.3	52.3
Graphic and Design Studies	2537	1110	2176	2652	8475	43.0	44.4
Communication and Media Studies	4272	2477	1128	1194	9071	74.4	40.5
The rest of creative arts	1537	1490	1093	2216	6336	47.8	58.5
Food and Hospitality	70520	25582	26871	30123	153096	62.8	36.4
Personal Services	4019	2245	29983	44617	80864	7.7	58.0

	Male, Employed, full-time	Male, Employed, part-time	Female, Employed, full-time	Female, Employed, part-time	Total Employed	% male	% PT
The rest of food, hospitality and personal service	16	7	70	112	205	11.2	58.0
Total	1102323	256315	335791	376984	2071413	65.6	30.6

Table A2: Average weekly income by Field of Education, employed full-time, male (2021)

	Number	Average weekly income (\$)	%>\$2000 (%)	%>\$1500 (%)
Natural and Physical Sciences	1775	1520	18	43
Information Technology	16239	1667	25	49
Engineering and Related Technologies, nfd	70595	1656	27	52
Manufacturing Engineering and Technology	40669	1468	16	40
Process and Resources Engineering	10273	1936	39	61
Automotive Engineering and Technology	103549	1536	20	45
Mechanical and Industrial Engineering and Technology	130989	1769	31	58
Civil Engineering	7280	1664	25	51
Electrical and Electronic Engineering and Technology	144039	1894	37	66
Aerospace Engineering and Technology	9407	1997	40	76
The rest of engineering and technology	10187	1868	38	64
Building	52976	1692	27	57
Bricklaying and Stonemasonry	13223	1535	19	45
Carpentry and Joinery	87898	1614	23	51
Ceiling, wall and floor fixing and roof fixing	6791	1491	17	42
Plastering	8254	1493	16	43
Furnishing Installation, floor coverings, glazing	6531	1468	16	40
Painting, Decorating and Sign Writing	18531	1406	13	36
Plumbing	58901	1643	24	55
Scaffolding and Rigging, building nec and architecture and building nfd	6532	1673	25	56
Architecture	1825	1495	17	40
Agriculture	11795	1309	16	38
Horticulture and Viticulture	26044	1384	12	33
The rest of agriculture	2223	1381	11	35
Nursing	1387	1230	6	24
Dental Studies	575	1742	27	56
Veterinary Studies	315	1155	5	19
Public Health	6388	1791	31	60
The rest of health	3470	1466	16	38
Education, nfd	961	1629	24	54
Teacher Education	10931	1879	36	67
Other Education	698	1265	11	27

	Number	Average weekly income (\$)	%>\$2000 (%)	%>\$1500 (%)
Management and Commerce, nfd	439	1729	28	49
Accounting	3623	1718	27	52
Business and Management	29064	1717	28	55
Sales and Marketing	13647	1729	26	47
Tourism	1275	1391	12	33
Office Studies	1389	1489	15	40
Banking, Finance and Related Fields	4554	1909	35	63
Other Management and Commerce	14296	1411	13	34
Justice and Law Enforcement	4589	1738	25	66
Sport and Recreation	12460	1359	13	33
The rest of society and culture	19240	1337	9	32
Visual Arts and Crafts	1549	1402	16	38
Graphic and Design Studies	2414	1521	20	43
Communication and Media Studies	4053	1498	20	43
The rest of creative arts	1421	1270	11	30
Food, Hospitality and Personal Services, nfd	13	936	0	0
Food and Hospitality	67444	1361	12	32
Personal Services	3736	1330	14	31
Total	1056457	1637	25	51

Table A3: Average weekly income by Field of Education, employed full-time, female (2021)

	Number	Average income	%>\$2000	%>\$1500
Natural and Physical Sciences	2122	1164	6	19
Information Technology	2199	1481	16	41
Engineering and Related Technologies, nfd	1011	1367	16	38
Manufacturing Engineering and Technology	2407	1228	9	27
Process and Resources Engineering	1341	1438	20	39
Automotive Engineering and Technology	1386	1268	11	28
Mechanical and Industrial Engineering and Technology	1740	1440	16	33
Civil Engineering	308	1522	16	41
Electrical and Electronic Engineering and Technology	2119	1631	26	53
Aerospace Engineering and Technology	499	1577	19	51
The rest of engineering and technology	1176	1494	26	44
Building	810	1420	16	41
Bricklaying and Stonemasonry	25	777	0	28
Carpentry and Joinery	347	1195	10	31
Ceiling, wall and floor fixing and roof fixing	18	664	0	17
Plastering	21	904	0	0
Furnishing Installation, floor coverings, glazing	29	843	10	10

	Number	Average income	%>\$2000	%>\$1500
Painting, Decorating and Sign Writing	703	1166	7	23
Plumbing	250	1346	15	39
Scaffolding and Rigging, building nec and architecture and building nfd	57	1605	19	44
Architecture	547	1233	7	31
Agriculture	3321	1027	5	17
Horticulture and Viticulture	2456	1126	5	19
The rest of agriculture	545	1147	6	21
Nursing	9036	1126	5	18
Dental Studies	5165	1133	4	14
Veterinary Studies	5268	1058	3	11
Public Health	5289	1372	11	34
The rest of health	8512	1134	4	17
Education, nfd	3453	1107	4	17
Teacher Education	10871	1253	11	30
Other Education	5782	1028	3	10
Management and Commerce, nfd	1028	1364	12	33
Accounting	12556	1387	10	35
Business and Management	65481	1330	9	30
Sales and Marketing	15647	1315	11	27
Tourism	4638	1266	8	25
Office Studies	6716	1289	7	28
Banking, Finance and Related Fields	7261	1506	15	42
Other Management and Commerce	2478	1390	12	35
Justice and Law Enforcement	3007	1554	14	52
Sport and Recreation	8099	1213	8	25
The rest of society and culture	51624	1115	4	19
Visual Arts and Crafts	2292	1115	7	21
Graphic and Design Studies	2008	1314	12	32
Communication and Media Studies	1077	1391	14	37
The rest of creative arts	969	1089	6	22
Food, Hospitality and Personal Services, nfd	71	1150	0	13
Food and Hospitality	24729	1116	5	18
Personal Services	26850	1125	7	21
Total	315344	1307	8	25

Appendix 3: Decomposing the income differential between men and women

Let w_{mj} denote the average weekly income of men who have a certificate III or IV in the Field of Education j .

Similarly denote the average weekly income of women who have a certificate III or IV in the Field of Education j as w_{fj} .

Further let n_{mj} be the proportion of men with a certificate III or IV in Field of Education j , and n_{fj} be the proportion of women with a certificate III or IV in Field of Education j

$$\text{Then } w_m - w_f = \sum_j (n_{mj}w_{mj} - n_{fj}w_{fj}) = \sum_j n_{mj}(w_{mj} - w_{fj}) + \sum_j w_{fj}(n_{mj} - n_{fj})$$

$$\text{Similarly, } w_m - w_f = \sum_j w_{mj}(n_{mj} - n_{fj}) + \sum_j n_{fj}(w_{mj} - w_{fj})$$

Taking the average we get

$$w_m - w_f = \sum_j \frac{(n_{mj} + n_{fj})}{2} (w_{mj} - w_{fj}) + \sum_j \frac{(w_{mj} + w_{fj})}{2} (n_{mj} - n_{fj})$$

The first term is labelled the income effect within fields of education (that is, the difference between the incomes of men and women within each field of education).

The second term is labelled the field of education structure effect (capturing the impact of the difference in the distributions of men and women across fields of education).