



What Do Students Earn After Their Tertiary Education?

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Acknowledgements and notes on the data

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1 Key points

For young domestic students last enrolled in tertiary education in 2003, median annual three-year post-study earnings were:

- 51 percent higher for those with a bachelor's degree compared with those with a level 1 to 3 (upper-secondary level equivalent) certificate.
- 30 percent higher for those with a bachelor's degree compared with those with a diploma.
- 16 percent higher for those with a diploma compared with those with a level 1 to 3 certificate.
- 16 percent higher for those with a master's degree compared with those with a bachelor's.
- 46 percent higher for those with a doctorate compared with those with a bachelor's.

Completing a bachelor's degree matters. Young students who completed their degree earned 29 percent more than those young students who left without completing their degree.

The median post-study earnings for young people completing a tertiary qualification grew by 30 percent after three years. The national median grew by 8 percent.

What you studied made a significant difference to what you earned. Compared with young bachelor's degree students studying humanities, graduates specialising in medical studies earned 2.59 times more three years post-study. Other high-earning fields were veterinary studies (1.61 times more), law (1.47), electrical engineering (1.44), pharmacy (1.43), accountancy (1.42), computer science (1.36), and nursing (1.26). Science subjects earned between 1.22 and 1.30 times more (except biology, 1.12). Degrees in teaching earned 1.27 times more in the first year, but 1.16 times by the third year. Degrees in tourism, performing arts, visual arts, and graphic and design arts earned between 10 and 20 percent less than degrees in humanities. However, degrees in communication and media studies earned 11 percent more.

Across other levels of study, qualifications in engineering, information technology, architecture and building, and health generally earned the most. Qualifications in science or management and commerce earned in the middle range of earnings, while qualifications in society and culture, creative arts, food, hospitality, and personal services earned less than other fields. Teaching and education qualifications started relatively higher, but after three years were earning similar amounts to those in the middle-earning fields.

In terms of post-study earnings, the labour market does differentiate course completion in addition to qualification completion. Young students completing most or all of their courses with no qualification earned more than those who failed all or most of their courses. However, the study found support for the commonly held view that for young people, gaining a qualification is what matters most.

The median earnings for young students gaining a bachelor's degree from a polytechnic were 8 percent less than for those gaining a degree from a university. This difference was similar both one year and three years after study, and remained the same after adjusting for differences in field of study, age, sex, ethnic group, industry, and firm size.

2 Summary

What do students earn after their tertiary education? looks at the group of nearly 30,000 young domestic students who last enrolled in a tertiary education institution in 2003, and examines the influence of their tertiary education on their one-year and three-year post-study earnings.

The report examines:

- What are the earnings for those with different levels of tertiary study?
- What are the earnings for those from different fields of study?
- What is the difference in earnings between those who complete a qualification and those who don't? How much difference is there between those students who pass all their courses but do not complete a qualification, those who pass some of their courses, and those who don't complete anything? Are there benefits to passing courses without gaining qualifications?
- Does it matter which type of provider you study at? Does a university qualification result in more benefit than a qualification at the same level in the same field from a non-university provider?

These questions are important for government, tertiary education providers, and students. Both government and students contribute significant funding to tertiary education. Total government spending on tertiary education in 2008 was \$4.8 billion, or 2.7 percent of gross domestic product (GDP). Both government and students have an expectation that the money they spend represents an investment, that the financial benefits (of a well-paying job) will eventually outweigh the costs of this education. Knowing more about the nature of these benefits can help both government and students decide what they should be investing in.

Tertiary education in New Zealand is diverse, encompassing a large range of provision across several hundred institutions and several thousand courses and qualifications – from one-week non-formal community classes to four-year doctorates. About half a million New Zealanders enrol in some form of institution-based learning each year, and over 100,000 qualifications are awarded each year. This makes it particularly important to have information on the relative benefits of these different forms of learning, so that government, providers, and students can make better-informed decisions about what to invest in.

This study forms one of the initial outputs from a joint government agency project on employment outcomes of tertiary education (EOTE). This project involved the linking of administrative education data with data on earnings, and on firms, to create a new longitudinally-linked dataset that can track students' employment and income over time.

Around 118,000 domestic students last enrolled in a tertiary institution in 2003. This study focuses on a subgroup of these leavers which we have called 'young leavers'. For this study, a 'young leaver' was defined as anyone aged 20 years or under who was studying at certificate level, 22 or under at diploma level, 24 or under at degree level (25 or under if this degree was a medical degree), 25 or under for anyone who was enrolled in a one-year post-bachelor's qualification, 26 or under for master's, and 28 years or under for doctorate students. These represent the more traditionally-defined students who moved to tertiary education more or less directly after school and who were more

likely to be completing their tertiary education for the first time, and entering the labour market proper for the first time. Education is likely to have more of a direct influence on earnings for these young leavers than it is for older students who perhaps already hold qualifications or have a number of years of work experience. Compared with other countries, New Zealand's tertiary education system has a lower proportion of such traditional students. In fact, of the 118,000 students last enrolled in 2003, only around 25 percent (or 29,000) were young leavers.

Young New Zealanders also have a tradition of travelling overseas after their education. Some will work for a year or two before embarking overseas, and their choice of work initially may reflect these aspirations more than any longer-term career goals that make use of their tertiary education. Of the 29,500 domestic young leavers in 2003, 69 percent had linked earnings for all three years following study.

Care is needed in interpreting the following differences in earnings, and in particular, the extent to which these differences can be attributed to education. There is a range of both educational and non-educational factors that influence how much one earns after tertiary education. Direct comparisons of actual post-study earnings for different educational characteristics can be misleading, for example, where one of the groups being compared has an older or more experienced composition than another. In this case, group composition is likely to explain more of the higher earnings than the specific characteristic being compared.

Even when limited to young leavers, there are likely to be differences in the innate ability of some groups being compared. While some education characteristics are likely to capture this, it may be that these differences in ability (or other unmeasured characteristics) are contributing to the resulting earnings differences, rather than the educational differences being compared. Some factors can and have been adjusted for in this study. These factors include age, sex, ethnic group, level of study, field of study, provider type, industry, and firm size of main employer.

Level of study and qualification completion

Table 1 shows one-year post-study median earnings for young domestic students last enrolled in 2003. All earnings are annual, and based on those who had pre-taxed income from wages and salary, or non-zero income from self-employment. 'Completing' means gaining a qualification.

Table 1
Median one-year post-study earnings for young students last enrolled in 2003

Level of study	Median earnings (\$)		As a proportion of the national median	
	Completing	Not completing	Completing	Not completing
Level 1-3 certificate	19,900	17,800	0.74	0.66
Level 4 certificate	21,200	19,600	0.79	0.73
Diploma	24,000	21,400	0.90	0.80
Bachelor's	31,900	24,100	1.19	0.90
Post-bachelor's cert or dip	37,100	36,500	1.38	1.36
Master's	34,100	36,000	1.27	1.34
Doctorate	37,100	S	1.38	S

(1) National median is the median earnings of anyone with earned income in LEED in tax year 2005 (\$26,800).

(2) S: Earnings for groups with less than 25 people have been suppressed.

For those young leavers who completed a qualification in 2003, the following table shows three-year post-study earning differences relative to those completing level 1 to 3 (upper secondary level equivalent) certificates. Actual differences are compared with differences once earnings are adjusted for differences in age, sex, ethnic group, field of study, provider type, industry and firm size of main employer.

Table 2
Post-study earnings premiums for young completers last enrolled in 2003

Level of study	Young completers			
	One-year		Three-year	
	Actual	Adjusted	Actual	Adjusted
Level 1-3 certificate	1.00	1.00	1.00	1.00
Level 4 certificate	1.06	1.00	1.04	1.16**
Diploma	1.20	1.03	1.16	1.14**
Bachelor's	1.60	1.06	1.51	1.27**
Post-bachelor's cert or dip	1.85	1.15**	1.64	1.30**
Master's	1.80	1.03	1.74	1.37**
Doctorate	2.30	1.28*	2.20	1.83**

(1) All premiums are expressed in relation to those completing level 1 to 3 certificates, and can't be compared across columns.

(2) ** means statistically significant at the 5 percent level, * means statistically significant at the 10 percent level. Figures with no asterisk are not statistically significant at the 10 percent level.

The median earnings for those with a bachelor's degree were significantly higher than those who studied at lower levels. However, when adjusted for differences in field of study, industry of employment, age, sex, ethnic group, provider type, and firm size, statistically significant differences only appeared in the third year post-study. In particular, once adjusted for differences in field of study one-year earnings premiums reduced significantly for bachelor's degree completers.

The lack of difference in first-year adjusted earnings may, in part, be reflecting the temporary work choices of some graduates; for example, those who are working to save money for travel overseas. Some of these may leave New Zealand before working a full year. Also, it could reflect delays in securing satisfactory employment, or accepting a temporary job until a more desired career-oriented position is obtained. As a result, some graduates may be working for less than a full tax year, or temporarily opting for a job where the level of qualification required is less than what they have.

By the third year of earnings, all adjusted premiums are statistically significant at the 1 percent level. This may again reflect a settling-in period as leavers move from more part-time work to more full-time work after study, or as they move from temporary jobs to career-oriented positions.

Three years post-study, the median earnings of young bachelor's degree graduates were 51 percent higher than those who completed level 1 to 3 certificates, and 30 percent higher than diploma completers.

The median earnings of young master's graduates were 16 percent higher than those of young bachelor's degree graduates three years post-study. Young doctorate completers earned 46 percent more than bachelor degree completers three years post-study.

The biggest advantage for completing a qualification was at bachelor's level, where the median earnings for completers were 28 percent higher than for those not completing their degree. This difference remained in the third year after study. Not completing at postgraduate level appeared less critical to one's first year earnings. Virtually all postgraduate non-completers are bachelor's completers, and so will be deriving some benefits from their bachelor's degree, despite having not completed their postgraduate study.

The median earnings for qualification completers grew by around 30 percent after three years. Across most levels, growth for non-completers was only a few percentage points less. By comparison, the national median grew by 8 percent between tax years 2005 and 2007.

Field of study

In general, qualifications in the more vocationally-specific or professionally-associated fields of engineering, information technology, architecture and building, and health earned the most. Qualifications in science or management and commerce earned in the middle range of earnings for fields, while qualifications in society and culture, creative arts, and food, hospitality and personal services earned less than in other fields. Those with qualifications in education started relatively higher, but after three years earnings were similar to those near the middle-earning fields.

Table 3 shows actual and adjusted earnings differences by field of study for young leavers who completed a bachelor's degree. Premiums were estimated relative to students completing degrees in humanities. Only fields with 25 or more graduates are able to be reported, affecting fields such as dentistry, physics, agriculture, and several engineering disciplines. The remaining fields, however, covered 95 percent of degree graduates.

Three years post-study, graduates specialising in medical studies earned 2.59 times more than students completing degrees in humanities. Other high earning fields were veterinary studies (1.61 times), law (1.47), electrical engineering (1.44), pharmacy (1.43), accountancy (1.42), and computer science (1.36). Science subjects earned between 1.22 and 1.30 times more (except biology where the premium was 1.12 times). Degrees in nursing earned 1.26 times more than degrees in humanities.

Degrees in teaching earned 1.27 times more in the first year, but 1.16 times by the third year. Degrees in tourism, performing arts, visual arts, and graphic and design arts earned between 10 and 20 percent less than degrees in humanities. However degrees in communication and media studies earned 11 percent more.

While these premiums reduced after adjusting for differences in age, sex, ethnic group, industry, and firm size, the relative positions remained largely the same.

Table 3
Post-study earnings premiums for young bachelor's degree completers
By field of study

Field (broad and narrow)	One-year		Three-year	
	Actual	Adjusted	Actual	Adjusted
Sciences	1.07	1.07	1.05	1.03
Mathematics	1.24	1.02	1.30	0.99**
Chemical sci	1.11	1.18	1.22	1.02**
Earth sci	1.11	0.96	1.28	1.20
Biological sci	1.10	0.93	1.12	1.02**
Other sciences	1.29	1.14	1.30	1.21
Information technology	1.10	1.15**	1.15	1.21**
Computer science	1.24	1.05	1.36	1.15
Information systems	1.19	1.10*	1.29	1.19
Engineering	1.21	1.16**	1.19	1.15*
Geomatic eng	1.38	1.08	1.44	1.08*
Electrical eng	1.28	0.94	1.44	1.30
Architecture & building	1.06	1.03	0.99	0.91
Architecture	1.15	0.95	1.13	0.97**
Agriculture	1.02	1.02	1.00	1.11
Health	1.24	1.62**	1.17	1.25**
Medical	2.67	2.89**	2.59	2.71
Nursing	1.26	1.19**	1.26	1.22
Pharmacy	1.27	1.71**	1.43	0.98**
Veterinary	1.70	1.48**	1.61	1.19
Radiography	1.60	1.63**	1.35	1.24
Rehabilitation	1.23	1.31**	1.19	1.10*
Other health	0.97	1.15	1.00	1.01**
Education	1.16	1.35**	1.02	1.13*
Teacher education	1.27	1.22**	1.16	1.11
Education studies	1.13	0.97	1.16	1.08*
Management & commerce	1.09	1.20**	1.09	1.14**
Accountancy	1.29	1.05	1.42	1.17
Business & management	1.19	1.09**	1.24	1.12
Sales & marketing	1.15	1.06	1.20	1.05**
Tourism	1.01	0.86*	0.89	0.93**
Banking & finance	1.26	1.07	1.30	1.09*
Society & culture	1.00	1.00	1.00	1.00
Pol sci & policy studies	1.12	0.90	1.16	1.06*
Human society	1.00	1.00	1.00	1.00
Human welfare	1.21	0.98	1.01	0.91**
Behavioural	1.07	0.95	1.15	1.10*
Law	1.33	1.19**	1.47	1.22
Language & literature	1.01	0.89*	1.05	0.89**
Philosophy & religion	0.98	0.96	1.06	1.22
Economics	1.28	0.99	1.37	1.12
Sport & recreation	0.88	0.80**	0.96	1.04**
Other society & culture	0.99	0.97	1.06	0.98**
Creative arts	0.85	0.91**	0.86	0.90**
Performing arts	0.57	0.56**	0.72	0.72**
Visual arts & crafts	0.74	0.73**	0.83	0.88**
Graphic & design	0.90	0.88**	0.98	0.87**
Comms & media	1.10	1.04	1.11	1.02**

(1) Earnings for groups with less than 25 people have been suppressed.

(2) The premiums for narrow fields (the indented fields) are in relation to those whose narrow field was 'studies in human society'. The premiums for the 10 broad fields are in relation to the earnings of those whose broad field was 'society and culture'. Premiums can't be compared across columns.

(3) ** means statistically significant at the 5 percent level, * means statistically significant at the 10 percent level. Figures with no asterisk are not statistically significant at the 10 percent level.

Course completion versus qualification

In terms of post-study earnings, the labour market does differentiate course completion in addition to qualification completion. Young leavers who passed some courses without completing a qualification earned more than those who failed their courses.

In fact, in some cases, particularly for first-year earnings, those who passed all their courses without completing a qualification earned more than their colleagues who completed a qualification. However, the effect was much reduced by the third year, and disappeared after adjusting for other factors.

Results from this study support the generally held view that, for young leavers, completing a qualification matters most, and that course success, once adjusted for known demographic, study-related, and work-related differences does not, in general, convey the same earnings rewards as holding a qualification.

Type of provider

The median earnings of leavers who gained qualifications from a university were generally higher than those who gained an equivalent-level qualification from other types of providers. Table 4 shows the range of median earnings differences across different levels of study, one-year and three years post-study.

Table 4
Post-study earnings premiums for young completers last enrolled in 2003
By level of study and provider type

Level of study and type of provider	One-year		Three-year	
	Actual	Adjusted	Actual	Adjusted ⁽¹⁾
Level 1 to 3 certificate				
Universities	1.00	1.00	1.00	1.00
ITPs	0.98	0.95	0.94	0.95
Wānanga	0.51	0.88	0.55	0.72**
PTEs	0.89	0.90	0.90	0.96
Level 4 certificate				
Universities	1.00	1.00	1.00	1.00
ITPs	0.94	0.94	1.00	0.98
Wānanga	0.62	0.51**	0.92	1.24
PTEs	0.90	0.81	0.99	0.94
Diploma				
Universities	1.00	1.00	1.00	1.00
ITPs	0.81	0.86*	0.84	0.97
PTEs	0.80	0.92	0.83	0.97
Bachelor's degree				
Universities	1.00	1.00	1.00	1.00
ITPs	0.93	0.96	0.87	0.92*
PTEs	0.68	0.98	0.84	1.18
Post-bachelor's cert or diploma				
Universities	1.00	1.00	1.00	1.00
ITPs	0.57	0.75*	0.75	0.91
PTEs	1.14	1.05	1.16	0.94

(1) Premiums are presented as proportions of the earnings for university completers for that level.

(2) Groups with less than 25 people have not been reported.

(3) ** means statistically significant at the 5 percent level, * means statistically significant at the 10 percent level.

Figures with no asterisk are not statistically significant at the 10 percent level.

(4) ITP: institute of technology or polytechnic, PTE: private training establishment

Most adjusted results were not statistically significant. However, the difference in polytechnic degree earnings compared with university degrees was. Young polytechnic degree graduates earned 8 percent less than university degree graduates after three years. This result is broadly consistent with recent research on university degree premiums for student loan borrowers (Smyth, Hyatt, Nair, Smart, 2009).

After adjusting for differences, a university diploma earned 14 percent more than a diploma from a polytechnic, but only in the first year post-study. By the third year there were no statistically significant differences in earnings for young people completing diplomas from different types of provider.

Students completing level 1 to 3 certificates from a wānanga earned less than those with certificates from other provider types. After adjusting for differences, there was no difference in earnings for level 4 certificate completers due to provider type.

Three-year post-study earnings for polytechnic degree completers were compared with those of university degree completers for seven narrow fields and five broad fields. These fields covered 87 percent of polytechnic degree completers. Differences ranged from 0.83 for management and commerce, 0.86 for nursing, 0.86 for graphic and design studies, 0.91 for communication and media studies, 0.92 for information technology to 0.97 for architecture. However, after adjusting for differences in age, sex, ethnic group, industry, and firm size, statistically significant differences remained only for the creative arts broad field, and the communications and media narrow field. In both these cases, the university premium increased after other factors had been adjusted for.

However, caution is needed in attributing actual or adjusted premiums as provider type differences. There are a number of factors, other than provider type, that have not been included in the adjustments, and which may be accounting for the difference in earnings. One such factor is the innate ability of students. Universities on average have a higher proportion of more academically able students, either through choice, or as a result of higher academic entry requirements. By contrast, wānanga provision is often targeted to less academically able students, or those who otherwise had no or low school achievement. While some education characteristics are likely to capture differences in ability, some of the higher earnings for university qualifications may be reflecting the higher innate ability of the students.

3 Background

For many, the prospect of securing a better-paid job is one of the main reasons for undertaking post-school study. Students know that, for many professions, having a tertiary education will significantly increase their chances of gaining work in a chosen field. For many employers, educational qualifications are used as a pre-requisite or credentials signifying suitability for employment.

In recent years, government focus has shifted away from access and participation in tertiary study towards one of relevancy. To this end, reforms over the last decade have seen government take more of a steering role in what is provided. The introduction of individual provider investment plans tied to funding has been introduced, while at the time of writing, government is exploring tying a component of funding to performance. These changes seek a balance between student choice, provider autonomy, and the responsibility of government for public funding accountability and to progress its national economic and social goals.

Increasingly, there has been interest in getting better information to help support better investment decision-making. There has been, for example, increased discussion around the need for better information to improve the match between the supply of skills from the tertiary education sector and the demand for these skills from the labour market.

The current *Draft Tertiary Education Strategy 2010–15* (Ministry of Education, 2009) lists as one of its expected tertiary system outcomes:

Raise the skills and knowledge of the current and future workforce to meet areas of labour market demand and social needs.

And goes on later to state:

We are committed to ... improving the information that is provided to students to allow them to make good decisions about what and where to study.

The *Tertiary Education Strategy 2007–12* (Ministry of Education, 2006) also had a focus on improving the match of the supply of skills and knowledge with current and future skills needs. For example, this strategy states:

The tertiary education sector in New Zealand delivers a great deal of education and training relevant to the needs of the economy. Quality tertiary education across a range of disciplines develops the broad competencies that New Zealanders need to meet today's needs and adapt to the future. Tertiary education also has a role in meeting the specific skill needs of particular industry groups. Trades, technical and professional qualifications equip New Zealanders with the specific skills and knowledge needed to enter an occupation.

It is in this policy context that the Employment Outcomes of Tertiary Education (EOTE) feasibility project was undertaken, and from which this study forms one of the initial outputs. This new EOTE data is intended to provide the basis for a valuable information resource on the financial benefits of tertiary education – one that can help shape decisions around both participation and provision.

There is now more New Zealand-specific information on of the nature and size of the benefits of tertiary education on income and employment. Some of this is summarised below. While estimates of earnings premiums vary according to the different study populations, time periods, data, and methods used, they have shown, in broad terms at least, that people with a bachelor's degree can expect to earn about 60 percent more than those with no qualification. People with a tertiary diploma can expect to earn about 30 percent more, while those with a postgraduate qualification will earn about 75 percent more.

For example, Maani (1999), and Maani and Maloney (2004) estimated returns to education using census data (1999) and then Household Labour Force Survey (HLFS) income supplement data in 2004. In these studies, the incomes for different levels of qualification attainment were compared with the incomes of people who held no school qualifications, or school qualifications only. Results were adjusted for various distributional differences, such as age, gender, and ethnicity. The results provided some of the first New Zealand-based quantitative estimates of the positive returns to education. For example, employed people with a diploma earned around 20 percent more a year than those with no tertiary qualifications, while those employed with a bachelor's degree earned around 60 percent more, and those with a master's degree, around 75 percent more than those with no tertiary qualifications.¹

Using census data, Hyslop, Maré, and Timmons (2003) examined the changing nature of qualifications across the New Zealand working-age population, and the relationship between this changing distribution and employment and income. This analysis has been recently updated (Hyslop and Maré, forthcoming 2009). They found that of the 15 percent increase in real average incomes between 1986 and 2001, upskilling accounted for 25 percent, while 70 percent was due to income growth across all qualifications. The pattern of qualification-employment share and relative income changes provides evidence of changing demand for skills within detailed industry-occupation cells.

Maré and Liang (2006) looked at the labour market outcomes for young post-school graduates, using 2001 Census data. One of the features of this study was its more detailed analysis of field of study and how this affected income. In particular, how income changed depending on how closely one's occupation and industry of employment matched one's field of study. For example, for young post-school graduates (ie those aged 18–30), those working in occupations that more closely matched their field of study earned nearly 20 percent more than those working out of field (Maré and Liang, 2006, table 3.1 page 19).

Much of the recent research on post-study returns has been undertaken by the Ministry of Education. This includes Nair (2006, 2007, and 2008), Hyatt, Gini, and Smyth (2005), Hyatt and Smyth (2006), and Smyth, Hyatt, Nair, and Smart (2009). The feature of these studies, compared with census and HLFS-based research, is that they make use of a unit-record longitudinally-linked dataset (Statistics NZ, nd), which can isolate leaving cohorts and follow their employment and earnings paths precisely for each year post-study. The limitation of the dataset is that is restricted to those who have used the Student Loan Scheme, or who have accessed Student Allowances. This covers

¹ While a range of models were used in the study, for the purposes of this introduction, premiums were selected using the exponential of the coefficients listed in the first column of Table 6 on page 36 of Maani and Maloney (2004).

between 50 and 60 percent of degree-level students, and between 30 and 40 percent of students who enrolled in certificates or diplomas.

The 2006 study by Nair looked at the factors impacting on graduates' earnings three years post-study. Nair followed up this study in 2007 by looking at earnings five years post-study, and by comparing three-year earnings for several different leaving cohorts.

His models included a large array of demographic and study-related variables, along with industry of employment, and a range of interaction variables. Income was grouped into 10 bands. His models had a relatively large explanatory power (over 80 percent), with industry of employment, qualification level, tertiary education provider type, and field of study having the greatest influences on post-study earnings. Bachelor's students who studied health, engineering, and education earned the most, along with those who worked in engineering, mining, telecommunication, finance and insurance industries. The earnings differential for a sub-degree qualification was about 20 percent lower than the earnings for a bachelor's degree, while those with postgraduate qualifications earned about 58 percent more than bachelor's holders.

Hyatt et al (2005, 2006) compared the benefits of completing a qualification for different levels of study, three years and then five years after study. Postgraduate student premiums increased between three and five years post-study, bachelor premiums stayed the same, while at lower levels the premiums decreased. The earnings of those who successfully completed a qualification were still higher than those who hadn't, but the margin had narrowed in the fourth and fifth years after study. They concluded that, at lower levels, the advantage of completion eroded slightly as abilities and experience played a greater role over time, while at higher levels "the skills, attitudes and competencies associated with completion at that level are increasingly valued in the labour market as time goes on."

More recently, Smyth, Hyatt, Nair, and Smart (2009) explored whether gaining a degree from a university conveyed a premium over gaining a degree from a polytechnic, again based on those who had used the Student Loan Scheme. They found no significant differences in first-year post-study earnings, but after five years university-degree graduates were earning slightly more. This question is explored further for young 2003 leavers in section 5 of this report.

In its annual publication of education indicators, *Education at a Glance*, the OECD compares the relative earnings of workers with different levels of educational attainment across OECD countries. New Zealand results are based on HLFS data. In 2006, for example, the relative earnings of degree- and higher-level students were between 25 and 30 percent more than those with post-secondary certificates below diploma level. This was one of the lower relative premiums of the 25 OECD countries compared. Those with diplomas or above earned about 15 percent more than upper secondary level (OECD, 2008).

In 2008, the Ministry of Education, Department of Labour, and Statistics New Zealand began to examine the feasibility of developing a new information resource for examining EOTE. This involved linking administrative data from education agencies on participation and achievement in institution-based and workplace-based tertiary education, with employment data from the Linked Employer-Employee Database

(LEED). LEED holds longitudinal employment and income data on individual workers, together with information on the firms they work for.

A feasible dataset was subsequently developed, providing the basis for a rich new resource for future ongoing research and analysis on employment outcomes. See Statistics NZ (2009a, 2009b) for more information about this project. The data and the definitions used in this report are also described in more detail in section 7.

Unlike the linked student loans and allowances dataset, EOTE has a much more complete coverage of employment outcomes for people in tertiary education, as it also includes those who haven't borrowed or taken out a student allowance. In particular, it also includes learners engaged in formal training in the workplace (industry training). The dataset also makes use of new more detailed information on field of study. This can allow us to drill beyond the limited number of broad fields previously available into more detailed fields. For example, beyond the broad field of health into the different fields of medical studies, nursing, or dentistry, and beyond the broad field of society and culture to separate the effects of law and economics from humanities and other social sciences.

Like the loans data, it retains the advantage over census and HLFS data of being able to identify and track employment and earnings pathways for particular cohorts. However, unlike census and HLFS, it does not hold information on occupation or hours worked. Another limitation of EOTE (unlike census and HLFS) is that while it holds details for qualification attainment from 1997 on, it does not hold details of any qualifications attained before then. This limits its use in isolating educational benefits for older, already qualified workers who return to study.

The new data currently affords only a short-term² view of the financial benefits of education, and therefore currently provides limited opportunity to add to our understanding of longer-term returns to education. However, short-term benefits (such as one-year or three-year earnings differences) still provide useful information, in particular on the current value that employers place on various types of qualification as credentials for employment.

A new set of prototype statistics on post-study earnings forms one of the main initial outputs of the EOTE feasibility study project (Statistics NZ, 2009b). A research report which analyses employment outcomes for learners involved in industry training forms another of the outputs of this project (Crichton, 2009). These are complemented by the present report, which examines the income benefits of provider-based tertiary education.

Around 118,000 domestic students last enrolled in a tertiary education institution in 2003. This study focuses on a subgroup of these leavers which we have called 'young leavers'. These represent those more traditionally-defined tertiary students who moved to tertiary education more or less directly after school and who were more likely to be completing their tertiary education for the first time, and entering the labour market proper for the first time. Education is likely to have more of a direct influence on earnings for these young leavers than it is for older students who perhaps already hold qualifications or have a number of years of work experience.

² Up to three years post-study for institution-based tertiary education, and up to six years for workplace-based tertiary education.

The study aimed to examine the following questions:

- What are the earnings for different levels of tertiary study?
- What are the earnings for different fields of study?
- What is the difference in earnings between those who complete a qualification and those who don't? How much difference is there between those students who pass all their courses but do not complete a qualification, those who pass some of their courses, and those who don't complete anything? Are there benefits to passing courses without gaining qualifications?
- Does it matter which type of provider you study at? Does a university qualification convey more benefit than a qualification of the same level in the same field from a non-university provider?

4 Students who last enrolled in 2003

The focus of this study is post-study earnings. For this, we have chosen young students who last enrolled in a tertiary education provider in 2003.

Around 118,000 domestic students last enrolled in a tertiary education institution in 2003. This study focuses on a subgroup of these leavers whom we have called 'young leavers'. These represent those more traditionally defined students who moved to tertiary education more or less directly after school and who were more likely to be completing their tertiary education for the first time and entering the labour market proper for the first time. Education and tertiary qualifications are likely to have more of a direct influence on earnings for these young leavers than they are for older students who perhaps already hold qualifications or have a number of years of work experience.

'Young' leavers have been defined based on their age and level of study. A 'normal' or 'traditional' age of completion is set for each level of study. For the purposes of this study, this is defined as the modal (i.e. most common) age of leavers at that level with an additional two years added to allow for students who take a short break in their study (and who therefore have not really gained extensive work experience). Specifically, a young leaver then has been defined as anyone aged 20 or under at certificate level, 22 or under at diploma level, 24 or under at degree (25 or under if this degree is a medical degree), 25 or under for anyone doing a one-year postgraduate study, 26 or under for master's, and 28 or under for doctorate students. Unlike other countries, New Zealand's tertiary education system has a lower proportion of such traditional students. In fact, of the 118,000 students last enrolled in 2003, around 25 percent (or 29,000) were young leavers.

The choice of 2003 as the leaving year was largely dictated by what was available in the data. Linking of education data to LEED is reasonably robust from 2003 on, but not so for earlier years. The latest year fully available in LEED at the time of writing was tax year 2007. Therefore for those last enrolled in 2003, there will be up to three years of post-study employment data available. Choosing later leaving cohorts is possible but reduces the number of post-study years available for analysis.

The focus on post-study outcomes requires us to define what post-study means. Many students leave study for one or more years, for a break, or to work or travel, only to return in subsequent years to continue their studies. For example, around 12 percent of students will return to study after a year out, 19 percent after two years, and 24 percent over three years. Over a 10 year period, this figure rises to over 35 percent. Students who are temporarily out of study more likely have not gained a qualification, and less likely to be engaged in career-oriented employment utilising their tertiary education.

In measuring employment outcomes of tertiary education, it is useful to distinguish these students from those who are leaving education and moving to the labour market on a more long-term basis. If we don't, then we will bias post-study earnings downwards a little.

For the purposes of this study, the group of 2003 leavers has been estimated by including all those students who enrolled in 2003 and were not enrolled in 2004 or 2005 or 2006. The latest year of education data available in this study was 2006. However, even after three years out of study, we know that more than 10 percent will return to study at a later time.

For this study we also focus on domestic students. While a number of international students will stay on and work in New Zealand and even become residents, it is more likely that they will leave New Zealand. This is suggested in table 5 where significantly fewer international students have been linked to LEED (showing they were less likely to have received taxable income in New Zealand). Even for those who have, it is likely that their patterns of earnings and the relationship between their education and earnings will be different to those of domestic students.

While the primary focus of this study is on domestic students, there is nonetheless interest in employment outcomes for international students, in particular for those who stay on in New Zealand. One question this data may help inform, for example, is the extent to which international students stay on in New Zealand after their study – in particular PhD students, where attracting and retaining some of the skills, research and knowledge these students bring to New Zealand was one of the reasons for introducing domestic fees status for this group in 2005. Under this policy change, international PhD students are now funded by the New Zealand government at the same rate as domestic PhD students and hence they are charged the same fees as domestic students.

Table 5

Students last enrolled in 2003

Students	Domestic		International		Total	
	Number	Percent	Number	Percent	Number	Percent
Total number of students last enrolled in 2003	117,900	100	14,700	100	132,600	100
Students matched to LEED ⁽¹⁾	111,100	94	5,200	35	116,300	88
Number in LEED in tax year 2005 ⁽²⁾	101,900	86	2,900	20	104,800	79
Number in LEED in tax year 2006 ⁽²⁾	97,800	83	2,600	18	100,400	76
Number in LEED in tax year 2007 ⁽²⁾	94,600	80	2,400	16	97,000	73
Number who earned income in tax year 2005	93,400	79	2,900	20	96,300	73
Number who earned income in tax year 2006	89,800	76	2,600	18	92,400	70
Number who earned income in tax year 2007	86,400	73	2,400	16	88,800	67

(1) Those matched to LEED include anyone on Inland Revenue's client register, including a small number who received no taxable income for the period covered by LEED at the time of the study (tax years 2000–07).

(2) In LEED in any given tax year means anyone who received taxable income from any source in that year.

Table 5 shows the breakdown of domestic and international students last enrolled in 2003 by how many were linked to LEED, and by how many of these earned income in the three tax years following their last year of enrolment. Table 5 also shows a declining percentage in LEED two and three years post-study. One of the realities of tertiary education – for younger students especially – is that many travel overseas soon after their study. Some work for a year or two before embarking overseas, and their choice of work may reflect these aspirations more than any longer-term career goals.

Table 6 shows comparisons of earnings between young and older leavers, and between those completing a qualification and those not. It provides some indication of patterns of engagement with the labour market in the first few years after leaving study. Younger leavers were more likely than older leavers to be in LEED, although less likely to have earnings three years post-study.

Table 6
Selected 2003 domestic leaver cohorts and their earnings status in tax years 2005–07

Group	Earned income in tax year			Number	Percent	Group	Earned income in tax year			Number	Percent
	2005	2006	2007				2005	2006	2007		
Young leavers						Older leavers					
1	Yes	Yes	Yes	19,670	68.8	1	Yes	Yes	Yes	60,080	67.2
2	Yes	Yes	No	2,070	7.2	2	Yes	Yes	No	4,320	4.8
3	Yes	No	Yes	570	2.0	3	Yes	No	Yes	1,290	1.4
4	Yes	No	No	1,660	5.8	4	Yes	No	No	3,800	4.3
5	No	Yes	Yes	710	2.5	5	No	Yes	Yes	2,210	2.5
6	No	Yes	No	170	0.6	6	No	Yes	No	590	0.7
7	No	No	Yes	440	1.5	7	No	No	Yes	1,450	1.6
8	No	No	No	2,390	8.4	8	No	No	No	9,660	10.8
9	Not matched to LEED			900	3.1	9	Not matched to LEED			5,980	6.7
Total				28,580	100.0	Total				89,370	100.0
Young completers						Young non-completers					
1	Yes	Yes	Yes	9,940	70.7	1	Yes	Yes	Yes	9,730	67.0
2	Yes	Yes	No	1,130	8.0	2	Yes	Yes	No	940	6.5
3	Yes	No	Yes	260	1.8	3	Yes	No	Yes	310	2.1
4	Yes	No	No	840	6.0	4	Yes	No	No	820	5.6
5	No	Yes	Yes	280	2.0	5	No	Yes	Yes	430	3.0
6	No	Yes	No	50	0.4	6	No	Yes	No	120	0.8
7	No	No	Yes	170	1.2	7	No	No	Yes	270	1.9
8	No	No	No	1,090	7.8	8	No	No	No	1,310	9.0
9	Not matched to LEED			310	2.2	9	Not matched to LEED			590	4.1
Total				14,060	100.0	Total				14,520	100.0
Young bachelor's completers						Doctorate completers					
1	Yes	Yes	Yes	3,720	66.3	1	Yes	Yes	Yes	230	56.1
2	Yes	Yes	No	520	9.3	2	Yes	Yes	No	20	4.9
3	Yes	No	Yes	100	1.8	3	Yes	No	Yes	10	2.4
4	Yes	No	No	400	7.1	4	Yes	No	No	30	7.3
5	No	Yes	Yes	90	1.6	5	No	Yes	Yes	10	2.4
6	No	Yes	No	20	0.4	6	No	Yes	No	0	0.0
7	No	No	Yes	70	1.2	7	No	No	Yes	10	2.4
8	No	No	No	570	10.2	8	No	No	No	90	22.0
9	Not matched to LEED			110	2.0	9	Not matched to LEED			10	2.4
Total				5,610	100.0	Total				410	100.0

(1) Counts have been rounded to the nearest 10. Counts may therefore not add to the total.

(2) See section 7 for details on the data and definitions used.

Table 7

2003 young domestic leavers and their earnings status tax years 2005–07

Group	Tax year			Leavers with earned income		Leavers with income from any source	
	2005	2006	2007	Number	Percent	Number	Percent
1	Yes	Yes	Yes	19,670	68.8%	21,450	75.1%
2	Yes	Yes	No	2,070	7.2%	1,790	6.3%
3	Yes	No	Yes	570	2.0%	470	1.6%
4	Yes	No	No	1,660	5.8%	1,480	5.2%
5	No	Yes	Yes	710	2.5%	420	1.5%
6	No	Yes	No	170	0.6%	70	0.2%
7	No	No	Yes	440	1.6%	270	0.9%
8	No	No	No	2,390	8.4%	1,740	6.1%
9	Not matched to LEED			900	3.1%	900	3.1%
All leavers				28,580	100.0%	28,580	100.0%

(1) Counts have been rounded to the nearest ten. Counts may therefore not add to the total.

Table 7 shows the patterns of earnings for young leavers in the first three years post-study alongside the proportions receiving income from any source. A total of 4,300 young leavers (groups 2, 3, 4), or 15 percent of the total, earned income in their first year post-study, but did not earn income in tax year 2006 or 2007, while 19,670 (group 1) earned income for all three years post-study. The first year of earnings for a further nearly 5 percent of leavers (groups 5, 6, 7) was not the year following the year they left.

This is important when deciding who to include in measures of first-year earnings, and when analysing income growth trends over time. The one-year post-study earnings of those who were employed continuously after leaving were around 5 percent (or between \$1,000 and \$2,000) higher than the one-year post-study earnings for those who weren't. For the purposes of this study we have included only group 1 in any analysis involving earnings growth over time. However, where the analysis only looks at one-year earnings, we have used the slightly larger cohort (groups 1-4).

Table 8 shows a summary of the size of the cohort of 2003 leavers by highest level of study in 2003, whether a qualification was completed or not, and by whether they earned income in their first year, or for all three years.

Table 8

Young domestic leavers in 2003 by highest level of study and qualification completion status

Level of study	All young leavers in 2003			Leavers who earned income in the first year post-study			Leavers who earned income for three years post-study		
	Completing	Not completing	Total	Completing	Not completing	Total	Completing	Not completing	Total
Level 1-3 certificate	3,150	5,340	8,490	2,790	4,330	7,120	2,420	3,610	6,040
Level 4 certificate	1,210	1,830	3,040	1,110	1,540	2,640	950	1,300	2,250
Diploma	1,630	2,440	4,070	1,450	2,050	3,500	1,230	1,720	2,950
Bachelor's	5,610	3,290	8,900	4,750	2,560	7,310	3,720	2,050	5,770
Post-bachelor's cert or dip	1,820	1,370	3,190	1,590	1,130	2,720	1,270	890	2,160
Master's	530	220	750	430	170	590	320	140	460
Doctorate	110	20	130	70	10	80	40	10	60
Total	14,060	14,520	28,580	12,170	11,790	23,960	9,940	9,730	19,670

(1) Counts have been rounded to the nearest ten. Counts may therefore not add to the total.

5 Post-study earnings

This study relates to young domestic leavers who last enrolled in a tertiary institution in 2003. A young leaver has been defined as anyone aged 20 years or under at certificate level, 22 or under at diploma level, 24 or under at degree level (25 or under if this degree is a medical degree), 25 or under for anyone doing a one-year post-bachelor's qualification, 26 or under for master's, and 28 years or under for doctorate students.

For details on the data and definitions used for this study, see section 7 of this report, and Statistics NZ (2009a, 2009b). Statistical regression has been used to take account of distributional differences in various factors. These adjusted results (based on means) are presented alongside actual results (based on medians). The methods and issues associated with this adjustment and comparison are discussed in section 6.

Care is needed in interpreting resulting differences in earnings – in particular, it is not certain how much these differences can be attributed to educational differences. There is a range of non-educational factors that influence how much one earns after tertiary education. Direct comparisons of actual post-study earnings for different educational characteristics can be misleading, for example, where one of the groups being compared has an older or more experienced composition than another. In this case, age or experience is likely to explain more of the higher earnings than the specific characteristic being compared.

Even when limited to young leavers, as in this study, there are likely to be differences in the innate ability of some groups being compared. While some education characteristics are likely to capture this, it may be that these differences in ability (or other unmeasured characteristics) are contributing more to the resulting earnings differences than the educational characteristic being compared. Some factors have been adjusted for in this study, including age, sex, ethnic group, level of study, field of study, provider type, industry, and firm size of main employer. However, these factors generally account for less than a fifth of the variation in post-study earnings, and so much of the variation in earnings remains unexplained.

Level of study

We know that income rises the more qualified you are. Section 3 discussed some of the existing New Zealand-based studies that measured the differences in earnings associated with different levels of qualification. Table 9 shows the median annual earnings by level of study using the new EOTE data for young domestic students who were last enrolled in 2003.

Earnings are shown in relation to the national median. These are not intended to indicate premiums but rather simply to provide a point of reference. The national median is based on all workers who had earnings in LEED, and is not adjusted for differences in age or qualification attainment with the young leaver cohort. A better comparison group might be those workers with no qualifications, or those with school qualifications only, adjusted to match the age distribution of the students. However, in the absence of this data, the national median has been used. One-year earnings relate to those with earnings in tax year 2005 (ie 1 April 2004 to 31 March 2005). In the following tables, 'completing' means gaining a qualification. The data and the definitions used in this section are also described in more detail in section 7.

Table 9
One-year median post-study earnings for young students last enrolled in 2003
By level of study

Level of study	Completing	Not completing	Total	Completing	Not completing	Total
	Median earnings			As a proportion of the national median		
Level 1-3 certificate	\$19,900	\$17,800	\$18,900	0.74	0.66	0.71
Level 4 certificate	\$21,200	\$19,600	\$20,500	0.79	0.73	0.76
Diploma	\$24,000	\$21,400	\$22,600	0.90	0.80	0.84
Bachelor's	\$31,900	\$24,100	\$29,100	1.19	0.90	1.09
Post-bachelor's cert or dip	\$37,100	\$36,500	\$36,900	1.38	1.36	1.38
Master's	\$34,100	\$36,000	\$34,700	1.27	1.34	1.29
Doctorate	\$37,100	S	\$39,200	1.38	S	1.46

(1) National median is the median earnings of anyone with earned income in LEED in tax year 2005 (\$26,800).

(2) S: Earnings based on less than 25 people have been suppressed. See table 8 for counts.

The effect of level of study is evident. Higher levels of study were associated with higher earnings. The exception was at master's level where one-year earnings were less than those of leavers who were enrolled in one-year post-bachelor's qualifications. One-year post-bachelor's qualifications are typically very vocationally specific. They also include bachelor's with honours degrees, and it may be these factors that are influencing the higher first-year earnings. By year three this advantage had disappeared.

Tables 10 to 12 and figure 1 show changes in earnings over time, comparing those who completed a qualification with those who didn't. In terms of earnings differences, there are broadly three groups; those who studied below degree level, those who studied at bachelor's degree level, and those who studied at postgraduate level.

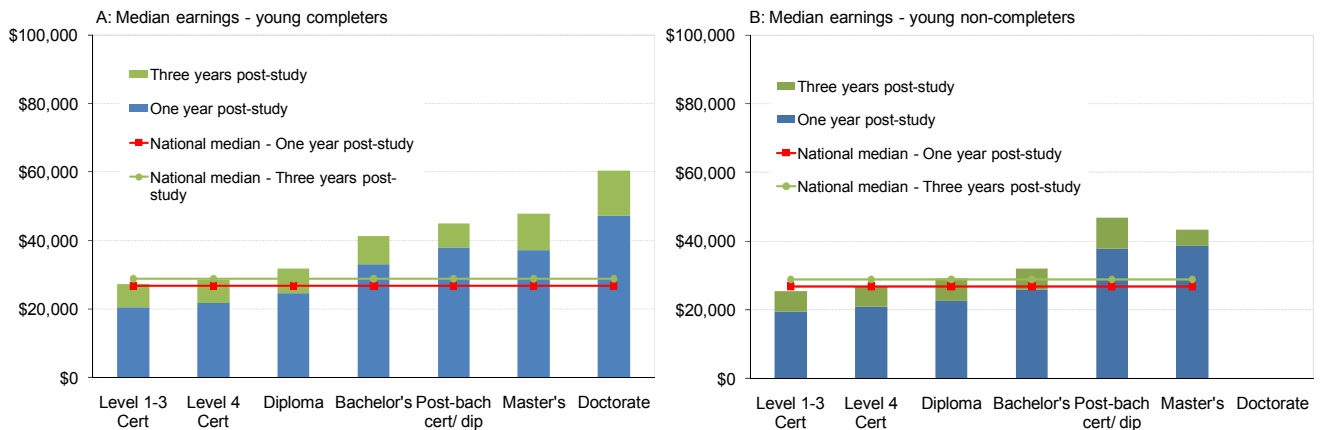
Table 10
Median earnings of young completers over time
By level of study

Level of study	One year post-study	Two years post-study	Three years post-study	\$ increase in earnings	% increase in earnings
	Annual earnings				
Level 1-3 certificate	\$20,600	\$25,100	\$27,400	\$6,800	33%
Level 4 certificate	\$21,800	\$26,200	\$28,500	\$6,700	30%
Diploma	\$24,700	\$29,700	\$31,900	\$7,200	29%
Bachelor's	\$33,000	\$39,000	\$41,300	\$8,300	25%
Post-bachelor's cert or dip	\$38,100	\$42,300	\$45,000	\$7,000	18%
Master's	\$37,100	\$44,800	\$47,800	\$10,700	29%
Doctorate	\$47,300	\$51,600	\$60,300	\$13,000	28%
National median	\$26,800	\$27,800	\$28,800	\$2,000	8%

(1) National median is the median earnings of anyone with earned income in LEED in tax years 2005 to 2007 respectively.

(2) Only leavers who earned income in all three tax years 2005 to 2007 are included, therefore the one-year earnings in this table may differ from one-year earnings reported elsewhere.

Figure 1
Earnings growth – young completers and young non-completers last enrolled in 2003
By level of study



- (1) Earnings based on less than 25 people have not been reported. See table 8 for counts.
- (2) National median is the median earnings of anyone with earned income in LEED in tax years 2005 to 2007 respectively.
- (3) Only leavers who earned income in all three tax years 2005 to 2007 are included, therefore the one-year earnings in this table may differ from one-year earnings reported elsewhere.

Young leavers who completed certificates and diplomas earned between 75 and 90 percent of the national median in their first year post-study. Certificate students still earned less than the national median after three years. However, diploma leavers had reached the national median by their third year of earnings.

Level 4 certificate study represents a level that is higher than upper secondary, one which is often associated with trade training. The median earnings of students who completed a qualification at this level were around 6 percent higher than those who completed a certificate at level 1 to 3 (the equivalent of upper secondary level). Diploma completers earned around 13 percent more than those completing a level 4 certificate, and 20 percent more than those completing level 1 to 3 certificates.

The median earnings of young bachelor's degree completers in their first year post-study were about 19 percent higher than the national median, but after three years this difference had increased to over 40 percent. First-year post-study median earnings for students who completed a degree were 33 percent higher than for those who had completed a diploma, and 30 percent higher after three years.

The median earnings of young one-year postgraduate-qualification completers in their first year post-study were 40 percent higher than the national median, and this increased to 60 percent after three years. The median earnings of these students were around 16 percent higher than for bachelor completers in their first year post-study, and 9 percent higher after three years.

The median earnings of young doctorate completers was more than twice the national median after three years of work post-study. Median one-year post-study earnings for completers at this level were 16 percent higher than for those leaving with bachelor's degrees. By the third year this difference had increased to 46 percent.

Table 11

**Median earnings of young non-completers over time
By level of study**

Level of study	One year post-study	Two years post-study	Three years post-study	\$ increase in earnings	% increase in earnings
	Annual earnings				
Level 1-3 certificate	\$19,400	\$23,200	\$25,500	\$6,100	31%
Level 4 certificate	\$20,900	\$24,800	\$26,800	\$5,900	28%
Diploma	\$22,700	\$27,100	\$29,100	\$6,500	28%
Bachelor's	\$25,900	\$30,500	\$32,100	\$6,300	24%
Post-bachelor's cert or dip	\$37,700	\$44,400	\$46,800	\$9,100	24%
Master's	\$38,600	\$44,000	\$43,300	\$4,700	12%
Doctorate	S	S	S	S	S
National median	\$26,800	\$27,800	\$28,800	\$2,000	8%

- (1) Earnings based on less than 25 people have not been reported.
- (2) National median is the median earnings of anyone with earned income in LEED in tax years 2005 to 2007 respectively.
- (3) Only leavers who earned income in all three tax years 2005 to 2007 are included, therefore the one-year earnings in this table may differ from one-year earnings reported elsewhere.

Income growth, in percentage terms, appeared to be similar for completers and non-completers for degree-level study and below. At postgraduate levels, there were more marked differences in growth. In general, premiums reduced slightly after three years, possibly as ability and work experience factors begin to play a bigger role. The exception was at master's level where the median earnings in the first year were less than those who did post-bachelor's certificates or diplomas. However, by the third year, the median earnings of master's students were higher.

Table 12

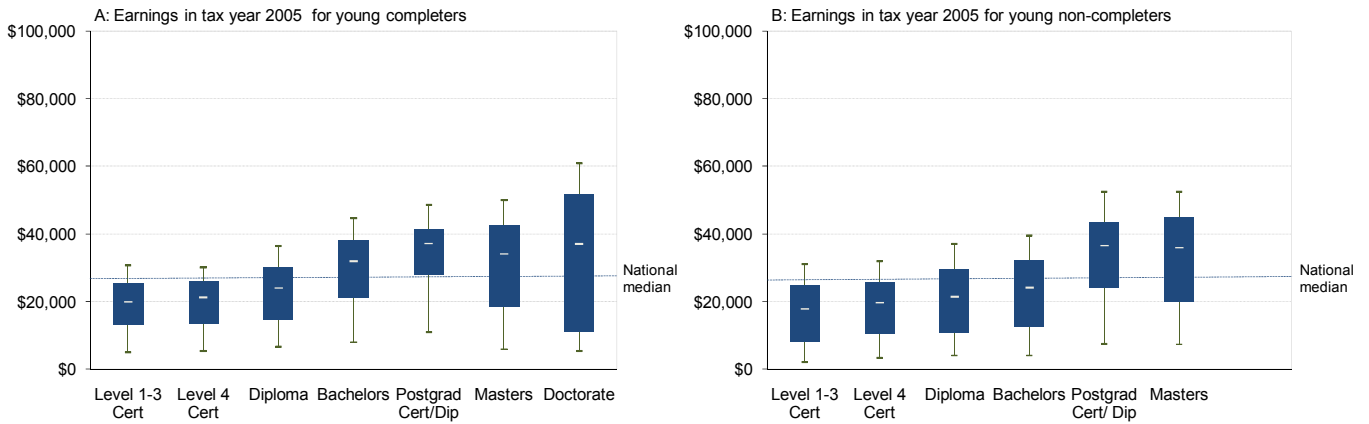
**Percentage difference in median earnings of completers over non-completers
By level of study**

Level of study	One year post-study	Two years post-study	Three years post-study
Level 1-3 certificate	6%	8%	7%
Level 4 certificate	4%	6%	6%
Diploma	9%	10%	9%
Bachelor's	28%	28%	29%
Post-bachelor's cert or dip	1%	-5%	-4%
Master's	-4%	2%	11%

- (1) Values based on less than 25 people have not been reported.
- (2) Differences are based on leavers who earned income in all three tax years 2005 to 2007.

The biggest advantage for completing a qualification was at bachelor's level, where the median earnings for completers were around \$7,000 (or 28 percent) higher than for those not completing their degree. This difference remained in the third year after study. Not completing at postgraduate level appeared less critical to one's first-year earnings, and in some cases non-completers earned more. Virtually all postgraduate non-completers are bachelor's completers, and so will be deriving some benefits from their bachelor's degree, despite having not completed their postgraduate study.

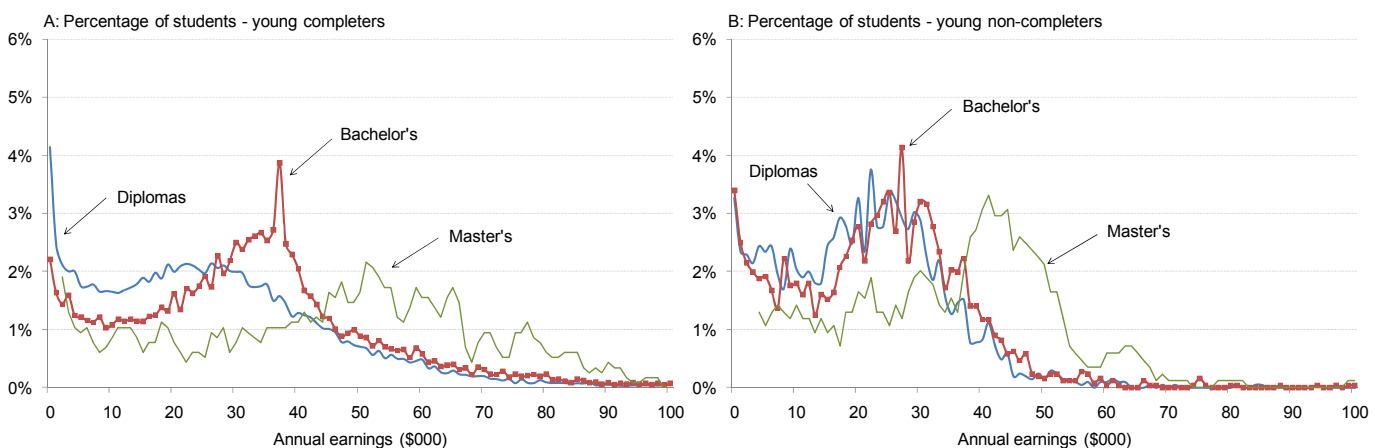
Figure 2
Earnings in the first year after study for young completers and young non-completers last enrolled in 2003
By level of study



- (1) The top and bottom points represent the 10th and 90th percentiles respectively. The top and bottom points of the bar represent the 25th and 75th percentiles respectively, while the middle white marker represents the median.
- (2) Earnings based on less than 25 people have not been reported.
- (3) National median is the median earnings of anyone with earned income in LEED in tax year 2005.

While medians are useful in characterising earnings for different groups, they often fail to reflect the nature of earnings where there is a wide or skewed distribution. Figures 2 and 3 show the distribution of earnings by level of study. There is a large spread of earnings across all levels. The inner-quartile range, which represents the middle 50 percent of earners, varies by between \$12,000 and \$40,000 for young leavers who completed a qualification, and by \$15,000 and \$25,000 for young leavers who did not complete a qualification.

Figure 3
Distribution of one-year post-study earnings for young completers and non-completers last enrolled in 2003
For selected levels of study



Apart from the spike near zero, figure 3B also shows a modal spike for bachelor's completers of \$37,000–\$38,000. This is likely to reflect benchmark setting by some employers for starting salaries for bachelor's graduates. The distributions for young diploma and bachelor's non-completers are much closer than for completers, again indicating the premium paid for completing a bachelor's degree. Master's non-completers have a distribution that is closer to that of bachelor's completers, although

the modal peak is slightly higher. This may reflect the slightly older age profile of master's students. Non-completers generally have a shorter tail; that is, fewer people earning higher incomes.

The spike near zero may, in part, reflect the fact that some young leavers are not able to secure employment straight away, or may leave employment before working a full year, either to travel overseas or to go back to study. For others who are self-employed, low first-year earnings may reflect higher business start-up costs.

The size of the spread confirms that other factors are also significantly influencing post-study earnings. Earnings can be influenced by factors other than qualification level. The nature and extent of some of these other influences is now explored further.

Table 13 presents a summary of adjusted earnings differences alongside the actual or observed differences. Actual earnings differences have been adjusted for age, sex, ethnic group, field of study, provider type, industry, and firm size of main employer. The methods used to adjust for some of the known demographic, study-related, and work-related influences are described in section 6.

Caution is needed in comparing these differences, or attributing them as qualification level differences. There are a number of factors, other than level of study, that have not been included in the adjustments, and which may be accounting for the difference in earnings. In particular, one factor is the innate ability of students, with more able students being more likely to enrol in higher levels of study. Even when limited to young leavers, as in this study, there are likely to be differences in the innate ability of some groups being compared. While level of study and completion status are likely to capture some of this ability, it may be that these differences in ability (or other unmeasured characteristics) are contributing more to the resulting earnings differences than is level of study itself.

Table 13
Actual and adjusted earnings premiums one and three years post-study
By level of study

Level of study	Young completers				Young non-completers			
	One-year		Three-year		One-year		Three-year	
	Actual	Adjusted	Actual	Adjusted	Actual	Adjusted	Actual	Adjusted
Level 1-3 certificate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Level 4 certificate	1.06	1.00	1.04	1.16**	1.10	1.23**	1.05	1.15**
Diploma	1.20	1.03	1.16	1.14**	1.20	1.17**	1.14	1.14**
Bachelor's	1.60	1.06	1.51	1.27**	1.35	1.17**	1.26	1.19**
Post-bachelor's cert or dip	1.85	1.15**	1.64	1.30**	2.05	1.27**	1.84	1.37**
Master's	1.80	1.03	1.74	1.37**	2.02	1.42**	1.70	1.41**
Doctorate	2.30	1.28*	2.20	1.83**	s	2.42**	s	2.96**

- (1) Premiums are in reference to the level 1-3 certificates group in each column, so can't be compared across columns.
- (2) In the 'Adjusted' columns ** means statistically significant at the 5 percent level, * means statistically significant at the 10 percent level. Figures with no asterisk are not statistically significant at the 10 percent level.
- (3) One-year premiums relate to all leavers who earned income in tax year 2005, while three-year premiums relate only to the subset of these who earned income in all three tax years 2005 to 2007.

In general, higher levels of study meant higher earnings after adjusting for differences in age, sex, ethnic group, field of study, provider type, industry, and firm size. Apart from

one-year earnings for completers, studying at a level beyond level 1 to 3 provided statistically significant benefits.

Results for one-year post-study earnings for young completers were in most cases not statistically significant. This is perhaps surprising, but may, in part, be reflecting the temporary work choices of some graduates who are working to save money for overseas travel. Some of these may leave New Zealand before working a full year. Also, it could reflect delays in securing satisfactory employment, or accepting a temporary job until a more desired career-oriented position is obtained. As a result, some graduates will be working for less than a full tax year, or temporarily opting for lower wages and salary in their first year.

When the one-year earnings model excludes completers who earned income in their first year, but not in the second or third year post-study, results became significant for all postgraduate levels of study, but remained not statistically significant for bachelor's degree and below. The adjusted premium at bachelor's level was similar to the full one-year cohort result (6 to 7 percent) but the p-value had reduced from 0.22 to 0.11.

By the third year of earnings, all adjusted premiums are statistically significant at the 1 percent level. The results may, in part, reflect a settling-in period as leavers move from more part-time work to more full-time work after study, or as they move from more temporary jobs to career-oriented positions.

While in general higher levels of study meant higher earnings, there were some exceptions. After adjusting, there was no longer a premium for studying at diploma level over studying a certificate at level 4. In most cases, level 4 certificate students had a higher adjusted premium, although the difference is small after three years. Diploma students are typically older than those doing level 4 certificates, and there are differences in the distribution of fields studied and industries worked in. When these differences are adjusted for, the result suggests that the labour market may not be rewarding the higher level of study or the extra year of study normally associated with diploma study.

The three-year earnings of bachelor's completers, once adjusted, were 27 percent higher than for those completing level 1 to 3 certificates, and 10 percent higher than for those completing level 4 certificates or diplomas. The corresponding figures for bachelor's non-completers were 19 percent, and 4 percent, respectively.

While students who studied one-year post-bachelor's qualifications initially earned more than master's students, by the third year master's students were earning more, regardless of whether the qualification was completed or not. However, there was not much difference in adjusted three-year earnings between those not completing their master's degree and those not completing their one-year post-bachelor's qualification. This reflects the fact that both groups may be being rewarded in the labour market primarily for their prerequisite bachelor's degree.

Field of study

There is an established relationship between certain fields of study and future income. Prospective students know, for example, that doctors and lawyers are likely to command higher income than those who graduate in other fields. For some of these students, the choice of what field to study will be influenced by what income they are likely to receive. However, for many students, the choice of what to study can be influenced by a range of other factors, such as pre-disposed ability or preference for a subject, or peer or parental influence.

In the previous sections, we examined the influences of level of study on one's earnings. In this section we analyse the influence of field of study. We focus only on young leavers who completed a qualification, and look at the actual and adjusted influences for different fields of study.

The EOTE dataset holds more detailed and more accurate fields of study information than has been available before (See Scott, 2009; Statistics NZ, 2009b). Field of study data is coded according to the New Zealand Standard Classification of Education (NZSCED). NZSCED has three levels of detail. At the highest level, fields are categorised into 12 broad fields. Below this, fields can be coded to one of 71 narrow fields. At the most detailed level, there are 376 detailed NZSCED field of study codes. In this report, we focus on the broad and narrow levels of this classification.

Unfortunately the EOTE dataset does not contain information on occupation, so the influence of field of study and occupation together on post-study income cannot be analysed directly. However, the dataset does hold information on industry of employment. Together with field of study, the EOTE dataset is able to provide additional insights on the influence that field of study has on post-study earnings.

Table 14
Median earnings one year post-study for young completers last enrolled in 2003
By broad field of study

Field of study (broad)	Level 1-3 certificate	Level 4 certificate	Diploma	Bachelor's	Post-bachelor's cert or dip	Master's	Doctorate
Natural and physical sciences	S	S	\$18,300	\$31,800	\$29,500	\$34,300	\$23,600
Information technology	\$19,700	\$23,900	\$24,600	\$33,200	\$36,600	S	S
Engineering and related technologies	\$22,100	\$26,200	\$28,400	\$35,500	\$38,200	\$41,200	S
Architecture and building	\$21,500	\$22,500	\$28,200	\$31,100	S	S	S
Agriculture, environmental and related	\$18,900	\$18,700	\$27,500	\$28,600	S	S	S
Health	\$22,600	\$20,600	\$24,000	\$37,400	\$38,200	\$34,300	S
Education	S	S	\$29,300	\$34,700	\$38,600	S	S
Management and commerce	\$20,700	\$22,200	\$26,600	\$32,500	\$36,000	\$31,600	S
Society and culture	\$17,800	\$19,100	\$21,300	\$28,700	\$37,500	\$31,200	S
Creative arts	\$18,800	\$17,300	\$20,700	\$25,400	\$28,200	\$20,300	S
Food, hospitality and personal services	\$18,300	\$19,100	\$24,700	S	S	S	S
Mixed field programmes	\$14,100	S	S	S	S	S	S
Total	\$19,900	\$21,200	\$24,000	\$31,900	\$37,100	\$34,100	\$37,100

(1) S: Earnings for groups with less than 25 people have been suppressed.

(2) Mixed field programmes at levels 1-3 include general education, employment skills and social skills courses at an upper-secondary level.

Table 15
Median earnings three years post-study for young completers last enrolled in 2003
By broad field of study

Field of study (broad)	Level 1-3 certificate	Level 4 certificate	Diploma	Bachelor's	Post-bachelor's cert or dip	Master's	Doctorate
Natural and physical sciences	S	S	\$27,300	\$42,200	\$42,400	\$48,000	S
Information technology	\$31,000	\$30,500	\$33,800	\$46,000	\$49,700	S	S
Engineering and related technologies	\$31,200	S	\$38,300	\$47,800	\$47,300	\$50,800	S
Architecture and building	\$29,700	\$31,700	\$35,900	\$39,600	S	S	S
Agriculture, environmental and related	\$26,400	\$27,000	\$33,200	\$39,900	S	S	S
Health	\$28,700	\$25,400	\$30,900	\$47,000	\$49,300	\$44,400	S
Education	S	S	\$34,900	\$40,800	\$44,700		S
Management and commerce	\$27,400	\$30,000	\$33,900	\$43,900	\$46,800	\$47,400	S
Society and culture	\$25,400	\$23,100	\$27,200	\$40,100	\$47,600	\$48,900	S
Creative arts	\$26,900	\$25,100	\$29,700	\$34,500	\$35,800	\$25,500	S
Food, hospitality and personal services	\$25,000	\$25,700	\$29,100	S	S	S	S
Mixed field programmes	\$20,500	S	S	S	S	S	S
Total	\$27,400	\$28,500	\$31,900	\$41,300	\$45,000	\$47,800	\$60,300

(1) S: Earnings for groups with less than 25 people have been suppressed.

(2) Mixed field programmes at levels 1-3 include general education, employment skills and social skills courses at an upper-secondary level.

(3) Earnings are based on leavers who earned income in all three tax years 2005 to 2007.

Tables 14 and 15 show one-year and three-year post-study earnings for young completers, by broad field of study across each level of study. In general, qualifications in the more vocationally-specific or professionally-associated fields of engineering, information technology, architecture and building, and health earned the most. Qualifications in science, and management and commerce generally earned in the middle range of earnings, while qualifications in society and culture, creative arts, and food, hospitality, and personal services generally earned less than in other fields. Qualifications in education started relatively higher but after three years were earning similar amounts to those near the middle-earning fields.

However, broad fields can span a diverse range of disciplines, and variations in earnings among these disciplines can distort the picture at the broad level. The most diverse broad field, society and culture, includes the relatively high-earning fields of law and economics along with the relatively lower-earning fields of humanities, social sciences, and language. The broad field of health includes the high-earning fields of medicine, dentistry, and veterinary science, along with the relatively lower-earning fields of nursing, occupational therapy, and complementary health.

Under current Statistics NZ release rules, median earnings can only be reported for groups with 25 or more students. When disaggregating our study cohort by seven levels of study and 70 narrow fields of study, resulting small numbers mean that for some levels a large number of categories are suppressed. However, the remaining categories generally still represent a large majority of the cohort, from 71 percent for post-bachelor's certificates and diplomas to 95 percent for bachelor's degrees. The exceptions are at master's and doctorate level, where small numbers mean most of the cohort is suppressed.

Tables 16 to 20 and figures 4 to 8 look at post-study earnings by narrow field across five levels of study, excluding master's and doctorate completers. The proportion of the population covered at each level is given under each corresponding graph.

Level 1 to 3 certificates

Level 1 to 3 certificate study represents study that is equivalent to upper secondary level. For some young students, studying a level 1 to 3 certificate is a chance to re-engage with the education system after perhaps leaving school early. For others, it is a way to gain training and credentials in specific vocational areas, such as hairdressing or beauty therapy, or to gain basic foundation skills that will enable prospects for a better job or further tertiary study.

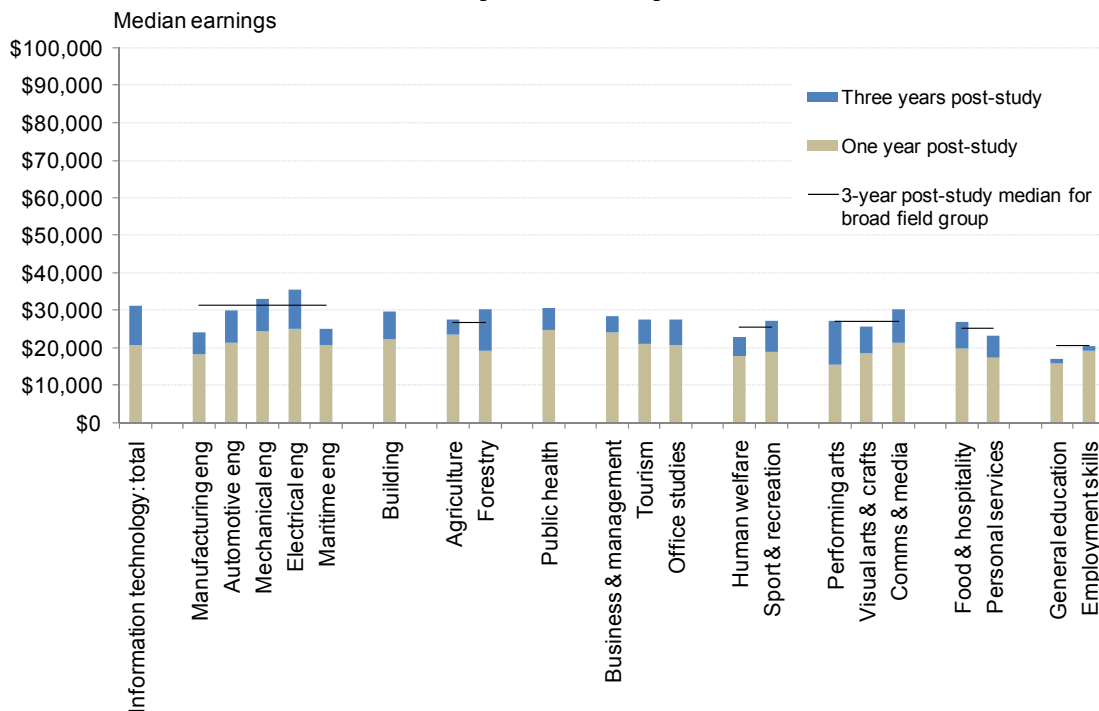
Young people who completed a level 1 to 3 certificate in 2003 studied predominantly in the fields of food and hospitality, personal services, engineering, office studies, tourism, public health, and agriculture.

Those who gained certificates in engineering, information technology, and public health had relatively higher median earnings in their first year after study. This was still the case after three years of earnings.

Those completing foundation-level certificates in general education (schooling) and employment skills had the lowest median earnings. Students completing level 1 to 3 certificates in personal services or in human welfare studies also had relatively lower earnings.

The median earnings of \$20,600 grew by 33 percent between the first and third years post-study. The fastest growing fields in terms of median earnings were performing arts, forestry, and information technology. The slowest growing fields were general education, employment skills, agriculture, and business and management.

Figure 4
Median post-study earnings for young leavers completing level 1 to 3 certificates in 2003
By field of study



(1) Earnings for fields with less than 25 people have been suppressed. The remaining categories represent 89% of the cohort.
 (2) All earnings are based on leavers who earned income in all three tax years 2005 to 2007.

Table 16
Post-study earnings for young leavers completing level 1 to 3 certificates in 2003
By field of study

Field (broad and narrow)	Number with earnings 2004 to 2006	One year post-study		Three years post-study		Earnings increase	
		Median \$	Proportion of national median	Median \$	Proportion of national median	\$	%
Information technology	50	20,500	0.76	31,000	1.08	10,500	51%
Other IT	30	23,700	0.88	31,000	1.08	7,300	31%
Engineering	510	22,500	0.84	31,200	1.08	8,700	39%
Manufacturing eng	30	18,100	0.68	24,000	0.83	5,900	33%
Automotive eng	210	21,400	0.80	29,700	1.03	8,300	39%
Mechanical eng	110	24,400	0.91	33,000	1.15	8,600	35%
Electrical eng	90	25,000	0.93	35,500	1.23	10,500	42%
Maritime eng	40	20,500	0.76	25,000	0.87	4,500	22%
Architecture & building	90	22,200	0.83	29,700	1.03	7,500	34%
Building	90	22,200	0.83	29,700	1.03	7,500	34%
Agriculture	150	19,200	0.72	26,400	0.92	7,200	38%
Agriculture	50	23,400	0.87	27,500	0.95	4,100	18%
Forestry	50	19,200	0.72	30,000	1.04	10,800	56%
Health	200	23,500	0.88	28,700	1.00	5,200	22%
Public health	150	24,500	0.91	30,400	1.06	5,900	24%
Management & commerce	440	21,400	0.80	27,400	0.95	6,000	28%
Business & management	80	24,100	0.90	28,300	0.98	4,200	17%
Tourism	150	21,000	0.78	27,400	0.95	6,400	30%
Office studies	240	20,700	0.77	27,500	0.95	6,800	33%
Society & culture	250	18,600	0.69	25,400	0.88	6,800	37%
Human welfare	90	17,800	0.66	22,700	0.79	4,900	28%
Sport & recreation	130	18,800	0.70	27,000	0.94	8,200	44%
Creative arts	120	19,500	0.73	26,900	0.93	7,400	38%
Performing arts	40	15,300	0.57	27,000	0.94	11,700	76%
Visual arts & crafts	40	18,400	0.69	25,600	0.89	7,200	39%
Comms & media	30	21,400	0.80	30,100	1.05	8,700	41%
Food, hospitality & personal	580	18,600	0.69	25,000	0.87	6,400	34%
Food & hospitality	370	19,700	0.74	26,700	0.93	7,000	36%
Personal services	210	17,200	0.64	23,100	0.80	5,900	34%
Mixed field programmes	110	16,200	0.60	20,500	0.71	4,300	27%
General education	40	15,700	0.59	17,000	0.59	1,300	8%
Employment skills	60	19,100	0.71	20,400	0.71	1,300	7%
All completers	2,420	20,600	0.77	27,400	0.95	6,800	33%
National median		26,800	1.00	28,800	1.00	2,000	8%

(1) Earnings for fields with less than 25 people have been suppressed. Students may have more than one field.

(2) All earnings are based on leavers who earned income in all three tax years 2005 to 2007. Therefore the one-year earnings in this table may differ from one-year earnings reported elsewhere.

(3) National median is the median earnings of anyone with earnings in LEED in tax year 2005 or tax year 2007 respectively.

Level 4 certificates

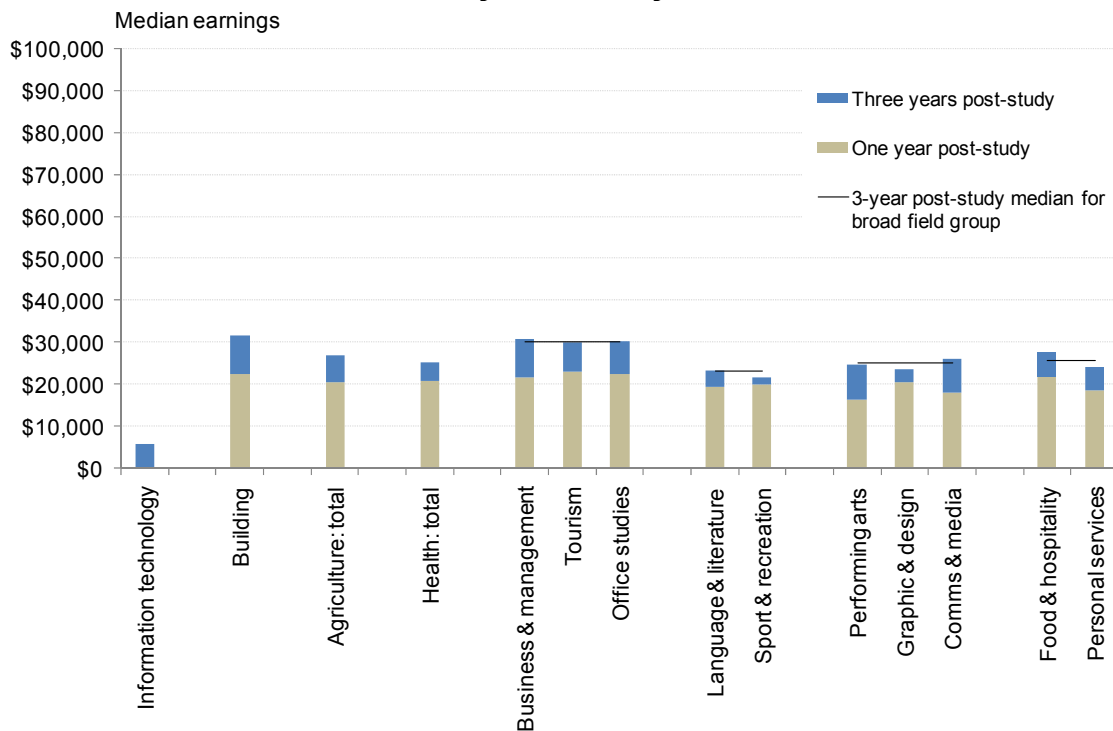
Level 4 certificate study is typically (but not always) associated with one-year vocationally-oriented or trade-based study. Much of the formal learning undertaken in the workplace is at this level, and many young people at this level are learning while working rather than through a tertiary education provider. This includes, for example, young people doing modern apprenticeship training.

Young people who gained level 4 certificates at a tertiary education provider studied predominantly in the fields of tourism, building, business and management, office studies, personal services, and food and hospitality.

Those completing certificates in building, information technology, and management and commerce subjects had relatively higher median earnings.

Those completing level 4 certificates in the performing arts, personal services, language, and sport and recreation had lower median earnings.

Figure 5
Median post-study earnings for young leavers completing level 4 certificates in 2003
By field of study



- (1) Earnings for fields with less than 25 people have been suppressed. The remaining categories represent 80% of the total cohort.
- (2) All earnings are based on leavers who earned income in all three tax years 2005 to 2007.

What Do Students Earn After Their Tertiary Education?

Table 17
Post-study earnings for young leavers completing level 4 certificates in 2003
By field of study

Field (broad and narrow)	Number with earnings 2004 to 2006	One year post-study		Three years post-study		Earnings increase	
		Median \$	Proportion of national median	Median \$	Proportion of national median	\$	%
Information technology	30	24,700	0.92	30,500	1.06	5,800	23%
Architecture & building	160	22,600	0.84	31,700	1.10	9,100	40%
Building	160	22,600	0.84	31,700	1.10	9,100	40%
Agriculture	30	20,600	0.77	27,000	0.94	6,400	31%
Health	40	21,000	0.78	25,400	0.88	4,400	21%
Management & commerce	320	23,100	0.86	30,000	1.04	6,900	30%
Business & management	110	21,800	0.81	30,800	1.07	9,000	41%
Tourism	230	23,200	0.87	30,100	1.05	6,900	30%
Office studies	160	22,500	0.84	30,200	1.05	7,700	34%
Society & culture	90	20,100	0.75	23,100	0.80	3,000	15%
Language & literature	30	19,300	0.72	23,300	0.81	4,000	21%
Sport & recreation	50	20,100	0.75	21,600	0.75	1,500	7%
Creative arts	100	18,200	0.68	25,100	0.87	6,900	38%
Performing arts	30	16,500	0.62	24,700	0.86	8,200	50%
Graphic & design	30	20,600	0.77	23,700	0.82	3,100	15%
Comms & media	30	18,100	0.68	26,000	0.90	7,900	44%
Food, hospitality & personal	180	19,500	0.73	25,700	0.89	6,200	32%
Food & hospitality	90	21,900	0.82	27,600	0.96	5,700	26%
Personal services	100	18,600	0.69	24,100	0.84	5,500	30%
All completers	950	21,800	0.81	28,500	0.99	6,700	31%
National median		26,800	1.00	28,800	1.00	2,000	8%

(1) Earnings for fields with less than 25 people have been suppressed. Students may have more than one field.

(2) All earnings are based on leavers who earned income in all three tax years 2005 to 2007. Therefore the one-year earnings in this table may differ from one-year earnings reported elsewhere.

(3) National median is the median earnings of anyone with earnings in LEED in tax year 2005 or tax year 2007 respectively.

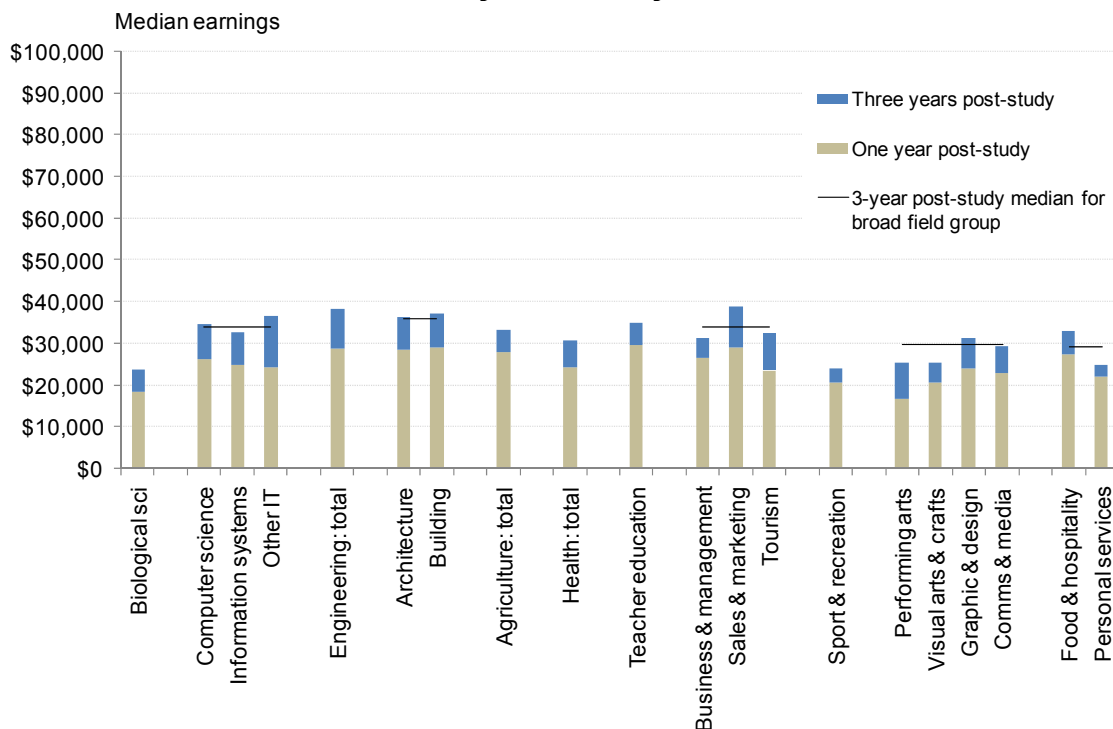
Diplomas

Diploma-level study is typically associated with two-year vocationally-oriented study, often at an institute of technology or polytechnic. The most common fields for diplomas completed in 2003 were graphic and design studies, communication and media studies, information technology, business and management, food, hospitality and personal services, engineering, office studies, tourism, public health, and agriculture.

The fields with the highest median earnings were building, education, sales and marketing, and engineering. These fields still had the highest earnings after three years, except for education which had slower growth. Performing arts, sports and recreation, visual arts and crafts, and personal services had lower median earnings both one year and three years post-study.

The median earnings for diploma completers (\$24,700) grew by 29 percent between the first and third years post-study. The fastest growing fields in terms of median earnings were performing arts and information technology (both grew by 50 percent). The slowest growing fields in terms of median earnings were personal services, sport and recreation, business and management, and education (which grew between 13 and 17 percent).

Figure 6
Median post-study earnings for young leavers completing diplomas in 2003
By field of study



(1) Earnings for fields with less than 25 people have been suppressed. The remaining categories represent 73% of the total cohort.

(2) All earnings are based on leavers who earned income in all three tax years 2005 to 2007.

Table 18
Post-study earnings for young leavers completing diplomas in 2003
By field of study

Field (broad and narrow)	Number with earnings 2004 to 2006	One year post-study		Three years post-study		Earnings increase	
		Median \$	Proportion of national median	Median \$	Proportion of national median	\$	%
Sciences	40	21,800	0.81	27,300	0.95	5,500	25%
Biological sci	30	18,500	0.69	23,800	0.83	5,300	29%
Information technology	200	25,500	0.95	33,800	1.17	8,300	33%
Computer science	140	26,400	0.99	34,700	1.20	8,300	31%
Information systems	60	25,000	0.93	32,800	1.14	7,800	31%
Other IT	30	24,400	0.91	36,700	1.27	12,300	50%
Engineering	70	29,000	1.08	38,300	1.33	9,300	32%
Architecture & building	60	27,400	1.02	35,900	1.25	8,500	31%
Architecture	40	28,400	1.06	36,400	1.26	8,000	28%
Building	30	29,200	1.09	37,200	1.29	8,000	27%
Agriculture	40	27,900	1.04	33,200	1.15	5,300	19%
Health	90	24,300	0.91	30,900	1.07	6,600	27%
Other health	40	24,200	0.90	29,000	1.01	4,800	20%
Education	80	29,800	1.11	34,900	1.21	5,100	17%
Teacher education	70	29,800	1.11	35,200	1.22	5,400	18%
Management & commerce	190	27,300	1.02	33,900	1.18	6,600	24%
Business & management	110	26,700	1.00	31,300	1.09	4,600	17%
Sales & marketing	40	29,100	1.09	39,000	1.35	9,900	34%
Tourism	30	23,600	0.88	32,500	1.13	8,900	38%
Society & culture	160	22,700	0.85	27,200	0.94	4,500	20%
Sport & recreation	90	20,600	0.77	24,000	0.83	3,400	17%
Creative arts	380	22,500	0.84	29,700	1.03	7,200	32%
Performing arts	40	16,900	0.63	25,400	0.88	8,500	50%
Visual arts & crafts	60	20,800	0.78	25,400	0.88	4,600	22%
Graphic & design	190	24,000	0.90	31,400	1.09	7,400	31%
Comms & media	120	22,900	0.85	29,500	1.02	6,600	29%
Food, hospitality & personal	120	25,300	0.94	29,100	1.01	3,800	15%
Food & hospitality	60	27,300	1.02	33,100	1.15	5,800	21%
Personal services	60	22,100	0.82	25,000	0.87	2,900	13%
All completers	1,230	24,700	0.92	31,900	1.11	7,200	29%
National median		26,800	1.00	28,800	1.00	2,000	8%

(1) Earnings for fields with less than 25 people have been suppressed. Students may have more than one field.

(2) All earnings are based on leavers who earned income in all three tax years 2005 to 2007. Therefore the one-year earnings in this table may differ from one-year earnings reported elsewhere.

(3) National median is the median earnings of anyone with earnings in LEED in tax year 2005 or tax year 2007 respectively.

Bachelor's degrees

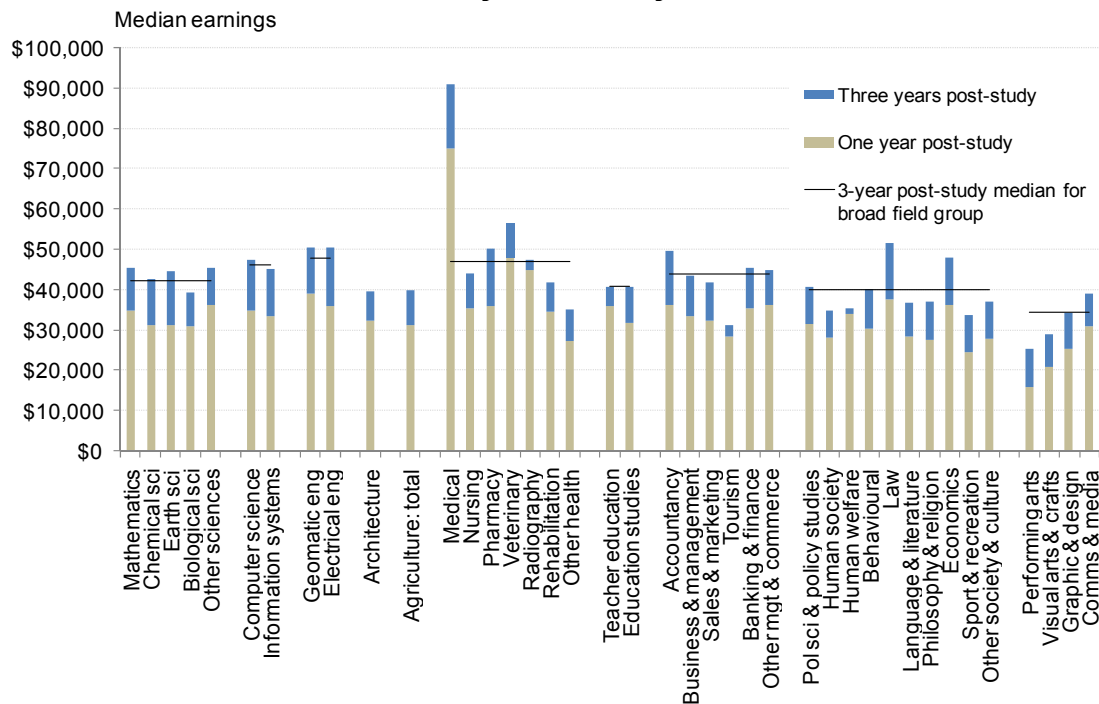
Degree graduates who specialised in engineering, health, or information technology-related fields had the highest median earnings. Students who graduated in the sciences or in management and commerce-related fields were in the middle range of earnings, while those graduating in society and culture and creative arts fields had lower median earnings. Graduates in medicine had significantly higher median earnings than those in other fields.

However, within these broad groupings there were noticeable differences: for example, law and economics (which are within society and culture) had significantly higher median earnings than other fields within this broad field. Within health, there was a large difference between medical, dentistry, and veterinary degrees and degrees in nursing or rehabilitation therapies (eg physiotherapy). Note that this data predates a significant pay rise for nurses in 2006. By contrast, median earnings for different engineering disciplines were more uniform, as were, to a lesser extent, earnings for different science disciplines.

The median first-year earnings of \$33,000 grew by 25 percent between the first and third years post-study. The fastest growing fields in terms of median earnings were performing arts, earth sciences, electrical engineering, and pharmacy (all by 40 percent or more). The slowest growing fields were studies in human welfare (social work), tourism, and education (which all grew by less than 15 percent).

Actual and adjusted earnings differences for bachelor's degree fields are discussed in more detail later in this section.

Figure 7
Median post-study earnings for young leavers completing bachelor's degrees in 2003
By field of study



(1) Earnings for fields with less than 25 people have been suppressed. The remaining categories represent 95% of the total cohort.

What Do Students Earn After Their Tertiary Education?

Table 19
Post-study earnings for young leavers completing bachelor's degrees in 2003
By field of study

Field (broad and narrow)	Number	One year post-study		Three years post-study		Earnings increase	
		Median \$	Proportion of national median	Median \$	Proportion of national median	\$	%
Sciences	260	32,900	1.23	42,200	1.47	9,300	28%
Mathematics	40	34,900	1.30	45,600	1.58	10,700	31%
Chemical sci	30	31,400	1.17	42,800	1.49	11,400	36%
Earth sci	40	31,400	1.17	44,800	1.56	13,400	43%
Biological sci	100	31,100	1.16	39,400	1.37	8,300	27%
Other sciences	80	36,400	1.36	45,500	1.58	9,100	25%
Information technology	430	33,900	1.26	46,000	1.60	12,100	36%
Computer science	200	35,000	1.31	47,600	1.65	12,600	36%
Information systems	300	33,600	1.25	45,200	1.57	11,600	35%
Engineering	120	37,200	1.39	47,800	1.66	10,600	28%
Geomatic eng	30	39,000	1.46	50,500	1.75	11,500	29%
Electrical eng	50	36,000	1.34	50,600	1.76	14,600	41%
Architecture & building	110	32,600	1.22	39,600	1.38	7,000	21%
Architecture	110	32,300	1.21	39,600	1.38	7,300	23%
Agriculture	40	31,400	1.17	39,900	1.39	8,500	27%
Health	580	38,100	1.42	47,000	1.63	8,900	23%
Medical	110	75,200	2.81	91,000	3.16	15,800	21%
Nursing	180	35,500	1.32	44,300	1.54	8,800	25%
Pharmacy	70	35,900	1.34	50,300	1.75	14,400	40%
Veterinary	30	47,900	1.79	56,600	1.97	8,700	18%
Radiography	30	45,000	1.68	47,500	1.65	2,500	6%
Rehabilitation	110	34,700	1.29	41,900	1.45	7,200	21%
Other health	40	27,400	1.02	35,100	1.22	7,700	28%
Education	550	35,700	1.33	40,800	1.42	5,100	14%
Teacher education	510	35,900	1.34	40,800	1.42	4,900	14%
Education studies	170	31,800	1.19	40,600	1.41	8,800	28%
Management & commerce	930	33,700	1.26	43,900	1.52	10,200	30%
Accountancy	150	36,400	1.36	49,800	1.73	13,400	37%
Business & management	470	33,500	1.25	43,600	1.51	10,100	30%
Sales & marketing	380	32,500	1.21	42,000	1.46	9,500	29%
Tourism	60	28,400	1.06	31,400	1.09	3,000	11%
Banking & finance	100	35,400	1.32	45,600	1.58	10,200	29%
Society & culture	770	30,800	1.15	40,100	1.39	9,300	30%
Pol sci & policy studies	50	31,500	1.18	40,800	1.42	9,300	30%
Human society	170	28,200	1.05	35,100	1.22	6,900	24%
Human welfare	30	34,200	1.28	35,600	1.24	1,400	4%
Behavioural	120	30,300	1.13	40,400	1.40	10,100	33%
Law	100	37,600	1.40	51,600	1.79	14,000	37%
Language & literature	140	28,500	1.06	37,000	1.28	8,500	30%
Philosophy & religion	40	27,500	1.03	37,300	1.30	9,800	36%
Economics	100	36,200	1.35	48,100	1.67	11,900	33%
Sport & recreation	50	24,700	0.92	33,800	1.17	9,100	37%
Other society & culture	100	27,900	1.04	37,100	1.29	9,200	33%
Creative arts	580	26,300	0.98	34,500	1.20	8,200	31%
Performing arts	70	16,000	0.60	25,400	0.88	9,400	59%
Visual arts & crafts	130	21,000	0.78	29,100	1.01	8,100	39%
Graphic & design	210	25,500	0.95	34,400	1.19	8,900	35%
Comms & media	190	31,000	1.16	39,000	1.35	8,000	26%
All completers	3,720	33,000	1.23	41,300	1.43	8,300	25%
National median		26,800	1.00	28,800	1.00	2,000	8%

(1) The same notes that are on Table 18 apply also to this table.

Post-bachelor's certificates and diplomas

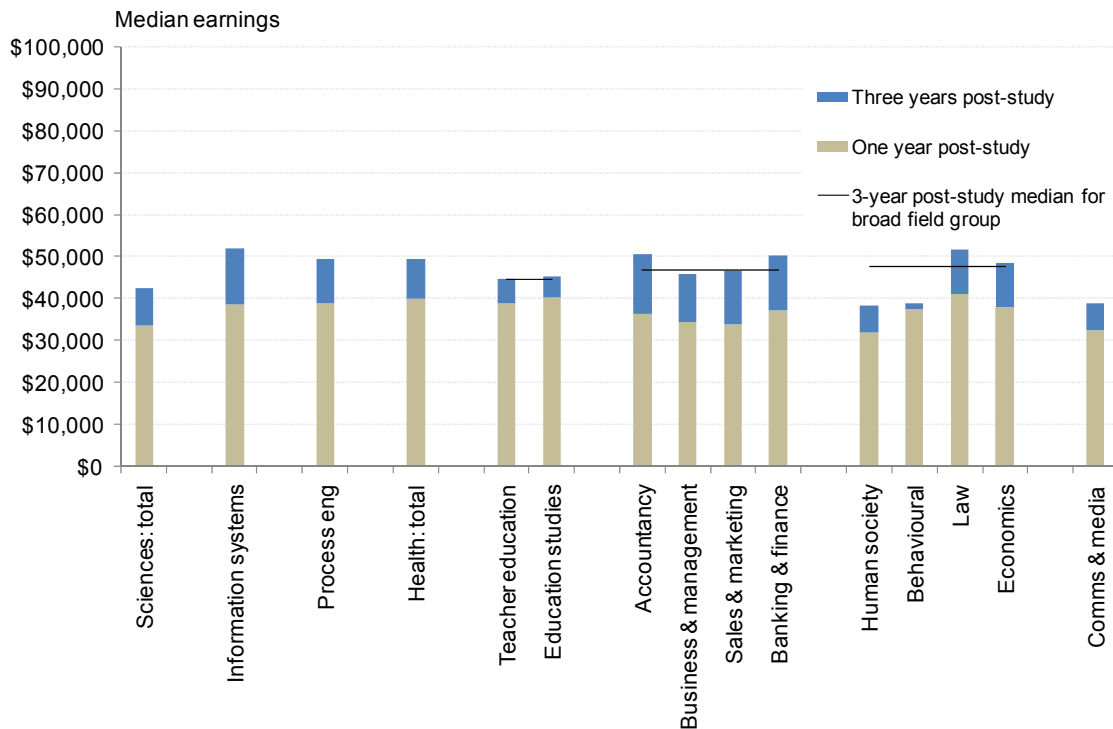
This level includes half-year to two-year graduate-level or postgraduate-level study that is typically highly specialised around a vocational field. The most common fields for young people completing these types of qualifications in 2003 were education, law, and business and management.

Those who completed qualifications in law, health, education, and engineering had relatively higher median earnings in their first year, and this persisted to their third year of earnings. By the third year, those in information technology, accountancy, banking and finance also had relatively higher median earnings.

Graduates in the creative arts, including communication and media studies, had relatively lower median earnings, along with graduates in the humanities, psychology, and other social sciences.

The median earnings of \$38,100 grew by 18 percent between the first and third years post-study. The fastest growing fields in terms of median earnings were information technology, accountancy, banking, finance, sales and marketing, and other business and management related fields (by 30 percent or more). The slowest growing fields were those relating to education (which grew between 12 and 15 percent). As with other levels of study, education graduates had higher starting salaries, but their relative median earnings had slipped by the third year.

Figure 8
Median post-study earnings for young leavers completing post-bachelor's certificates and diplomas in 2003
By field of study



- (1) Earnings for fields with less than 25 people have been suppressed. The remaining categories represent 71% of the total cohort.
- (2) All earnings are based on leavers who earned income in all three tax years 2005 to 2007.

Table 20
Post-study earnings for young leavers completing post-bachelor’s certificates and diplomas in 2003
By field of study

Field (broad and narrow)	Number with earnings 2004 to 2006	One year post-study		Three years post-study		Earnings increase	
		Median \$	Proportion of national median	Median \$	Proportion of national median	\$	%
Sciences	70	33,600	1.25	42,400	1.47	8,800	26%
Information technology	50	37,800	1.41	49,700	1.73	11,900	31%
Information systems	30	38,600	1.44	52,000	1.81	13,400	35%
Engineering	50	39,200	1.46	47,300	1.64	8,100	21%
Process eng	30	38,800	1.45	49,400	1.72	10,600	27%
Health	50	40,000	1.49	49,300	1.71	9,300	23%
Education	360	38,800	1.45	44,700	1.55	5,900	15%
Teacher education	350	38,800	1.45	44,700	1.55	5,900	15%
Education studies	90	40,200	1.50	45,200	1.57	5,000	12%
Management & commerce	260	36,000	1.34	46,800	1.63	10,800	30%
Accountancy	90	36,500	1.36	50,700	1.76	14,200	39%
Business & management	110	34,500	1.29	45,700	1.59	11,200	32%
Sales & marketing	70	34,000	1.27	46,500	1.61	12,500	37%
Banking & finance	50	37,200	1.39	50,300	1.75	13,100	35%
Society & culture	410	38,400	1.43	47,600	1.65	9,200	24%
Human society	40	31,800	1.19	38,200	1.33	6,400	20%
Behavioural	30	37,600	1.40	38,800	1.35	1,200	3%
Law	240	41,100	1.53	51,800	1.80	10,700	26%
Economics	30	38,000	1.42	48,400	1.68	10,400	27%
Creative arts	80	29,800	1.11	35,800	1.24	6,000	20%
Comms & media	40	32,500	1.21	39,000	1.35	6,500	20%
All completers	1,270	38,100	1.42	45,000	1.56	6,900	18%
National median		26,800	1.00	28,800	1.00	2,000	8%

- (1) Earnings for fields with less than 25 people have been suppressed. Students may have more than one field.
- (2) All earnings are based on leavers who earned income in all three tax years 2005 to 2007. Therefore the one-year earnings in this table may differ from one-year earnings reported elsewhere.
- (3) National median is the median earnings of anyone with earnings in LEED in tax year 2005 or tax year 2007 respectively.

One of the issues with comparing actual earnings for different fields is that some of the difference may be reflecting demographic, employment-related, or other educational differences in the make-up of the groups being compared. For example, if one group has higher ability, or a higher rate of part-time work, or if inherent gender or ethnic biases remain in some groups, then this may be accounting for some of the observed difference, rather than it being the influence of field of study.

The EOTE dataset allows us to adjust earnings for some of these factors. These include age, sex, ethnic group, level of study, completion status, type of provider, main field of study, industry of employer, and firm size. However, much of the variation in earnings is left unexplained, so care is needed in interpreting how much of the adjusted premiums can be attributed to field of study. Table 21 provides a summary of the adjusted results for young bachelor’s degree completers. The premiums shown for each field represent the premium that this field provides compared with someone who completed a degree in human society studies (humanities and social sciences), holding other factors constant.

Table 21

Actual and adjusted earnings premiums three years post-study for young bachelor's degree completers
By field of study

Field (broad and narrow)	Number	One year post-study		Three years post-study	
		Actual	Adjusted	Actual	Adjusted
Sciences	260	1.07	1.07	1.05	1.03
Mathematics	40	1.24	1.02	1.30	0.99**
Chemical sci	30	1.11	1.18	1.22	1.02**
Earth sci	40	1.11	0.96	1.28	1.20
Biological sci	100	1.10	0.93	1.12	1.02**
Other sciences	80	1.29	1.14	1.30	1.21
Information technology	430	1.10	1.15**	1.15	1.21**
Computer science	200	1.24	1.05	1.36	1.15
Information systems	300	1.19	1.10*	1.29	1.19
Engineering	120	1.21	1.16**	1.19	1.15*
Geomatic eng	30	1.38	1.08	1.44	1.08*
Electrical eng	50	1.28	0.94	1.44	1.30
Architecture & building	110	1.06	1.03	0.99	0.91
Architecture	110	1.15	0.95	1.13	0.97**
Agriculture	40	1.02	1.02	1.00	1.11
Health	580	1.24	1.62**	1.17	1.25**
Medical	110	2.67	2.89**	2.59	2.71
Nursing	180	1.26	1.19**	1.26	1.22
Pharmacy	70	1.27	1.71**	1.43	0.98**
Veterinary	30	1.70	1.48**	1.61	1.19
Radiography	30	1.60	1.63**	1.35	1.24
Rehabilitation	110	1.23	1.31**	1.19	1.10*
Other health	40	0.97	1.15	1.00	1.01**
Education	550	1.16	1.35**	1.02	1.13*
Teacher education	510	1.27	1.22**	1.16	1.11
Education studies	170	1.13	0.97	1.16	1.08*
Management & commerce	930	1.09	1.20**	1.09	1.14**
Accountancy	150	1.29	1.05	1.42	1.17
Business & management	470	1.19	1.09**	1.24	1.12
Sales & marketing	380	1.15	1.06	1.20	1.05**
Tourism	60	1.01	0.86*	0.89	0.93**
Banking & finance	100	1.26	1.07	1.30	1.09*
Society & culture	770	1.00	1.00	1.00	1.00
Pol sci & policy studies	50	1.12	0.90	1.16	1.06*
Human society	170	1.00	1.00	1.00	1.00
Human welfare	30	1.21	0.98	1.01	0.91**
Behavioural	120	1.07	0.95	1.15	1.10*
Law	100	1.33	1.19**	1.47	1.22
Language & literature	140	1.01	0.89*	1.05	0.89**
Philosophy & religion	40	0.98	0.96	1.06	1.22
Economics	100	1.28	0.99	1.37	1.12
Sport & recreation	50	0.88	0.80**	0.96	1.04**
Other society & culture	100	0.99	0.97	1.06	0.98**
Creative arts	580	0.85	0.91**	0.86	0.90**
Performing arts	70	0.57	0.56**	0.72	0.72**
Visual arts & crafts	130	0.74	0.73**	0.83	0.88**
Graphic & design	210	0.90	0.88**	0.98	0.87**
Comms & media	190	1.10	1.04	1.11	1.02**

(1) Earnings for fields with less than 25 people have been suppressed. Students may have more than one field.

(2) The premiums for narrow fields (the indented fields) are in relation to those whose narrow field was 'studies in human society'. The premiums for the 10 broad fields are in relation to the earnings of those whose broad field was 'society and culture'.

(3) In the 'Adjusted' columns ** means statistically significant at the 5 percent level, * means statistically significant at the 10 percent level. Figures with no asterisk are not statistically significant at the 10 percent level.

Course completion versus qualification completion

Not all students enrol in tertiary education with the intention of completing a qualification. Around 20 percent of diploma students, for example, pass every course they enrol in, without having enrolled in sufficient courses to gain their diploma. Even at degree level, this is the case for around 12 percent of students. However, these students are more likely to be older, and many will have a previous qualification. They may include, for example, those older people who are coming back to study a particular course or courses³ for vocational upskilling reasons.

There is ongoing discussion about the relative benefits of course-based versus qualification-based achievement and the attention that funding and other policy work should focus on each. If the labour market does not discriminate course completion sufficiently well – say for young non-tertiary qualified students – then some argue that funding and monitoring work should be less focused on this, and more focused on qualification completion. However, if course-based achievement does convey benefits – either for older or younger students – then some funding or monitoring attention may be appropriate. This is particularly so where there is interest in policies aimed at influencing the supply of particular skills, which is often more associated with course-based rather than qualification-based study.

In this section, we look at the question of whether the labour market differentiates between young leavers who are successful at the course level but not at the qualification level. In this analysis, we have used five different types of completion:

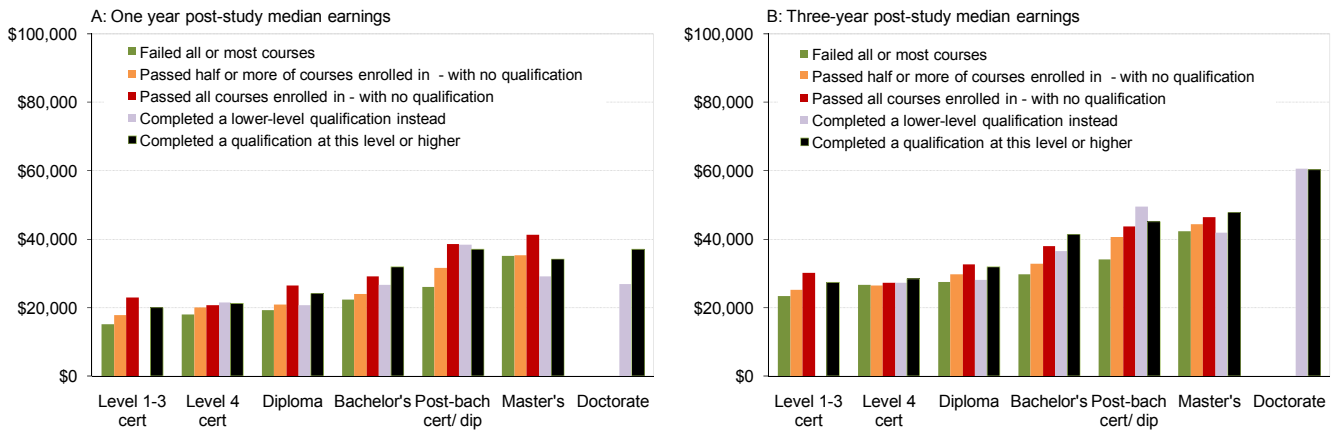
- those who failed all or most of their courses
- those who passed more than half the courses enrolled in, but did not complete a qualification
- those who passed all courses enrolled in, but did not complete a qualification
- those who completed a qualification at a lower-level than the level enrolled at
- those who completed a qualification at the same level as, or higher than, the level enrolled at.

Each student can be assigned to one category only. Given that doctoral study is primarily thesis-based, analysis at doctoral level relates to the last two categories only. For the purposes of this study, no distinction is made for the number of courses enrolled in, or whether the student had enrolled in sufficient courses to gain a qualification or not.

³ While the term 'course' is often used as a synonym for qualification, in this study it is used to encompass the terms 'paper', 'module', or 'unit' etc that are variously used to represent components of study towards a qualification.

Figure 9 compares one-year and three-year actual post-study earnings by completion status across different levels of study. The graphs show some discrimination for course success, in addition to qualification success. Students who passed all courses but left with no qualification generally earned more in their first year than those who had left with a qualification. This was true for all levels, except level 4 certificates and bachelor's level. By the third year of earnings this advantage still remained for level 1 to 3 certificate and diploma level, but had disappeared for other levels.

Figure 9
Median earnings for young 2003 leavers one and three years post-study
By level of study and completion status



- (1) S: Earnings for groups with less than 25 people have been suppressed.
- (2) One-year earnings (Figure 10A) include anyone with earned income in tax year 2005, while three-year earnings (Figure 10B) only include those with earned income in all three tax years, 2005–07.

The biggest difference in median earnings was for level 1 to 3 certificates, where young leavers who had passed all courses without a certificate earned 15 percent more than certificate holders in their first year. This reduced to 10 percent after three years. While level 1 to 3 certificate qualifications often comprise single courses, the results suggest that, at this level, as well as at diploma level, course success is being rewarded at least as well as qualification success. However, while these results relate to young leavers only (and are therefore less likely to be confounded by previous work experience or qualification attainment), there may be other factors accounting for these differences.

Tables 22 and 23 include results adjusted for differences in age, sex, ethnic group, field of study, provider type, firm size, and industry. While diploma students who had passed all their papers with no qualification still had higher earnings in their first year than diploma completers, this difference had disappeared by the third year.

Table 22
Earnings premiums one year post-study for young leavers last enrolled in 2003
By level of study and completion status

Level of study	Failed all or most courses enrolled in	Passed half or more of courses enrolled in with no qualification	Passed all courses enrolled in with no qualification	Completed a lower-level qualification instead	Completed a qualification at this level or higher
	Actual				
Level 1-3 certificate	1.00	1.17	1.50	...	1.30
Level 4 certificate	1.00	1.10	1.15	1.20	1.17
Diploma	1.00	1.09	1.37	1.08	1.24
Bachelor's	1.00	1.07	1.30	1.19	1.42
Post-bachelor's cert or dip	1.00	1.21	1.48	1.47	1.42
Master's	1.00	1.00 ⁽³⁾	1.18	0.83	0.97
Doctorate	...	...	...	...	...
Adjusted					
Level 1-3 certificate	1.00	1.30**	1.54**	...	1.67**
Level 4 certificate	1.00	1.11**	1.24**	1.31**	1.30**
Diploma	1.00	1.13**	1.39**	1.27**	1.32**
Bachelor's	1.00	1.01	1.05	1.25**	1.21**
Post-bachelor's cert or dip	1.00	1.01	1.23	1.16	1.24**
Master's	1.00	1.25	1.53	1.42	1.03
Doctorate	...	...	...	...	...

(1) Premiums are in relation to the failed group in each respective row, so can't be compared across rows.

(2) ... means not applicable.

(3) Actual premiums for master's students are compared with a base combining groups from the first two columns.

(4) In the 'Adjusted' columns ** means statistically significant at the 5 percent level, * means statistically significant at the 10 percent level. Figures with no asterisk are not statistically significant at the 10 percent level.

Table 23
Earnings premiums three years post-study for young leavers last enrolled in 2003
By level of study and completion status

Level of study	Failed all or most courses enrolled in	Passed half or more of courses enrolled in with no qualification	Passed all courses enrolled in with no qualification	Completed a lower-level qualification instead	Completed a qualification at this level or higher
	Actual				
Level 1-3 certificate	1.00	1.08	1.28	...	1.17
Level 4 certificate	1.00	0.99	1.03	1.03	1.07
Diploma	1.00	1.09	1.19	1.03	1.16
Bachelor's	1.00	1.10	1.27	1.23	1.39
Post-bachelor's cert or dip	1.00	1.20	1.29	1.45	1.32
Master's	1.00	1.00	1.05	0.94	1.08
Doctorate	...	....	...	...	...
Adjusted					
Level 1-3 certificate	1.00	1.17**	1.36**	....	1.36**
Level 4 certificate	1.00	1.02	1.24**	1.12	1.27**
Diploma	1.00	1.27**	1.25**	1.20*	1.35**
Bachelor's	1.00	1.09*	1.12*	1.21**	1.33**
Post-bachelor's cert or dip	1.00	1.31**	1.18	1.38**	1.33**
Master's	1.00	1.32	1.21	1.01	1.37
Doctorate	...	...	...	...	...

(1) Tables notes for Table 22 apply for this table also.

Results tend to support what is perhaps already known about young leavers with no previous tertiary qualifications who are entering the labour force: namely, that course success, once adjusted for known demographic, study-related, and work-related differences does not in general convey the same earnings rewards as holding a

qualification. However, the study does find support for the fact that some course achievement is better than none at all, in particular for qualifications below degree level.

The focus of this study has been on young leavers, and in many ways the question of whether course-based success conveys benefits over and above qualifications is perhaps more applicable to older leavers. Initial modelling for older leavers shows that those passing all papers with no qualification earned more than those who gained the qualification. This was true for all levels of study, and for both one year and three years after leaving. All results were statistically significant at the 5 percent level.

However, as the data does not hold information on highest previous qualification held, one might argue that those older students who passed all their courses with no qualification were more likely than those currently completing a qualification to have a qualification from before their latest period of study. This may be accounting for a large part of the result.

A proper treatment of this question would consider the before and after benefits of course success. This is left for future research, in particular once a longer period of longitudinal data has been developed in the EOTE dataset.

Type of provider

Smyth, Hyatt, Nair, and Smart (2009) provide some background to changes over the last 20 years in the nature of degree-level provision in New Zealand. In the reforms of 1989-90, non-university providers won the right to offer degrees. Some non-university providers also won the right to offer postgraduate programmes. By 2006, 15 percent of bachelor's completers came from non-university providers, including 1 percent from wānanga and 1 percent from private training establishments. In recent years, there has been focus again on the distinctive provision that different types of provider offer. This has seen a slight reduction in degree provision by non-university providers.

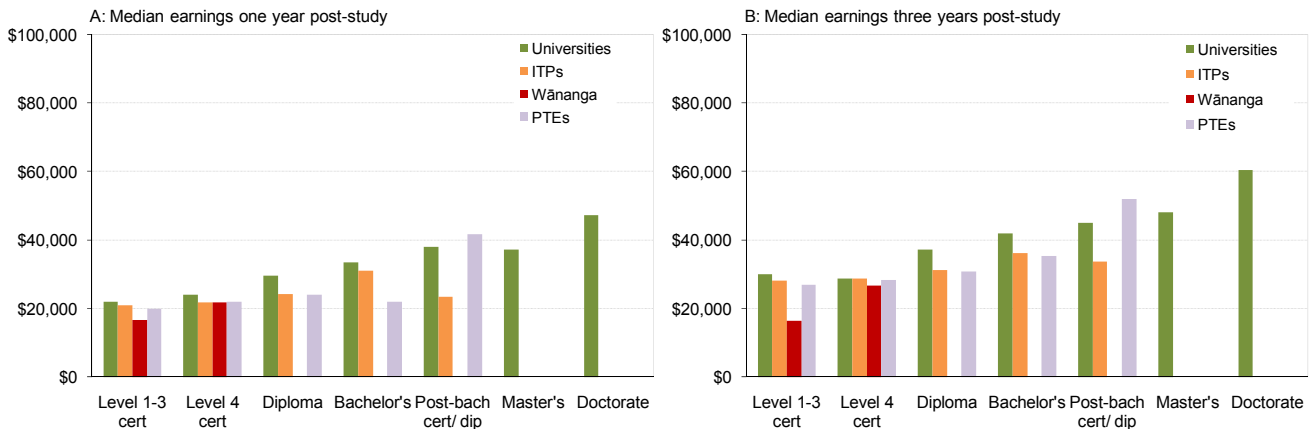
These changes have raised questions about how the labour market rates similar level qualifications from different types of provider. In the research from Smyth et al (2009), which was based on those leaving study in 2000, they showed that there was no earnings premium in the first year post-study for university degrees over polytechnic degrees, but by the third year those with university degrees had begun to earn more.

There are four types of tertiary education provider. These are universities, institutes of technology and polytechnics (ITPs), wānanga, and private training establishments (PTEs). For the purposes of this study, the four colleges of education that existed in 2003 were combined with the universities that they subsequently merged with.

The country's three wānanga are characterised by a strong te reo (Māori language) and tikanga (Māori culture and customs) component. While their provision covers all educational levels, a higher proportion is focused on providing lower-level skills; for example, for students with low or no school qualifications. While there are around 800 formally registered private training establishments, only those that provided formally assessed study and who received government funding (around 220) are included in this study. PTEs often provide specialist vocational or niche training in particular disciplines that may be less well served by public providers.

Figure 10 shows the observed or actual median earnings differences one year and three-years post-study, by level of study and type of provider.

Figure 10
Median earnings one and three years post-study for young completers last enrolled in 2003
By level of study and type of provider



- (1) Earnings for groups with less than 25 people have been suppressed.
- (2) One-year earnings (Figure 9A) include anyone with earned income in tax year 2005, while three-year earnings (Figure 9B) only include those with earned income in all three tax years 2005–07.

Table 24 includes both actual and adjusted results. Results have been adjusted for differences in age, sex, ethnic group, field of study, industry, and firm size.

It is important when inferring relative performance based on comparisons that, as far possible, like groups are being compared. In particular, caution is needed in attributing actual or adjusted differences as provider-type premiums. There are a number of factors, other than provider type, that have not been included in the adjustments, and that may be accounting for the difference in earnings.

One such factor is the innate ability of students, with more able students more likely to enrol in universities, either by choice or as a result of higher academic entry requirements. By contrast, wānanga provision is often targeted to less academically able students, or those who otherwise had no or low school achievement. Polytechnic and wānanga students are typically older, and on average have lower school qualifications than university students. The higher observed and adjusted earnings for university completers may just reflect higher innate ability of its students. This is more likely to be the case for those completing qualifications below degree level.

At bachelor's level and above, polytechnic degrees are also characteristically different in nature from university degrees. They are typically vocationally-specific. There are fewer of the general academic degrees, such as Bachelor of Arts or Science, which are more commonly studied at universities.

Table 24
Post-study earnings premiums for young completers last enrolled in 2003
By level of study and provider type

Level of study and type of provider	One-year		Three-year	
	Actual	Adjusted	Actual	Adjusted
Level 1 to 3 certificate				
Universities	1.00	1.00	1.00	1.00
ITPs	0.98	0.95	0.94	0.95
Wānanga	0.51	0.88	0.55	0.72**
PTEs	0.89	0.90	0.90	0.96
Level 4 certificate				
Universities	1.00	1.00	1.00	1.00
ITPs	0.94	0.94	1.00	0.98
Wānanga	0.62	0.51**	0.92	1.24
PTEs	0.90	0.81	0.99	0.94
Diploma				
Universities	1.00	1.00	1.00	1.00
ITPs	0.81	0.86*	0.84	0.97
PTEs	0.80	0.92	0.83	0.97
Bachelor's Degree				
Universities	1.00	1.00	1.00	1.00
ITPs	0.93	0.96	0.87	0.92*
PTEs	0.68	0.98	0.84	1.18
Post-bachelor's cert or diploma				
Universities	1.00	1.00	1.00	1.00
ITPs	0.57	0.75*	0.75	0.91
PTEs	1.14	1.05	1.16	0.94

- (1) Premiums are presented as proportions of the earnings for university completers at that level.
- (2) Groups with less than 25 people have not been reported.
- (3) In the 'Adjusted' columns ** means statistically significant at the 5 percent level, * means statistically significant at the 10 percent level. Figures with no asterisk are not statistically significant at the 10 percent level.
- (4) One-year earnings include anyone with earned income in tax year 2005, while three-year earnings only include those with earned income in all three tax years 2005 to 2007.

In actual terms, young university completers had higher median earnings in their first year post-study across every level of study, from level 1 to 3 certificates to post-bachelor's certificates and diplomas. The smallest difference in median earnings was around \$1,000 a year (2 percent). The biggest difference was at diploma level, where the median first-year earnings of students with a diploma from a university were 25 percent higher than those from polytechnics or PTEs.

The exception to the pattern was at post-bachelor's certificate and diploma level, where students from PTEs had higher median earnings than those from universities. PTEs often provide specialist vocational or niche training in particular disciplines that may be less well served by public providers – for example, in professional postgraduate law qualifications that many students who have completed a university law degree then undertake.

The median first-year earnings of young polytechnic bachelor's degree graduates were \$2,500 (7 percent) lower than that of university degree graduates. This increased to \$5,600 (13 percent) after three years. Across other levels of study, the university advantage remained the same or had increased by the third year post-study. The exception was for level 4 certificates, where the median earnings were about the same for most provider types.

After adjusting for differences in field of study, age, sex, ethnic group, industry, and firm size, most resulting differences were not statistically significant. However, the difference in polytechnic degree earnings compared with university degrees was, but only in the third year post-study. Young polytechnic degree graduates earned 8 percent less than university degree graduates after three years. This result is broadly consistent with recent research on university degree premiums for student loan borrowers (Smyth, Hyatt, Nair, Smart, 2009), although, in this study, there was no adjustment for age. Subsequent adjustment of this data by age, however, also shows lower earnings for younger polytechnic completers (personal communication, Roger Smyth).

After adjusting for differences, a university diploma earned 14 percent more than a diploma from a polytechnic, but only in the first year post-study. By the third year there were no statistically significant differences in earnings for young people completing diplomas from different types of provider. Students completing a level 1 to 3 certificate from a wānanga earned less than those completing a level 1 to 3 certificate from other provider types.

We now explore polytechnic and university differences further for young bachelor degree completers. Table 24 showed a 13 percent premium in three-year earnings in actual terms, and an 8 percent premium in earnings once adjusted for various factors, including field of study. However, given that polytechnic degrees are largely focused in particular vocational areas, it is useful to explore these differences further by field of study. Table 25 shows these differences in actual and adjusted terms for fields with more than 25 completers.

Table 25
Three-year post-study earnings for young university and polytechnic bachelor's degree completers
By field of study

Field of study	Students		Three-year post-study earnings		ITP earnings as a proportion of Uni	
	Uni	ITP	Uni	ITP	Actual	Adjusted
Information technology: total	370	80	\$46,000	\$42,400	0.92	0.89
Computer science	180	40	\$47,500	\$42,300	0.89	0.80
Information systems	250	60	\$45,600	\$42,200	0.93	0.88
Architecture & building: total	90	30	\$39,300	\$38,200	0.97	1.07
Architecture	90	30	\$39,300	\$38,200	0.97	1.01
Health: total	430	190	\$50,500	\$37,200	0.74	0.84
Nursing	50	150	\$46,200	\$39,600	0.86	0.90
Management & commerce: total	970	30	\$42,900	\$35,800	0.83	0.95
Creative arts: total	400	190	\$35,600	\$30,500	0.86	0.84**
Visual arts & crafts	80	50	\$28,300	\$27,000	0.95	1.04
Graphic & design	130	90	\$35,600	\$30,700	0.86	0.81
Communications & media	150	50	\$39,100	\$35,700	0.91	0.77*
All fields	3,390	540	\$41,200	\$34,900	0.87	0.92*

(1) Earnings for fields with less than 25 people have been suppressed. Students may have more than one field.

(2) ** Means statistically significant at the 5 percent level, * Means statistically significant at the 10 percent level.

Just seven out of 70 narrow fields and five out of 12 broad fields have more than 25 polytechnic degree completers who had earnings three years post-study. However, these fields covered 87 percent of all polytechnic degree completers.

While the university premium remained for most of these fields after adjusting, results were only statistically significant for the creative arts broad field, and the communications and media narrow field. In both these cases, the university premium increased after other factors had been adjusted for.

6 Adjusting earnings for differences

In this study, we have compared median earnings for young leavers with different educational characteristics. Care is needed in interpreting these results – in particular, in how much of the differences in earnings can be directly attributed to educational differences. There is a range of educational and non-educational factors that influence how much one earns after tertiary education. Direct comparisons of actual post-study earnings for different educational characteristics can be misleading where, for example, one of the groups being compared has an older or more experienced composition than another. In this case, experience may be explaining much more of the higher earnings than the specific characteristic being compared.

Even when limited to young leavers, as in this study, there are likely to be differences in the innate ability of some groups being compared. While some education characteristics are likely to capture this, it may be that these differences in ability (or other unmeasured characteristics) are contributing to the resulting earnings differences, rather than the educational differences being compared.

One way to better isolate individual effects of certain factors is through statistical modelling, or regression. Modelling can provide an estimate of what earnings might be if a group of other known influences were controlled for; that is, if all populations being compared had the same make up in respect of these other known factors. Regression can also provide estimates of how much individual factors contribute to one's earnings, and how much of one's earnings in total a group of known factors can explain.

In this study, we have chosen annual earnings as our dependant variable (ie the thing we are trying to model). Following Maani and Maloney (2004), we use the natural logarithm of these annual earnings as the dependant variable. The definition we have used for un-modelled earnings includes losses from self-employment as earnings (see section 7). For convenience, however, only positive earnings are included for the statistical model – as this provides a positive value required for the logarithm. Removing people with negative earnings affects less than 1 percent of leavers, and increases median earnings by around 1 percent.

The following variables were selected for the model:

Demographic characteristics:	age, sex, ethnic group
Educational characteristics:	level of study, completion status, field of study, type of provider
Employment characteristics:	industry of main employer, firm size of main employer

The choice of variables was largely determined by their availability, but also with consideration of their likely influence on earnings. All variables provide a statistically significant contribution to the model. There is a number of key variables which are not available in the EOTE dataset. These include: hours of work or hourly rate, occupation, highest qualification held or multiple qualifications, years of work experience, and ability. Hours of work or hourly rate is clearly important for those groups whose annual earnings may be less because of fewer hours worked, but whose hourly rate is otherwise similar – for example, groups which are more likely to include women with family responsibilities, or groups which are more likely to involve part-time work.

Figure 11 shows the relationship between actual median earnings and age for males and females. Figure A relates to all 2003 leavers, while B relates to bachelor's degree completers. Both younger and older leavers are included. The negative quadratic relationship between age and earnings, and the lower female earnings are evident in the all leavers graph. However, the relationship for bachelor's completers is quite different, with a more linear relationship between age and earnings up to around 50 years, and less difference between males and females. Consistent with other models of earnings, a quadratic term was retained, with results showing statistically significant contributions for all subgroups modeled, albeit that in some cases, these contributions were very small. The lower gender difference in earnings at degree level is also consistent with findings from Maani and Maloney (2004), which showed that while hourly wage rate discrimination persisted, higher qualifications reduced gender differences in annual earnings by opening access to work for degree holders.

Figure 11
Median earnings three years post-study – all 2003 leavers and all 2003 bachelor's completers
By age and sex



The functional form of the model was defined as follows:

$$\ln[\text{earnings}] = \beta_1 + \beta_2 \text{age} + \beta_3 \text{age}^2 + \beta_4 \text{sex} + \beta_5 \text{ethnic group} + \beta_6 \text{level} + \beta_7 \text{completion status} + \beta_8 \text{field of study} + \beta_9 \text{provider type} + \beta_{10} \text{industry of main employer} + \beta_{11} \text{firm size of main employer}$$

Where:

earnings is positive earnings from wages and salary and self employment, and $\ln[\text{earnings}]$ is the natural logarithm of these earnings.

age is the age of the student at 1 July 2003. Consistent with other models of earnings, a quadratic term is included to reflect the negative quadratic relationship of earnings at older ages. For young leavers this effect is small.

sex is a dummy variable for the sex of the student, with 0=male, 1=female.

ethnic group is an array of four dummy variables, Māori, Pacific people, Asian, and Other, with the reference group (0s in each dummy) being European.

level of study is an array of six dummy variables representing the highest level of qualification studied in 2003. The six variables include level 4 certificates, diplomas, bachelor's, post-bachelor's certificate or diploma, master's or

doctorate. The reference group represented by 0s in each dummy relates to level 1–3 certificates.

completion status is an array of four dummy variables representing completion as follows: passed more than half one's courses – with no qualification, passed all courses but did not gain a qualification, gained a qualification at a lower level than the level studied at, and gained a qualification at the same level as or higher than the level studied at. The reference group, represented by 0s in each of these variables, is the group of leavers who failed all or most of their courses. This variable does not capture any previous level of qualification attainment.

field of study represents the student's main field of study or specialisation. An array of 70 dummy variables is used, each representing one of the 70 narrow fields of study from the New Zealand Standard Classification of Education NZSCED. The reference group, represented by 0s in each of these dummy variables, relates to the narrow field 'studies in human society' (ie humanities and social sciences), which is one of the more commonly studied fields. Two definitions were used for field depending on the sub-population modelled. For those subgroups involving completers, the student's major(s) or main field(s) of study were used. These are not available for non-completers, so for models involving non-completers, the field of study which had the highest study load (in terms of equivalent full-time students (EFTS) over all years enrolled was used. This is less precise than the fields available for completers, but still provides a statistically significant contribution to the models for non-completers.

One of the features of the new dataset is the availability of richer information on field of study and on completion status. New, more accurate and more detailed information on field of study can allow analysis down to 70 categories, where just 12 were available before. It can allow us, for example, to distinguish the effects of law and economics separately rather than as part of a broad society and culture field only.

provider type is an array of three dummy variables representing whether the student last studied in an institute of technology or polytechnic (ITP), wānanga, or a private training establishment (PTE). The reference group here is universities.

industry of main employer. An array of 18 dummy variables was used, with each variable representing one of 18 categories from the ANZSIC 2006 classification of industries at the broadest (ie division) level.

firm size of main employer. Uses an array of five dummy variables relating to the following firm size groups: 6–9, 10–19, 20–49, 50–99, and 100 or more employees – with five employees or fewer serving as the reference group.

β_1 to β_{11} are constant coefficient terms. One advantage of this form of model is that the coefficient terms (β_2 to β_{11}) can be readily converted into premium estimates by taking the exponential of their value.

The model relates to domestic students only. While some international students stay on and work in New Zealand and even become residents, the primary focus of this study is on employment outcomes for domestic students. This is not to say that there is not interest in outcomes for international students. In fact, one question this data may help inform is the level to which international students stay on in New Zealand after their

study – in particular, PhD students, where attracting and retaining some of the skills, research, and knowledge these students bring to New Zealand was one of the reasons for introducing domestic fees status for this group in 2005. Under this policy change, international PhD students are now funded by the New Zealand government at the same rate as domestic PhD students, and hence they are charged the same fees as domestic students.

Although years of work experience is not directly available, age has been used as a proxy for this. Work experience and job tenure can be estimated in LEED back to 1999, but will be an incomplete proxy for older workers. One of the reasons for focusing this study on young leavers was to reduce the effects of work experience. The definition of young leavers was designed to approximately capture only students who are entering the long-term labour market for the first time.

Previous qualification attainment presents a limitation of the data. While level of study and completion status can provide a reasonable picture of the highest qualification for young people (as used in this study), for many older students it may not reflect their highest qualification. For example, many older students enrolling in diploma courses may already hold a diploma or other qualification. They may return to enrol in one or two papers only, perhaps for vocational upskilling reasons. What's more, they may be completely successful in passing these papers, but because they don't complete a diploma, they have usually been counted as 'failures'.

The definition of young leavers used in this study is designed to capture students leaving their initial tertiary education. These students are unlikely to have gained qualifications beginning this initial period of education. While the EOTE dataset allows us to differentiate between course completion and qualification achievement for this group, it can't yet help with before and after benefits of course completion for those returning to study already holding a qualification from an earlier period of tertiary education. However, it may be able to in future, once a sufficient period of longitudinal data has been developed.

There is a range of other demographic and educational variables available in the data, which have not been included in this initial study. These include one's main activity prior to enrolling in tertiary education, disability status, employment sector, and work location. These variables all provide interesting options for future research.

One of the realities of tertiary education – for younger students especially – is that many will travel overseas soon after their study. Some work for a year or two before embarking overseas and their choice of work initially may reflect these aspirations more than longer-term career aspirations that make use of their tertiary education. Model testing also shows distinct and sometimes dramatic differences between how much a factor influences earnings in the first year compared with the third year. Hence we model both first-year earnings and third-year earnings. For reasons described in section 4, the cohort used in the three-year model is different to that used in the one-year model. Only those who earned income for three years (tax years 2005–07) are included in the three-year model, while all those who earned income in their first year are included in the one-year model, regardless of whether they earned after this.

This study presents actual earnings and earnings differences based on medians. Means could also be used, but medians have been selected because of the generally skewed nature of the earnings distributions. Specifically, because earnings distributions generally have a longer tail with relatively fewer people at higher incomes. This can result in a mean that is significantly higher than the income that half the population has.

However, using medians can present an issue when making comparisons with modelled earnings, or when comparing adjusted premiums with actual premiums, since the regression method is based on means. This may mean that the modelled or adjusted earnings are not really comparable. In this study, we are modelling the log of earnings rather than earnings directly. The closer this is to being normally distributed the closer the median and means align, and so the issue of non-comparability is reduced.

Statistical tests (Kolmogorov-Smirnov, Cramer-von Mises, and Anderson-Darling) reject the null hypothesis that the log of earnings distributions is normally distributed. For all leaver cohorts used in this study there is still a small amount of left- or negative-skewness in the distribution of log(earnings), with skewness values around -2.5. This indicates that any adjusted earnings using this model (ie based on means) won't be strictly comparable to actual earnings (based on medians). However, the tests of lognormality of earnings suggest that comparisons should still be broadly reasonable.

Given that all adjusted results in this report are presented as relative differences or 'premiums' rather than as adjusted dollar earnings, we expect to further mitigate any issues of comparability. Even so, relative differences in mean earnings are also likely to differ, in some cases, from relative differences based on median earnings. This will limit the extent to which actual and adjusted earnings differences can be compared. Nevertheless, the adjusted results on their own still provide an indication of relative differences once earnings are adjusted for the selected set of factors.

Because effects can be different for different groups, the model was tested for a number of groups. These included completers and non-completers separately, males and females separately, and for individual levels of study. For completeness, the full model was run for older leavers, and the results for five main groups are included in the appendix. Sex remained a significant factor in almost all cases, and the model worked better (in terms of explaining more) for males than females. This was consistent with Maani and Maloney (2004).

Ten models are summarised here, relating to one-year and three-year earnings for five groups:

- Model 1: Young completers – one-year post-study earnings
- Model 2: Young completers – three-year post-study earnings
- Model 3: Young non-completing students – one-year post-study earnings
- Model 4: Young non-completing students – three-year post-study earnings
- Model 5: Young bachelor's completers – one-year post-study earnings
- Model 6: Young bachelor's completers – three-year post-study earnings
- Model 7: All young leavers in 2003 – one-year post-study earnings
- Model 8: All young leavers in 2003 – three-year post-study earnings
- Model 9: Older leavers – one-year post-study earnings
- Model 10: Older leavers – three-year post-study earnings

Tables 26 and 27 show the marginal and single contributions of each individual factor to the models. Full regression results are contained in the appendix. The values in table 26 are the exponentials of the model coefficients where the model has been run using all factors except that factor. As such, the values in the table represent estimates of the marginal contribution that that factor makes to explaining variation in earnings. The values in table 27 are the exponentials of the model coefficients where the model has been run using just that factor. As such, the values in the table represent estimates of single effects on earnings. Note that these effects cannot be added, as their influences are not independent of each other.

Table 26

Marginal factor contributions to earnings models

Model	Full model	Field of study	Industry	Level of study	Age	Completion Status	Provider type	Sex	Ethnic group	Firm size
Young completers										
One-year	15.9%	3.6%	3.4%	0.1%	0.2%	...	0.1%	0.0%	0.5%	0.3%
Three-year	14.0%	2.3%	2.4%	0.2%	0.1%	...	0.1%	0.4%	0.1%	0.2%
Young non-completers										
One-year	18.1%	1.5%	3.9%	0.3%	1.0%	0.8%	0.2%	0.3%	1.0%	0.3%
Three-year	15.9%	1.1%	4.2%	0.3%	0.3%	0.6%	0.4%	0.5%	0.6%	0.2%
Young bachelor's										
One-year	15.1%	5.5%	4.7%	...	0.1%	...	0.0%	0.0%	0.1%	0.4%
Three-year	10.1%	2.9%	3.3%	...	0.0%	...	0.0%	0.3%	0.1%	0.2%
All young leavers										
One-year	18.3%	2.6%	3.3%	0.2%	0.6%	1.2%	0.2%	0.1%	0.8%	0.2%
Three-year	16.1%	1.6%	3.2%	0.3%	0.2%	1.0%	0.3%	0.4%	0.3%	0.2%
Older leavers										
One-year	18.4%	2.2%	3.1%	0.5%	1.1%	0.4%	0.2%	1.3%	0.5%	0.5%
Three-year	17.3%	1.6%	3.0%	0.6%	1.4%	0.2%	0.2%	1.9%	0.3%	0.6%

(1) ... Not applicable.

Table 27

Single factor contributions to earnings models

Model	Full model	Field of study	Industry	Level of study	Age	Completion Status	Provider type	Sex	Ethnic group	Firm size
Young completers										
One-year	15.9%	9.9%	8.2%	5.4%	4.8%	...	4.2%	0.0%	1.7%	1.2%
Three-year	14.0%	8.9%	6.6%	5.8%	4.9%	...	4.7%	0.8%	1.7%	1.5%
Young non-completers										
One-year	18.1%	6.7%	7.7%	5.0%	5.1%	3.5%	2.4%	1.1%	4.0%	0.3%
Three-year	15.9%	5.2%	8.3%	4.4%	3.6%	2.4%	3.5%	1.2%	2.8%	0.5%
Young bachelor's										
One-year	15.1%	9.5%	8.2%	...	0.4%	...	0.3%	0.0%	0.4%	1.5%
Three-year	10.1%	5.8%	4.9%	...	0.5%	...	0.4%	1.2%	0.4%	1.1%
All young leavers										
One-year	18.3%	8.3%	8.0%	5.9%	6.0%	4.3%	4.5%	0.2%	3.6%	0.7%
Three-year	16.1%	6.7%	7.6%	5.7%	5.0%	2.9%	4.7%	0.6%	2.7%	1.0%
Older leavers										
One-year	18.4%	7.9%	6.9%	3.5%	2.2%	2.2%	3.8%	2.6%	2.3%	1.7%
Three-year	17.3%	6.4%	6.4%	3.9%	2.3%	1.2%	3.4%	2.9%	1.5%	1.8%

(1) ... Not applicable.

Field of study had the highest explanatory power, explaining between 6 and 10 percent of earnings. Industry of main employer provides only slightly smaller explanatory power. Because of the non-independent relationship between industry and field of study, the

combined effect of these two factors is less than the sum of their individual effects. However, together these two factors explained around 10 to 12 percent of the variation in earnings for most leaver groups.

Level of study and age provided the next highest contributions – individually each explains between 3 and 6 percent. However, in marginal terms its contribution was in many cases less than age, sex, or ethnic group. Both level and age are bigger single factor predictors of earnings for younger leavers than for older leavers. This, perhaps, supports the notion that in the absence of work experience for younger people, age and level of study play more of a role for employers in assessing the ability of young applicants.

Relative to other factors, sex on its own contributes between 1 and 2 percent to the model. Its power is higher for older workers. Also its power increases over time. Sex is not a significant factor in one-year earnings for young completers, once the other factors have been adjusted for, but it is after three years. One of the limitations of the data is information on part-time work and hourly rate. This is likely to affect females with family responsibilities more than males, and may be the reason why sex as a factor becomes more important three years after study. Separate modelling for males and females shows reasonably large differences in explanatory power. The eight other factors are generally able to explain about 3 to 4 percent more for males than for females.

Ethnic group also explained between 1 and 2 percent of young leavers' earnings. In general, students of European ethnicity earned the most, followed by Asian, Pacific people and Māori. Its effect was greater for lower levels of study, and for older leavers. Its effect reduced after three years, and was not a statistically significant factor for young bachelor completers. The exception was for young Māori bachelor's completers who, once adjusted, earned more than completers of European ethnicity.

Whether you completed your qualification accounted for between 2 and 3 percent of the variation in earnings in young leavers, but its effect reduced over time. Similarly, it played a role for older workers, although its effect was much less and reduced over time. This is consistent with the fact that older students are less likely to be studying for credentialing purposes.

Where you studied mattered, and individually this factor explained more than someone's completion status. Unlike completion status, the explanatory power of provider type persisted three years after study. However, this may be reflecting the fact that different types of providers focus on different types of students (eg with different mixes of previous academic achievement or ability).

Firm size played a role in earnings in every model tested, with higher earnings associated with larger firms. However, while its contribution was statistically significant, the magnitude of its influence was generally relatively small.

Level of study, where you studied, and sex mattered more three years post-study. Field of study, completion status, industry, and ethnic group mattered less over time. The effect was mixed for age and firm size.

7 Data and definitions

Data

The data used for this study is known as the Employment Outcomes of Tertiary Education, or EOTE, dataset. This dataset was created by linking administrative data on participation and achievement in institution-based and workplace-based tertiary education with employment data from the Linked Employer-Employee Database (LEED). LEED holds longitudinal employment and income data on individuals, together with information on the firms they work for.

The linking was principally done using national student numbers, names, and dates of birth, and involved extensive statistical matching development and testing over a period of several months. The project itself was subject to a full privacy impact assessment. The feasibility of being able to link this data to produce robust statistics and analysis on employment outcomes was subsequently established, and this study forms one of the initial outputs from this new data source (See Statistics NZ, 2009a).

Compared with the linked student loans and allowances dataset, EOTE has a more complete coverage of the employment outcomes for people in tertiary education, as it also includes those who haven't borrowed or taken out a student allowance. In addition, a feature of the data is that, for the first time, it links learners engaged in formal tertiary training in the workplace (industry training) with the more traditional institution- or provider-based tertiary education. This includes those doing modern apprenticeship training.

Provider-based data includes details on all enrolments in formally assessed courses and qualifications in tertiary education providers between 1997 and 2006, while data on industry training is available from 2000 to 2006. However, for provider-based students, the linking to LEED is currently only reliable for the years after 2002.

The provider-based data makes use of new information on field of study, which can allow us to drill beyond broad fields into more detailed fields (for example, beyond the broad field of health into the different fields of medical studies, nursing, dentistry etc.). The data also includes information on achievement at the course (ie paper) level, along with qualification achievement data.

LEED holds information on both firms and employees. This dataset is itself the result of linking of administrative data sources. Information on income is taken from employers' monthly schedules for all individuals who received wage and salary income, and any other income that is deducted at source. This is supplemented with annual information on income from self-employment. The database also holds information on other forms of income such as income from benefits, Accident Compensation Corporation payments, paid parental leave, and student allowances. This data is linked to data on firms, which is taken from Statistics NZ's Business Frame. Data on firms includes ownership relationships, industry and sector of employment, location, and firm size.

Like the linked loans data, EOTE retains the advantage over census and HLFS data of being able to identify and track employment and earnings pathways for particular cohorts (such as recent young graduates). However, unlike census and HLFS, EOTE does not hold information on occupation or hours worked. Another limitation of EOTE (unlike census and HLFS) is that while it holds details for qualification attainment from 1997 on, it does not hold details of any qualifications attained before this.

For a more complete documentation on the feasibility project and resulting data see Statistics NZ, 2009a.

Definitions

This study uses data subject to the following definitions or issues. For further information see Statistics NZ, 2009b.

Leaver

For this study, we examine the post-study earnings of students. This requires us to identify those who have left study. It is relatively common in New Zealand for students to re-enrol in tertiary education after an initial period of education. This may be to complete something that they originally began, to commence postgraduate study, or simply to gain new skills and knowledge in a particular new course or qualification.

Around 12 percent of students, for example, will take a break of a year before re-enrolling in tertiary education. Over a 10 year period, this figure rises to over 35 percent. Normally, leaving year is imputed from the absence of enrolment records in following years. Limitations in the number of years available in the dataset impose some practical constraints on how many years ahead we are able to look. This makes it problematic to define with certainty the size of any leaving cohort. For example, if we only look one year ahead, our estimates of one-year post-study earnings will be biased downwards by between \$1,000–\$2,000 because of the 12 percent of students who return after a year's break.

For this study, therefore, a 2003 leaver is defined as someone enrolled in 2003, but not enrolled in 2004, 2005, or 2006.

Young leaver

For this study a subgroup of leavers called 'young leavers' has been defined to represent the more traditionally defined tertiary students who moved to tertiary education more or less directly after school and who were more likely to be completing their tertiary education for the first time and entering the labour market proper for the first time. Education is likely to have more of a direct influence on earnings for these young leavers than it is for older students who perhaps already hold qualifications or have a number of years of work experience.

A young leaver is defined based on their age and level of study. A 'normal' or 'traditional' age of completion is set for each level of study. For the purposes of this study, this is defined as the modal (ie most common) age of leavers at that level. An additional two years is added to allow for students who take a short break in their study, and who therefore have not really gained extensive work experience.

Specifically, a young leaver is anyone aged 20 years or under at certificate level, 22 or under at diploma level, 24 or under at degree (25 or under if this degree is a medical degree), 25 or under for anyone doing a one-year postgraduate study, 26 or under for master's, and 28 years or under for doctorate students.

Compared with other countries, New Zealand's tertiary education system has a lower proportion of such traditional students. In fact, while young leavers are based around modal ages of leavers, they represent just 25 percent of all leavers.

Older leaver

An older leaver is anyone who is not a 'young leaver'.

Age

Age is based on the student's age at 1 July of the leaving year, in this case 2003. Age is taken from that reported in the administrative institution-based education data.

Earnings

Earnings relates to annual pre-taxed income from wages and salary, and any non-zero income from self-employment. Annual income is based on a tax year, so covers income for the year ending 31 March.

Year, tax year, years post-study

Any year refers to a calendar year unless otherwise stated. However, annual earnings are based on a tax year, so include earnings from two calendar years. For example, one-year post-study earnings for a student last enrolled in 2003 are their earnings in tax year 2005; that is, from 1 April 2004 to 31 March 2005. Similarly, three years post-study refers to tax year 2007, or 1 April 2006 to 31 March 2007.

Many students do not enter the labour market directly, or they work for a year or two and then go overseas. For the purposes of analysing three-year earnings those who had a break in their earnings were not included. Three-year earnings therefore relate only to those who had earnings in all three tax years 2005–07.

Domestic student

This study relates to domestic students and excludes international students. A domestic student is defined as one who is a New Zealand citizen or permanent resident, or who is an Australian citizen. Australian citizens are currently treated the same as domestic for funding purposes in New Zealand.

Ethnic group

Ethnic group is based on self-defined affiliation to one, two or three of the following groups: European, Māori, Pacific people, Asian, or Other. It is based on the ethnicity as reported in the student's leaving year. A student is counted in each group they affiliate with.

Level of study

Level of study relates to the highest qualification level enrolled in during the last year a student was enrolled. It is classified into the following seven categories:

- Level 1-3 certificate
- Level 4 certificate
- Diploma
- Bachelor's
- Post-bachelor's certificate or diploma
- Master's
- Doctorate.

A level 1–3 certificate is equivalent to upper secondary level study. A level 4 certificate is often but not exclusively associated with a one-year vocational or trades-based training. Diplomas generally involve two years of study, but there are diplomas that take longer and that require a level of study equivalent to bachelor's level (level 7). Bachelor's includes all ordinary bachelor's degrees, regardless of length, and all conjoint degrees, but excludes bachelor's with honours. Post-bachelor's certificate or diploma includes all bachelor's with honours, and all qualifications, excluding Master's and doctorates that require a degree as a pre-requisite. 'Graduate' certificates and diplomas (level 7) are included with 'postgraduate' certificate and diplomas (level 8) in this group. While this is inconsistent with standard Ministry of Education statistics, it was felt that this was more meaningful in the context of analysing employment outcomes. Doctorate includes PhDs as well as higher and other doctorates.

Field of study

This study uses recently developed data on more detailed fields of specialisation for tertiary graduates. This data allows us to drill beyond the 12 broad fields of study previously available down to 70 narrow fields and over 370 detailed fields of study. This study uses 70 narrow fields of the classification. These fields are based on the New Zealand Standard Classification of Education (NZSCED). The full NZSCED classification can be found at: www.educationcounts.govt.nz/technical_info/code_sets/new_zealand_standard_classification_of_education_nzsced.

Main field of study is only available for those who completed a qualification. The analysis of actual or observed results is therefore limited to tertiary completers. However, in the modelled or adjusted results an approximate field of specialisation has been estimated for those subpopulations involving leavers who did not complete their qualification. For models involving non-completers, the field of study which had the highest study load (in terms of EFTS) over all years enrolled was used. This is less precise than the fields available for completers, but still provides a statistically significant contribution to the models for non-completers.

In both cases, field of study has been derived from the fields of study assigned to individual courses or papers that a student was enrolled in as part of their qualification. For more information on this new data and on its derivation see Scott (2009).

Completion, completer and graduate, course versus qualification completion

The term 'completer' has been given to any student who has successfully completed the academic requirements for a qualification. Current education data collects qualification completion data on this basis, rather than whether the qualification was actually awarded or conferred. While most students who meet the requirements for a qualification will have it awarded, some will subsequently decide not to take out that qualification, and will use those credits towards a different qualification. Technically, a graduate is someone who has been awarded a qualification, but the terms 'graduate' and 'completer' are often treated as synonyms.

Students complete both courses and qualifications. Courses in this context are the component papers, units, or modules that make up the requirements for a qualification. Not all students enrol in all the courses needed to complete a qualification. A significant minority of students (especially at older ages) pass all courses enrolled in, but do not complete a qualification. The EOTE data allows us to explore the outcomes of those with different mixes of course and qualification completion. For the purposes of this study, no distinction is made for the number of courses enrolled in, or whether the student had enrolled in sufficient courses to gain a qualification or not.

For this study, completion status has been grouped into the following five mutually exclusive categories:

- Failed all or most courses
- Passed more than half the courses enrolled in, but did not complete a qualification
- Passed all courses enrolled in, but did not complete a qualification
- Completed a qualification at a lower level than the level enrolled at
- Completed a qualification at the same level as, or higher than, the level enrolled at.

Given that doctoral study is mostly thesis based, analysis at doctoral level relates to the last two categories only.

Provider type

Provider types are defined in legislation and cover universities, institutes of technology and polytechnics, colleges of education, wānanga, private training establishments, and specialist colleges. There are now no longer any colleges of education. The last of these merged with universities in 2007. Even though the category of specialist college exists there have never been any. For the purposes of this study the four colleges of education existing in 2003 have been combined with universities.

The country's three wānanga are characterised by a strong te reo (Māori language) and tikanga (Māori culture and customs) component. While their provision covers all educational levels, a higher proportion is focused on providing lower-level skills; for example, for students with low or no school qualifications. While there are around 800 formally registered private training establishments, only those that provided formally assessed study and who received government funding (around 220) are included in this study. PTEs often provide specialist vocational or niche training in particular disciplines that may be less well served by public providers.

Industry of employment

Industry is based on the Australian and New Zealand Standard Industrial Classification (ANZSIC) developed by Statistics NZ and the Australian Bureau of Statistics. This classification was updated in 2006 and it is this version (ANZSIC 2006), that is used in this study. The classification has four levels of hierarchy. At the broadest, or division level, there are 20 categories. This is the level used in this study. More information on ANZSIC can be found at: www.stats.govt.nz/economy/industry/introducing-anzsic-2006/default.htm

Where an individual works in more than one industry over a tax year, their industry is defined as that from which they earned the most income over the year.

Firm size of main employer

Firm size is based on the job-count employee size of the enterprise where the employee earned most of their income. For this study, firm size has been grouped into six groups: less than 5, 6–9, 10–19, 20–49, 50–99, and 100 or more employees. Self-employed persons are coded in the first group, regardless of whether they were contracted to larger firms or not.

Appendix: Table of adjusted earnings premiums

Table 28

Adjusted earnings premiums one year and three years post-study – for selected leaving cohorts

Variable	Young completers		Young non-completers		Young bachelor's completers		All young leavers		Older leavers	
	One-year	Three-year	One-year	Three-year	One-year	Three-year	One-year	Three-year	One-year	Three-year
Adjusted R-squared	0.1588	0.1398	0.1812	0.1585	0.1514	0.1007	0.1834	0.1605	0.1839	0.1726
F	22.07***	10.39***	24.69***	18.12***	10.10***	4.01***	49.00***	34.52***	138.00***	110.64***
Sample size	12,165	9,932	11,776	9,711	4,743	3,713	23,941	19,643	68,103	58,845
Constant	1,019 ***	4,885 ***	70 ***	1,310 ***	0.03	82	105 ***	1,420 ***	4,312 ***	5,315 ***
Age	1.288 ***	1.147 *	1.580 ***	1.280 ***	3.526 ***	1.706	1.529 ***	1.254 ***	1.082 ***	1.086 ***
Age ²	0.995 ***	0.997	0.990 ***	0.995 ***	0.971 ***	0.988	0.991 ***	0.995 ***	0.999 ***	0.999 ***
<i>Sex (reference = males)</i>										
Female	0.983	0.863 ***	0.853 ***	0.834 ***	1.033	0.895 ***	0.919 ***	0.853 ***	0.727 ***	0.711 ***
<i>Ethnic group (reference = European)</i>										
Māori	0.855 ***	1.140 ***	0.735 ***	0.800 ***	0.917 *	1.139 **	0.776 ***	0.846 ***	0.819 ***	0.855 ***
Pacific people	0.886 ***	1.104 **	0.851 ***	0.934 *	1.034	1.059	0.867 ***	0.958	0.916 ***	0.939 ***
Asian	0.916 ***	1.220 ***	0.872 ***	0.986	0.933	1.029	0.899 ***	1.032	0.797 ***	0.889 ***
Other	0.831 ***	1.254 ***	0.892 ***	0.990	0.907 **	1.082 *	0.861 ***	1.009	0.887 ***	0.937 ***
<i>Level of study (reference = level 1-3 certificates)</i>										
Level 4 certificate	0.997	1.329 ***	1.226 ***	1.153 ***	...	...	1.136 ***	1.156 ***	1.101 ***	1.085 ***
Diploma	1.027	1.772 ***	1.175 ***	1.137 ***	...	...	1.118 ***	1.127 ***	1.201 ***	1.188 ***
Bachelor's	1.056	0.922 ***	1.168 ***	1.188 ***	...	...	1.139 ***	1.223 ***	1.209 ***	1.259 ***
Post-bachelor's cert or dip	1.152 ***	0.988	1.273 ***	1.369 ***	...	...	1.237 ***	1.304 ***	1.438 ***	1.455 ***
Master's	1.031	1.057	1.425 ***	1.412 ***	...	...	1.152 **	1.345 ***	1.583 ***	1.601 ***
Doctorate	1.280 *	1.018	2.422 ***	2.957 ***	...	...	1.435 ***	1.981 ***	1.459 ***	1.722 ***
<i>Completion status (reference = failed all)</i>										
Failed some courses	...	...	1.169 ***	1.153 ***	...	...	1.161 ***	1.146 ***	1.149 ***	1.087 ***
Passed all courses with no qualification	...	...	1.350 ***	1.262 ***	...	...	1.344 ***	1.260 ***	1.322 ***	1.173 ***
Gained a lower-level qualification	...	...	1.334 ***	1.231 ***	...	...	1.334 ***	1.245 ***	1.040	0.981
Gained a qualification at same level or higher	...	...	...	...	...	...	1.412 ***	1.336 ***	1.202 ***	1.144 ***
<i>Provider type (reference = universities)</i>										
ITP	0.930 **	0.952	0.966	0.964	0.955	0.916 *	0.947 **	0.948 **	0.894 ***	0.913 ***
Wānanga	0.690 ***	0.715 ***	0.752 ***	0.639 ***	0.938	0.927	0.725 ***	0.652 ***	0.941 ***	0.993
PTE	0.920 **	0.945	0.872 ***	0.866 ***	0.983	1.176	0.896 ***	0.893 ***	0.806 ***	0.857 ***

Variable	Young completers		Young non-completers		Young bachelor's completers		All young leavers		Older leavers	
	One-year	Three-year	One-year	Three-year	One-year	Three-year	One-year	Three-year	One-year	Three-year
<i>Firm size (reference = Less than 5 employees)</i>										
6-9 employees	1.125 ***	1.088 **	1.121 ***	1.009	1.236 ***	1.160 *	1.120 ***	1.041	1.128 ***	1.122 ***
10-19 employees	1.076 **	1.089 **	1.128 ***	1.089 **	1.143 **	1.108	1.098 ***	1.090 ***	1.162 ***	1.196 ***
20-49 employees	1.182 ***	1.196 ***	1.167 ***	1.108 ***	1.249 ***	1.196 ***	1.168 ***	1.146 ***	1.245 ***	1.281 ***
50-99 employees	1.240 ***	1.141 ***	1.174 ***	1.113 **	1.326 ***	1.214 ***	1.200 ***	1.131 ***	1.287 ***	1.292 ***
100 or more employees	1.173 ***	1.164 ***	1.236 ***	1.166 ***	1.248 ***	1.201 ***	1.192 ***	1.158 ***	1.327 ***	1.300 ***
<i>Industry (reference = manufacturing)</i>										
Agriculture, forestry, and fishing	0.672 ***	0.801 ***	0.703 ***	0.647 ***	0.576 ***	0.653 ***	0.681 ***	0.687 ***	0.656 ***	0.716 ***
Mining	1.251	1.229	1.608 **	1.388	2.028	2.058	1.457 **	1.342 *	1.357 ***	1.402 ***
Electricity, gas, water, and waste services	0.976	1.238	1.009	0.867	1.209	1.384	1.001	1.015	1.130 **	1.171 ***
Construction	1.007	0.998	1.094 *	0.980	0.834	0.858	1.081 **	0.990	0.923 ***	0.933 ***
Wholesale trade	1.051	1.059	1.033	0.988	1.091	1.100	1.040	1.009	1.003	1.047 **
Retail trade	0.774 ***	0.834 ***	0.851 ***	0.823 ***	0.765 ***	0.877	0.826 ***	0.829 ***	0.738 ***	0.757 ***
Accommodation and food services	0.622 ***	0.649 ***	0.644 ***	0.631 ***	0.561 ***	0.520 ***	0.639 ***	0.635 ***	0.555 ***	0.594 ***
Transport, postal, and warehousing	0.939	0.968	0.895 *	0.903 *	1.053	0.879	0.914 **	0.925 *	0.859 ***	0.912 ***
Information media and telecommunications	1.097 *	1.091	1.148 *	1.049	1.208 **	1.166 *	1.092 **	1.040	1.014	1.028
Financial and insurance services	1.269 ***	1.157 ***	1.353 ***	1.213 ***	1.377 ***	1.119	1.291 ***	1.165 ***	1.218 ***	1.231 ***
Rental, hiring, and real estate services	0.816 ***	0.859 *	0.881	0.963	0.840	1.058	0.851 ***	0.905 *	0.958	1.065 **
Professional, scientific, and technical services	1.194 ***	1.050	0.979	0.988	1.322 ***	1.098	1.081 **	1.005	0.995	1.022
Administrative and support services	0.691 ***	0.648 ***	0.479 ***	0.459 ***	0.839 **	0.644 ***	0.567 ***	0.532 ***	0.503 ***	0.618 ***
Public administration and safety	1.192 ***	1.135 **	1.124 *	0.988	1.237 **	1.083	1.149 ***	1.045	1.165 ***	1.206 ***
Education and training	0.822 ***	0.870 ***	0.743 ***	0.771 ***	0.966	0.954	0.814 ***	0.843 ***	0.865 ***	0.906 ***
Health care and social assistance	0.910 *	0.907 *	0.782 ***	0.726 ***	1.078	0.878	0.860 ***	0.811 ***	0.836 ***	0.871 ***
Arts and recreation services	0.852 **	0.794 ***	0.730 ***	0.695 ***	0.975	0.725 ***	0.789 ***	0.730 ***	0.700 ***	0.729 ***
Other services	0.888 **	0.922	0.950	0.859 ***	0.847	0.788 **	0.935 *	0.888 ***	0.601 ***	0.617 ***
<i>Main field of study (ref = studies in human society)</i>										
Mathematical sciences	0.853	1.086	0.965	0.917	0.929	0.987	0.990	1.038	1.233 ***	1.298 ***
Physics and astronomy	0.672 **	1.180	1.368	1.340	0.896	1.119	0.895	1.420 **	0.922	1.077
Chemical sciences	1.131	1.074	1.028	0.964	1.079	1.017	1.070	1.091	1.103	1.047
Earth sciences	0.806 **	1.155	1.195	1.092	0.800 *	1.198	0.873	1.181	0.884	0.922
Biological sciences	0.896 *	0.941	1.022	0.777 **	0.874	1.019	1.003	0.956	0.973	0.964
Natural and physical sciences nec	1.009	1.176 *	0.859	0.862	1.084	1.212 *	1.188 *	1.164	1.143	1.105
Computer science	1.096 *	1.075	1.151	1.027	1.089	1.152 *	1.194 ***	1.192 ***	1.109 **	1.160 ***
Information systems	1.142 ***	1.124 **	1.028	1.010	1.101	1.189 ***	1.157 **	1.162 **	1.163 ***	1.189 ***
Information technology nec	1.017	1.153	1.334 **	1.171	1.238	1.361 *	1.183 *	1.292 ***	0.987	1.073

Variable	Young completers		Young non-completers		Young bachelor's completers		All young leavers		Older leavers	
	One-year	Three-year	One-year	Three-year	One-year	Three-year	One-year	Three-year	One-year	Three-year
Manufacturing, engineering, and technology	1.023	0.898	1.337	0.936	1.182	1.153	1.300 **	1.026	1.209 **	1.050
Process and resources engineering	1.201	1.349 **	1.295 *	1.024	0.545	0.966	1.415 ***	1.296 ***	1.200 **	1.130
Automotive engineering and technology	1.316 ***	1.303 ***	1.486 ***	1.289 ***	...	...	1.529 ***	1.437 ***	1.357 ***	1.266 ***
Mechanical and industrial engineering and technology	1.327 ***	1.298 ***	1.297 ***	1.115	1.008	1.011	1.416 ***	1.314 ***	1.194 ***	1.238 ***
Civil engineering	1.262 **	1.146	1.478 ***	1.068	0.998	1.239	1.572 ***	1.273 ***	1.435 ***	1.314 ***
Geomatic engineering	1.038	1.136	0.689	1.089	0.882	1.084	1.250	1.168	0.822	0.924
Electrical and electronic engineering and technology	1.155 **	1.320 ***	1.196 **	1.141	0.906	1.303 *	1.256 ***	1.314 ***	1.425 ***	1.391 ***
Aerospace engineering and technology	0.921	1.387 **	0.989	0.953	0.716	1.136	1.186 *	1.319 ***	1.168 **	1.280 ***
Maritime engineering and technology	0.997	0.761 **	1.600 ***	1.000	...	...	1.453 ***	1.005	1.300 ***	1.210 ***
Engineering and related technologies nec	1.506 ***	1.065	1.401 **	1.426 **	1.606 **	1.001	1.532 ***	1.488 ***	1.177 **	1.070
Architecture and urban environment	0.980	0.968	1.167	0.872	0.870 *	0.974	1.071	0.984	1.020	0.986
Building	1.291 ***	1.131 *	1.284 ***	1.067	1.044	0.596	1.354 ***	1.218 ***	1.324 ***	1.252 ***
Agriculture	1.173 *	1.085	1.475 ***	1.259 **	0.989	1.308	1.560 ***	1.371 ***	1.569 ***	1.259 ***
Horticulture and viticulture	1.062	0.911	1.094	1.198	1.604	1.023	1.132	1.212 **	1.214 ***	1.103 *
Forestry studies	1.258 **	1.093	1.163	1.250 *	1.155	1.343	1.301 ***	1.356 ***	0.972	0.954
Fisheries studies	1.784 **	1.151	1.559	0.983	...	...	1.969 ***	1.207	1.368 *	0.993
Environmental studies	0.781 **	0.860	0.729	0.824	0.942	1.239	0.800 *	0.998	1.129	1.073
Agriculture, environmental and related studies nec	0.907	0.694 *	1.283	1.316	0.784	0.621 *	1.254	1.233	1.288 ***	1.082
Medical studies	3.061 ***	2.387 ***	1.358	1.806	3.198 ***	2.708 ***	3.118 ***	2.640 ***	1.822 ***	1.649 ***
Nursing	1.279 ***	1.115	1.127	1.048	1.085	1.223 *	1.305 ***	1.208 **	1.444 ***	1.294 ***
Pharmacy	1.896 ***	0.989	1.101	1.094	1.997 ***	0.981	1.770 ***	1.032	1.402 ***	1.367 ***
Dental studies	2.686 ***	1.608 ***	2.699 ***	1.968 **	2.537 ***	1.583 **	2.754 ***	1.865 ***	1.685 ***	1.814 ***
Optical science	0.891	3.350 **	...	...	1.360	3.725 **	0.967	3.609 **	1.958 ***	2.085 ***
Veterinary studies	1.055	0.983	1.525 ***	1.246	1.523 **	1.187	1.311 ***	1.195 *	1.031	0.922
Public health	1.485 ***	1.127	0.962	1.227	0.387 **	2.048 *	0.949	0.915	1.371 ***	1.320 ***
Radiography	1.879 ***	1.154	1.643	1.976	1.600 ***	1.239	2.010 ***	1.311	1.646 ***	1.416 **
Rehabilitation therapies	1.327 ***	1.036	1.164	0.984	1.217 **	1.105	1.372 ***	1.154 *	1.014	0.955
Complementary therapies	0.692	1.446	1.198	1.119	...	...	1.239	1.169	0.940	0.996
Health nec	1.130 *	1.027	1.122	1.146	1.148	1.013	1.199 **	1.130	1.185 ***	1.183 ***
Teacher education	1.370 ***	1.177 ***	1.202 **	0.974	1.217 ***	1.113	1.394 ***	1.207 ***	1.179 ***	1.147 ***
Curriculum and education studies	1.090	1.115 *	1.077	0.876	0.987	1.080	1.309 ***	1.156 *	1.296 ***	1.181 ***
Education nec	0.921	1.158	1.260	0.544 ***	2.889	2.380	1.130	0.733 *	0.691 ***	0.699 ***

Variable	Young completers		Young non-completers		Young bachelor's completers		All young leavers		Older leavers	
	One-year	Three-year	One-year	Three-year	One-year	Three-year	One-year	Three-year	One-year	Three-year
Accountancy	1.083	1.176 ***	1.384 ***	1.191 *	1.020	1.171 **	1.380 ***	1.352 ***	1.315 ***	1.226 ***
Business and management	1.143 ***	1.092 **	1.234 ***	1.130	1.091 *	1.123 **	1.278 ***	1.244 ***	1.523 ***	1.380 ***
Sales and marketing	1.101 **	1.078 *	1.225 **	1.137	1.103 **	1.046	1.241 ***	1.207 ***	1.350 ***	1.297 ***
Tourism	1.127 **	1.061	1.298 ***	1.234 **	0.990	0.927	1.306 ***	1.266 ***	1.288 ***	1.195 ***
Office studies	1.009	1.019	1.004	1.035	...	...	1.066	1.141 **	1.076 *	1.101 **
Banking, finance, and related fields	1.062	1.083	1.136	1.410 **	1.065	1.094	1.175 *	1.381 ***	1.389 ***	1.300 ***
Management and commerce nec	1.166	1.144	0.786	0.693 *	1.562 ***	1.357 *	0.959	0.906	1.650 ***	1.293 ***
Political science and policy studies	0.856 *	1.015	1.008	0.980	0.817 *	1.064	0.962	1.147	1.198 *	1.183 *
Human welfare studies and services	0.908	0.833 **	0.833	0.965	0.898	0.908	0.957	0.990	0.904 **	0.920 *
Behavioural science	0.996	1.071	0.923	0.942	0.967	1.095	1.077	1.119	1.081	1.094
Law	1.264 ***	1.281 ***	1.435 ***	1.282 **	1.053	1.215 **	1.448 ***	1.433 ***	1.401 ***	1.313 ***
Justice and law enforcement	1.125	1.039	1.281	1.236	1.153	0.973	1.286	1.418 *	1.272 **	1.314 **
Librarianship, information management, and curatorial	0.939	0.731	0.413 *	0.714	0.427	...	0.624	0.769	0.984	1.003
Language and literature	0.889 **	0.833 ***	1.045	0.981	0.841 **	0.889	1.033	1.028	1.124 ***	1.058
Philosophy and religious studies	0.898	1.078	1.088	0.947	0.971	1.216	1.138	1.029	1.209 ***	1.096 *
Economics and econometrics	1.038	1.155 *	1.185	1.209	0.981	1.123	1.192 **	1.298 ***	1.262 ***	1.213 ***
Sport and recreation	0.894 **	0.836 ***	1.051	0.988	0.842	1.043	1.033	1.022	0.940	0.918 *
Society and culture nec	0.964	0.932	0.580 ***	0.530 ***	1.002	0.980	0.716 ***	0.763 **	1.084	1.077
Performing arts	0.647 ***	0.789 ***	0.832 *	0.776 **	0.561 ***	0.718 ***	0.751 ***	0.847 **	0.713 ***	0.710 ***
Visual arts and crafts	0.862 ***	0.896 *	0.680 ***	0.802 **	0.773 ***	0.882	0.797 ***	0.911	0.698 ***	0.773 ***
Graphic and design studies	0.935	0.907 *	0.983	0.880	0.877 **	0.873 *	0.990	0.959	0.881 **	0.923
Communication and media studies	0.920 *	0.918 *	1.040	0.898	0.933	1.017	1.008	1.001	1.014	1.017
Creative arts nec	0.938	0.977	0.320 ***	0.320 ***	1.198	1.213	0.450 **	0.457 **	0.623 ***	0.719 *
Food and hospitality	1.279 ***	1.168 ***	1.201 **	1.000	...	...	1.321 ***	1.201 ***	1.122 **	1.085
Personal services	0.994	0.909	0.855 *	0.895	...	...	0.977	1.005	1.088	1.060
General education programmes	0.866	0.752 **	1.072	0.995	...	...	1.083	1.088	0.831 **	0.868
Social skills programmes	0.621 **	1.007	0.898	1.310	...	...	0.708 *	1.070	1.013	0.977
Employment skills programmes	0.679 ***	0.785 **	0.920	1.057	...	...	0.862 *	1.053	0.695 ***	0.769 ***

(1) The premiums reported in this appendix relate to the exponential value of the model coefficient term.

(2) *** means statistically significant at the 1 percent level ** significant at the 5percent level * significant at the 10 percent level.

(3) ... means not applicable.

(4) nec means not elsewhere classified, mixed, or not otherwise defined fields of study.

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