Longitudinal Surveys of Australian Youth

Research Report 42

Pathways from School to Further Education or Work:
Examining the Consequences of Year 12 Course Choices

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EXECUTIVE SUMMARY

At the end of secondary school, most students complete a Year 12 certificate. The subjects that they choose to study for this certificate have a major influence on the educational and career options open to them after finishing school. Some students choose subjects that are related in some way, forming a course of study in which concepts from one subject inform studies in other subjects. Other students choose subjects that are unrelated, according only to their preferences or what is available in the school. While there is an enormous number of possible subject combinations, prior research has found that there are certain combinations that are traditionally taken by students in senior secondary school.

In particular, the advanced mathematics-physical sciences combination of subjects appears to be an enduring facet of senior secondary education. Other analyses have drawn together clusters of manual skills subjects, humanities and social sciences subjects, and technical and applied studies subjects. However, schools now retain a much greater proportion of their students to Year 12, resulting in a wider range of ability and interests being present in more recent Year 12 cohorts. Studies of subject choice of these cohorts have found an increase in the number of students taking *mixed* courses, courses with no defined area of specialisation (Ainley et al, 1994; Fullarton et al, 2003).

Particular subjects or subject combinations are traditionally more likely to act as gateways to higher education or to vocational education and training, while other combinations are more likely to lead to the workforce or perhaps to unemployment. In general, tertiary or vocational qualifications facilitate the transition to work, and graduates earn significantly more than those who enter the workforce directly from school. However, some groups of students are less likely to participate in further education and training, including low achievers and those from lower socioeconomic backgrounds. The literature has pointed to differences in curriculum participation according to background variables such as social background and gender. If these choices lead to different but equal outcomes then there is no problem: there are just different choices. If, however, such differences lead to better or poorer outcomes for particular groups, then it is important that such issues be explored and exposed. Some subject groups may just appeal more to males or females, but is it likely that some subject groups would appeal more to those from high socioeconomic backgrounds than low socioeconomic backgrounds? Do some schools provide better opportunities for their students, and if so, which schools and how? These are the types of questions this study has addressed.

The major findings of this report are:

Courses of study at Year 12

- Cluster analysis found seven identifiable clusters of subjects: *advanced mathematics–physical sciences, business studies, humanities and social sciences, arts, technical vocational studies, service-clerical vocational studies* and *other sciences*. As well, three *mixed* groups were defined: one which had two major foci, including subjects from the *mathematics-physical sciences* group, one which had two major foci but none from the *mathematics-physical science* group, and a *mixed eclectic* group for which no major focus was identifiable. From the 1995 cohort to the 1998 cohort, subjects settled into clusters that were easier to identify; however, fewer students were able to be classified into the seven major courses, with 45 per cent of Y98 students being classified into the three *'mixed'* groups, compared to 30 per cent of the Y95 cohort.

- Profiles were derived for each course according to gender, achievement, parents' occupational group, school location, school sector and home language background. Males were more likely than females to participate in the *advanced mathematics–physical sciences* and the *technical vocational* courses. Females were more likely to be enrolled in *social sciences and humanities*, *arts*, the *mixed-eclectic* courses, and the *service-clerical vocational* subjects.

- Level of achievement was one of the dominating characteristics in determining course participation. Students from high achievement levels dominated the areas of *advanced mathematics–physical sciences*, and the *mixed* area that included *mathematics-physical sciences*, and *social sciences and humanities*. Students from lower achievement levels were more likely to be doing courses with a *vocational* focus.

- Socioeconomic status had little effect once other confounding factors were removed. In general, those from higher socioeconomic levels were more likely to be engaged in the *physical sciences* courses and least likely to be engaged in any of the *vocational* courses.

- Students in government schools were more likely than those in other sectors to be undertaking courses in *service–clerical* and *technical vocational* studies, and *other sciences*.

- Language background had some effect on course choice, with students with a language background other than English more likely to study in the *mathematics-physical sciences* and *business studies* areas.

Pathways to further education and training

- Those courses that were the best pathways to higher education, with more than half of their participants moving on to university, were *advanced mathematics-physical sciences*, the *mixed* group including *advanced mathematics-physical sciences*, and the *social sciences and humanities* course. The first of these was dominated by males, the last by females; all three were dominated by those from higher achievement levels.

- The course areas of *business studies*, *other sciences* and *technical vocational* in particular provide some alternative pathways for a broad range of students, both in terms of ability and social status, language background and gender.

- The courses that provided the poorest pathway to further education and training of any type, were the *service–clerical vocational*, *mixed-eclectic* and *visual and performing arts* courses. All of these are dominated by female enrolments, and generally by those in lower achievement levels.

Science students

- Most students who took a course in the sciences in secondary school continued their education at university rather than at TAFE. These students were primarily enrolled in the tertiary areas of natural and physical sciences, engineering and health.

Moving into the workforce

- Most students who left school immediately after completing Year 12 moved into low-level positions, primarily in the areas of retail trades, accommodation, cafes and restaurant, and manufacturing. The course of study that appeared to lead most often to poor outcomes — unemployment, part-time work or not in the labour force was the *service-vocational* area.

While it is encouraging that so many of our students do go on to further studies or to work, it is of concern that some course choices seem to be 'dead ends' for many of those who choose them. Students who choose subjects at Year 12 level without some thought as to the ramifications of such choices may find themselves unable to participate in further education and in a very vulnerable position in the labour force. Those students whose parents are well educated or in professional jobs have role models from whom to receive advice about which subjects work together and which ones are likely not to do so. There are sections of the population who do not have such role models, and it is imperative that schools fulfil this role. Clear careers advice and guidance are vital at this stage of young people's lives.

Pathways from school to further education or work: Examining the consequences of Year 12 course choices

1. INTRODUCTION

The subjects chosen and studied in the senior secondary years have a major influence on the educational and career options open to young people. The study of particular subjects or subject combinations are traditionally more likely to act as gateways to higher education, while other groupings are more likely to lead to the workforce or perhaps to unemployment (Lamb & Ball, 1999).

Studies examining labour market outcomes of graduates (from university or TAFE) and non-graduates concluded that the transition from study to work was generally smoother for graduates, and that tertiary qualifications worked to protect young people from many of the difficulties involved with making this transition (Lamb, 2001; Lamb & McKenzie, 2001). As well, the authors found that higher education and TAFE graduates earned significantly more than those who entered the workforce directly from school. However, it is not only low achievers who are less likely to enter higher education or TAFE, but other groups are less likely to participate, including those from lower socioeconomic backgrounds. Part of the explanation for this may be the choice of subjects or courses in senior secondary school, and perhaps a lack of understanding of the consequences of such choices. For example mathematics (mostly an advanced mathematics) at Year 12 is a prerequisite for acceptance to around two thirds of all courses offered at both the University of Melbourne and the University of Sydney, and around 50 per cent of courses at La Trobe University in Melbourne. For engineering, science and health degrees, a physical science is an added prerequisite.

Differences in participation in the curriculum can emerge because children enter school with different levels of preparation, or they can emerge because children from different backgrounds do not receive the same schooling. Children throughout school are separated according to the type of school they attend, the area they live in and the subjects they take. They are separated according to the expectations and aspirations not only of their own families, but of key others in their school environment. Not only do students partake in the curriculum to the extent to which it is available to them, but also, more subtly, through the encouragement they receive.

If it is more likely that particular groups of students are following particular pathways which lead more often than not to negative outcomes, then it is important that research identifies these patterns of participation so that policy is able to target these groups.

Courses of Study

At the end of secondary school, most students complete a Year 12 certificate. However, beneath this generality there are vast differences. Traditionally, students choose to undertake groups of subjects that form quite coherent ‘courses’. There are advantages to students in undertaking studies of groups of subjects that have common concepts, with concepts from one subject being reinforced by teaching in the other subjects. In the early twentieth century, for example, a study conducted by Lewis examining the popularity of school subjects amongst English and Welsh students found that school subjects formed clusters. One cluster comprised subjects involving manual skills, another science subjects (Lewis, 1913). More recently, Ainley, Jones and Navaratnam (1990) used cluster analysis on a national data sample of young people and a much wider range of subject options to derive course types. Twelve clusters were derived, including a mathematics-science cluster, a humanities and social sciences cluster, and a technical and applied studies cluster. The mathematics-physical sciences cluster in particular appears to be an enduring

facet of senior secondary education (see also Department of School Education, 1992; Lamb & Ainley, 1999; Lamb & Ball, 1999; Myhill, Herriman & Mulligan, 1994).

However, unlike education in the early part of the twentieth century, more children now stay on to complete their secondary schooling. Increased retention to Year 12 results in a wider range of ability currently being present in the Year 12 cohort than previously (Dekkers & De Laeter, 1997) and school systems have worked to provide a much wider variety of subjects to Year 12 students, including more vocational subjects. In addition, students are actively encouraged to broaden their choices and widely sample the curriculum that is on offer, so it is important to examine whether the 'typical' course choices still occur. Data from the last decade suggest that some changes have already taken place. Ainley, Robinson, Harvey-Beavis, Elsworth and Fleming (1994) found that there was an increase in the number of students enrolled in a '*mixed*' course type, one which had no defined area of specialisation, over that found in a previous analysis (Ainley et al, 1990). Similarly, Fullarton, Walker, Ainley and Hillman (2003) found a general decline in traditional course types, with fewer students taking more than one subject from typical areas of specialisation.

Differential Enrolments

The majority of research focussing on school and subject enrolments suggests that there are social, gender and regional differences in the types and patterns of subjects studied in the senior secondary years (Ainley, Jones & Navaratnam, 1990; Ainley et al, 1994; Fullarton & Ainley, 2000; Fullarton et al, 2003; McKenzie, Harrold & Sturman, 1996; Teese, McLean & Polesel, 1993; Teese et al, 1995). For example a variety of studies throughout the course of the twentieth century found that subject choices were gendered, from Shakespeare's (1936) study which found that boys preferred mathematics and science while girls preferred languages and history through to a study by Brown and Fitzpatrick (1981) which found that boys tended to enrol in physical sciences and advanced mathematics and girls in cultural, linguistic, general science and less advanced mathematics subject areas. Eder & Parker (1987) argued that schools play a role in 'tracking' girls into particular areas of study such as clerical and domestic courses while boys are more likely to be 'tracked' into industrial and technical courses. By such tracking, they argued, schools produce and reproduce gender differences in values and interaction styles, reinforcing gender differences in the workforce, where females are often employed in lower-status occupations.

Other research has found that students from higher socioeconomic levels tend more often to take subjects that will promote access to higher education and to prestigious courses at university. Bordieu and Passeron (1977) argued that schools actually help to maintain class differences by stratifying students by course, thus preparing students for their futures within a stratified labour market.

From Year 12, some students will progress to university, some to TAFE or alternative educational providers, some to the labour force. Are students' choices of a 'course' in Year 12 an indication of their intended study or work? Are there differences in subject choice based on gender, or socioeconomic status, or locality? Do students who are undertaking studies in the mathematics-physical sciences area move into these areas in their tertiary education, or are these subjects simply used as a springboard to higher university entrance scores and into courses that may not involve science? Of course, this should not be seen as a particular negative: a workforce in which lawyers, teachers, and accountants as well as doctors, scientists and engineers have a working knowledge of scientific principles and methodologies is not, in itself, a problem.

Studying Science

Science is, of course, more than physics and chemistry. However, the study of physics or chemistry (together with advanced mathematics) is a prerequisite for most engineering and many science courses. In this section, science courses refer to those that include physics and chemistry.

The study of science has been a focal area of concern for educators at most levels in Australia for the past few decades. There has been widespread concern for a number of years that the number of students studying science at both the secondary and tertiary level is in decline (Dekkers & De Laeter, 1997, DeLaeter, Malone & Dekkers, 1989; Dobson & Calderon, 1999; FASTS, 2002). In particular, concerns have been raised about the low levels of participation in secondary and tertiary level science courses by females (Kelly, 1981) and of the male predominance in subjects such as physics and chemistry (Dawson, 2000; DeLaeter et al, 1989; Walding, Fogliani, Over & Bain, 1994). Australian findings are consistent with those found in, for example, the United Kingdom (Gallagher, McEwen & Knipe, 1997; Stables & Stables, 1995), the United States (Sellinger, 2002), Holland (Bosker & Dekkers, 1994) and Nigeria (Akpan, 1986).

Students from non-English speaking backgrounds have also been found to be more likely to enrol in a science course type (Lamb & Ainley, 1999, Myhill et al, 1994). In particular, data examining specific ethnic groupings indicate that students of Asian background are more likely to take physics and chemistry than any other cultural group (Fullarton et al, 2003) and that the rate of participation of Asian students in science is more than twice the rate of other groups (Department of School Education, 1992). While Asian students are a proportionally over-represented cultural group in the choice of science subjects, it is worth noting that some cultural backgrounds are notably under-represented, including students of Aboriginal and Torres Strait Islander background (Ainley et al, 1994; Department of School Education,1992).

Socioeconomic status (SES; generally measured by parental occupation) has also been found to be associated with subject choice, with higher SES being consistently associated with the choice of the traditional science subjects (Elsworth, Harvey-Beavis, Ainley & Fabris, 1999; Rosier & Long, 1991). Lamb and Ball (1999) also found that for cohorts of Australian Youth Survey, the higher up the socioeconomic scale the more likely it was that a student would be enrolled in academic courses, particularly those groups which combined higher level mathematics with science subjects. Consistent with these findings, Fullarton and Ainley (2000) and Fullarton et al (2003) also found higher proportions of enrolments in higher mathematics, physics and chemistry amongst those students from high than those from low socioeconomic backgrounds.

Early achievement at school (generally measured in terms of literacy and/or numeracy) was found to be positively correlated with the choice of traditional science subjects at Year 12 level (Ainley et al, 1990, Ainley, et al., 1994; Lamb & Ainley, 1999; Robertson, 2000). There is a concomitant minimal level of participation in the mathematics–physical science course type by students with lower achievement in the early school levels. Increasing ability level is also associated with the choice of science courses at a tertiary level (Kidd, 1992; Kidd & Naylor, 1991).

The final characteristic common to those students who are particularly likely to choose science subjects at Year 12 level is subsequent participation in higher education. Lamb and Ainley (1999) found that more than three-quarters of those students who participated in a science course at Year 12 level entered higher education by the age of 19 compared to less than two-thirds of those students who completed vocational education and technology courses, or courses based on health and physical education. The data collected by Ainley et al (1990) suggested an even higher figure, with nine out of ten students enrolled in a mathematics–physical science course at Year 12 continuing formal study beyond the secondary level.

These figures are not surprising when one considers the reasons given by students for choosing to study science subjects. While numerous researchers have linked interest with subject choice (see for example Ainley & Elsworth, 1997; Elsworth et al, 1999; Kidd, 1992; Kidd & Naylor, 1991), recent data suggest that the main reason for studying science subjects is that they were a means to achieving the end goal of either further study (most commonly), or work (Ainley et al, 1994). Science being relevant to further study was given as a reason for its choice in about one-third of cases, a noticeably greater proportion of responses than the next most frequently occurring responses (relevant to work: 18 per cent, interest in the subject: 13 per cent). This trend is also evident in other parts of the Western world. For example Stables and Stables (1995) found that when choosing subjects for A-Levels in the United Kingdom, an important reason for choosing chemistry and physics was that they were seen to be useful for a future career.

Higher Education and Labour Market Outcomes for Science Students

As has been discussed, the vast majority of students taking a science course at Year 12 level go on to participate in some form of higher education. Of the students surveyed by Ainley et al (1990) about two-thirds of those taking a science course at Year 12 studied science, mathematics, engineering or the health sciences at tertiary level. Almost one fifth of the students taking a science course at secondary level indicated that commerce or law was their main area of study at the tertiary level.

Labour market outcomes for the group of students taking a science course at Year 12 are extremely positive compared to the outcomes for other course types. Lamb and Ball (1999) found that the rates of students taking this course who were neither studying nor working full time at the age of 19 was very low, and in general, students taking this course were less likely to experience long periods of unemployment (over 50% of this group spent no time unemployed) and were likely to earn more than their counterparts taking other courses.

Subject choices and the combination of these choices in cohesive courses at the Year 12 level have significant impact on subsequent outcomes, with those taking science courses experiencing particularly positive participation in both higher education and the work force. Using longitudinal data enables the tracking of groups of students and the construction of profiles of students taking particular course types, an exercise of great value in gaining a clear picture of changing societal trends. The following research questions have emerged from the literature as being of particular importance in the context of this report.

Research Questions

1. What are the typical clusters of subjects or course types studied by Year 12 students? Have these changed since prior analyses (for example, Ainley et al, 1994; Lamb & Ball, 1999), particularly with the increased participation in VET subjects and with the apparent broadening of subject choices across the Key Learning Areas?
2. What are the profiles of students enrolled in particular course types in Year 12? Are there particular courses that are more likely to be studied by males or females, or those from different social backgrounds?
3. Into which field of study area or work do students from particular course types tend to move?
4. Into which area of work do students from particular course types tend to move into? Are there particular course types that appear to lead more often to unemployment or other poor outcomes?

Data for This Study

Data have been drawn for this study from the 1995 and 1998 LSAY cohorts. These cohorts were typically in Year 12 in 1998 and 2001 respectively. The LSAY 1995 cohort (Y95) comprises approximately 13 000 students who were in Year 9 in 1995, and the LSAY 1998 cohort (Y98) comprises approximately 14 000 students who were in Year 9 in 1998. When they were in Year 9, students completed literacy and numeracy tests, which have provided baseline achievement data for analysis. In addition, a wide range of background data was collected at this point.

Both data sets contain detailed information about the subjects studied in Year 12, the broad field of study undertaken in higher education and in vocational education and training, and the nature of the industry and occupation for those who enter employment. Further details about the LSAY methodology and samples, as well as a description of all variables used in this report, are available in Appendix 1.

Organisation of This Report

The next chapter of this report discusses the techniques used to derive the courses of study used as the basis for this report. Chapter 3 provides profiles for each of the courses of study that are derived in Chapter 2, examining gender, socioeconomic status, achievement level, school location and sector, and home language background. Chapter 4 examines each of the courses of study for their level of participation in further education and training, while Chapter 5 follows those who did not participate in any further education or training into the workplace, looking at their levels of success as well as the types of employment that they gain. Chapter 6 draws together the findings from the substantive chapters and provides some suggestions for policy and practice.

2. DERIVING THE COURSES OF STUDY

As has been discussed, one of the problems associated with the analysis of enrolment data is that students enrol in more than one subject in their final year of school (usually five or six), and so an individual enrolment in a subject does not uniquely characterise a student's Year 12 course. Rather it is the *combination of subjects* that characterises the type of course a student is undertaking. While recognising that this combination is constrained by a variety of factors, it would be most common for students with a particular area of interest to take several subjects from a particular subject grouping. For each student there is a unique group of subjects that makes up a *course*, and herein lies the problem for analysis.

There is an enormous number of different courses that are available (at least theoretically) to students. However for an analysis of characteristics associated with course choice to be feasible and useful, it is necessary to reduce that enormous number to a few major courses which cover a majority of students and which are similar in their essential elements. In the Y95 data collection, for example, 325 subjects are listed as being undertaken by students across Australia, however many of these subjects are the same as each other, just with differing names. For example *Biology* taken by students in New South Wales, Victoria, South Australia, Western Australia, Tasmania and the Australian Capital Territory could be grouped with *Biological Science* undertaken by students in Queensland. Course guides available on the websites of the Curriculum Authority for each state and Territory were consulted to provide a basic grouping of these 325 subjects into broader subject groupings.[1] After carrying out this initial grouping, and developing some 40 broad subject groups, cluster analysis[2] was used to identify the most common *groupings* of subjects. Each subject was available to be included in *one* subject grouping only.

Cluster Analysis Results – Y95 cohort

An initial examination of the Y95 data (See Figure 1) using cluster analysis (Ward's method, 1-Pearson r distance metric) suggested[3] six major broad course types or subject groupings, which comprised the following subjects and could be described as:

- *Physical sciences*: Physics, chemistry and advanced mathematics;
- *Technical vocational studies*: Engineering technology, agriculture, automotive, design, materials technology;
- *Business*: Legal studies, economics, accounting, IT, business, and general mathematics;
- *Other sciences*: Biology, psychology, home sciences, geography;
- *Visual and performing arts*: Music, performing arts, other arts, visual arts;
- *Humanities and languages*: History, social sciences, religion, Asian languages, European languages, and English literature.

A further group of subjects, comprising childcare, work education, VET business, office skills, health, hospitality, other technology subject, other sciences, general sciences, physical education, VET IT, and basic mathematics, was more difficult to characterise. The course was labelled *service/clerical vocational* studies because the primary focus of more than half of the subjects was in this area.

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1 Indicative (but not exhaustive) subject groupings are provided for both the Y95 and Y98 cohorts in Appendix 2.

2 For a more complete discussion of the processes underpinning the cluster analysis, the reader is referred to Appendix 3.

3 It should be noted that these groups are suggested, not defined, by the analysis and interpreted by the researcher.

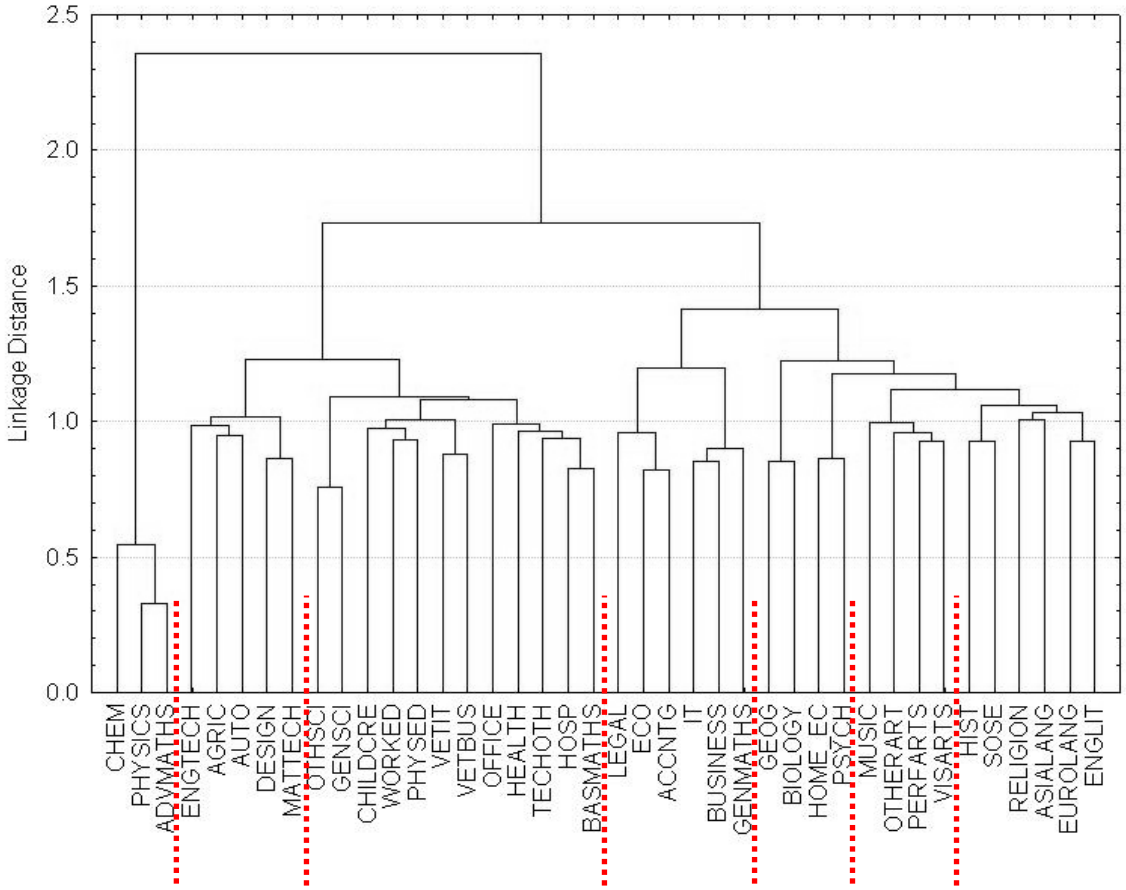

Figure 1 Dendrogram showing clusters of courses and proposed groups for Y95 LSAY data

The concept of *major studies* was defined for this report as the study of at least *two* subjects from *one* group. Major studies are used to define the course type for each student. Courses which involve major studies in more than one area were examined to determine the course type into which they best fit and courses which had no clear major studies are grouped as such.

This basic coding allocated 5238 of the 7396 students to unique course types by grouping them into the area in which they were predominantly studying (if there was a clear area). The remaining 2158 students were then classified into three broad groups:

- Mixed – eclectic – no more than one subject from each group. For example:
  - Asian language, basic mathematics, chemistry, geography, IT, or
  - General mathematics, religion, visual arts, design, geography, or
  - European language, advanced mathematics, biology, general science;
- Mixed – including physical sciences– multiple major foci including the physical science group. Students in this category generally study 2 or 3 subjects in two groups, *including* the physical science group. Primarily the second focus was in the area of business studies. For example:
  - Advanced mathematics, chemistry, accounting, IT, European language, or
  - Advanced mathematics, biology, chemistry, economics, religion, or
  - Advanced mathematics, physics, biology, other science, VET IT;

- Mixed – general – multiple major foci *without* a physical science subject or advanced mathematics. Students in this category generally study 2 or 3 subjects in two groups, with no studies in the physical sciences group. For example:
    - English literature, basic mathematics, accounting, legal studies, history, or
    - Biology, social sciences, religion, geography, hospitality, or
    - Basic mathematics, biology, VET business, religion, geography.

Of course these are only examples; there were many other variations of courses studied by students. Table 1 provides the number and proportion of Year 12 students whose primary identification, for this report, is in each of these groups.

Table 1 Year 12 subject groups and sample sizes, Y95 cohort

Course of Study	Number of students (weighted)	% of enrolments
Physical Sciences	1196	16
Technical Vocational Studies	88	1
Service/Clerical Vocational Studies	1842	25
Business Studies	1072	14
Other Sciences	443	6
Visual & Performing Arts	170	2
Humanities & Languages	427	6
Mixed - eclectic	1023	14
Mixed – including physical sciences	391	5
Mixed - general	744	10
Total	7396	100

Cluster Analysis Results – Y98 cohort

Using the same method of analysis, the tree diagram shown in Figure 2 provides the groupings that were found for the Y98 cohort of students. While there are some similarities with the Y95 groupings, there are also notable differences. During the period of time between 1998 (when the Y95 group were in Year 12) and 2001 (when the Y98 group were in Year 12), there was growth in the number of VET in Schools subjects available to students. The subject groupings for the Y98 cohort have been labelled for this report as:

- *Physical sciences*: Physics, chemistry and advanced mathematics;
- *Technical vocational studies*: Engineering technology, agriculture, automotive, design, materials technology, other technology and other sciences;
- *Service vocational studies*: Childcare, work education, hospitality, and home sciences;
- *Business*: Economics, accounting, IT, business, general mathematics, languages, religion, VET IT, VET Business, and office skills;
- *Other sciences*: Biology, general sciences, basic mathematics, geography, health, and physical education;
- *Visual & performing arts*: Music, performing arts, other arts, visual arts; and
- *Social sciences*: Social sciences, psychology, legal studies, history, English literature.

As with the Y95 cohort, three '*mixed*' groups were devised, and were identified in the same manner. Table 2 provides the number and proportion of Year 12 students from the Y98 cohort who were primarily enrolled in each area.

Table 2 Year 12 subject groups and sample sizes, Y98 cohort

Course of Study	Number of students (weighted)	% of enrolments
Physical Sciences	1048	12
Technical Vocational Studies	161	2
Service Vocational Studies	119	1
Business Studies	1748	20
Other Sciences	1057	12
Visual & Performing Arts	227	3
Social Sciences	404	5
Mixed - eclectic	3136	35
Mixed – including physical sciences	307	4
Mixed - general	569	6
Total	8777	100

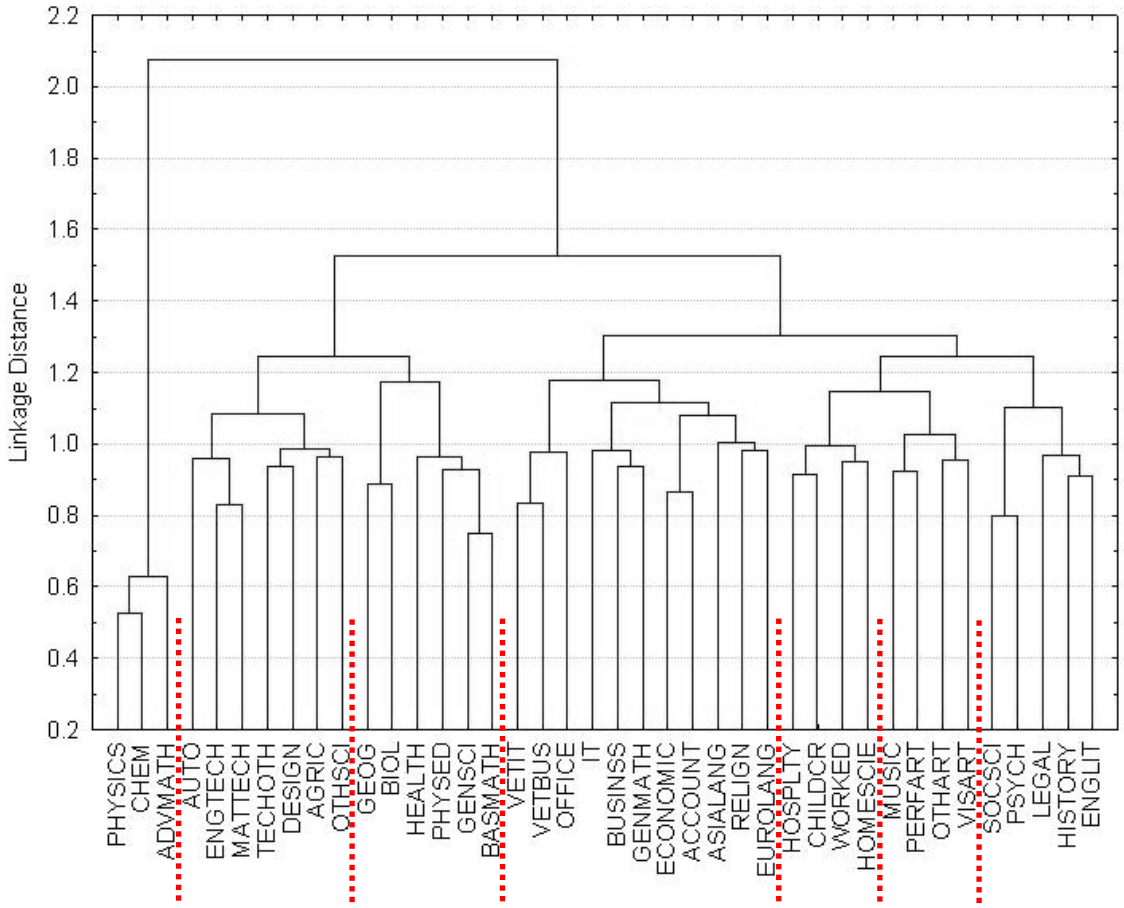

Figure 2 Dendrogram showing clusters of courses and proposed groups for Y98 LSAY data

Changes between Cohorts

There are two rather substantial changes apparent in these analyses. The first is that the proportion of Year 12 students who were able to be categorised into the groups suggested by the cluster analysis declined from 70 per cent for the Y95 cohort to 55 per cent of the Y98 cohort (the remaining students being assigned to *mixed* courses). The second is the changing subjects in most of the clusters. These clusters are suggested by the data, and changes in the composition of the

clusters, and of the proportion of students that even 'fit' into the clusters, suggest that there have been substantial changes in schools over the three-year period between the Y95 cohort and the Y98 cohort completing Year 12. It could be hypothesised that this may indicate a larger proportion of students choosing subjects according to interest rather than because they 'fit' into a defined 'course of study'. It may be because of a relaxing in demand for prerequisites for some tertiary courses, with a number of courses only requiring passes in English (along with substantial tertiary entrance scores). However, the exceptions to this usually require the completion of at least one advanced mathematics subject, and often one of the physical sciences – physics or chemistry. Thus students who do not complete any of these still limit their choices of tertiary course.

Of the seven defined clusters in each analysis, two remain the same between cohorts: *the physical sciences* and the *visual and performing arts* clusters. The areas that appear to have changed the most over the two years (and remembering that the labels are not prescriptive, but an attempt by the author to be descriptive) are in the areas of *business*, *other sciences* and, to a lesser extent, *humanities and languages*. The clustering from the Y98 cohort shows a stronger grouping together of technology subjects such as engineering, automotive and other technologies into the overall *technical vocational studies* area, while the *business* cluster draws together VET subjects such as IT, business and office skills with more traditional subjects such as economics, business and accounting. That these subjects cluster together means that a greater proportion of students are taking more than one subject in the area, so it could be that more students studying in the traditional areas are also taking VET subjects in similar areas.

The next chapter of this report examines the 'profile' of each of these groups of students for both Y95 and Y98 cohorts. In some cases, such as with the *physical sciences* grouping, comparisons can be made, as the subject composition of the group is identical from one cohort to the next. For most other groups comparisons should be made with some caution, as the subject compositions vary from cohort to cohort, but in many cases the primary subjects are the same in each group for both cohorts.

3. PROFILES OF PARTICIPATION IN YEAR 12 COURSES

With an increase over the last 20 years in the number of young people remaining at school to complete Year 12, curriculum has of necessity evolved and changed to meet the growing needs of a diverse group of students. In particular over the last five years, there has been an increase in the range of subjects oriented towards students whose aim is not university but TAFE, apprenticeships or traineeships, or employment. However, not all courses lead equally to positive outcomes, and so the issue of participation is an important one if particular groups of young people do not make informed choices. This chapter looks at the profiles of young people enrolled in each of the different course types, by gender, school sector, socioeconomic status, school locality and ethnicity.

Multivariate Analysis

Multivariate analysis, using logistic regression in this case, allow for the identification of factors that exert an independent or 'net' effect, after controlling for all other factors. For example in Table 3, which presents summary data on participation levels in the *physical sciences* courses, it appears as though school sector is a major influence on participation, as students in independent schools were enrolled in such courses at a rate of about one-and-a-half that of government school students. Is this due to the influence of school sector, or could it be a confounding influence of socioeconomic level and achievement level, considering that we know both are higher at independent schools? We need to be able to examine the effects of each, one by one, holding constant the effects of the other variables in the model. In short, we need to have 'other things equal' when talking about, for example, the effects of attending an independent school on participating in a mathematics-physical science course. These effects are known as 'net' effects because they are 'net of' the confounding influence of other variables in question. Logistic regression can answer these questions, as it allows us to estimate the probability of an event occurring or not, after controlling for all the other factors in a model.

Logistic regression coefficients are presented in Tables A3 and A4 in Appendix 4. The sign of the logistic coefficient indicates whether the factor has a positive or negative influence; that is, whether it increases or decreases participation. The interpretation of the results differs according to whether the independent variable is dichotomous, categorical or continuous. The interpretation of the logistic coefficients will be included for each of the courses of study.

For dichotomous independent variables (that is, variables which have only two categories such as male/female), the size of the logistic regression coefficients can be compared. For example the effects of gender and region can be compared using the data contained in Table A3. For the Y95 cohort, the effect of gender on participation in the physical sciences course (-0.79) was higher than the effect of region (-0.20).

For categorical independent variables (which comprise three or more categories, such as occupational groups), the size of the regression coefficients can also be compared, but the size is always relative to the reference category. For example, Table A3 shows that the effect on participation in physical sciences of coming from a high socioeconomic background (relative to a low socioeconomic background) is greater than the effect of coming from an upper middle socioeconomic background (relative to a manual background). The choice of the reference category does not change the relative differences in the logistic regression coefficients between categories.

Odds Ratios

The logistic regression coefficients (and their statistical significance) are presented in Appendix 4. However, when the results are discussed in the text, the logistic regression coefficients are converted to odds ratios, which are more readily interpretable. The odds ratios are calculated by taking the exponent of the logistic coefficient.[4] Presentation of the raw logistic regression coefficients in the tables allows readers to check their interpretations of the tables in the text and to make their own comparisons. Odds ratios in the multivariate context are net effects; that is, an odds ratio is the effect (odds) of a factor on participation relative to a reference group, having taken into account the influence of other factors.

The results of the logistic analyses are included in the relevant following sections.

Physical Sciences

The following is a summary of the differences associated with the factors represented by the groupings in Table 3. This area of the curriculum is generally seen as the most academically challenging, and this is recognised both by the weightings given to advanced mathematics, physics and chemistry in the calculation of tertiary entrance scores in each State and Territory, and by the proportion of subjects at tertiary level with a requirement of previous study in one or more of these areas.

- *Gender.* Study of the *advanced mathematics–physical sciences* combination has been found in previous studies to be the province of high achieving males, and these data support this. Whilst the gender gap appears to have lessened, the participation rate of males is twice that of females in the Y95 cohort, and almost that for the Y98 cohort. The gender gap is widest in physics, where the participation rate for males is more than three times that for females for both cohorts. About three in 20 young males were undertaking major studies in this area in 2001, compared to about one in ten females.
- *Earlier achievement.* There is a strong association between participation in the physical sciences and earlier achievement in literacy and numeracy. Participation among the top quarter of students was more than eight times that of the bottom quarter for the Y95 cohort and 15 times that for the Y98 cohort. The participation rate for the highest achieving quartile was more than twice that even of the next highest achievement quartile, supporting other studies that have indicated that these subjects attract the highest achieving students.
- *Socioeconomic level.* These subjects also attract those in the higher socioeconomic quartiles. The participation rate for those students whose parents were in the highest socioeconomic quartile, typically professionals and managers, was twice that of students whose parents were in the lowest socioeconomic levels, typically unskilled manual labourers.
- *Location.* Differences between city and rural schools were small. For the Y95 cohort there was a slightly higher participation rate amongst those students in metropolitan schools, but this difference was not apparent with the Y98 cohort.
- *School sector.* Participation rates in the physical sciences for students in independent schools for the Y95 cohort was almost twice that for those in government or Catholic schools, while for the Y98 cohort participation was greater by about 50 per cent.
- *Language background.* Participation in the mathematics-physical sciences was lower among those students from Australian or other English speaking backgrounds than for those whose parents came from a country where the main language was not English by approximately 50 per cent.

[4] Appendix 5 provides a more detailed explanation of how to interpret odds ratios

Table 3 Percentage enrolments in Physical Sciences course of study by student background characteristics, Y95 and Y98 cohorts

	Y95	Y98
Total percentage enrolment	16	12
Gender		
Males	22	15
Females	11	9
Achievement		
Lowest	4	2
Below average	8	5
Above average	16	11
Highest	32	30
Parents' occupational quartile		
Lower	12	8
Lower-middle	14	10
Upper-middle	16	14
Upper	24	20
School location		
Metropolitan	17	15
Non-metropolitan	15	15
School sector		
Government	14	11
Catholic	16	12
Independent	25	18
Language background		
English	15	11
LBOTE	21	17

For both cohorts, the strongest influences on participation in the *physical sciences-advanced mathematics* courses were achievement, followed by language background, then gender. Those from the highest socioeconomic level were significantly more likely than those in the lowest socioeconomic level to participate in these courses, however other effects were not significant. The results for school sector are inconclusive, as they are quite different for each cohort, but it is clear that after controlling for differences in achievement and socioeconomic level, the effect of school sector on participation in *physical sciences* is not as strong as the data in Table 3 suggest *prima facie*.

Business Studies

For the Y95 cohort, the *business studies* grouping included economics, accounting, IT, business, general mathematics and legal studies. For the Y98 cohort the grouping included all of these subjects other than legal studies, and added languages and religion, plus the vocational subjects VET IT, VET Business, and office skills. While this means that the data for the two cohorts are not strictly comparable, there is still a great deal of subject overlap between the two groupings.

- *Gender.* Gender differences were not large for either cohort. The vocational subject of VET IT enrols primarily males, while the other two vocational areas have quite small enrolments. More males than females studied the non-vocational IT subject, the languages area predominantly enrols females, and for both cohorts about the same numbers of males and females studied accounting.

- *Earlier achievement.* Enrolments in this area are spread reasonably evenly across the four achievement quartiles, although primarily amongst the middle two. Around one in five students in each achievement quartile is undertaking study of two or more subjects in this course of study.
- *Socioeconomic level.* For both the Y95 and Y98 cohorts there were only minor differences in enrolments by socioeconomic level. There were higher enrolments in both the vocational and non-vocational IT areas for those students from a lower socioeconomic background, while enrolments in economics were higher for those from higher socioeconomic backgrounds.
- *Location*. For both cohorts, students from metropolitan schools enrolled in the business area to a greater extent than their non-metropolitan counterparts. This is most likely due to fewer resources for an array of business subjects at non-metropolitan schools.
- *School sector*. While there was little difference in enrolments between the three sectors for the Y95 cohort, there were large differences between them for the Y98 cohort. Enrolments were certainly larger for the Catholic sector than for the government or independent sector, and enrolments in the independent sector slightly larger than for the government sector, most likely due to the addition of religion to this cluster, which is a compulsory subject for most students in Catholic schools in Year 12, and for students in some independent schools. Around one in three students in Catholic schools, one in five in independent schools, and one in six students in government schools were undertaking major studies in the *business studies* area in 2001.

Table 4 Percentage enrolments in Business Studies course of study by student background characteristics, Y95 and Y98 cohorts

	Y95	Y98
Total percentage enrolment	14	20
Gender		
Males	16	21
Females	13	19
Achievement		
Lowest	13	18
Below average	15	21
Above average	15	23
Highest	15	18
Parents' occupational quartile		
Lower	15	21
Lower-middle	15	21
Upper-middle	14	18
Upper	14	21
School location		
Metropolitan	16	26
Non-metropolitan	15	21
School sector		
Government	15	16
Catholic	14	33
Independent	14	20
Language background		
English	14	17
LBOTE	22	31

- *Language background*. Participation rates for economics and accounting, languages, and IT are all more traditionally higher for those students with a language background other than English (Fullarton et al, 2003), so it is not surprising that enrolments in this course of study are also substantially higher for these students. Around one in three students from a language background other than English compared to around one in six with an English language background participated in this subject area in 2001.

For the Y95 cohort, the strongest influence on participation in *business studies* (from the logistic regression analyses) was achievement, with students in the lower middle, upper middle and high achievement levels all about 1.5 times as likely as those in the lowest achievement level to be enrolled in *business studies.* Students in metropolitan schools were also about 1.4 times as likely as those in non-metropolitan schools to be studying in this area. Females were significantly less likely than males, and students with a language background other than English were significantly *more* likely than those with an English language background to be enrolled in this area.

For the Y98 cohort, probably due to the inclusion of religion in the subject grouping, school sector was a significant influence on enrolments in this area. Students attending a Catholic school were 2.5 times and students in independent schools were 1.3 times as likely as those in government schools to be enrolled in *business studies*. Other significant factors were language background, achievement and gender. Students from a language background other than English were 1.7 times as likely to be enrolled in this area as those from an English-speaking background, and those in the lowest achievement quartile were 1.7 times as likely as those from the highest achievement quartile to be enrolled in this area. Gender exerted a significant, although minor, influence on participation, with males 1.2 times as likely as females to be taking *business studies* courses.

Other Sciences

For the Y95 cohort this course of study included the subjects geography, biology, home sciences and psychology. While this formed a loose group, for the Y98 cohort the cluster was more well-defined, and included geography, biology, health, physical education, general sciences and basic mathematics.

- *Gender*. The inclusion of biology, home sciences, and to a lesser extent psychology, in the clustering for the Y95 cohort results in enrolments in this course being largely female for this cohort. Individually, all these subjects show substantially higher enrolments for females than males, while enrolments in geography are fairly even with regards to gender. For the Y98 cohort, enrolments in this subject area are similar for males and females, with slightly more than one in ten male and female students undertaking major studies in this area.
- *Earlier achievement*. Disregarding the change in overall participation levels from the Y95 cohort to the Y98 cohort, a similar pattern of enrolments in this course of study emerges. Higher participation rates tended to be among the middle two achievement levels, although it is unlikely that the differences are significant. The increased numbers participating in this subject area for the Y98 cohort are due to the inclusion of the health and physical education subjects into this course, both of which have reasonably strong enrolment levels. About one in ten students in the highest and lowest achievement quartiles are enrolled in major studies in this whole area, compared to about one in seven for those in the middle two achievement quartiles.
- *Socioeconomic level.* Differences in participation in the *other sciences* area due to socioeconomic differences were negligible. A slight tendency for fewer of those from higher socioeconomic levels to participate is due to the higher proportion of those students choosing subjects in the physical sciences area rather than in biology or general sciences, and choosing advanced mathematics over basic mathematics.

- *Location.* The Y95 data show no differences by school location, and the differences for the Y98 cohort are quite small. A slightly greater proportion of students in non-metropolitan schools than metropolitan schools take two or more subjects in this area.
- *School sector.* Differences between school sectors are, again, not very large. The Y98 data show that the lowest enrolments in this course of study were in the Catholic sector, enrolling one in ten students. The government and independent sectors enrolled one in eight and one in seven students, respectively.
- *Language background.* This was the only background characteristic that showed substantial differences, although not for the older cohort. For the younger cohort, the participation rate for students with an English language background was more than twice that of students from a language background other than English.

Table 5 Percentage enrolments in Other Sciences course of study by student background characteristics, Y95 and Y98 cohorts

	Y95	Y98
Total percentage enrolment	6	12
Gender		
Males	3	11
Females	8	13
Achievement		
Lowest	6	11
Below average	6	14
Above average	7	14
Highest	5	10
Parents' occupational quartile		
Lower	6	11
Lower-middle	6	13
Upper-middle	7	12
Upper	6	12
School location		
Metropolitan	6	14
Non-metropolitan	6	17
School sector		
Government	6	12
Catholic	6	10
Independent	7	14
Language background		
English	6	13
LBOTE	4	6

Results from the logistic regression for *other sciences* for the Y95 cohort show that the strongest influence on participation was gender, with females 2.7 times as likely as males to be participating. The only other significant influence, all other things equal, was language background, with students from an English-speaking background 1.6 times as likely to study in this area as those from a language background other than English.

For the Y98 cohort, and the more well-defined subject grouping, the only significant influences were related to achievement in Year 9, school sector and language background. Students from the lowest achievement level were significantly more likely than those from the upper middle (1.3 times as likely) and high achievement levels (2.0 times as likely), those in government schools were 1.3 times as likely as those in Catholic schools, and those with an English speaking

background were 2.9 times as likely as those with a language background other than English to undertake studies in this area.

Technical Vocational Studies

This is a course of study with very small enrolments for both the Y95 and the Y98 cohorts, primarily due to the effects of early school leaving. Many of the students from lower achievement levels and from lower socioeconomic backgrounds have already left school before Year 12, and it is from this pool of students that the candidates for this less academic part of the curriculum would usually draw. In Y95 the course was defined by the subjects engineering technology, agriculture, automotive, design, and materials technology, and for the Y98 cohort also other technology and other sciences.

- *Gender.* It is clear that this area consists of subjects dominated by males. Enrolments in the course by females were negligible for both cohorts.
- *Earlier achievement.* Studies in the *technical vocational* area are also more likely to attract those in the lower achieving quartiles than those in the higher achieving quartiles. This is hardly surprising given that those in the higher achieving quartiles are more likely to aspire to university and those in the lower achieving quartiles more likely to aspire to vocational education and training or work.
- *Socioeconomic level.* This course primarily attracted students from the middle two socioeconomic quartiles, those who generally represent clerical workers and skilled manual workers.

Table 6 Percentage enrolments in Technical Vocational course of study by student background characteristics, Y95 and Y98 cohorts

	Y95	Y98
Total percentage enrolment	1	2
Gender		
Males	2	3
Females	0	0
Achievement		
Lowest	2	3
Below average	2	2
Above average	1	2
Highest	0	1
Parents' occupational quartile		
Lower	1	2
Lower-middle	1	2
Upper-middle	2	2
Upper	1	1
School location		
Metropolitan	1	2
Non-metropolitan	2	4
School sector		
Government	2	2
Catholic	1	1
Independent	0	1
Language background		
English	1	2
LBOTE	1	1

- *Location.* With the reminder that overall numbers in this course area are not large, about twice as many non-metropolitan as metropolitan students are enrolled in *technical vocational* areas, and much of this difference lies in enrolments in agriculture, which is predominantly studied in non-metropolitan schools.
- *School sector, language background.* There were few apparent differences between enrolments in this course of study either by school sector or by language background.

The logistic regression for both cohorts found that the significant influences on participation in this subject grouping were gender, school sector and achievement. Gender was the strongest influence, with males around 12 times as likely as females to participate in this area, and this was evident for both cohorts. School sector appeared to have the next strongest influence. Students in government schools were between two and three times as likely as those in Catholic schools among both cohorts and 11 times as likely as those in independent schools in the Y95 cohort to participate in this area; but there was no significant difference between government and independent schools for the Y98 cohort. All other things equal, it would appear that school sector does play an important role, and primarily this would be in the depth of provision of the subjects in this area. Students in the highest achievement levels were less likely than those in the lowest achievement level to undertake major studies in this area. The findings for locality were conflicting but this may be due to the small numbers in this group.

Service Vocational Studies

This grouping of subjects was very difficult to characterise for the Y95 cohort, and consisted of other sciences, general sciences, childcare, work education, physical education, VET IT, VET business, office skills, health, other technology subject, hospitality, and basic mathematics. Due to the wide variety of subjects that grouped together in this cluster, enrolments in it were quite high. For the Y98 cohort the course of study was more easily classified, with the subjects: childcare, work education, hospitality, and home sciences clustering together. With the more specific definition of the area using the Y98 cohort, however, the proportion of students enrolled in this course of study declined sharply. Table 7 provides the proportions of enrolments for each cohort, and the following summary for the Y98 cohort should be thought of as indicative only, given the low numbers.

- *Gender.* For the older cohort, this course of study showed no gender differences, enrolling about one-quarter of male and female students. For the Y98 cohort, enrolments were mainly female, as most of the subjects in which males participate in any numbers clustered in other groups.
- *Earlier achievement.* Similar trends were apparent for both cohorts: enrolments in this course of study were generally amongst those from lower achievement levels. Around four in ten of those students from the lowest achievement quartile had a major course of study in this area in the Y95 cohort, compared to one in ten of those from the highest quartile. For the Y98 cohort, fewer than 1 per cent of students in the highest achievement quartile participated to any extent in this course, compared with around 3 per cent of those in the lowest quartile.
- *Socioeconomic level.* Similarly, for both cohorts, a much greater proportion of enrolments was from students from a skilled or unskilled manual background. For the older cohort some six in ten students from these backgrounds had a major course of study in this area, compared to fewer than four in ten from those from skilled or professional backgrounds.
- *Location*. For the Y95 cohort, approximately one-third more non-metropolitan students than metropolitan students participated in this course of study. For the Y98 cohort no differences were apparent.

Table 7 Percentage enrolments in Service Vocational course of study by student background characteristics, Y95 and Y98 cohorts

	Y95	Y98
Total percentage enrolment	25	1
Gender		
Males	25	0
Females	25	2
Achievement		
Lowest	41	3
Below average	34	1
Above average	21	1
Highest	10	0
Parents' occupational quartile		
Lower	31	2
Lower-middle	28	2
Upper-middle	22	1
Upper	15	0
School location		
Metropolitan	22	2
Non-metropolitan	29	2
School sector		
Government	28	2
Catholic	21	0
Independent	16	0
Language background		
English	26	2
LBOTE	17	1

- *School sector.* As this is a course of study already described as being typified by lower achieving, lower socioeconomic background students, the proportions of enrolments by school sector are hardly surprising. Given that, for the Y95 cohort, around one in six students from independent schools undertook major studies in this area, compared with around one-quarter of those at government schools and around one-fifth of those in Catholic schools. For the Y98 cohort, negligible proportions of those in either Catholic or independent schools participated in this area.
- *Language background.* The area was also characterised primarily in both cohorts by enrolling students with an English language background. Around one in six students from a language background other than English compared to around one-quarter of those from an English speaking background were undertaking major studies in this area in the Y95 cohort.

The logistic regression results for the Y95 cohort are likely to be more reliable than those from the Y98 cohort because of the small number of cases for the latter group. This should be kept in mind, as the levels of significance are more difficult to attain for smaller numbers.

The significant effects on participation in the *service vocational* course of study were gender (Y98 only), achievement, socioeconomic level (mainly Y95), school sector, and language background (Y95 only). The strongest influence on participation in this subject area was achievement. Students in the lowest achievement level were between 1.4 and 6.3 times as likely as those in the other achievement levels to be studying in this area. As is suggested by the univariate analysis, few students in the high achievement quartiles took subjects in this area. Similarly, few in the higher socioeconomic levels took these subjects. For the Y95 cohort, students in the lowest socioeconomic level were 1.4 to 1.9 times as likely as those in the upper

middle and high socioeconomic levels to be participating in courses in this area. Over and above the effects of achievement and social background, school sector also had a strong independent effect, with students in government schools 1.3 and 1.4 times as likely as students in Catholic schools and independent schools, respectively, to participate in this area. Those from non-metropolitan schools were 1.3 times as likely as those from metropolitan schools, and those with an English language background were 2.3 times as likely as those with a language background other than English, other things equal, to enrol in these subject areas.

Visual and Performing Arts

Again, this is a course of study that has very low enrolments. In any category no more than 4 per cent of the relevant subgroup are enrolled in two or more subjects within this area, so these data should be treated as trends only. For both cohorts, the subjects in this area were: music, performing arts, visual arts, and other arts.

- *Gender.* For both cohorts, it was primarily females who were enrolled in major studies in this area.
- *Earlier achievement.* While the proportions for enrolments were the same for all achievement quartiles for the older cohort, for the younger cohort there was a slight tendency for enrolments to come more from the lower achievement quartiles.

Table 8 Percentage enrolments in Arts courses of study by student background characteristics, Y95 and Y98 cohorts

	Y95	Y98
Total percentage enrolment	2	3
Gender		
Males	1	2
Females	3	4
Achievement		
Lowest	2	3
Below average	2	3
Above average	2	2
Highest	2	2
Parents' occupational quartile		
Lower	2	3
Lower-middle	3	3
Upper-middle	2	4
Higher	2	3
School location		
Metropolitan	2	3
Non-metropolitan	3	3
School sector		
Government	2	3
Catholic	2	2
Independent	2	2
Language background		
English	2	3
LBOTE	1	2

- *Socioeconomic level.* Socioeconomic level does not appear to have any great effect on participation in the *Arts*, with similar proportions of students from each socioeconomic level enrolling in major studies in this area in both cohorts.
- *Location, school sector and language background.* Similarly, location, school sector or language background appear to have no effect on participation in the *Arts*.

The logistic regression results for both cohorts indicate that, as suggested by the univariate results, gender was a strong influence on participation in the *Arts*. Consistently, the odds of a female being enrolled in the *arts* was about two and a half times that of the odds of a male being enrolled. The only other significant influence for the Y95 cohort was language background, where students with a language background other than English were only half as likely as those from an English-speaking background to be enrolled in this area. For the Y98 cohort, the only other significant influences were school sector and achievement. Students in Catholic schools were about half as likely as those in government schools, and those in the highest achievement quartile about half as likely as those in the lowest achievement quartile to be studying in this area.

Social Sciences and Humanities

This course of study also changed somewhat in the cluster analysis for each cohort. For the Y95 cohort it included the subjects: social sciences, history, English literature, religion, and languages, while for the Y98 cohort it became more truly a social sciences grouping, incorporating the first three of these subjects with psychology and legal studies. Table 9 shows the proportions of enrolments by each of the background characteristics.

- *Gender.* Females dominate this subject grouping, and more particularly so for the younger cohort. Twice the proportion of females than males for the Y95 cohort, and more than three times the proportion of females than males for the Y98 cohort undertook major studies in this course of study.
- *Earlier achievement.* Participation in this course of study tended to be by those in the higher achievement levels, with twice the proportion of students from the highest compared to the lowest achieving quartiles enrolled in two or more subjects in this area.
- *Socioeconomic level.* Approximately the same proportion enrolled from each of the four occupational group backgrounds, with perhaps a slight tendency for a higher proportion of enrolments from those in the higher socioeconomic levels.
- *Location.* For the older cohort, a slightly greater proportion of students in metropolitan areas than in rural areas participated in this course of study, while for the younger cohort these differences were negligible.
- *School sector.* Students in the Catholic and independent sectors participated at a higher level than those from government schools in this course of study for the Y95 cohort, when religion was included in the grouping. For the Y98 cohort, there was a slight tendency for participation still to be higher for those students in the independent sector.
- *Language background.* The data in Table 9 indicate that proportions of enrolments according to language background for both cohorts were negligible.

Table 9 Percentage enrolments in Social Sciences and Humanities course of study by student background characteristics, Y95 and Y98 cohorts

	Y95	Y98
Total percentage enrolment	6	5
Gender		
Males	4	2
Females	8	7
Achievement		
Lowest	4	3
Below average	4	4
Above average	7	6
Highest	8	6
Parents' occupational quartile		
Lower	5	4
Lower-middle	5	3
Upper-middle	7	5
Higher	7	7
School location		
Metropolitan	7	6
Non-metropolitan	4	5
School sector		
Government	4	4
Catholic	10	4
Independent	8	6
Language background		
English	6	5
LBOTE	6	4

The logistic regression analyses for *social sciences and humanities* found that gender and achievement were significant influences on participation for both cohorts. In addition, for the Y95 cohort only, location and school sector were also significant influences on participation. For both cohorts, females were about two and a half times as likely as males to be studying in this area. Remembering the changes in subject composition between the Y95 and Y98 cohorts, students in the Y95 cohort in Catholic schools were about 2.5 times as likely and students in independent schools 1.7 times as likely as their government school counterparts to be studying in this area, however this was not the case for the Y98 cohort. Achievement was also a constant influence, with students in the top two quartiles being about two times as likely to participate in this area as those in the lowest achievement quartile. Students in metropolitan schools were 1.8 times as likely as those in rural schools to be enrolled in this area than for the Y95 cohort, but there were no significant differences for the Y98 cohort. There were no significant socioeconomic differences.

Mixed Courses – eclectic

This group was originally defined as being *mixed – eclectic*, as students tended to spread their subject choice wide and take no more than one subject from each group. Examples of courses that were undertaken include:

- Asian language, basic mathematics, chemistry, geography, IT.
- General mathematics, religion, visual arts, design, geography.
- European language, advanced mathematics, biology, general science.

Generally these courses do not have a lot of cohesion, as subjects come from different Key Learning Areas. Table 10 provides the proportions of enrolments for these courses of study, by student background characteristic. It should be noted that these courses only accounted for some 14 per cent of enrolments for the Y95 cohort, but for 35 per cent of the enrolments for the Y98 data. As a result of the smaller numbers enrolled in these courses for the older cohort, very few differences were apparent in proportions, therefore the following discussion will primarily focus on the Y98 cohort.

- *Gender.* There were slight gender differences apparent for the Y95 cohort, but none for the Y98 cohort.
- *Earlier achievement.* For the Y98 cohort, large differences were evident in the proportions of low and high-achievement students enrolled in these *mixed* courses. More than half of those students in the lowest achievement levels took such *mixed* courses, compared to one-fifth of those students in the highest achievement level.
- *Socioeconomic level.* Differences by socioeconomic background were not particularly substantial for the older cohort, but for the Y98 cohort, a substantially larger proportion of students from lower socioeconomic levels than high socioeconomic levels tended to participate in such *mixed* courses of study.
- *Location.* Almost one-quarter of students in non-metropolitan schools and about one in five of those in metropolitan schools were enrolled in *mixed-eclectic* courses of study.

Table 10 Percentage enrolments in Mixed - eclectic courses of study by student background characteristics, Y95 and Y98 cohorts

	Y95	Y98
Total percentage enrolment	14	35
Gender		
Males	12	36
Females	16	36
Achievement		
Lowest	15	52
Below average	14	40
Above average	14	31
Highest	12	20
Parents' occupational quartile		
Lower	14	43
Lower-middle	13	36
Upper-middle	14	32
Higher	15	26
School location		
Metropolitan	14	19
Non-metropolitan	14	23
School sector		
Government	14	41
Catholic	12	24
Independent	13	24
Language background		
English	14	37
LBOTE	11	28

- *School sector.* Students in government schools enrolled in this type of course with much greater frequency than those students in other school sectors. With a wider range of academic achievement levels at government schools, this is probably to be anticipated, and it may also be either that independent and Catholic schools are more tertiary-focussed than government schools or that they provide students with better advice about cohesive subject choice.
- *Language background.* Students from an English-speaking background were more likely than those with a language background other than English to be studying such courses.

For the Y95 cohort, logistic regression found three significant influences on participation in *mixed-eclectic* courses. All other things equal, gender was the strongest influence, with females 1.3 times as likely as males to be enrolled in these courses. Other significant influences were achievement level and language background. Students in the lowest achievement level were about 1.4 times as likely as those in the highest achievement level, and students with an English speaking background 1.5 times as likely as those with a language background other than English to be studying in this area.

Logistic regression for the Y98 cohort found that, other things equal, gender, achievement, school sector and language background were significant predictors of participation. The data in Table 10 mask the gender differences that exist in the data for the Y98 cohort. All other things equal, females were around one and a half times as likely as males to be enrolled in this area. Students in government schools were 1.9 times as likely as students in Catholic schools and 1.3 times as likely as those in independent schools to undertake studies in such diverse areas. Students in the lowest achievement quartile were most likely to be enrolled in this area: 1.3 times as likely as those in the lower middle achievement quartile, 1.5 times as likely as those in the upper middle achievement quartile and 1.9 times as likely as those in the highest achievement level. Students with an English-speaking language background were 1.6 times as likely as those with a language background other than English to be enrolled in this area.

Mixed Courses – including physical sciences

With this subject grouping, students were classified as having multiple major foci, including subjects in the mathematics- physical science group. These students are similar to those in the mathematics-physical sciences group, except that they also study at least two subjects in *another* main grouping. Primarily this second grouping was in the area *of business studies*. Examples of such subject choices might be:

- Advanced mathematics, chemistry, accounting, IT, European language,
- Advanced mathematics, biology, chemistry, economics, religion,
- Advanced mathematics, physics, biology, other science, VET IT.

Table 11 shows the background characteristics of students in both cohorts classified in this group.

- *Gender.* Similar proportions of males and females were found to be studying this type of course, for both cohorts of students.
- *Earlier achievement.* Students in the higher achievement levels were much more likely to be studying this type of course than those in the lower achievement levels. Twice the proportion of students in the highest achievement level than those in the average – above average quartile participated in such a course.
- *Socioeconomic level.* Those students from higher socioeconomic backgrounds were found to be more likely than those from less affluent backgrounds to participate in such courses.

Table 11 Percentage enrolments in Mixed (including physical sciences) courses of study by student background characteristics, Y95 and Y98 cohorts

	Y95	Y98
Total percentage enrolment	5	4
Gender		
Males	6	4
Females	4	3
Achievement		
Lowest	2	0
Below average	3	2
Above average	6	4
Highest	9	8
Parents' occupational quartile		
Lower	4	2
Lower-middle	5	3
Upper-middle	6	4
Higher	7	6
School location		
Metropolitan	6	5
Non-metropolitan	5	4
School sector		
Government	5	2
Catholic	5	5
Independent	6	7
Language background		
English	5	3
LBOTE	6	5

- *Location.* School location did not appear to have an effect on participation in this type of course.
- *School sector.* While there were no apparent differences seen for the older cohort, some differences could be seen for participation for the younger cohort. For the Y98 students, those from independent and Catholic schools were much more likely than their counterparts in government schools to participate in this type of course.
- *Language background.* Few differences could be seen for participation by language background.

Achievement level was the strongest influence on participation in these courses, which are more focussed than the *mixed-eclectic* courses. Also significant were gender and language background for both cohorts, and socioeconomic status and school sector for the Y98 cohort.

Compared to students in the lowest achievement quartile, students in the highest achievement quartile were almost six times as likely for the Y95 cohort and nine times as likely for the Y98 cohort to be enrolled in this area. Even students in the lower-middle achievement quartile were 1.7 times for the Y95 cohort and 4.1 times for the Y98 cohort more likely than those in the lowest achievement quartile to be studying in this area. Students with a language background other than English were about one and one-half times as likely as those from English-speaking backgrounds to participate. While there was a tendency for enrolments for the Y95 cohort to be from the highest socioeconomic level (about 1.4 times as likely as those in the lowest socioeconomic quartile), this was more emphatic for the Y98 cohort, with students from all other socioeconomic levels between 1.8 and 2.1 times as likely as students from the lowest socioeconomic level to participate.

Although the proportions studying in this area look similar, males were significantly more likely to do so, other things equal. For both cohorts males were around 1.5 times as likely as females to be studying in this area.

Mixed Courses – general (no advanced mathematics-physical sciences)

With this subject grouping, students were classified as having multiple major foci, not including a focus in the mathematics- physical sciences group. These students study at least two subjects in two main groupings, for example:

- English literature, basic mathematics, accounting, legal studies, history
- Biology, social sciences, religion, geography, hospitality
- Basic mathematics, biology, VET business, religion, geography.

Around 10 per cent of those in the Y95 cohort and around 6 per cent of those in the Y98 cohort participated in such general courses. The background characteristics of these students are shown in Table 12.

Table 12 Percentage enrolments in Mixed – general courses of study by student background characteristics, Y95 and Y98 cohorts

	Y95	Y98
Total percentage enrolment	10	6
Gender		
Males	8	6
Females	12	7
Achievement		
Lowest	12	5
Below average	12	7
Above average	11	8
Highest	7	6
Parents' occupational quartile		
Lower	10	5
Lower-middle	10	6
Upper-middle	10	8
Higher	10	6
School location		
Metropolitan	10	8
Non-metropolitan	10	7
School sector		
Government	9	6
Catholic	13	9
Independent	10	8
Language background		
English	10	7
LBOTE	10	6

While there were a few differences apparent in the proportions for the older cohort, none of these was particularly large, and many of the differences in proportions were not apparent for the younger cohort. However, the logistic regression analyses did show that gender, achievement and sector all had significant influences on participation in this course grouping. Other things equal, females were about one and one-half times as likely as males to be studying in this area, those from the lowest achievement quartile were 1.6 to 1.9 times as likely to be studying in this

area as those from the highest achievement quartile, and those in Catholic schools about one and one-half times as likely as those in government schools to participate in such courses.

Summary

The purpose of this chapter was to examine the profiles of students who were categorised into each of the particular subject groupings derived by cluster analysis. The results presented in this chapter suggest that there are some differences in participation in the Year 12 curriculum based on gender, social background, early school achievement, and language background. On the one hand, differences in patterns of participation can be seen as a measure of schools successfully accommodating a more diverse group of students than they have in the past. On the other hand, however, if schools are entrenching gender and social differences by accommodating particular groups of students in particular parts of the curriculum, then these differences could be seen as a problem.

The following section summarises the significant differences in the profiles defined in this chapter. The significance is 'other things equal', in other words holding constant the effects of all of the other background factors as used in this chapter.

- Males were more likely than females to be enrolled in the *physical sciences, business, technical vocational* and *mixed-including physical sciences* courses.

- Females were more likely than males to be enrolled in the *service vocational (Y98 only), other sciences (Y95 only), arts, humanities and social sciences, mixed eclectic* and *mixed general* courses.

- Those in the lower achievement levels were more likely than the higher achievers to be enrolled in *service vocational, technical vocational, other sciences, arts, mixed-eclectic* and *mixed-general* courses.

- Those in the highest achievement levels were more likely than the low achievers to be enrolled in both the *physical sciences* courses and the *mixed* course that included physical sciences, and *social sciences and humanities*. They were least likely to be in *technical vocational studies, service vocational studies, other sciences (Y98 only), visual & performing arts (Y98 only),* or either of the other two *mixed* courses.

- There were not many differences by socioeconomic level in the 'other things equal' analysis. Students from higher socioeconomic levels were more likely than those in lower levels to be doing the *physical sciences* course and the *mixed-including physical sciences* course, and were least likely to be enrolled in either of the *vocational* courses.

- There were conflicting findings for school sector, but students from Catholic and independent schools were generally less likely than those from government schools to be enrolled in *vocational* courses.

- Students with a language background other than English were significantly more likely than those with an English-speaking background to have subjects from the *physical sciences* group, the *mixed-including physical sciences* group and the *business* group. They were least likely to be involved in *other sciences, arts* or *mixed-eclectic* courses.

- There was only one significant difference in patterns of course choice between metropolitan and non-metropolitan students for the Y98 cohort, and this was a higher probability of non-metropolitan students being involved in *technical vocational* subjects. This was in contrast to the Y95 cohort, in which the non-metropolitan students were less likely to do *vocational*

courses, and more likely than the metropolitan students to be undertaking *business studies* or *social sciences*.

The next chapter of this report examines the destinations of those students from each of these groups who moved on to further education and training after completing Year 12. Chapter Five examines the destinations of those students who moved directly into the workforce from Year 12.

4. PARTICIPATION IN FURTHER EDUCATION AND TRAINING

One of the most important reasons for examining curriculum participation at Year 12 level is to determine whether there are systematic differences in participation which then lead to differences in post-school outcomes, in particular if there are equity groups which are differentially affected by course choice. Outcomes are measured both in terms of post-school education and training, and as experiences in the labour market. This chapter examines post-school education and training and the next chapter examines experiences in the labour market. The current chapter documents patterns of participation in higher education and in vocational education and training, and in other educational courses, which might be short courses provided by particular organisations or non-accredited providers. As well, this chapter provides estimates of the number of young people who do not participate in any further education and training. The focus of this chapter is to establish whether the education and training activities of young people vary depending on the course of study they had taken in Year 12.

Post-school Education and Training

The post-school education and training activities of the Year 12 students, for their first year after school, are presented in Table 13. These data provide details on the percentage of students who, in their first year after completing Year 12, had entered higher education, vocational education and training (including TAFE, apprenticeships or traineeships), or any other form of post-school education, and those who had not.

Table 13 Initial participation in post-school education and training, Y95 and Y98 cohorts

		Y95		Y98	
		n	%	*n*	%
Higher education		2683	41	2853	45
Vocational Education and Training	TAFE	1068	16	1230	20
	Apprenticeship	303	5	317	5
	Traineeship	330	5	369	6
Other study		281	4	136	2
No further study or training		1900	29	1380	22
Total		6565	100	6285	100

The data in Table 13 indicate that around two in five students from the Y95 cohort, and slightly more of the Y98 cohort, entered higher education in the year after completing Year 12. An additional quarter of the Y95 group and almost one-third of the Y98 group entered into study in the vocational education and training area, and a handful into other courses. In all, around seven in ten of the older group, increasing to eight in ten of the younger group, had continued study in some form in their year after school. A declining proportion did not undertake any further education or training.

Figure 3 shows pictorially the different enrolments by gender for both cohorts. The growth in participation rates for both higher education and TAFE are apparent, as is a slight growth in the rate of participation in traineeships by both males and females. There is a corresponding decline in the proportion of students who do not participate in any further education and training, and in the proportion engaged in study in other areas.

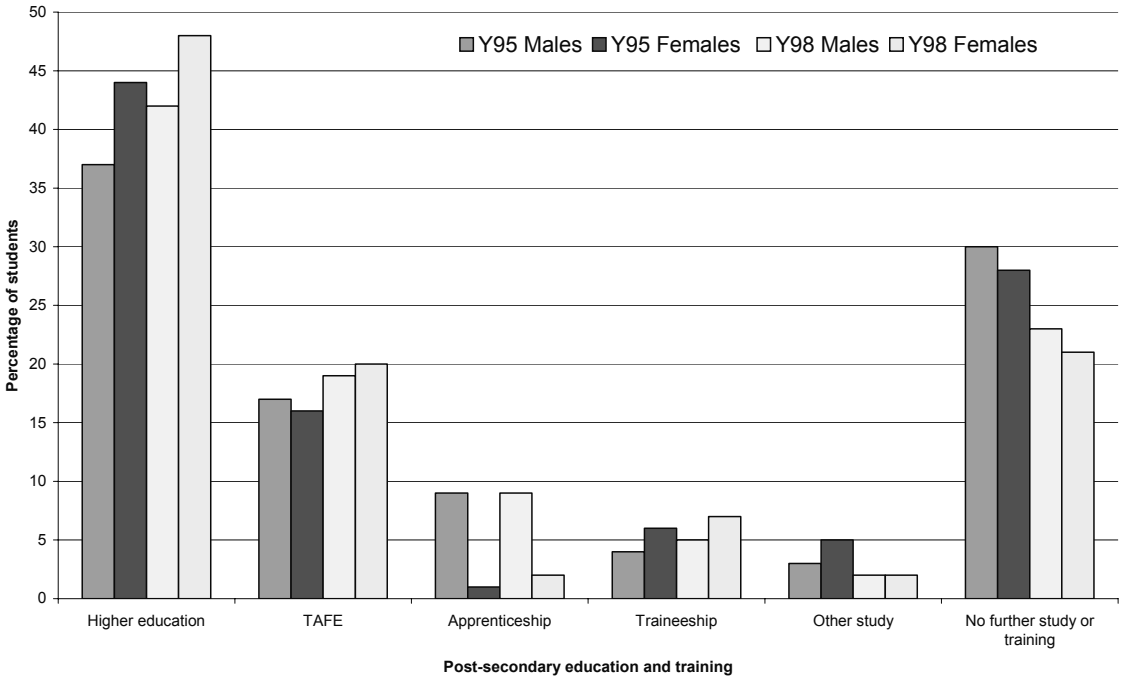

Figure 3 Participation in post-school education and training, Y95 and Y98 cohorts, by gender

While there are clearly some differences in participation in further education and training based on the gender of the student, Table 14 and Table 15 show that there are also very clear (and more substantial) differences in post-secondary outcomes depending on choice of course in Year 12. Table 14 presents the post-school outcomes for the Y95 group by course of study in Year 12, and Table 15 presents the same data for the Y98 group, while Figure 4 and Figure 5 show the data graphically in order from highest level of participation in higher education to lowest.

Higher Education

The proportion of young people entering higher education varies a great deal depending on the course of study chosen in Year 12. For those who chose to study the *advanced mathematics–physical sciences* course, around four in five students went on to higher education. Even those students who had more of a *mixed* course, but who included an *advanced mathematics and a physical science* option, still entered higher education at a rate greater than any other group who did not include these subjects. Of course, one of the research questions to be addressed in this study is concerned with where these students then go – do they necessarily move into tertiary courses that involve mathematics and science, or is this high status course more often used as a 'springboard' into other areas of study? This question will be examined in the next section of this chapter.

Other subject groupings act as a gateway to higher education, although none to the same extent as the *mathematics–physical sciences* grouping. For both groups of students (Y95 and Y98), the *humanities and social sciences* courses also provided quite strong pathways to higher education. Around three in five of the students enrolled in this course entered higher education in the year after completing Year 12.

Table 14 Initial post-school destinations by Year 12 course grouping, Y95 cohort (%)

Group	n	% of cohort	Initial post-school education or training (%)						
			Higher Education	*Vocational Education and Training*			*Other study*	*No further education or training*	*total*
				TAFE	*Apprentice ship*	*Trainee ship*			
Physical sciences	1082	16	77	6	2	1	2	12	100
Technical vocational studies	77	1	7	22	33	11	0	27	100
Service/Clerical vocational studies	1638	25	12	22	7	9	5	45	100
Business studies	962	15	46	20	3	5	3	24	100
Other sciences	399	6	43	17	2	4	5	28	100
Visual & performing arts	152	2	32	11	4	7	10	37	100
Humanities & languages	376	6	57	12	2	4	4	21	100
Mixed - eclectic	868	13	35	18	4	4	5	34	100
Mixed – incl physical sciences	351	5	66	10	5	3	2	14	100
Mixed - general	672	10	37	18	5	5	7	28	100

Note: Includes only cohort members for whom initial post-school destinations data are available.

Table 15 Initial post-school destinations by Year 12 course grouping, Y98 cohort (%)

Group	n	% of cohort	Initial post-school education or training (%)						
			Higher Education	*Vocational Education and Training*			*Other study*	*No further education or training*	*total*
				TAFE	*Apprentice-ship*	*Trainee ship*			
Physical sciences	934	15	80	5	1	3	1	10	100
Technical vocational studies	148	2	12	21	34	3	3	27	100
Service vocational studies	97	2	11	35	3	9	1	40	100
Business studies	1570	25	41	27	5	6	2	19	100
Other sciences	945	15	39	21	6	7	2	24	100
Visual & performing arts	194	3	34	26	1	5	1	32	100
Social sciences & humanities	352	6	58	15	1	4	1	22	100
Mixed - eclectic	1163	19	32	21	5	10	2	31	100
Mixed – incl physical sciences	284	5	81	5	2	2	1	10	100
Mixed - general	490	8	40	26	5	5	2	22	100

Note: Includes only cohort members for whom initial post-school destinations data are available.

Other courses of study were less successful as conduits to higher education. Fewer than one half of those students studying courses such as those defined as *business studies* and *other sciences*, and the *mixed general* course (with no advanced mathematics or physical sciences), and around one third of students in the *visual and performing arts* or *mixed – eclectic* areas of study gained entry to higher education in the year after they completed Year 12.

Students enrolled in the vocational parts of the curriculum, defined primarily by the *technical vocational* and *service/clerical vocational* areas of study, did not enter higher education in very high numbers, with only around one in ten students gaining entry to university.

Vocational Education and Training

Many students entering vocational education and training courses after completing Year 12 will have completed some subjects or subject combinations from the available VET in Schools subjects. Not surprisingly then, participation in vocational education and training courses is highest amongst those students who had participated in the *technical* or *service/clerical vocational* streams in senior secondary school. For example, around 60 per cent of those who were enrolled in *technical vocational* studies and between two-fifths (Y95) and one-half (Y98) of those in the *service/clerical vocational* studies area went on to some form of vocational education and training in the year after completing secondary school. For some students, however, their course choice acted more as a pathway to apprenticeships and to a lesser extent traineeships than for others. For example, of those in the *technical vocational* stream, more than one-half of the students went into apprenticeships on leaving school, compared to fewer than 10 per cent of those in the *service/clerical vocational* area. Students in this latter area were more likely to enrol in a TAFE course; however, they were also the group less likely to participate in any further education and training.

The *business studies* area, which contained several VET in Schools subjects for both cohorts, also acted as a pathway to non-apprenticeship TAFE, which for the younger cohort enrolled more than one-quarter of its students. Similar proportions were also found for those students who studied the *visual & performing arts*, and the *mixed- general* course in Year 12.

Lamb & Ball (1999) noted 'the increasing importance of traineeships as a form of post-school training is indicated by the fact that in some instances rate of entry to traineeships outstripped that of apprenticeships' (p. 27), and this trend can be seen in these data as well. Other than for the *technical vocational* group, the proportion of students who were undertaking traineeships was equal to or greater than the proportion of students undertaking apprenticeships. This was true for both cohorts.

No Further Education or Training

As has previously been mentioned, the s*ervice/clerical vocational* area appears to be a particularly poor pathway to further education and training. Of those students who choose subjects primarily in this area (primarily those from low achievement and low socioeconomic levels), around two in five do not participate in education and training post Year 12. For both cohorts, around one-third of students from the v*isual and performing arts* and *mixed-eclectic* course groupings do not continue on with any further study. This is of some concern particularly for the younger cohort as the *mixed-eclectic* grouping is the second largest in terms of numbers of participating students.

Curriculum Participation and Post-secondary Education and Training

Clearly there are some parts of the curriculum that act as better pathways to different aspects of post-secondary education and training than others. Figure 4 and Figure 5 show this graphically for the Y95 and Y98 cohorts respectively. In both graphs, it is clear which subject groupings act as pathways to higher education, which subject groupings lead to vocational education and training, and which subject groupings are associated with lower levels of further education and training.

Together with the results from the previous chapter, these findings indicate that the parts of the curriculum that are more likely to lead to university are dominated by students who are high achievers, and are generally from high socioeconomic backgrounds. In contrast, those parts of the curriculum that tend to be associated with no further education and training are dominated by students who were low achievers, from lower socioeconomic backgrounds, and from government schools. These findings are similar to those of Lamb & Ball (1999) in their analysis of five cohorts of data from the Australian Youth Survey.

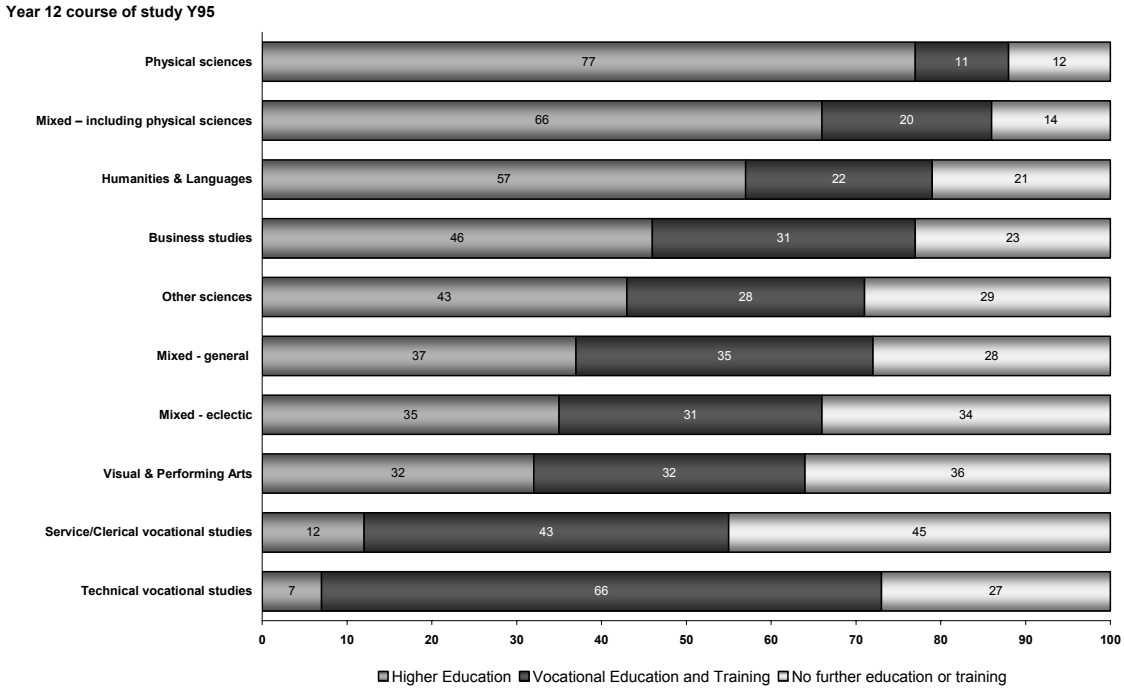

Figure 4 Post-school participation in education and training, by course in Year 12, Y95 cohort

While it could be concluded that the organisation of the curriculum still maintains some entrenched social, cultural and academic differences, it could also be argued that in many cases alternative pathways are becoming clearer for some of those who are most likely to drop out of formal education and training after Year 12. Certainly the proportions of students who do not participate in any further education and training are lower than in the analysis of Lamb and Ball (1999), although it is difficult to make direct comparisons, as the course groupings are different.

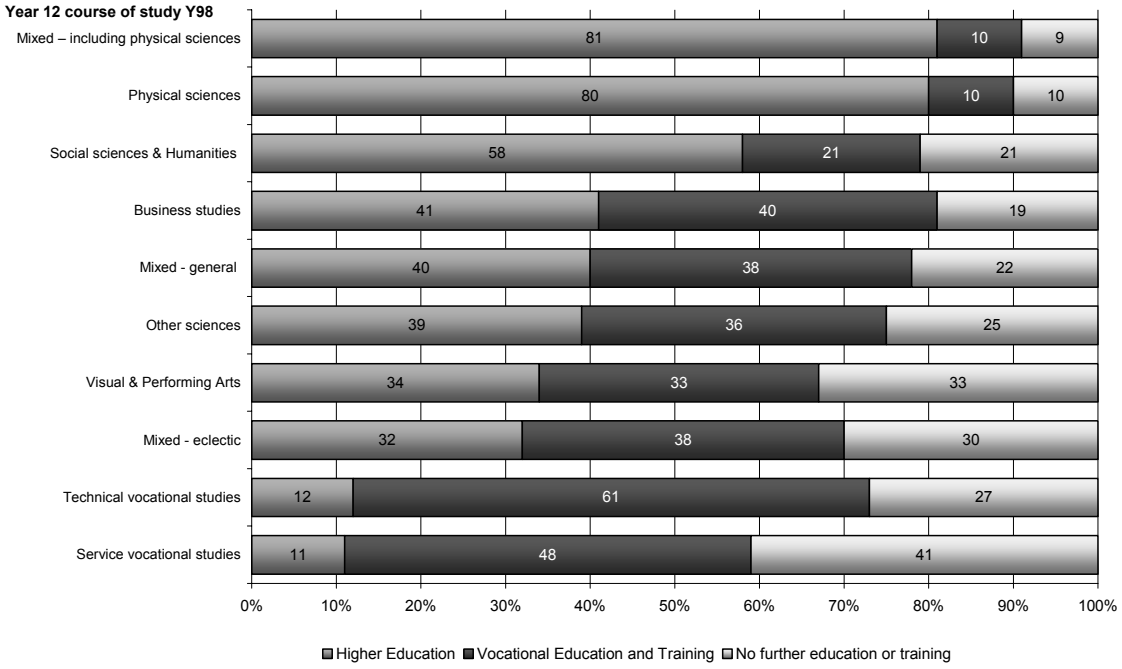

Figure 5 Post-school participation in education and training, by course in Year 12, Y98 cohort

Of course the differences in outcomes reported in this chapter could be due to student factors – to the types of students who primarily enrol in particular course types – rather than to the influence of the course studied in Year 12. To look at this, a set of multilevel regression analyses were carried out using multilevel modelling[5]. This is important as we have students clustered within courses, and multilevel modelling allows us to separate out the amount of variance due to individual factors such as gender, parental occupation, language background, prior achievement and school sector, from that due to differences between subjects or courses (level-two variables). Using multilevel analysis we are able to estimate the proportion of variance in the outcome variables (entry to higher education, participation in vocational education and training, and no further education or training) due to the effects of student factors and how much, if any, is due to factors associated with the courses of study.

At the first step, a null model was tested. This model contains no explanatory variables and simply estimates the amount of variance in entrance rates to higher education that is due to students (level 1) and the amount that is due to the course of study (level 2). The results of this analysis and the parallel analyses for vocational education and training and no further education, are shown in Table 16, in the lower two lines of each panel.

The predicted mean rates of entry to higher education and vocational education and training, as well as rates of non-participation in further education are also presented in the first row of each panel in Table 16. The predicted rate of entry to higher education is 44 per cent for both Y95 and Y98, for vocational education and training 25 per cent for Y95 and 31 per cent for Y98, and the rates of non-participation were estimated to be around 27 per cent Y95 and 23 per cent for Y98.

[5] For a more detailed discussion of multilevel regression (or modelling) techniques, the reader is directed to Bryk and Raudenbush (1992).

Table 16 Variance in and estimates of influence on participation in post-school education and training explained by multilevel models, Y95 and Y98 Year 12 completers

Panel 1: Higher education	Y95	Y98
Estimated mean participation rate	44%	44%
Gender	**.12 (.01)**†	**.13 (.01)**
School type	**.04 (.01)**	**.06 (.01)**
Achievement	**.10 (.01)**	**.12 (.01)**
Parental occupation	**.04 (.01)**	**.04 (.01)**
Language background	**.15 (.02)**	**.11 (.02)**
Physical sciences	**.28 (.02)**	**.30 (.02)**
Technical vocational	**-.20 (.05)**	**-.12 (.04)**
Service vocational	**-.20 (.02)**	**.02 (.02)**
Business	**.08 (.02)**	**.06 (.02)**
Other sciences	-.04 (.03)	**-.20 (.05)**
Arts	**-.08 (.04)**	**-.02 (.04)**
Humanities	**.12 (.03)**	**.14 (.03)**
Mixed eclectic	-.02 (.02)	**-.06 (.02)**
Mixed – with maths	**.22 (.03)**	**.30 (.03)**
Mixed – without maths	.00 (.00)	**.00 (.00)**
Student-level variance	82%	81%
Course of study- level variance	18%	19%
Panel 2: Vocational education and training		
Estimated mean participation rate	25%	31%
Gender	**-.07 (.01)**	**-.07 (.01)**
School type	-.01 (.01)	**-.04 (.01)**
Achievement	**-.07 (.01)**	**-.08 (.01)**
Parental occupation	.02 (.01)	.02 (.01)
Language background	-.03 (.02)	**-.04 (.02)**
Physical sciences	**-.16 (.02)**	**-.19 (.02)**
Technical vocational	**.25 (.05)**	**.17 (.04)**
Service vocational	**.07 (.02)**	**.03 (.02)**
Business	-.02 (.02)	-.01 (.02)
Other sciences	-.03 (.03)	-.06 (.05)
Arts	.00 (.04)	.00 (.04)
Humanities	**-.07 (.03)**	**-.10 (.03)**
Mixed eclectic	-.03 (.02)	-.01 (.02)
Mixed – with maths	**-.10 (.03)**	**-.18 (.03)**
Mixed – without maths	.00 (.00)	.00 (.00)
Student-level variance	90%	95%
Course of study- level variance	10%	5%
Panel 3: No further study		
Estimated mean participation rate	27%	23%
Gender	**-.05 (.01)**	**-.06 (.01)**
School type	**-.03 (.01)**	-.02 (.01)
Achievement	**-.03 (.01)**	**-.04 (.01)**
Parental occupation	.02 (.01)	.02 (.01)
Language background	**-.12 (.02)**	**-.08 (.02)**
Physical sciences	**-.12 (.02)**	**-.11 (.02)**
Technical vocational	-.05 (.05)	-.05 (.04)
Service vocational	**.13 (.02)**	.01 (.02)
Business	**-.05 (.02)**	**-.05 (.02)**
Other sciences	-.01 (.03)	.14 (.05)
Arts	**-.08 (.04)**	.02 (.04)
Humanities	-.04 (.03)	-.04 (.03)
Mixed eclectic	**-.05 (.02)**	**-.05 (.02)**
Mixed – with maths	**-.11 (.03)**	**-.11 (.03)**
Mixed – without maths	.00 (.00)	.00 (.00)
Student-level variance	90%	96%
Course of study- level variance	10%	4%

† multilevel regression coefficient is shown with its standard error following in brackets. Significant coefficients are shown in bold. The regression coefficient divided by the standard error gives the t-value.

From a comparison of the partitioning of variance, it was found that 18 - 19 per cent of the variation in rates of entry to higher education was related to differences between courses rather than to differences between individuals. Panel 1 of Table 16 shows that course participation is a stronger predictor of participation in higher education than any of the background variables tested. Those students who participated in *physical sciences* courses or *mixed* courses including mathematics were most likely to go on to higher education, while those with courses in either *technical vocational* or *service vocational* areas were least likely to do so.

Course choice is also an influence, albeit weaker, on participation in vocational education and training and other forms of education, with between five and 10 per cent of the variation in rates of participation due to differences between courses of study rather than to differences between students. As with participation in higher education, course participation is a stronger influence (positive or negative) on enrolment in this area than any of the student background factors. Enrolment in particular courses (*technical* and *service vocational studies*) significantly increases the likelihood of entering vocational education and training, while participation in others (physical sciences, for example) significantly decreases the chances of participation in this area.

Finally, course choice has a similar level of effect on students' non-participation in any further education or training, explaining between four and 10 per cent of the variance in rates of non-continuation of study. Of some concern again, the strongest influence on non-continuation of any further education or training is participation in the *service vocational* area, over and above the background characteristics of the students. The other strong influences in this area are negative, with students who participate in *physical sciences* or *mixed* courses which include mathematics least likely to do no further study after completing school.

The results of this chapter so far suggest that there are differences in post-secondary education and training outcomes depending on curriculum participation in Year 12. The results strongly suggest that the student's subject choice in their senior secondary years is influential in shaping future education and training opportunities, even after allowing for the influence of other aspects of student background.

Post-secondary Education and Training – course choice

This part of the chapter provides greater detail on the education and training destinations of students post-Year 12. The initial education and training destinations described in this chapter are grouped according to the ASCED (ABS, 2000) broad fields of study. As background for this, Appendix 6 provides data on the ASCED broad fields of study and their enrolment rates for the Y95 and Y98 cohorts from each of the year 12 course groupings. Participation rates for the Y98 cohort to the level of narrow field of study will be discussed where appropriate; however for many groups the cell sizes are too small to be meaningful.

It should be noted that some of the fields of study, and many of the pathways, enrol only a small number of students. Pathways are provided in this section to give examples of where students may proceed after Year 12, and it can be seen in many cases which are the strongest pathways for students in particular areas.

Advanced mathematics–physical sciences

The post-school destinations of the students who participated in the *advanced mathematics–physical sciences* course in Year 12 for both Y95 and Y98 cohorts are shown in Table 17. This course grouping enrolled a large number of students in both cohorts, almost 1100 in the Y95 cohort and over 900 in the Y98 cohort. As has been shown, almost four in five students undertaking such a course moved into higher education in the following year (Figure 4 and Figure 5).

A large proportion of these students, 22 per cent for the Y95 group and 24 per cent for the Y98 group, moved on to studies in the broad area of *natural and physical sciences.* Females were predominantly enrolled in the area of biological sciences, and to a lesser extent chemical sciences, while males were primarily enrolled in mathematical sciences, and to a lesser extent biological and chemical sciences. About half again as many males as females studied in this area.

The next largest proportion of students, 17 per cent of the Y95 group and 15 per cent of the Y98 group, moved on to studies in *Engineering*. The three main areas of study were mechanical engineering, electrical engineering and civil engineering. Male enrolments outnumbered female enrolments at a rate of almost eight to one.

Health enrolled a further 12 per cent of the Y95 students and 11 per cent of the Y98 students. Of the Y98 cohort, almost twice as many females as males were enrolled in this field of study. Overall, 40 per cent of students from the *advanced mathematics – physical sciences* grouping, in both cohorts, were enrolled in Medicine. Gender differences were apparent when the narrow fields of study were examined for the Y98 cohort. For males the primary area of enrolment was medicine (60 per cent of males), followed by rehabilitation therapies (10 per cent). For females, medicine was also the most popular choice, but only marginally, with 27 per cent of female enrolments and 26 per cent enrolments in rehabilitation therapies. A further 14 per cent were enrolled in nursing, and 10 per cent in pharmacy.

Table 17 Level of post-school education and broad field of study for Year 12 course group: Physical sciences

Post-school Education	Broad Field of Study	Y95		Y98	
		n	% of Year 12 course group	n	% of Year 12 course group
Higher Education	Natural and physical sciences	202	22	226	24
	Information technology	93	10	61	6
	Engineering and related technologies	155	17	137	15
	Architecture and building	13	1	10	1
	Agriculture, environmental & related studies	22	2	9	1
	Health	115	12	102	11
	Education	14	2	8	1
	Management and commerce	90	10	73	8
	Society and culture	89	10	73	8
	Creative arts	27	3	42	4
TAFE	Information technology	11	1	6	1
	Engineering and related technologies	19	2	9	1
Apprenticeships	Engineering and related technologies	15	2	5	0

Very few students from this subject grouping were involved in vocational education and training in their first year after school; however, those who did were mainly engaged in the areas of information technology, and engineering and related technologies.

Mixed – including mathematics-physical sciences

A similar group in character to the *advanced mathematics–physical sciences* group is the group of students whose course was characterised by two major foci, including a focus in the mathematics-

physical sciences area. There were around 350 students categorised as such for the Y95 and a little more than 280 for the Y98 cohort.

Not surprisingly, the pattern of enrolments for the Y98 cohort is characterised by a large proportion of enrolments in the *natural and physical sciences* field (19 per cent), but also with significant enrolments in the areas of *society and culture* (13 per cent), *health* (11 per cent) and *management and commerce* (10 per cent).

Table 18 Level of post-school education and broad field of study for Year 12 course group: Mixed course, including mathematics/physical sciences

Post-school Education	Broad Field of Study	Y95		Y98	
		n	% of Year 12 course group	n	% of Year 12 course group
Higher Education	Natural and physical sciences	44	15	55	19
	Information technology	24	8	24	8
	Engineering and related technologies	9	3	23	8
	Agriculture, environmental and related studies	12	4	4	1
	Health	24	8	31	11
	Management & commerce	43	15	29	10
	Society & culture	47	16	38	13
	Creative arts	12	4	11	4
TAFE	Engineering and related technologies	11	4	3	1
Apprenticeship	Engineering and related technologies	15	5	3	1

Humanities and Social sciences

The course area that contained subjects categorised as *humanities and social scie*nces provided the next greatest proportion of higher education enrolments (see Table 19). There were 376 students included in this grouping for the Y95 cohort and 352 for the Y98 cohort. As would be expected, the largest proportion of students from this subject grouping moved into higher education studies in the same area (*society and culture*) with a third of the Y95 and a little over one-quarter of the Y98 *humanities and social sciences* students moving into this field in higher education.

Of the Y98 group, highest enrolments in this area were in either social sciences or behavioural sciences (primarily psychology), while there were fewer males in the subject area and so no clear enrolment trends. In the area of *health*, most of the males were enrolled in medicine, most of the females in rehabilitation therapies and pharmacy. In the area of *management and commerce*, males were primarily enrolled in business management courses, while there were no clear trends for females due to smaller numbers.

In the TAFE area, most of the enrolments for females in the *society and culture* area were in the field of human welfare studies and services; numbers for enrolments for males were too small to report.

Table 19 Level of post-school education and broad field of study for Year 12 course group: Humanities and social sciences

Post-school Education	Broad Field of Study	Y95		Y98	
		n	% of Year 12 course group	n	% of Year 12 course group
Higher Education	Health	19	7	14	4
	Education	13	5	13	4
	Management and commerce	23	8	27	8
	Society and culture	95	34	95	27
	Creative arts	44	16	40	11
TAFE	Management and commerce	14	5	9	2
	Society and culture	12	4	22	6

Business studies

Courses categorised as *business studies* enrolled large numbers of students for both the Y95 and Y98 cohorts: almost 1000 for the Y95 and almost 1600 for the Y98 cohort; however, as the subjects that were included in this grouping for the two cohorts are different, some caution should be exercised in making any direct comparisons between the groups about levels of enrolments or destinations.

Table 20 Level of post-school education and broad field of study for Year 12 course group: Business studies

Post-school Education	Broad Field of Study	Y95		Y98	
		n	% of Year 12 course group	n	% of Year 12 course group
Higher Education	Natural and physical sciences	9	1	37	2
	Information technology	44	6	61	4
	Engineering and related technologies	9	1	14	1
	Agriculture, environmental and related studies	3	0	10	1
	Health	14	2	46	3
	Education	21	3	33	2
	Management & commerce	192	28	221	14
	Society & culture	112	16	132	8
	Creative arts	24	4	67	4
TAFE	Information technology	29	4	86	6
	Engineering and related technologies	16	2	20	1
	Architecture & building	14	2	16	1
	Health	1	0	13	1
	Management & commerce	96	14	161	10
	Society & culture	14	2	49	3
	Creative arts	9	1	28	2
	Food, hospitality & personal services	10	2	22	1
Apprenticeships	Engineering and related technologies	12	2	33	2
	Architecture & building	6	1	24	2
Traineeships	Management & commerce	13	2	53	3

Table 20 provides the major education and training destinations for the *business studies* students. Probably due to the nature and breadth of the subjects categorised under this heading, students spread quite widely in terms of destination courses. The largest proportion of students from this area of study move into further education, at the higher education, TAFE and traineeship levels, to enrol in courses in the area of *management and commerce*. In particular, the areas of accounting, business and management, and sales and marketing, attracted the majority of students in this field, while at the TAFE level, around one-fifth of the females enrolled in this area were undertaking courses in the office studies area (for example secretarial and clerical studies, practical computing skills).

Enrolments in *information technology* at both university and TAFE level were dominated by males, with male enrolments about 3.5 times that of female enrolments for university level course and almost five times for TAFE enrolments. In contrast, the area of *society and culture* enrolled female students at twice the rate as male students at university level, with most of the male and female students enrolled in behavioural science courses and around 10 per cent of female students enrolled in each of the areas of social sciences and language and literature.

A substantial number of students at higher education level also entered courses in the *creative arts* area. These were mainly in the area of communications and media studies, and similar numbers of males and females were enrolled.

Mixed – general studies

The *mixed – general* course of study also enrolled a substantial proportion of its students in further education or training. This course was characterised by major foci in two areas, but not including the *advanced mathematics–physical sciences* area. There were 672 students from the Y95 cohort and 490 from the Y98 cohort included in this grouping. For both cohorts, most students moved into higher education and TAFE in the areas of *management and commerce* and *society and culture* (see Table 21).

Table 21 Level of post-school education and broad field of study for Year 12 course group: Mixed - general

Post-school Education	Broad Field of Study	Y95		Y98	
		n	% of Year 12 course group	n	% of Year 12 course group
Higher Education	Natural and physical sciences	7	2	13	3
	Information technology	11	2	7	1
	Health	31	7	14	3
	Education	26	6	19	4
	Management & commerce	56	12	46	9
	Society & culture	82	18	69	14
	Creative arts	25	6	19	4
TAFE	Information technology	10	2	17	3
	Management & commerce	44	10	29	6
	Society & culture	28	6	26	5
	Creative arts	7	2	16	3
	Food, hospitality & personal services	-	-	14	3
Apprenticeship	Engineering and related technologies	18	4	8	2
	Architecture & building	5	1	13	3
Traineeship	Management & commerce	21	5	16	3
	Food, hospitality & personal services	10	2	4	1

About equal numbers of males and females were enrolled in higher education courses in *management and commerce*, and for both, the main area of study was business and management. However, female enrolments in TAFE courses outnumbered those of males in the area of five to one, with main enrolments in the areas of business and tourism.

The higher education area of *society and culture* enrolled the largest proportion of students in this course of study. Two-and-a-half times the numbers of females to males were enrolled in this area, and while participation in behavioural sciences (psychology) was the most common for both sexes, female participation in studies in law and studies in human society was also notable. In this subject area at the TAFE level the majority of enrolments for females (numbers of males were too small) was in the area of human welfare studies and services.

Other sciences

The Year 12 subject grouping for *other sciences* changed a little from the cluster analysis for the Y95 to the Y98 cohort. There were around 400 students in the Y95 cohort who were placed in this category, and 945 of the Y98 cohort. Psychology and home sciences became part of other clusters for the Y98 cohort, while basic mathematics, health and physical education, and general sciences were added to this cluster. Again, direct comparisons of rates of enrolment should not be made, as changes in enrolments might be related to changing demographics; however, given these caveats this section of the report examines the destinations of these students (Table 22).

Table 22 Level of post-school education and broad field of study for Year 12 course group: Other sciences

Post-school Education	Broad Field of Study	Y95		Y98	
		n	% of Year 12 course group	n	% of Year 12 course group
Higher Education	Natural and physical sciences	18	7	55	6
	Agriculture, environmental and related studies	11	4	21	2
	Health	30	11	60	6
	Education	23	9	43	4
	Management & commerce	14	5	49	5
	Society & culture	58	22	88	9
	Creative arts	8	3	21	2
TAFE	Natural and physical sciences	2	1	13	1
	Engineering and related technologies	2	1	16	2
	Health	10	4	23	2
	Management & commerce	21	8	53	6
	Society & culture	17	6	42	4
	Creative arts	3	1	15	2
	Food, hospitality & personal services	5	2	15	2
Apprenticeship	Engineering and related technologies	4	1	31	3
	Architecture & building	2	1	12	1
Traineeship	Management & commerce	-	-	25	2
	Society & culture	-	-	12	1

Most of the higher education enrolments for the Y95 cohort were in the subject areas of *society and culture, health*, and *natural and physical sciences* and in the TAFE areas of *management and commerce* and *society and culture*. These patterns were also evident in the Y98 data.

There were quite substantial gender differences in enrolments in studies of *society and culture*. Female enrolments were two-and-a-half times that of male enrolments, with most males in behavioural sciences and most females equally in behavioural and social sciences.

In the higher education area of *health*, there were again substantial gender differences in enrolments, this time in the order of five females to every male, and three in five females were enrolled in a nursing course.

In the vocational education and training area similar numbers of males and females participated in TAFE courses in *management and commerce*, however in quite different areas. Males were predominantly enrolled in business and management courses, females in tourism and office studies courses. In the area of *society and culture*, in which twice as many females as males participated, half of the males were enrolled in sports and recreation courses, and half of the females in the area of human welfare studies and services.

A substantial number of students in the Y98 cohort moved on to apprenticeships in the year after completing Year 12. These students, with only a very few exceptions, were male and were predominantly in the areas of automotive, electrical and building trades.

A number of students also moved into traineeships after completing Year 12. Female students outnumbered males two to one, and while males were primarily training in areas of information technology, engineering and sales and marketing, females were primarily training in the areas of business and management, and human welfare studies and services.

Visual and performing arts

There were 152 students from the Y95 cohort and 194 from the Y98 cohort grouped in this subject area. Few students who study primarily in the *visual and performing arts* area in Year 12 go on to undertake any form of higher education or TAFE study. Those who do tend to go into areas of *creative arts* and *society and culture*. These areas are predominantly female, with enrolments by females in most areas twice those of males.

Table 23 Level of post-school education and broad field of study for Year 12 course group: Visual and performing arts

Post-school Education	Broad Field of Study	Y95		Y98	
		n	% of Year 12 course group	n	% of Year 12 course group
Higher Education	Society & culture	18	22	10	5
	Creative arts	16	20	30	16
TAFE	Creative arts	6	7	27	14

Mixed – eclectic courses

There was a large number of students included in this grouping; 868 of the Y95 cohort and 1163 of the Y98 cohort. These students chose widely from the subjects offered to them in Year 12, so it is not surprising that as a group they spread in many directions after completing school. These courses tended not to have any particular focus, that is, students did not take any more than one subject from each of the groupings. The choice of this type of course was not a particularly

strong conduit to further education or training, with one-third of students not continuing to either in the year after completing Year 12.

The bulk of those students who did go on to higher education did so in the area of *society and culture* and *creative arts*. In *society and culture*, main areas of study were studies in human society, which enrolled similar numbers of males and females, human welfare studies and services, in which enrolments were almost all females, and psychology, which enrolled more than three times as many females as males. The bulk of enrolments in the *Arts* area were in the area of communication and media studies, which enrolled twice as many females as males. Enrolments in *health* and *education* were primarily nursing and teaching, in which few males enrolled.

Enrolments in TAFE studies for this group of students appear to be growing. Students who attended TAFE were likely to be doing a course in *management and commerce*, particularly females, who outnumbered males in this course four to one. Most were undertaking courses in business and management.

About five times as many females as males were enrolled in TAFE courses in the area of *society and culture*, overwhelmingly in the area of human welfare studies and services.

Table 24 Level of post-school education and broad field of study for Year 12 course group: Mixed eclectic

Post-school Education	Broad Field of Study	Y95		Y98	
		n	% of Year 12 course group	n	% of Year 12 course group
Higher Education	Natural and physical sciences	27	5	30	2
	Information technology	15	3	11	1
	Architecture & building	12	2	5	0
	Health	26	5	38	3
	Education	35	7	34	3
	Management & commerce	36	7	41	3
	Society & culture	93	18	113	9
	Creative arts	48	9	81	6
TAFE	Information technology	12	2	21	2
	Engineering and related technologies	9	2	15	1
	Health	10	2	11	1
	Management & commerce	50	10	61	5
	Society & culture	18	3	46	4
	Creative arts	22	4	41	3
	Food, hospitality & personal services	16	3	29	2
Apprenticeship	Engineering and related technologies	12	2	35	3
	Architecture & building	11	2	21	2
	Food, hospitality & personal services	7	1	19	2
Traineeship	Management & commerce	9	2	69	6
	Food, hospitality & personal services	-	-	19	2
Other Study	Management & commerce	13	2	-	-
	Creative arts	13	2	-	-

A growing proportion of students also appear to have completed school and taken up an apprenticeship or traineeship in the year following Year 12. The take up of apprenticeships was again dominated by males (three times as many males as females), primarily in the areas of *electrical and automotive engineering* and *building*. Traineeships were most often in the areas of *sales and marketing*, *business and management*, and *food and hospitality*, and twice as many females as males in the Y98 cohort were undertaking such training.

The last two areas to examine are those that were characterised by students' involvement with two or more studies in the areas of *technical vocational* or *service and clerical vocational* subjects. The subjects for Y95 were quite broad, and limited conclusions only can be drawn for this cohort, however for the Y98 cohort the subjects formed a cohesive and sensible group (childcare, work education, hospitality and home sciences).

Technical vocational studies

There were 77 students in this subject grouping in the Y95 cohort and 148 in the Y98 cohort. As would be expected, few of these students gained access to higher education, however only about one-quarter of the students who did such a course in Year 12 did not continue any further education or training in the subsequent year. Most of the students went into trade apprenticeships on completing Year 12, in the areas of *automotive, mechanical and electrical engineering* and *building*. It has already been noted that most of the students in this area were males.

Table 25 Level of post-school education and broad field of study for Year 12 course group: Technical vocational studies

Post-school Education	Broad Field of Study	Y95		Y98	
		n	% of Year 12 course group	n	% of Year 12 course group
Apprenticeship	Engineering and related technologies	17	36	30	20
	Architecture & building	7	15	19	13

Service and clerical vocational studies

As has been mentioned, this grouping was quite broad for the Y95 cohort, and this is reflected in the number of students in the category for the Y95 cohort and in the breadth of studies undertaken by those students who went on to further education and training after completing Year 12. There were 1638 students classified in this area for the Y95 cohort, but only 97 of the Y98 cohort. It should be noted, however, that only a little more than half of the group continued education or training after completing Year 12.

Predominantly for the Y95 cohort, education was in the areas of *management and comm*erce, and *society and culture*. Major studies in this area included business and management, and tourism under the umbrella of management and commerce, and human welfare studies and services and sports and recreation in the society and culture area. Enrolments in *food and hospitality* were also notable.

A little fewer than one in 10 of the students who took subjects in this area in Year 12 went on to apprenticeships in the following year, primarily in *electrical, mechanical and automotive engineering*.

Of those students in the Y98 cohort who participated in this type of course, four in ten did not participate in any further education and training after Year 12. This choice of subjects is therefore the poorest in terms of acting as a conduit to further education and study. Almost all of the students involved in this course choice were female.

Of those who did continue education and training, the majority were enrolled in the fields of *society and culture*, and *food, hospitality and personal services*, more particularly in the areas of human welfare studies and services, and food and hospitality. A further 6 per cent continued into higher education and teaching courses. The number of apprenticeships and traineeships was also negligible for students in this cohort.

Table 26 Level of post-school education and broad field of study for Year 12 course group: Service and clerical vocational studies

Post-school Education	Broad Field of Study	Y95		Y98	
		n	% of Year 12 course group	n	% of Year 12 course group
Higher Education	Natural and physical sciences	12	2	-	-
	Health	28	4	-	-
	Education	38	5	6	6
	Management & commerce	36	5	3	3
	Society & culture	44	6	2	2
	Creative arts	18	2	-	-
TAFE	Information technology	34	5	2	2
	Engineering and related technologies	28	4	-	-
	Architecture & building	13	2	-	-
	Agriculture, environmental and related studies	21	3	-	-
	Health	16	2	2	2
	Management & commerce	105	14	5	5
	Society & culture	81	11	11	11
	Creative arts	14	2	1	1
	Food, hospitality & personal services	27	4	13	13
Apprenticeship	Engineering and related technologies	70	9	-	-
	Architecture & building	22	3	-	-
	Food, hospitality & personal services	25	3	3	3
Traineeship	Management & commerce	33	4	4	4
	Food, hospitality & personal services	10	2	2	2

Summary

This chapter has examined the relationship between course studied at Year 12 and participation in further education and training. These are summarised as follows:

- *Physical sciences*: A large proportion (nine in ten students) continued with further education and training, mainly higher education in the two main areas of *natural and physical sciences* and *engineering*. Both of these areas tended to be male-dominated; the areas in which females tended to be enrolled in greater numbers were in the biological sciences, nursing and rehabilitation therapies.
- *Mixed, including physical sciences*: Most students continued on to further education and training, and as with the *physical sciences* grouping, about four in every five to higher education. These were enrolled in areas of *natural and physical sciences* (almost 20 per cent), *society and culture, health*, and *business and management*. More than twice the number of females as males were enrolled in *health* courses: most of the males in medicine and most of the females in nursing or rehabilitation therapies.

- *Humanities and social sciences*: A substantial proportion (four in five students) with humanities 'majors' in Year 12 moved on to higher education the following year, and of these, a little more than half entered university. Highest enrolments were in the areas of *society and culture*, in particular social sciences and psychology, and in the field of *creative arts*, more particularly in the area of communication and media studies.
- *Business studies*: About four in five students from this course grouping continued their education or training past Year 12. Of those entering higher education and TAFE, many continued studying in the *management and commerce* fields. Similar proportions of males and females participated in studies in this area, with accounting and business management courses attracting the majority of students, followed by sales and marketing for males and office skills for females. Courses in *IT* at both university and TAFE were dominated by males, while enrolments in *society and culture* (mainly psychology, social sciences and languages) were dominated by females.
- *Mixed- general studies*: This course grouping was not a particularly strong conduit to either higher education or TAFE, but combined, about 80 per cent of students from this area moved into further education or training. Most of the enrolments in both university and TAFE were in the fields of *management and commerce*, and *society and culture*. At university level, females dominated enrolments in the areas of behavioural sciences, law and studies in human society. At TAFE level, females also dominated enrolments in these fields, primarily in the areas of business and tourism, and human welfare studies and services.
- *Other sciences*: Around three-quarters of the students in this area continued on to further education and study, with around four in 10 in higher education. Enrolments in higher education were in the main areas of *society and culture, health*, and *natural and physical sciences*. Enrolments of females in these areas were about twice that of males. Gender differences were apparent in a number of areas. TAFE enrolments were also primarily in the areas of *management and commerce*, and *society and culture*, with males mainly in areas of business and management and females in tourism and office studies.
- *Visual and performing arts*: About two-thirds of students from this area of study continued into further education and training, with about one-third entering higher education. Females outnumbered males two to one, and most students continued in both higher education and TAFE in the field of *creative arts*.
- *Mixed-eclectic studies*: As would be expected from students who chose a broad range of subjects in Year 12, these students moved into a wide range of studies in further education and training in the year after completing school. Twice as many females as males studied subjects in this area, and as a result, females dominated enrolments in many areas. The main areas of study in higher education courses were *society and culture*, and *creative arts*; for TAFE the main areas were *management and commerce*, and *society and culture*. Males dominated all apprenticeships, but females dominated enrolments in traineeships.
- *Technical vocational studies*: Few of these students gained access to higher education, however only about one-quarter of these students did not undertake any further education or training in the subsequent year. Most of the students in this area were male, and most went into trade apprenticeships in the year after completing school.
- *Service and clerical vocational studies*: Four in 10 students in this area did not participate in any further education and training after Year 12, making this grouping of subjects poorest in terms of acting as a conduit to further education and study. Almost all of the students involved in this course were female. Of those who did continue education and training, the majority were enrolled in the fields of *society and culture*, and *food, hospitality and personal services*, more particularly in the areas of human welfare studies and services and food and hospitality. A further 6 per cent continued into *teaching* courses in higher education.

The next chapter examines the pathways of those students who did not participate in further education and training immediately after completing Year 12.

5. MOVING INTO THE WORKFORCE

Education and training are not the only possible successful outcomes for students. This chapter examines the early labour market outcomes for the young people who did not participate in any further education or training in the year after finishing school, and looks at whether differences in patterns of curriculum participation in the last year of school lead to different labour market experiences.

It should also be acknowledged that this early transitional period might not be an accurate reflection of the long-term employment prospects for these young people, as research suggests that the youth labour market is characterised by instability and change as young workers attempt to find suitable jobs (Lamb, 1997). However, the extent to which young people do begin to engage in labour market activities soon after finishing school might be an indication of their long-term prospects.

To put this chapter into context, Figure 6 illustrates the post-school education, training and employment outcomes for both cohorts of students, by gender. Those in the first three categories could be viewed as engaged in productive labour market oriented activities, whether undertaking further education or training or working full time. The fourth category is working part-time; however the young people in this category either cannot find a full-time position or they are not able to work full-time.

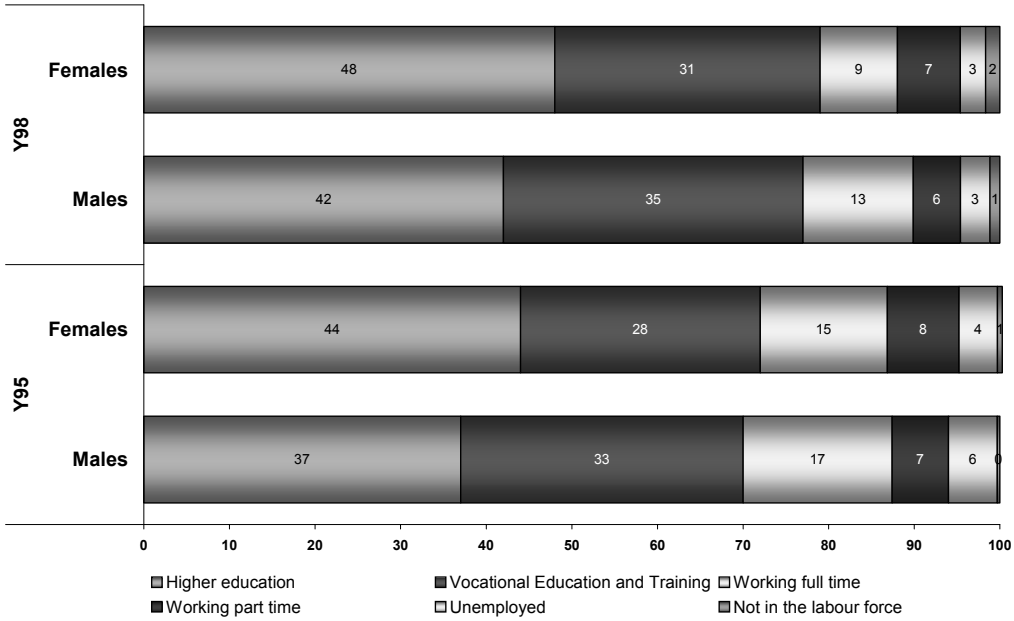

Figure 6 Education and employment status of young people in the year after completing Year 12, Y95 and Y98 cohorts, by gender

The last three categories are often combined into describing those young people who are in marginal situations: working part-time (with no additional study), unemployed or not in the labour force.

The proportion of young people participating in further education and study increased a little between cohorts, and while there was a corresponding decline in the proportion of students in full time employment, the change in proportion of those working part-time was negligible.

Further to this grouping, young people not in further education or training were classified into four groups, depending on the primary activity in which they reported being engaged in the year after completing Year 12:

- Working full time

- Working part-time
- Unemployed
- Not in the labour force.

Transition to Work

Table 27 shows the labour market status of males and females who did not go on to further study for each cohort. Approximately 30 per cent of the Y95 cohort and a little more than 20 per cent of the Y98 cohort did not participate in any further education and training after completing Year 12. Table 27 shows that of these, one-half were employed full-time in the year after school, approximately one-quarter of the Y95 cohort and slightly more of the Y98 cohort were employed part-time, one in seven were unemployed and a small proportion of the Y95 cohort but around one in 14 of the Y98 cohort were classed as not in the labour force.

Gender differences were apparent: males were more likely to be employed on a full-time basis, females on a part-time basis. Unemployment rates were similar for both cohorts, but females were more likely not to be in the labour force.

Table 27 Labour market status for Y95 and Y98 cohorts, by gender

	Y95						Y98					
	Males		*Females*		*All*		*Males*		*Females*		*All*	
	n	%	n	%	n	%	n	%	n	%	n	%
Working full time	520	58	534	53	1053	55	380	56	288	43	669	50
Working part time	198	22	299	30	497	26	159	24	231	35	390	29
Unemployed	166	19	161	16	327	17	99	15	94	14	193	14
Not in the labour force	8	1	15	2	24	1	37	5	53	8	90	7
Total	*892*		*1009*		*1901*		*675*		*666*		*1342*	

The data in Table 28 and Table 29 show the labour market status for the Y95 and Y98 groups, by the Year 12 course of study. The proportions are a percentage of the number of students *not* continuing study or training past Year 12 level.

These outcomes, together with the education and training outcomes as described in the previous chapter, are also displayed in Figure 7 for those young people from the Y95 cohort, and in Figure 8 for those from the Y98 cohort. The percentages in these figures are percentages of the total number of students in the sample in that particular course grouping.

Y95 cohort

The highest full-time employment rates for those young people in the Y95 cohort were for those who had taken a course in the *business studies* area, of whom almost two-thirds were working full-time. High full-time employment rates were also attained by those students who had been in the *other sciences* group.

Students from the *service/clerical vocational* course of study made up the largest proportion of the group of young people not continuing education and training, and a little more than half of them had found full-time employment in the year after completing school. However, a further one-quarter of students from this group found themselves working part-time and one in five were unemployed.

Outcomes were worst for this group and for the group who were categorised as *visual and performing arts*. Almost three in five of these students were also in the situation of being either employed part-time, unemployed or not in the labour force.

Table 28 Labour market status, Y95 cohort, by Year 12 course of study

Group		Employed		Unemployed	Not in the labour force	Total marginal†
	n	*Full-time*	*Part-time*			
		%	%	%	%	%
Physical sciences	135	51	31	14	3	49
Technical vocational studies	20	39	28	33	0	61
Service/Clerical vocational studies	731	55	26	18	1	45
Business studies	232	63	21	15	0	37
Other sciences	112	60	25	15	0	40
Visual & performing arts	56	42	36	19	3	58
Humanities & languages	78	55	30	13	2	45
Mixed - eclectic	299	52	26	19	2	48
Mixed – including physical sciences	49	58	30	12	0	42
Mixed - general	188	57	22	19	1	43

† This is a total of those students considered to be marginal to the labour force: part-time workers, unemployed and not in the labour force. Inconsistent totals may be due to rounding

Full-time employment rates are the lowest and unemployment rates the greatest for those in the *technical vocational* group; however the number of young people in this group who did not participate in further education or training was very small and so these numbers should be treated with some caution.

Overall, the picture is not particularly good for those young people who do not continue education and training. While there are always exceptions to the rule, in general more than 40 per cent of each of the groups in the Y95 cohort suffered marginalised transitions to the workforce.

Outcomes were clearly best for those students who had included some *advanced mathematics–physical sciences* in their Year 12 course. For these students, only six in 100 of the original group of students were in the marginal category: working part-time, unemployed or not in the labour force. This is indeed a very strong outcome.

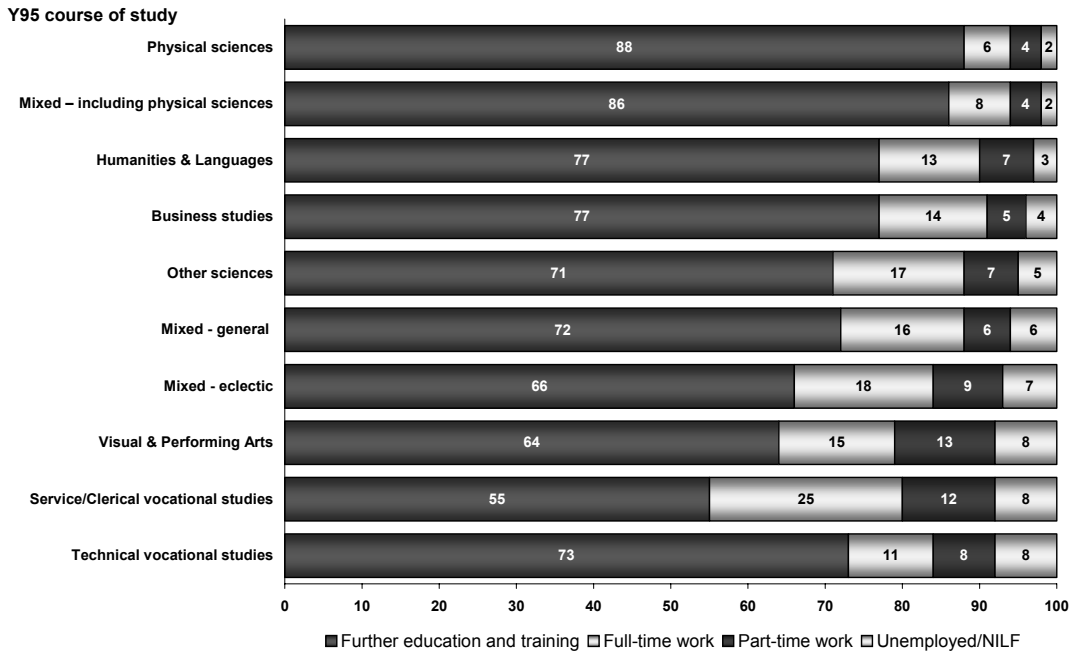

Figure 7 Post-school education and employment outcomes, Y95 cohort

Other good outcomes were found for *humanities and languages*, *business, other sciences,* and *mixed – general* courses, with around one in 10 students in each of these groups having marginalised transitions.

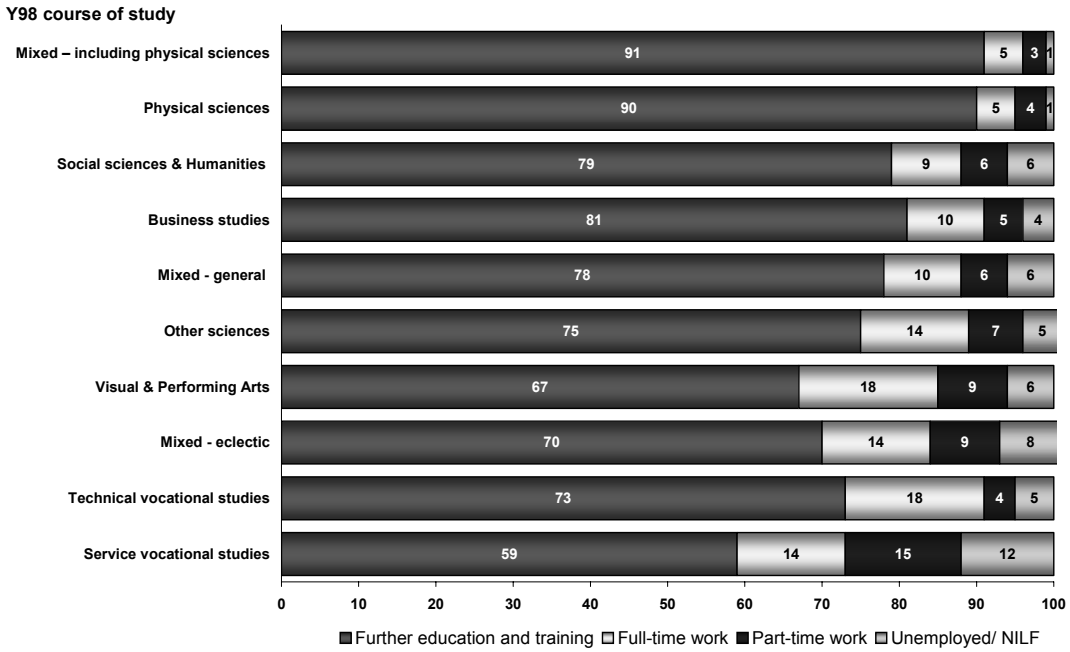

Figure 8 Post-school education and employment outcomes, Y98 cohort

Y98 cohort

A very similar picture is apparent for those students from the Y98 cohort. While overall the rate of full-time employment had decreased from that of the Y95 cohort, some groups were more affected than others. Excellent outcomes were evident for those students in the Y98 cohort who included *advanced mathematics–physical sciences* in their Year 12 course, with 95 per cent of these students either participating in further education or training, or working full-time. Again, outcomes were poorest for those students whose major study was in the *service/clerical vocational studies* area, of whom more than one quarter were either employed part-time, unemployed or not in the labour force (Figure 8), and of whom only one-third of those entering the workforce obtained full-time employment (Table 29).

Table 29 Labour market status, Y98 cohort, by Year 12 course of study

Group	n	Employed		Unemployed	Not in the labour force	Total marginal
		Full-time	*Part-time*			
		%	%	%	%	%
Physical sciences	92	52	35	8	5	48
Technical vocational studies	40	67	16	13	4	33
Service vocational studies	39	33	36	23	7	66
Business studies	305	53	28	13	6	37
Other sciences	231	55	27	15	3	45
Visual & performing arts	63	55	27	14	4	45
Social sciences & humanities	77	42	28	20	9	57
Mixed - eclectic	357	45	30	15	10	55
Mixed – including physical sciences	28	53	36	1	10	47
Mixed - general	110	45	29	19	6	54

For young people from most of the other areas of study, participation rates in full-time employment ranged from 40 to 50 per cent. Compared to the Y95 cohort, the proportion of young people in full-time employment increased for those from *technical vocational studies* and *visual and performing arts*, but for most other groupings it had decreased.

Occupations

At this early stage of their working lives, and with so many of their cohort still in education and training, the type of jobs on offer to teenagers and young adults is likely not to vary a great deal. However, there may be differences in the occupations in which young people are employed that are linked to their course choice in Year 12. This section of the report examines these occupations.

Figure 9 shows the broad industry areas (ANZSIC) into which young people from the Y95 cohort finishing Year 12 and not participating in further education and training moved, separately for those employed full-time and part-time. Figure 10 provides the same information for the Y98 sample. The main industries in which young people are involved are:

- Retail trades
  - Food retailing (supermarkets),
  - Personal and household goods retailing (department stores, clothing and soft good retailing, furniture, houseware and appliance retailing, recreational goods retailing, other personal and household goods).

- Property & business services
  - Property Services (property operators and developers, real estate agents, non-financial asset investors, machinery and equipment hiring and leasing)
  - Business Services (scientific research, technical services, computer services, legal & accounting services, marketing & business management services, other business services).

- Manufacturing
  - Food, beverage and tobacco manufacturing
  - Textile, clothing, footwear and leather manufacturing
  - Wood and paper product manufacturing
  - Printing, publishing and recorded media
  - Petroleum, coal, chemical and associated product manufacturing
  - Non-metallic mineral product manufacturing
  - Metal product manufacturing
  - Machinery and equipment manufacturing
  - Other manufacturing.

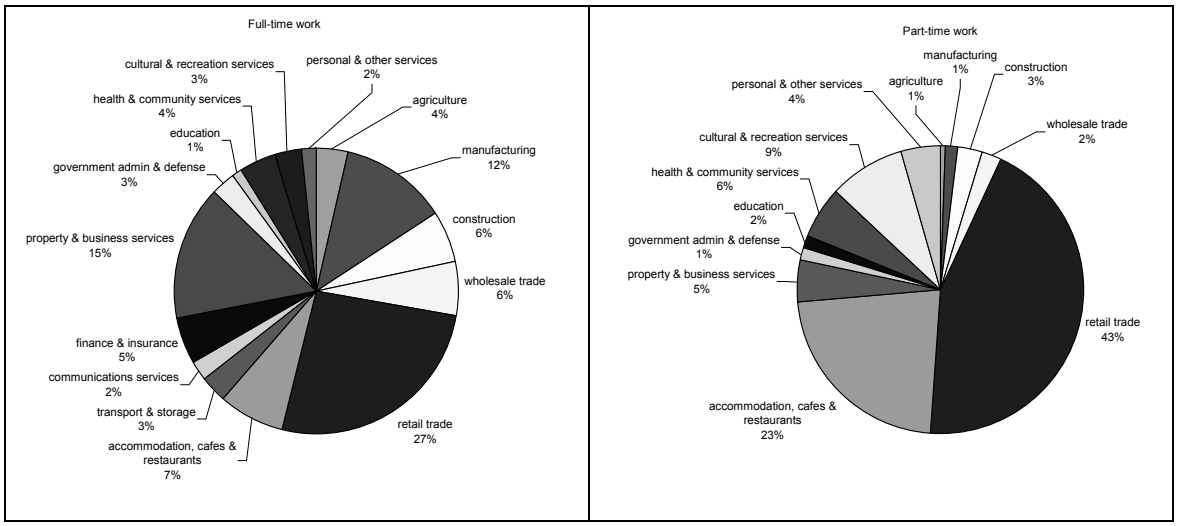

Figure 9 Broad industry areas for occupations of Y95 full-time and part-time employed group

Around one-half of the young people who left school after completing Year 12 and who did not participate in any further education and training were employed within three main industries. Overall, three in 10 were employed in the area of retail trades, and one in ten each in property and business services and in accommodation, cafes and restaurants. However, both Figure 9 and Figure 10 show that there are substantial differences in the areas in which young people working full-time and those working part-time are employed. Retail trade, for example, while still the largest employment sector, is much more so for part-time workers than for full-time workers.

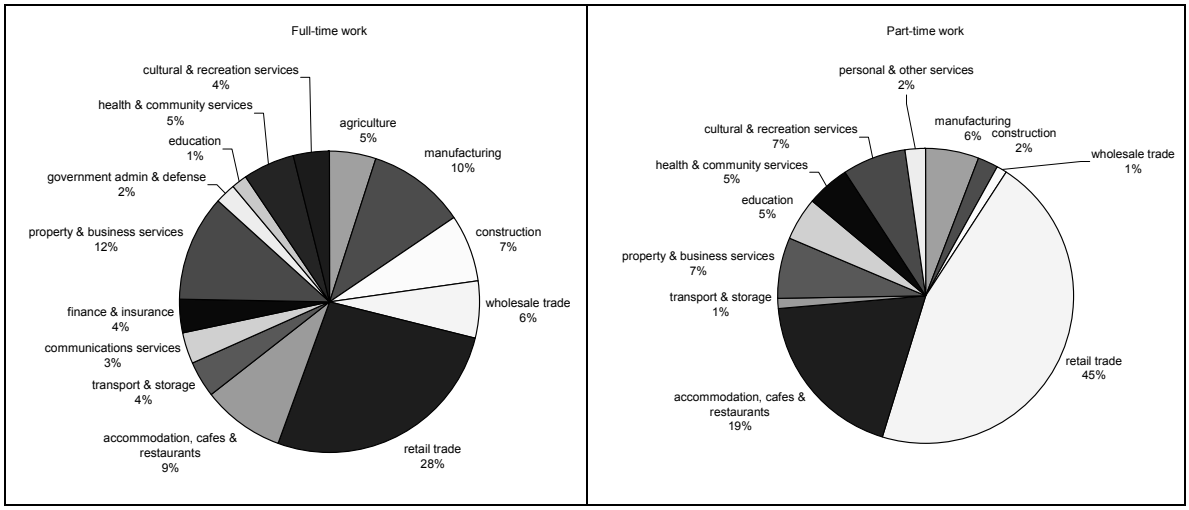

Figure 10 Broad industry areas for occupations of Y98 full-time and part-time employed group

The same is true for the accommodation, cafes and restaurants sector. Both of these areas have experienced greater casualisation in recent times. The areas of property and business services and manufacturing are industries in which more full-time young workers find positions.

Table 30 provides the three major industry areas in which young people from the Y95 group were employed in their first year after school, and Table 31 provides the same information for the Y98 cohort (for all workers – full-time and part-time – combined).

Table 30 Major industry areas, Y95 group, by Year 12 course

Group	Industry	%	Industry	%	Industry	%
Physical sciences	Retail trade	25	Property & business services	13	Accommodation, cafes & restaurants	12
Technical vocational studies	Retail trade	32	Manufacturing	22	Property & business services	12
Service vocational studies	Retail trade	30	Accommodation, cafes & restaurants	12	Manufacturing	9
Business studies	Retail trade	23	Property & business services	18	Manufacturing	10
Other sciences	Retail trade	37	Accommodation, cafes & restaurants	9	Property & business services	7
Visual & Performing Arts	Retail trade	28	Accommodation, cafes & restaurants	22	Property & business services	16
Social sciences & Humanities	Retail trade	44	Accommodation, cafes & restaurants	17	Manufacturing	14
Mixed - eclectic	Retail trade	28	Accommodation, cafes & restaurants	14	Property & business services	12
Mixed – including physical sciences	Property & business services	44	Retail trade	22	Accommodation, cafes & restaurants	9
Mixed - general	Retail trade	39	Property & business services	21	Manufacturing	8

It is clear that the retail industry provides the majority of employment for young Australians. The usual positions within this industry are sales assistants, checkout operators, and storepersons (ASCO, 1997). The patterns for the Y95 cohort are not particularly clear; however, for the Y98 cohort the patterns begin to make some sense.

While retail trades is still the largest employer of young people, there are some possible pathways from education into the workforce that can begin to be seen in the second and third highest employers of young people. While numbers in individual occupations are generally small, this section of the report will attempt to describe these pathways.

For young people who were in the *Mixed – including physical sciences* group in the Y95 cohort, and *physical sciences* in the Y98 cohort in Year 12, retail trades was not the largest employer, albeit by a small margin. In contrast though, for each of the other course types, the differences between the proportion employed in retail trades and anything else is large. Students from the *physical sciences* area were often employed as legal clerks, keyboard or data entry operators in the field of property and business services.

The next highest employers of students from the *technical vocational studies* area were construction and manufacturing, two areas in which students could well have gained some experience while at school. Similarly, students from the *service and clerical vocational services* area also appear to be gaining employment in areas in which they have had some experience, such as child care and special care workers within the field of health and community services, and clerical work in the area of property and business services.

Students of *visual and performing arts* were employed in the areas of transport and storage (primarily as receptionists), and cultural and recreation services (designers, sales assistants in areas such as television, radio and libraries, the arts in general). Other than these examples, most of the young people from other Year 12 course groups are employed in similar low-skill jobs such as restaurant waitstaff, sales assistants, storepersons, bar attendants, fast-food cooks and a variety of clerical jobs.

Table 31 Major industry areas, Y98 group, by Year 12 course

Group	Industry	%	Industry	%	Industry	%
Physical sciences	Property & business services	19	Retail trade	18	Manufacturing	10
Technical vocational studies	Retail trade	29	Construction	16	Manufacturing	15
Service vocational studies	Retail trade	41	Health & community services	21	Property & business services	20
Business studies	Retail trade	34	Accommodation, cafes & restaurants	10	Property & business services	8
Other sciences	Retail trade	33	Accommodation, cafes & restaurants	11	Manufacturing	11
Visual & Performing Arts	Retail trade	30	Transport & storage	15	Cultural & recreation services	10
Social sciences & Humanities	Retail trade	41	Property & business services	16	Education	7
Mixed - eclectic	Retail trade	30	Accommodation, cafes & restaurants	13	Manufacturing	11
Mixed – including physical sciences	Retail trade	29	Accommodation, cafes & restaurants	21	Communications services	11
Mixed - general	Retail trade	24	Property & business management	17	Accommodation, cafes & restaurants	13

Summary

This chapter has examined the labour force destinations of those young people from the Y95 and Y98 cohorts who did not continue with further education and training after completing Year 12 (30 per cent of the Y95 cohort and 20 per cent of the Y98 cohort), among both cohorts as a whole and then by Year 12 course of study. About one-half of these young people entered full-time employment, with the remaining half either employed part-time, unemployed, or not in the labour force.

For the Y95 cohort, full-time employment rates were highest for those who had been in *business studies*, and *other sciences*, lowest for *visual and performing arts*. For the Y98 cohort, highest full-time employment rates were achieved by those in *technical vocational studies, other sciences* and *visual and performing arts*, lowest rates were recorded for those in *service vocational studies* and *social sciences and humanities*. Full-time employment rates had declined for most of the Year 12 course of study areas.

Most of the young people in employment were employed in retail trades, property and business and accommodation, cafes and restaurants. Typically they work as clerks, data entry operators, cashiers, kitchen hands, waiters and bar attendants.

The analysis of industry of employment conducted for the occupational destinations of the Y98 cohort showed that some pathways were beginning to emerge. Students from the *mathematics-physical sciences* area were most likely to be engaged in the area of property and business services. It is a little difficult to explain exactly why this might be so, but perhaps the jobs involved are more technical than simple sales assistant jobs, and so require a higher level of ability, which is generally found in students from this grouping.

Students who had been in the *technical vocational studies* area were likely to be engaged in construction and manufacturing, and students from the *service and clerical vocational services* area also appear to be gaining employment in areas in which they have had some experience, such as child care and special care workers within the field of health and community services, and clerical work in the area of property and business services.

Students of *visual and performing arts* gained employment in the areas of transport and storage (primarily as receptionists), and cultural and recreation services (designers, sales assistants in areas such as television, radio and libraries, the arts in general).

These beginning pathways could well be a result of students getting better careers guidance information, and choosing subjects in Year 12 that fit better with their ambitions.

6. DISCUSSION

This research study investigated the patterns of course choice in Year 12, and the consequences of these choices. The literature has pointed to differences in curriculum participation according to background variables such as social background and gender. If these choices lead to different but equal outcomes then there is no problem: there are just different choices. If, however, such differences lead to better or poorer outcomes for particular groups then it is important that such issues be explored and exposed. Some subject groups may just appeal more to males or females, but is it likely that some subject groups would appeal more to those from high socioeconomic backgrounds than those from low socioeconomic backgrounds? Do some schools provide better opportunities for their students, and if so, which schools and how? These are the types of questions this study has addressed.

Research questions

The research questions, and the answers provided to these by the analyses in this report, are presented in this section.

What are the typical 'clusters' of subjects, or 'course types' studied by Year 12 students? Have these changed since prior analyses, particularly with the increased participation in VET subjects and with the apparent broadening of subject choices across the Key Learning Areas?

Cluster analysis was conducted for both the Y95 and Y98 cohorts of the *Longitudinal Studies of Australian Youth*. These analyses found that there were seven identifiable clusters: *advanced mathematics–physical sciences, business studies, humanities and social sciences, arts, technical vocational studies, service – clerical vocational studies*, and *other sciences*. As well, three *mixed* groups were defined; one which had two major foci, including subjects from the *mathematics-physical sciences* group, one which had two major foci but none from the mathematics-physical science group, and a *mixed eclectic* group for which no major focus was identifiable. From the 1995 cohort to the 1998 cohort, subjects settled into clusters that were easier to identify, however less students were able to be classified into the seven major courses, with 45 per cent of students being classified into the three '*mixed*' groups, as compared to 30 per cent of the Y95 cohort. This could reflect the encouragement of schools and systems for students to broaden their choice of subjects in Year 12, or it could reflect a growing level of dissonance in student subject choice.

What are the 'profiles' of students enrolled in particular course types in Year 12? Are there particular courses that are more likely to be studied by males, or females, or those from different social backgrounds?

Profiles were derived for each course according to gender, achievement, parents' occupational quartile, school location, school sector, and home language background.

Males were more likely than females to participate in the *advanced mathematics–physical sciences* and the *technical vocational* courses. Females were more likely to be enrolled in *social sciences and humanities, arts*, the *mixed-eclectic* courses, and the *service-clerical vocational* subjects.

Level of achievement was one of the dominating characteristics in determining course participation. Students from high achievement levels dominated the areas of *advanced mathematics–physical sciences*, and the *mixed* area that included *mathematics-physical sciences*, and *social sciences and humanities*. Those students from lower achievement levels were more likely to be doing any of the *vocational* courses.

Socioeconomic status (in this case measured by parents' occupational level) had little effect once other confounding factors were removed. In general, those from higher socioeconomic levels were more likely to be engaged in the *physical sciences* courses and least likely to be engaged in any of the *vocational* courses than those from lower socioeconomic levels.

Students in government schools were more likely than those in other sectors to be undertaking courses in *service – clerical* and *technical vocational* studies, and *other sciences*.

Language background had some effect on course choice, with students with a language background other than English more likely to study in the *mathematics-physical sciences* and *business studies* area.

Clearly, courses are still stratified to some extent – not only by ability, but by gender, socioeconomic status and language background.

Which field of study do students from particular course types tend to move into?

It is evident that not all courses of study will lead to higher education. With high retention to Year 12, the senior secondary curriculum must also cater for those who aim for vocational education and training: TAFE studies, an apprenticeship or traineeship, and for those who simply want a general education before leaving school and entering the workforce.

Those courses that were the best pathways to higher education, with more than half of their participants advancing to university, were the *advanced mathematics-physical sciences*, the *mixed group including advanced mathematics-physical sciences*, and the *social sciences and humanities* group. The first of these was dominated by males, the last by females, all three by those from higher achievement levels.

The course areas of *business studies*, *other sciences*, and the *technical vocational* courses in particular, provide some alternative pathways for a broad range of students, both in terms of ability and social status, language background and gender.

The courses that were the poorest pathway to further education and training of any type were the *service –clerical vocational* courses, the *mixed-eclectic* courses and *visual and performing arts*. All of these are dominated by female enrolments, and generally by those in lower achievement levels.

The *service –vocational* courses, in particular, appear to be the courses that do not lead anywhere in terms of further education and training. *Arts* and the *mixed-eclectic* courses are also problematic, however at least *Arts* is more likely to be a vocation of some sort, rather than just the result of poor course advice or decisions made about subjects to study with little thought about the ramifications of such a choice. It is perhaps not surprising that the majority of enrolments in the *mixed-eclectic* and *service-vocational* areas are by students from government schools. In general, government schools cater for a broader range of abilities and backgrounds than independent schools, so this finding may simply reflect the broader range of subjects offered by government schools and the more limited and more academic curriculum structure of the independent school sector.

Do students who are undertaking science courses at secondary school continue with their studies into higher education and TAFE?

For the most part, the answer is yes. Most students in these areas continued their education at university rather than at TAFE. Students who took subjects in the area of *advanced mathematics-physical sciences* were primarily enrolled in the tertiary areas of natural and physical sciences, in

biological sciences, mathematical sciences and chemical sciences, and engineering, in mechanical, electrical and civil engineering. A substantial proportion were also enrolled in the area of health, particularly in medicine and rehabilitation therapies.

Into which work area do students from particular course types tend to move into? Are there particular course types that appear to lead more often to unemployment or other poor outcomes?

Most students who leave school immediately after completing Year 12 move into low-level positions, primarily in the areas of retail trades, accommodation, cafes and restaurant, and manufacturing. The course of study that appeared to lead most often to poor outcomes — unemployment, part-time work or not in the labour force - was the *service-vocational* area.

At the conclusion of 13 years of schooling, most students receive a certificate of completion. For some, this certificate illuminates a pathway to university and to the professions and for others a pathway to vocational education and training. Others simply complete Year 12 and move into the workforce. Prior research has linked differential curriculum participation to gender and to socioeconomic background, and has argued that if this differential participation leads to poorer outcomes for some students then this raises equity issues. This current research study has found that while one of the main influences on course choice appears to be achievement, other significant influences are gender, language background and to a lesser extent socioeconomic status.

While it is encouraging that so many of our students do go on to further studies or to work, it is of concern that some course choices seem to be lacking in opportunities in the short-term for many of those who choose them. Students who choose subjects at Year 12 level without some thought as to the ramifications of such choices may find themselves unable to participate in further education and in a very vulnerable position in the labour force. Those students whose parents are well-educated, or in professional jobs, have role models from whom to receive advice – about which subjects work together and which ones are likely not to do so; however, there are sections of the population who do not have such role models and it is imperative that schools fulfil this role. Clear careers advice and guidance would seem to be vital at this stage of young people's lives.

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APPENDIX 1: SAMPLE AND MEASURES

The Sample

The LSAY samples involved a two-stage clustered design. Schools were first sampled with a probability proportional to the size of their Year 9 enrolments, and then intact classes of Year 9 students were sampled from within each school. When a school declined to take part in the study, a replacement school of the same type (Government, Catholic or Independent) in a nearby locality (identified by postcode) was selected.

In large schools two or three classes were sampled, whereas in small schools all Year 9 students constituted the sample. On average, 48 students were sampled per school. Around 6 per cent of all Year 9 students were selected in each sample, and around 12 per cent of schools with Year 9 students. Small States and Territories were over-sampled in order to give large enough samples for estimates at State level. The two-stage clustered nature of the sample means that the confidence limits for population estimates are larger than for a simple random sample of students of the same size.

In the year following the school-based collection of data from sample members in Year 9, ACER mails a short pen-and-paper survey form to their home address. This form collects basic information on their educational and labour force activities over the previous 12 months and contact details for subsequent telephone-based interviews. In the second year after the initial survey contact (by which time sample members are normally in Year 11) the method of data collection changes to Computer-Assisted Telephone Interviewing (CATI).

The initial contact in Year 9 also involves students in completing a short questionnaire that collects information on their family background, and their educational and occupational aspirations. Over time the LSAY data collections from each cohort build up a comprehensive picture of the social and educational backgrounds of young people, their participation in various forms of education, training and work, and their attitudes to education, work and life more generally.

Sample Weights

Longitudinal samples are subject to attrition as contact is lost with some sample members and others decline to continue with the survey. Typically, the annual response in LSAY has exceeded 90 per cent. However, the impact of sample attrition is cumulative. At the end of 2000, for instance, the active sample size of the Y95 cohort was 7889 members (58 per cent of the original sample). Sample attrition is generally non-randomly distributed among the original sample members. The common pattern is for attrition to be greatest among young people from more disadvantaged backgrounds, and those who drop out of the study tend to have less successful outcomes than those who remain in the study. Weighting largely corrects this bias.

The weights comprise two components. The first component (the stratification weights) accounts for differences in the distribution of respondents by State, school sector and gender in the original Year 9 sample and these distributions for the Year 9 population in 1995 (or 1998 for the Y98 sample) as reported in the ABS publication *Schools Australia*. These weights are necessary to account for the sample design whereby the smaller States and Territories were over-sampled. In addition there are small differences between the sample and 1995 (or 1998) population distributions of school sector by gender within the States and Territories that are corrected by this component. The second component of the weights adjusts for sample attrition. The attrition from the sample is not random, but is associated with Year 9 achievement and gender. Further details on the calculation of weights for this sample are provided in LSAY Technical Paper Number 15

(Marks & Long, 1996). Information on attrition for both cohorts is provided in LSAY Technical Paper Number 32 (Rothman, forthcoming).

Measures

The variables used in this study were defined as follows:

Main Activity

Main activity was assessed by the respondent's major activity at the time of interview, usually conducted between September and November. Main activity was categorised into six groups: higher education, vocational education and training – TAFE, vocational education and training – apprenticeship, vocational education and training – traineeship, other study, and no further study or training.

Social and Demographic Variables

This section describes the measures of the social and demographic variables.

Gender: Information on the sex of the respondents was obtained from responses to the initial questionnaire. In cases where this information was not provided, the students' names were used to infer the students' sex. This information was confirmed in subsequent telephone interviews.

Language Background was measured by asking students in the initial questionnaire 'What language does your family mostly speak at home?' A distinction was drawn between households where the main language spoken at home was English, and households where English was not the main language spoken. This is the measure of language background used in the majority of analyses in this report.

Region was measured by two categories (metropolitan and non-metropolitan based on the number of people in the locality of the student's place of residence in 1995 or 1998 (when the student was in Year 9). Metropolitan centres were defined as centres with populations of 100 000 persons or more. Non-metropolitan regions were defined as centres with populations less than 100,000 persons.

Parental occupation: Sample members were asked in the initial questionnaire to report the occupations of their father (or male guardian) and mother (or female guardian), and to describe their work. If a parent was not employed at the time of the interview, respondents were asked to describe that parent's last job. Respondents were asked to provide information on both parents, even if their mother or father was not living with them. The information provided by respondents was coded to the four-digit level of the Australian Standard Classification of Occupations (ASCO).

To simplify presentation and to make best use of the available information, the occupation of the male parent was taken as the basis for the occupational measure. When information on the occupation of the male parent was not available, the occupation of the female parent was substituted. This approach was taken because a large proportion of the respondents indicated that the occupation of the female parent was 'home duties', an occupation for which there is no occupational class or occupational prestige score. For this report, this measure was collapsed into four broad categories: professional/managerial; clerical/sales/personal service; skilled manual; and semi/unskilled manual.

Education Variables

This section describes the measures of the education variables.

School sector: This measure refers to the school attended at the time of sample selection (Year 9, 1995 or 1998), and the data for this measure were obtained from the sample design. Three categories are used – government schools, Catholic non-government schools, and non-Catholic non-government schools – identified respectively as government, Catholic and independent.

Achievement measures were based on students' performance in ACER administered tests of literacy and numeracy conducted when the students were in Year 9. Each test comprised 20 short answer or multiple answer tests. The tests included many items used in previous national studies of literacy and numeracy (the 1975 and 1980 ASSP studies) and in longitudinal studies of Australian young people (the 1989 *Youth in Transition* study and the *Australian Youth Survey*).

In the literacy test students were asked to read some text and then to answer several questions about what they had read. The text comprised short newspaper articles and longer textual passages. The material from newspapers included stories about a tug of war with a camel, a hang gliding flight, an armed robbery, birds trapped by dumped oil, scientific explanations of floating, and the flight of bees. The longer textual passages were on diverse topics such as the birth of a volcano, a railway worker's near fatal experience with an express train, and a dispute between two motorists.

In the numeracy test three broad types of questions were asked. The first type dealt with mathematical operations (mainly computations) with little or no practical component. This included simple operations such as addition and subtraction, and more complex operations such as long division, fractions, squares, cubes, and square roots. The second type of questions required practical applications of numerical skills. Examples are questions about buying things, reading scales, tables and graphs, and calculating interest. The third type of questions required the application of abstract mathematical concepts. These were mainly logical and spatial problems.

The measure of achievement was developed from student's test scores. For this measure, the literacy and numeracy test results were combined in order to provide an overall measure of achievement, then quartiles were calculated. The highest quartile represents the top 25 per cent of students, the next quartile represents the next 25 per cent of students, and so forth.

APPENDIX 2: SUBJECT GROUPINGS

Table A1 Indicative subject groupings- Y95 cohort

Subject grouping	Indicative subjects
Asian language	Chinese
	Indonesian
	Japanese
	Vietnamese
European language	French
	German
	Italian
Basic mathematics	Mathematics in Practice
	Mathematics in society
	Mathematics A
	Applied Mathematics
General mathematics	Mathematics: Logic
	Mathematics 1
	Further mathematics
Advanced mathematics	Mathematical methods
	Mathematics 3/4 unit
	Mathematics B
	Applicable mathematics
Biological sciences	Biology
	Human Biology
Chemistry	Chemistry
Physics	Physics
General science	Science for life
	Environmental studies
	Sciences
Other sciences	Earth science
	Marine studies
	Multi-strand science
Business	Business organisation & management
	Business studies
	Industry studies
Accounting	Accounting
Economics	Economics
Office skills	Office administration
	Office studies
Social sciences	Australian studies
	International studies
	Aboriginal studies
History	Modern history
	Contemporary society
	Classical societies and cultures
Religion	Religion & society
	Studies of religion
Psychology	Psychology

Subject grouping	Indicative subjects
Creative arts	Art & design
	Practical design
	Art & design
Performing arts	Ballet studies
	Dance studies
	Speech & drama
Music	Music in society
	Musicianship
Health	Health education
	Personal development
Physical education	Sport
	Physical education studies
	Sport science
	Recreation & health
VET IT	Information processing
	Computing control systems
Information technology	Information technology studies
	Information systems
	Computing studies
Home sciences	Home economics
	Nutrition
Hospitality	Food and hospitality
	Food studies
Childcare	Childcare
	Child studies
Materials technology	Materials & technology
	Applied studies
	Woodwork
	Design in plastics
Design	Technological design & development
	Textiles & design
Auto	Automotive technology
	Auto workshop
Engineering technology	Electronics
	Metals engineering
	Industrial technology
Work ed	Work studies
	Learning enterprise
Agriculture	Agriculture
	Horticulture
	Ag science

Table A2 Indicative subject groupings- Y98 cohort

Subject grouping	Indicative subjects
Asian language	Chinese
	Indonesian
	Japanese
	Vietnamese
European language	French
	German
	Italian
Basic mathematics	Foundation mathematics
	Mathematics A
	Applicable mathematics
	Mathematics in practice
	Vocational mathematics
General mathematics	Further mathematics
	General mathematics
	Unit 2 mathematics
Advanced mathematics	Mathematics extension
	Mathematics methods
	Specialist mathematics
	Mathematics C
	Calculus
	Advanced mathematics
Biological sciences	Biology
	Human biology
	Life science
Chemistry	Chemistry
Physics	Physics
General science	Earth & environmental science
	Multi-strand science
	Integrated science
	Applied science
Other sciences	Marine science
	Environmental science
	Geology
	Oceanography & meteorology
Business (VET)	Accounting VET
	Business services (VET)
Business	Business studies
	Business management
	Small business
	Business, enterprise & technology
Accounting	Accounting
Economics	Economics
Office skills	Secretarial studies
	Office administration
Social sciences	Aboriginal studies
	Citizenship & society
	Society & culture
	Classical societies & culture
	Women's studies
	Social studies
	International studies

Subject grouping	Indicative subjects
History	Ancient history
	History for leisure
	Liberty & authority
	Modern history
Religion	Religious studies
	Texts & traditions
Psychology	Psychology
	Behavioural sciences
Creative arts	Ceramics
	Photography
	Visual arts
Performing arts	Dance
	Drama & theatre
	Ballet studies
Music	Music in society
	Music performance
Health	Health education
	Health studies
Physical education	Outdoor education
	Fitness
	Physical education
	Recreation studies
VET IT	Information technology VET
Information technology	Software design & development
	Business information technology
	Information systems
	Computing
Home sciences	Home economics
	Community services
Hospitality	Catering practices
	Food and hospitality
Childcare	Family studies
	Exploring early childhood
Materials technology	Furnishing
	Printing
	Plastics
	Furniture construction
Design	Textiles & design
	Design & technology
Auto	Automotive technology
Engineering technology	Local area mining
	Engineering manufacturing
	Electronics
Work ed	Communication
	Work & society
Agriculture	Pastoral industries
	Horticulture
	Plant production & enterprise

APPENDIX 3: NOTES ON METHODS OF ANALYSIS

Cluster Analysis

Cluster analysis is a method of multivariate data analysis in which a heterogeneous group (Year 12 subjects in this case) is divided into more homogeneous sub-groups or clusters (courses of study) based on the strength of the relationship between particular response variables for individual cases. It is a classification procedure which can be used in an exploratory or confirmatory way. The goal of cluster analysis is to determine natural groups which reflect underlying structure.

Agglomerative hierarchical cluster analysis was used to derive the course of study groupings in this report. This method of cluster analysis starts with all cases as individuals. At the first step, two cases are merged to form a single cluster, based on their linkage distance (calculated within SPSS). Small values for this distance indicate that clusters that are quite similar are being blended, while large values indicate that the clusters are quite diverse. At the second and subsequent steps, either individual cases are added to existing clusters or two existing clusters are combined. Eventually only one cluster, containing the whole data set, remains. Ward's method was used as the particular clustering algorithm. Using Ward's method, all of the possible combinations of clusters are examined at each step of the clustering process to find the two clusters for which minimal information loss will occur when they are combined.

To facilitate interpretation of the clusters, a dendrogram may be produced. The dendrogram for the Y95 data, shown in Figure 1, is reproduced here.

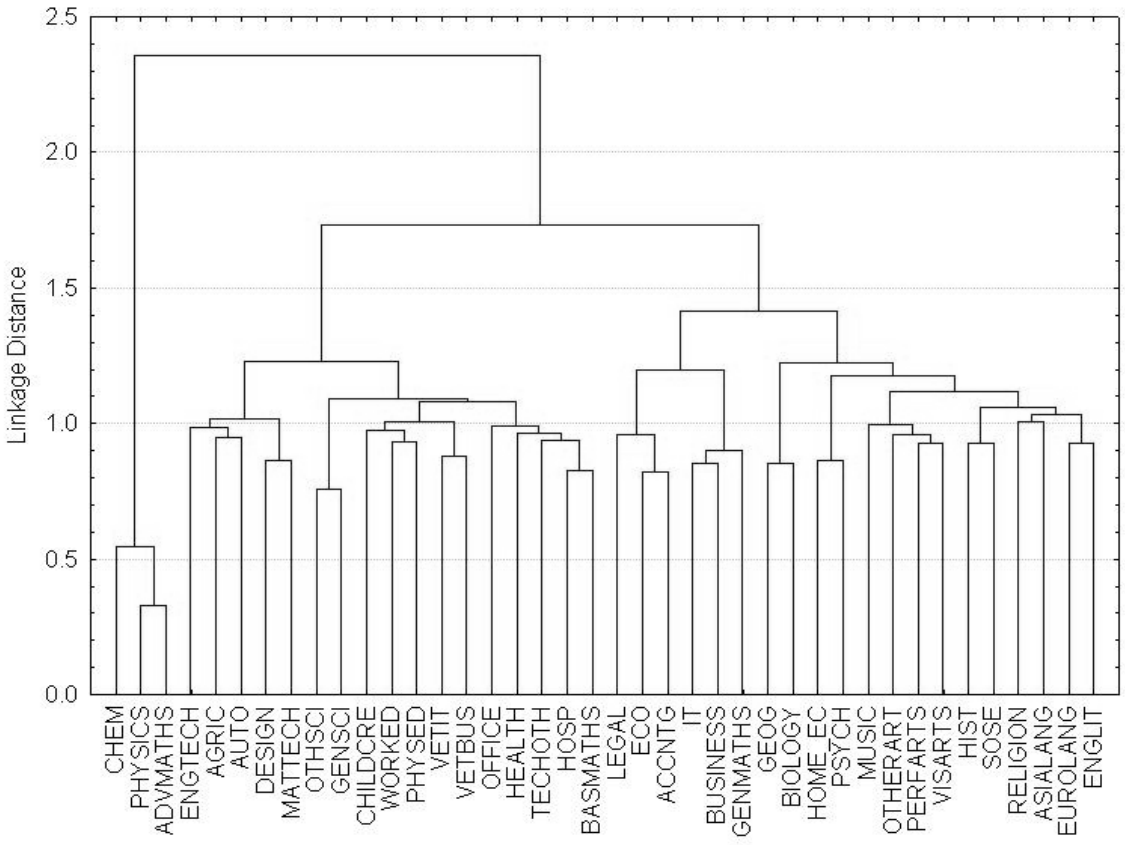

Figure A3.1 Dendrogram showing clusters of courses for Y95 LSAY data

The tree structure of the dendrogram presents many different groups that may be present in the data, and so the question becomes where to 'cut' the tree so as to extract the optimal number of groups. This method is reliant purely on the judgement of the researcher.

From Figure A3.1 it is clear that there are many groupings. However, examining the plot, it can be noted that the subjects *physics* (PHYSICS) and *advanced mathematics* (ADVMATHS) are the first two subjects to 'join' together, meaning that of all the subjects available, those who are enrolled in one are most likely also to be enrolled in the other as well. Chemistry (CHEM) is the next subject to 'join' these two, forming what was labelled as the *physical sciences* group.

Choosing the other clusters was not as straightforward as this one. However, the aim with cluster analysis is to choose a solution which is interpretable, and in which subjects are combined before distances become too large.

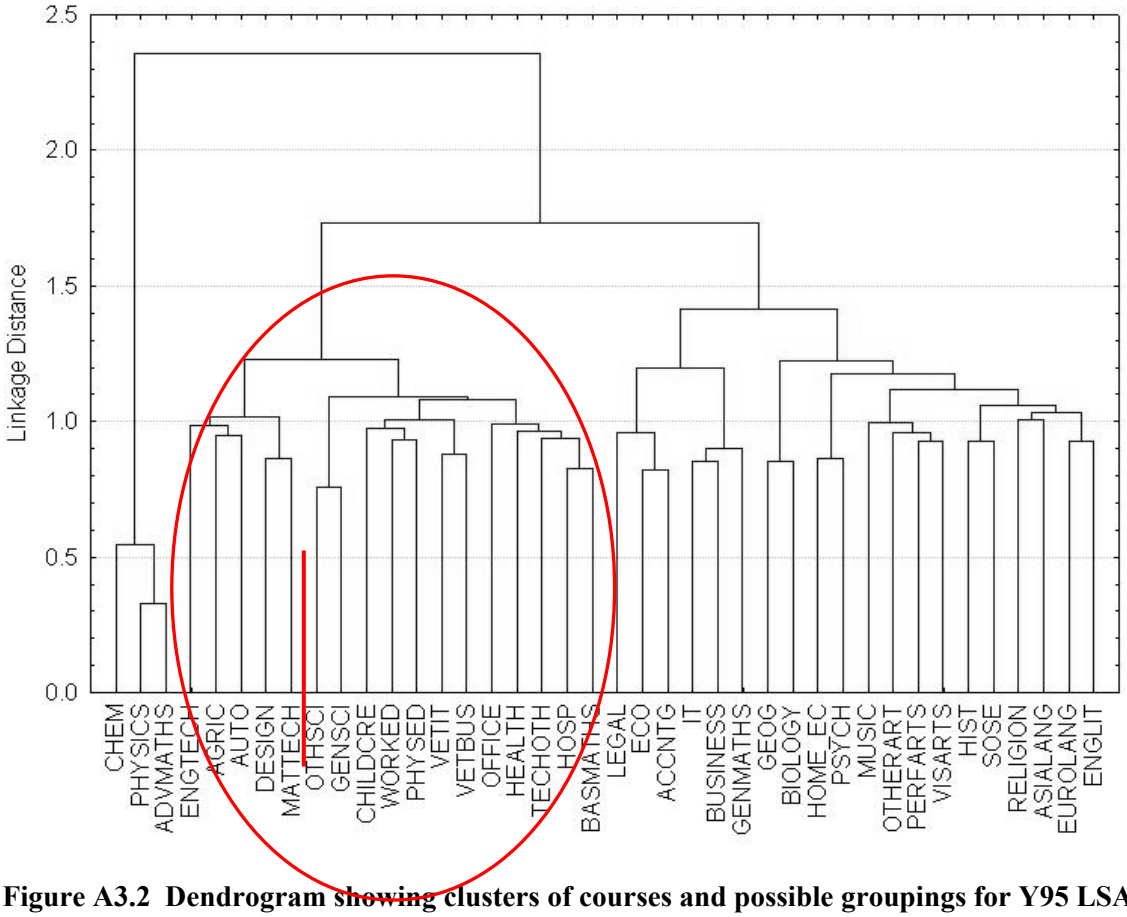

Figure A3.2 Dendrogram showing clusters of courses and possible groupings for Y95 LSAY data

Examining Figure A3.2, it can be seen that there are a large group of subjects clustered together in the group following the *physical sciences* group, starting with *engineering technology* (ENGTECH) and ending with *basic mathematics* (BASMATHS). These subjects all cluster together at a distance of about 1.2, however trying to categorise this whole group of subjects is difficult. A smaller group comprising *engineering technology* (ENGTECH) through to *materials technology* (MATTECH) clusters at a distance of about 1.0. On inspection, this cluster is reasonably interpretable, being *technical-vocational* subjects. There are a number of options with the rest of the subjects in this group, however the grouping is also a matter of obtaining a reasonable number

of cases in each groups so that it can be characterised using other variables in the LSAY data. As such, while small groups such as *office* (OFFICE)*, health* (HEALTH)*, other technology* (TECHOTH)*, hospitality* (HOSP) and *basic maths* (BASMATHS) could be formed, there were a small number of cases, and so in this instance the larger distance of 1.1 was acceptable, producing the larger grouping from *other sciences* (OTHSCI) through to *basic maths* (BASMATHS) which was labelled as *service/clerical vocational studies.* This methodology was then followed to determine the groupings for each set of data.

APPENDIX 4: ESTIMATION OF THE IMPACT OF VARIOUS FACTORS ON PARTICIPATION IN YEAR 12 SUBJECTS

Table A3 Unstandardised logistic regression coefficients – Y95 cohort †

	Gender	Achievement			Locality	Parents' occupational level			Sector		Language background	Constant
	Female	Lower middle	Upper middle	High	Rural	Lower middle	Upper middle	High	Catholic	Independent	LBOTE	
Physical sciences	-.79 ***	.71 ***	1.52 ***	2.39 ***	-.20 **	.09	.18	.51 ***	.02	.33 ***	1.12 ***	-1.97 ***
Technical vocational studies	-2.54 ***	.47	-.07	-1.06 **	-.97 ***	.02	.50	.04	-.66 *	-2.42 **	.40	-2.00 ***
Service vocational studies	-.07	-.33 ***	-.98 ***	-1.84 ***	-.24 ***	-.12	-.33 ***	-.66 ***	-.24 ***	-.35 ***	-.83 ***	-0.11
Business studies	-.28 ***	.40 ***	.38 ***	.38 ***	.31 ***	.01	-.01	-.12	-.16	-.15	.44 ***	-2.13 ***
Other sciences	.99 ***	.02	.12	-.26	.13	.03	.18	.12	-.04	.16	-.48 *	-3.87 ***
Visual & performing arts	.82 ***	-.07	.01	-.01	-.08	.31	.11	.16	-.21	.11	-.76 *	-4.28 ***
Social sciences & humanities	.91 ***	-.01	.58 **	.80 ***	.58 ***	.10	.23	.12	.94 ***	.52 ***	.06	-4.71 ***
Mixed - eclectic	.30 ***	-.21	-.18	-.35 ***	.05	-.07	-.03	.08	-.16	-.08	-.41 ***	-1.88 ***
Mixed – incl physical sciences	-.37 ***	.56 *	1.28 ***	1.76 ***	.06	.10	.25	.32 *	-.05	-.24	.52 **	-3.28 ***
Mixed - general	.44 ***	-.06	-.17	-.68 ***	-.06	.05	.05	.10	.37 ***	.16	-.18	-2.60 ***

† *Unstandardised logistic regression coefficients. Reference categories: male, lowest achievement level, metropolitan school, lowest parental occupational level, government school sector, English language background.*

** $p < .05$, ** $p < .01$, *** $p < .001$*

Table A4 Unstandardised logistic regression coefficients – Y98cohort †

	Gender	Achievement			Locality	Parents' occupational level			Sector		Language background	Constant
	Female	Lower middle	Upper middle	High	Rural	Lower middle	Upper middle	High	Catholic	Independent	LBOTE	
Physical sciences	-.76 ***	1.02 ***	1.82 ***	3.00 ***	.10	.14	.23	.35 **	-.42 ***	-.11	1.03 ***	-2.48 ***
Technical vocational studies	-2.44 ***	-.52	-.58 *	-1.78 ***	.61 **	.24	.17	-1.02 **	-1.06 ***	-.54	-1.83 *	0.04
Service vocational studies	2.79 ***	-.64 *	-1.77 ***	-1.43 ***	-.35	.34	-.42	-1.09 *	-2.0 ***	-1.24 ***	-.67	-9.09 ***
Business studies	-.20 *	.02	-.07	-.51 ***	-.05	.02	-.25 *	-.18	.90 ***	.24 *	.52 ***	-1.29 ***
Other sciences	.12	-.07	-.25 *	-.74 ***	-.04	.01	-.05	-.11	-.27 **	-.09	-1.05 ***	-0.71 **
Visual & performing arts	.94 ***	-.16	-.46	-.71 **	.18	-.18	.34	.12	-.61 **	-.14	-.67 **	-4.66 ***
Social sciences & humanities	1.01 ***	.44	.74 ***	.59 **	-.12	-.49 *	.02	.11	.00	-.08	-.56	-3.81 ***
Mixed - eclectic	.41 ***	-.29 **	-.43 ***	-.63 ***	.10	-.22 *	-.19	-.06	-.66***	-.27 **	-.47 ***	-1.74 ***
Mixed – incl physical sciences	-.43 ***	1.42 ***	1.91 ***	2.21 ***	-.13	.60 *	.55 *	.73 **	.50 ***	.57 ***	.48 *	-3.06 ***
Mixed - general	.26 *	.13	-.06	-.49 **	-.23	.22	.44 **	.04	.45 ***	.30	-.22	-2.29 ***

† *Unstandardised logistic regression coefficients. Reference categories: male, lowest achievement level, metropolitan school, lowest parental occupational level, government school sector, English language background.*

** p < .05, ** p < .01, *** p < .001*

APPENDIX 5: INTERPRETING ODDS RATIOS

An odds ratio is simply a ratio of odds. For example, the following table shows the proportion of males and females who were classified in the *Physical sciences* grouping in the final year of school.

Gender	In Physical Sciences	Not in Physical Sciences
Males	22	78
Females	11	89

The odds ratios are calculated as the odds of males being in *Physical sciences* rather than not in *Physical sciences* compared to the ratio for females. For males, 22 per cent were enrolled in such courses compared to 78 per cent who were not, so the odds for males being in *Natural and Physical sciences* courses are 22/78 or 0.28. For females the odds are 11/89 or 0.12. Therefore the odds ratio is 0.28/0.12 or 2.33. The interpretation of the odds ratio is that the odds of males being in a *Physical sciences* course rather than not in a *Physical sciences* course is 2.33 times greater *than that for females*.

Odds ratios are always positive. An odds ratio equal to one signifies no effect of the variable concerned on participation. Odds ratios above one indicate an increased likelihood of participation and odds ratios below one indicate a decreased likelihood. The further an odds ratio is from one, the stronger the effect of the variable.

APPENDIX 6: PARTICIPATION IN HIGHER EDUCATION BROAD FIELDS OF STUDY

Table A5 Participation in higher education broad fields of study, by Year 12 course and gender

Higher education broad field of study	Y95			Y98		
	Males	Females	All	Males	Females	All
Natural & physical sciences	*(n=139)*	*(n=216)*	*(n=355)*	*(n=244)*	*(n=232)*	*(n=476)*
Physical sciences	66	54	59	55	42	49
Technical vocational studies	1	0	0	0	0	0
Service vocational studies	6	5	6	0	0	0
Business studies	4	2	3	11	8	10
Other sciences	2	9	6	13	16	14
Visual & Performing Arts	0	0	0	2	0	1
Social sciences & Humanities	0	3	2	1	3	2
Mixed - eclectic	6	10	8	3	14	8
Mixed – including physical sciences	12	13	13	12	11	12
Mixed - general	2	4	3	2	5	4
Information technology	*(n=262)*	*(n=72)*	*(n=334)*	*(n=274)*	*(n=67)*	*(n=341)*
Physical sciences	36	21	33	22	15	20
Technical vocational studies	2	0	1	1	0	1
Service vocational studies	12	15	13	0	3	1
Business studies	22	24	23	44	48	45
Other sciences	2	6	3	6	4	5
Visual & Performing Arts	0	0	0	0	2	1
Social sciences & Humanities	2	4	2	1	2	1
Mixed - eclectic	7	14	9	11	12	11
Mixed – including physical sciences	11	7	10	8	9	8
Mixed - general	6	10	7	7	6	7
Engineering & related technologies	*(n=435)*	*(n=27)*	*(n=462)*	*(n=408)*	*(n=31)*	*(n=439)*
Physical sciences	40	78	42	34	52	35
Technical vocational studies	5	0	4	10	0	9
Service vocational studies	23	7	22	0	0	0
Business studies	9	4	9	18	0	17
Other sciences	1	0	1	14	10	14
Visual & Performing Arts	0	0	0	0	0	0
Social sciences & Humanities	1	0	1	0	3	1
Mixed - eclectic	6	7	6	12	32	14
Mixed – including physical sciences	8	4	8	7	3	7
Mixed - general	6	0	6	5	0	4
Architecture & building	*(n=142)*	*(n=23)*	*(n=165)*	*(n=154)*	*(n=25)*	*(n=179)*
Physical sciences	13	13	13	6	12	7
Technical vocational studies	7	4	7	16	0	14
Service vocational studies	26	0	22	0	0	0
Business studies	15	13	14	29	20	28
Other sciences	4	9	4	12	20	13
Visual & Performing Arts	0	13	2	0	0	0
Social sciences & Humanities	7	9	7	1	12	3
Mixed - eclectic	13	35	16	19	24	20
Mixed – including physical sciences	8	0	7	3	0	2
Mixed - general	6	4	6	13	12	13
Agriculture, environmental & related studies	*(n=62)*	*(n=55)*	*(n=117)*	*(n=71)*	*(n=35)*	*(n-105)*
Physical sciences	21	20	20	13	17	14
Technical vocational studies	3	0	2	7	3	6
Service vocational studies	24	27	26	0	0	0
Business studies	6	7	7	25	23	24
Other sciences	14	11	13	31	37	33
Visual & Performing Arts	0	0	0	0	0	0
Social sciences & Humanities	2	0	1	0	3	1
Mixed - eclectic	14	6	10	18	14	17
Mixed – including physical sciences	6	16	11	3	3	3
Mixed - general	8	13	10	3	0	2

Higher education broad field of study	Y95			Y98		
	Males	Females	All	Males	Females	All
Health	*(n=63)*	*(n=286)*	*(n=349)*	*(n=98)*	*(n=288)*	*(n-386)*
Physical sciences	60	29	35	37	24	27
Technical vocational studies	0	0	0	0	0	0
Service vocational studies	11	14	13	0	1	1
Business studies	2	6	5	22	15	17
Other sciences	6	13	12	18	25	23
Visual & Performing Arts	0	1	1	0	2	2
Social sciences & Humanities	2	7	6	1	6	4
Mixed - eclectic	5	12	11	9	15	13
Mixed – including physical sciences	8	7	7	9	8	8
Mixed - general	6	12	11			
Education	*(n=24)*	*(n=166)*	*(n=190)*	*(n=35)*	*(n=145)*	*(n=180)*
Physical sciences	12	7	7	9	3	4
Technical vocational studies	0	0	0	3	2	2
Service vocational studies	29	20	21	0	4	3
Business studies	25	10	12	29	17	19
Other sciences	4	13	12	20	27	26
Visual & Performing Arts	12	1	3	0	5	4
Social sciences & Humanities	0	8	7	9	6	7
Mixed - eclectic	4	20	18	20	21	21
Mixed – including physical sciences	4	5	5	3	3	3
Mixed - general	8	16	15	9	12	11
Management & commerce	*(n=397)*	*(n=535)*	*(n=932)*	*(n=408)*	*(n=624)*	*(n=1032)*
Physical sciences	14	8	10	12	7	9
Technical vocational studies	1	0	0	1	0	0
Service vocational studies	15	22	19	0	2	1
Business studies	37	28	32	46	39	42
Other sciences	2	5	4	13	12	12
Visual & Performing Arts	0	1	1	0	2	2
Social sciences & Humanities	4	6	5	3	5	4
Mixed - eclectic	8	12	11	10	21	17
Mixed – including physical sciences	7	3	5	6	2	4
Mixed - general	12	14	13	8	9	9
Society & culture	*(n=239)*	*(n=607)*	*(n=846)*	*(n=255)*	*(n=623)*	*(n=878)*
Physical sciences	18	8	11	15	7	9
Technical vocational studies	0	0	0	2	1	1
Service vocational studies	12	17	15	0	2	2
Business studies	19	13	15	27	19	21
Other sciences	5	10	9	13	18	16
Visual & Performing Arts	2	3	3	1	3	2
Social sciences & Humanities	10	14	13	9	15	14
Mixed - eclectic	13	14	14	15	20	19
Mixed – including physical sciences	10	5	6	6	4	4
Mixed - general	9	15	14	12	11	11
Creative arts	*(n=112)*	*(n=231)*	*(n=343)*	*(n=174)*	*(n=290)*	*(n-464)*
Physical sciences	17	6	9	14	7	10
Technical vocational studies	0	0	0	4	0	2
Service vocational studies	12	12	12	0	0	0
Business studies	13	10	11	28	16	20
Other sciences	1	5	4	9	8	8
Visual & Performing Arts	9	8	8	10	14	12
Social sciences & Humanities	10	18	15	3	14	10
Mixed - eclectic	28	23	25	22	29	26
Mixed – including physical sciences	4	4	4	3	3	3
Mixed - general	5	14	11	7	9	8
Food, hospitality & personal services	*(n=55)*	*(n=109)*	*(n=164)*	*(n=66)*	*(n=155)*	*(n=221)*
Physical sciences	7	0	2	12	2	5
Technical vocational studies	2	0	1	2	0	0
Service vocational studies	34	41	39	2	11	8
Business studies	14	13	13	17	24	22
Other sciences	7	9	8	14	17	16
Visual & Performing Arts	2	3	2	4	2	3
Social sciences & Humanities	6	1	2	6	4	4
Mixed - eclectic	4	20	15	26	34	31
Mixed – including physical sciences	6	0	2	2	0	0
Mixed - general	18	13	15	17	6	10