Copyright Notices

Notice 1

Under the Copyright Act 1968, this thesis must be used only under the normal conditions of scholarly fair dealing. In particular no results or conclusions should be extracted from it, nor should it be copied or closely paraphrased in whole or in part without the written consent of the author. Proper written acknowledgement should be made for any assistance obtained from this thesis.

Notice 2

I certify that I have made all reasonable efforts to secure copyright permissions for third-party content included in this thesis and have not knowingly added copyright content to my work without the owner’s permission.
Adults returning to study VCE Mathematics:
lifelong learning, transition and engagement, and the adult learner

Roy Thomas Smalley
Bachelor of Applied Science (Physics/Mathematics) (Ballarat C.A.E.)
Graduate Diploma in Education (Science/Mathematics) (Monash University)
Graduate Diploma in Computer Education (The University of Melbourne)
Master of Education by Coursework (The University of Melbourne)

Thesis submitted in partial fulfilment of the requirements for the degree of
Master of Education by Research,
Monash University

September 2011
Declaration: This thesis contains no material that has been accepted for the award of any other degree or diploma in any educational institution and, to the best of my knowledge and belief, it contains no material previously published or written by another person, except where due reference is made in the text of the thesis.

Signed:

Date:

Ethics Approval: The research for this thesis received the approval of the Monash University Standing Committee for Ethical Research on Humans

(Group approval reference: CF08/2674 - 2008001339).
Acknowledgements

I would like to thank my family, friends and colleagues for their enthusiastic support and encouragement prior to and during the four years I was working on this thesis.

I have been fortunate to work with several research staff in a range of different capacities while working on this thesis. Firstly, I would like to thank Dr Anita Devos, my primary supervisor, Drs Allie Clemens and Gail FitzSimons, associate supervisors, for their insightful guidance and gentle support. Secondly, I would like to thank Professor Terri Seddon for the opportunity to participate in the CROSSLIFE project. This project allowed me to work and study with a diverse group of students and academics from a range of different countries, learning cultures, and traditions. Lastly I would like to acknowledge the collegial support consistently offered by the staff and students of the Monash Education Research Community, the Maths Colloquium, the Education writing groups, and the various faculty research groups and seminar series.

I would also like to sincerely thank the three students who volunteered to be interviewed for this study. Your willingness to provide frank and open answers despite talking to your teacher was both appreciated and illuminating. I wish you well in your future studies. I would especially like to congratulate Ryu on his success in obtaining a place in the B.Sc course at the University of Melbourne.

Lastly I would like to acknowledge a life time of support and encouragement I received from my parents and grandparents. While the term lifelong learning was unknown to us learning has been an integral part of our daily life for generations.

Credits

Figure 1 & 2: Photograph taken by Roy T Smalley, 2010

Figure 3: This screen print is reproduced with permission subject to the following acknowledgement. For this work I used version 1.2.6 of Audacity(R) recording and editing software. Audacity(R) software is copyright (c) 1999-2011 Audacity Team. Web site: http://audacity.sourceforge.net/. It is free software distributed under the terms of the GNU General Public License. The name Audacity(R) is a registered trademark of Dominic Mazzoni.
Abstract
This study investigates the experiences of adults returning to study mathematics in an adult learning environment. Current government policy aims to increase school retention rates, and the proportion of low socio-economic status school leavers who successfully make the transition to higher education (Skills Victoria, 2010a). The Technical and Further Education (TAFE) system in Australia has a long history of providing adults who experienced school as problematic, with a ‘second chance’ to complete their general education in a post-school setting. This study seeks to improve understanding of how these policy goals might be achieved, and to contribute to pedagogical debates on how we meet the needs of learners who have experienced social, economic and educational barriers (Kell, 2010).

The study explores the factors that influence persistence and non-persistence of second chance learners who chose to study a Year 12 Mathematics subject at the Victorian Certificate of Education level (VCE) at a suburban TAFE Institute. The primary motivation of adults who enroll in a senior secondary certificate at TAFE “is to obtain a university entrance score as a prerequisite for university” (Karmel, 2004, p. 3). Year 12 Mathematics presents a significant hurdle for students who may have had a disrupted education, yet is needed for progression into many study and career paths.

This study used qualitative semi-structured interviews to gather insight into educational experiences of the three participants who were all enrolled in Year 12 Mathematical Methods. Two students were early school leavers; the third was a school completer returning to study to pursue an alternate career path after ten years in the workforce.

The study highlights how the interaction of affective, cognitive and conative factors can influence a student’s successful reengagement with a ‘hard’ Year 12 Mathematics subject. Each of the participants reported a positive attitude towards mathematics as a discipline. However, there were significant differences in work habits (Corno, 2004) and approaches to learning, of the students who did or did not persist in the subject. The data analysis suggests that one’s self-theory of intelligence may be influence one’s ability to study effectively (see Dweck, 1999). Experiential learning in the work place, and through extra-curricula activities, may also assist some older students to develop an incremental mindset and a strategic approach to learning.

The outcomes of this study, while small scale, are important for a few reasons. The study contributes to the under-researched field of adults returning to study mathematics at senior secondary level. Students with a clear sense of agency, who have developed a strategic approach to learning, are able to overcome significant deficits of prior knowledge and successfully complete an academic year 12subject. Teachers in both secondary school and TAFE need to make the link between effort and learning explicit for students at all levels. The study also has implications for the recent punitive education policies of the Australian State and Commonwealth governments. Time is a critical factor in the development of an incremental mindset, and the associated sense of agency, needed to enable second chance learners to successfully reengage with school mathematics. For some adults this process may take years.
Table of Contents

Introduction.......................................................................................................................1

1.1 Rationale ...........................................................................................................1

1.2 The Research Context .......................................................................................2

1.2.1 An overview of Further Education in Victoria .........................................2

1.2.2 The Victorian Certificate of Education.....................................................5

1.2.3 Why VCE Mathematics? ..........................................................................6

1.2.4 Outer Melbourne Institute of TAFE ..........................................................7

1.3 The Research Question .....................................................................................8

1.4 How this Thesis is organised ............................................................................8

2 Literature Review....................................................................................................10

2.1 Introduction.....................................................................................................10

2.2 Adult Mathematics Education.........................................................................10

2.2.1 Senior Secondary Mathematics...............................................................12

2.2.2 Bridging mathematics .............................................................................14

2.3 Transition and Persistence ..............................................................................19

2.3.1 Leaving school early ...............................................................................20

2.3.2 Attrition and Retention in the Further education sector.........................21

2.4 Key Concepts ..................................................................................................24

2.4.1 Bandura: Self-regulation and agency ......................................................24

2.4.2 Dweck: Self Theories of Intelligence......................................................25

2.4.3 Corno: Motivation and Volition..............................................................26

2.5 Summary .........................................................................................................26

3 Methodology Chapter .............................................................................................28

3.1 Rationale of the research design .....................................................................28

3.2 Insider Research ..............................................................................................29

3.2.1 Practice-based Insider Research..............................................................30

3.2.2 Initial Proximity ......................................................................................30

3.3 Methodology in detail .....................................................................................32

3.3.1 The Institute ............................................................................................32

3.3.2 Recruiting the participants ......................................................................32

3.3.3 Method of collecting the data..................................................................34

3.3.4 Approach to Analysing the data..............................................................35

4 The student who left................................................................................................40
Table of Figures

Figure 1: Interview Room – Interviewer’s perspective ................................................. 41
Figure 2: Interview Room – Interviewee’s perspective ............................................... 41
Figure 3: Danielle "I didn't know anyone who was doing it" ....................................... 47
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABS</td>
<td>Australian Bureau of Statistics</td>
</tr>
<tr>
<td>ACE</td>
<td>Adult and Community Education</td>
</tr>
<tr>
<td>ACER</td>
<td>Australian Council for Educational Research</td>
</tr>
<tr>
<td>ACOTAFE</td>
<td>Australian Committee on Technical and Further Education</td>
</tr>
<tr>
<td>AEI</td>
<td>Australian Education International</td>
</tr>
<tr>
<td>ALM</td>
<td>Adults Learning Mathematics</td>
</tr>
<tr>
<td>ANTA</td>
<td>Australian National Training Authority</td>
</tr>
<tr>
<td>AQF</td>
<td>Australian Qualifications Framework</td>
</tr>
<tr>
<td>CAE</td>
<td>Centre for Adult Education</td>
</tr>
<tr>
<td>CGEA</td>
<td>Certificates in General Education for Adults</td>
</tr>
<tr>
<td>DEECD</td>
<td>Department of Education and Early Childhood Development (Victorian Government)</td>
</tr>
<tr>
<td>DEEWR</td>
<td>Department of Education, Employment and Workplace Relations (Australian Government) – formerly DEST</td>
</tr>
<tr>
<td>DEST</td>
<td>Department of Education, Science and Training</td>
</tr>
<tr>
<td>ENTER</td>
<td>Equivalent National Tertiary Entrance Rank</td>
</tr>
<tr>
<td>LLEN</td>
<td>Local Learning and Employment Network</td>
</tr>
<tr>
<td>NCVER</td>
<td>National Centre for Vocational Education Research</td>
</tr>
<tr>
<td>OMHS</td>
<td>Outer Melbourne High School (pseudonym)</td>
</tr>
<tr>
<td>OMIT</td>
<td>Outer Melbourne Institute of TAFE (pseudonym)</td>
</tr>
<tr>
<td>PISA</td>
<td>Programme for International Student Assessment</td>
</tr>
<tr>
<td>RTO</td>
<td>Registered Training Organisation</td>
</tr>
<tr>
<td>SAC</td>
<td>School Assessed Coursework</td>
</tr>
<tr>
<td>SSCE</td>
<td>Senior Secondary Certificate of Education</td>
</tr>
<tr>
<td>TAFE</td>
<td>Technical and Further Education</td>
</tr>
<tr>
<td>TIMSS</td>
<td>Trends in International Mathematics and Science Study</td>
</tr>
<tr>
<td>VASS</td>
<td>Victorian Assessment Software System</td>
</tr>
<tr>
<td>VCAA</td>
<td>Victorian Curriculum and Assessment Authority</td>
</tr>
<tr>
<td>VCAB</td>
<td>Victorian Curriculum and Assessment Board</td>
</tr>
<tr>
<td>VCAL</td>
<td>Victorian Certificate of Applied Learning</td>
</tr>
<tr>
<td>VCE</td>
<td>Victorian Certificate of Education</td>
</tr>
<tr>
<td>VET</td>
<td>Vocational Education and Training</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Full Name</td>
</tr>
<tr>
<td>--------------</td>
<td>------------------------------------------------</td>
</tr>
<tr>
<td>VLESC</td>
<td>Victorian Learning and Employment Skills Commission</td>
</tr>
<tr>
<td>VTAC</td>
<td>Victorian Tertiary Admissions Centre</td>
</tr>
</tbody>
</table>
Introduction
Like most practitioner-researchers this study was influenced by my interest in solving a practical issue in my workplace (Dirkx, 2006). I teach adults and early school leavers who want to complete the Victorian Certificate of Education (VCE) in an adult learning environment. Within the VCE program teachers continually strive to improve the retention, participation and learning of a diverse cohort of students. I am particularly interested in enabling these students to successfully complete Year 12 mathematics.

Each year students choose to study a VCE mathematics subject as a prerequisite for entry into a wide variety of tertiary courses and careers. Unlike in secondary schools, adult students cannot be compelled to attend class and some students may drop out during the course. Hence, attrition has been a problem for the Technical and Further Education (TAFE) sector since its inception (eg. Brougham, 1978). This is a particular issue for early school leavers as any unsuccessful attempt to return to study may reinforce “earlier feelings of inadequacy and failure” (McGivney, 2003, p. 13).

An underlying assumption of this study is that teaching VCE Mathematics in TAFE is “likely to be more effective when teachers understand who their students are, their backgrounds, the contexts they bring with them, and their reasons and purposes” for returning to study (Swain, 2005, pp. 317-318). Therefore the aim of this study is to develop a clearer understanding of the affective, cognitive and conative factors that influence persistence and non-persistence of adults undertaking a Year 12 Mathematics subject in a Further Education setting.

1.1 Rationale
In their report on the effective delivery of courses to young people, 15-24 years old, Volkoff, Keating, Walsttab, and Marr (2006) concluded that

> Young people who are engaged in studying senior secondary certificates in TAFE and ACE, that is, early school leavers, are likely to require quite intensive learning support, career and pathway planning assistance and personal support, particularly when compared to the support needs of young people engaged in mainstream VET programs while still at school or following completion of Year 12 (pp. 3-4).

Volkoff et al. (2006, p. 4) asserted that while TAFE teachers cannot be expected to “work with these young people on an ongoing basis” there is a need for professional
development activities which builds expertise in supporting young people at risk of disengaging with education. These activities include developing an understanding of “the learning needs and preferences of young people” and “the varied disadvantaging circumstances encountered by young people” (p. 4). Despite the delivery of modules using adult learning principles young people continue to withdraw from VCE classes, especially Science and Mathematics subjects. However, the main participants consulted were staff of key organisations associated with the Vocational Education and Training (VET) sector (pp. 10-12). If we are to support all students who are ‘at risk’ then we need to give a voice to those students who do not make a successful transition to reengage with education in the adult learning environment.

1.2 The Research Context
TAFE Institutes are primarily responsible for the delivery of certificate and diploma programs for the VET sector (Australian Education International [AEI], 2008, p. 31). Thus, the learning culture of the typical TAFE program is focused on delivering specific vocational training for motivated and engaged adults.

However, TAFE, and its predecessors, also has a long history of providing general education courses to meet the learning needs of students who experience disadvantage due to the deficiencies in the education system. The following sections will provide an overview of the historical context for both the evolution of the VET and the Schools sectors, with a particular focus on Victoria.

1.2.1 An overview of Further Education in Victoria
As in other states, the development of the TAFE in Victoria has “been both ad hoc and independent in manner” (Van Der Linde, 2006, p. 38). The genesis of the contemporary VET sector is widely attributed to the establishment of Mechanics Institutes in most Australian colonies during the early nineteenth century (see, for example: Department of Education Employment and Workplace Relations [DEEWR], 2010b; Docherty, 1973; Van Der Linde, 2006). The Melbourne (Mechanics) Institute was established in 1839 at a time of little formal education when “vocations were learnt through on-the-job experience” (Docherty, 1973, p. 607).

Historical Overview of Education in Victoria (1838-1973)
For most of the early 1800s, education was voluntary and mostly provided for the middle class by non-government institutions, such as the Mechanics institutes (Docherty, 1973, p. 607). During the 1850s and 1860s a few night schools were established to provide some adults with the “opportunity to proceed to ‘higher branches’ of learning if possible” (Blake, 1973, p. 153). From 1869 the state government began to take a greater interest in providing a basic education for all citizens. From 1869 to 1890 the Technological Commission established sixteen independent technical institutions throughout Victoria to provide the Working Classes with instruction related to technological and industrial occupations (Docherty, 1973, pp. 608-610). The most common were the Schools of Mines which had their genesis in the need to train the personnel in charge of mining operations (p. 611). Despite the introduction of compulsory primary education in 1872, most Schools of Mines needed to provide State school classes as students often “came ill-prepared for science and trade courses” (p. 619).

Between 1872 and 1910 secondary education was, with a few exceptions, the exclusive domain of the denominational and private school sector. In 1898 the Working Men’s College, a predecessor of RMIT, introduced a preparatory year to meet the scholarship demands of the “many students who were ill-prepared for the day diploma courses” (Docherty, 1973, p. 644). In 1910 the Victorian Government established the state controlled secular secondary education system. However, there was still a need for some Technical Colleges to provide a range of preparatory classes until they also became an “obligation of the high schools” in 1965 (p. 736).

**Technical and Further Education (1973-2010)**

In 1972 a new federal Labour government was elected with a strong social justice platform and it quickly established various education advisory commissions. The report of the Australian Committee on Technical and Further Education (ACOTAFE) (1974), commonly known as the Kangan report, “defined the roles and the mission of what is now known as the TAFE system” (DEEWR, 2010a).

In particular the social role of TAFE as a ‘second chance’ enabler was stressed: “Strong emphasis should be placed on unrestricted access to recurrent education … to enable adults to attempt [to make] good of omissions or deficiencies related to primary and
secondary schooling” (ACOTAFE & Kangan, 1974, pp. xxiii-xxix). However, by the late 1980s the success of policies aimed at improving retention of secondary school students through to Year 12 resulted in a reduced demand for TAFE preparatory courses (Connell, 1993, p. 347).

The 1990s was a “turning point in the development of the Australian VET system” (Knight & Mlotkowski, 2009, p. 37). A new national body, the Australian National Training Authority (ANTA), was established to oversee a nationally consistent VET system (Goozee, 2001, p. 85). During its tenure, 1992-2005, ANTA developed three major national training strategies which set the agenda for the ongoing development of TAFE and the VET sector in Australia: Towards a Skilled Australia (1994-1998); A Bridge to the Future (1998-2003); and Shaping our Future (2004-2010) (DEEWR, 2010c).

ANTA’s first two national strategies implemented a shift in education policy towards an economic paradigm focused on developing human capital to enhance the economic development of Australia (G. N. McMillan, 2007, p. 181). Resulted in a gradual reduction in the “quality and comprehensiveness” of the provision of services for young adults at risk of being unable to secure full time employment (McIntyre, Freeland, Melville, & Schwenke, 1999, p. 82). Despite this some TAFEs continued to support programs which provided early school leavers with a second chance at completing their schooling (see, for example McIntyre, et al., 1999).

During the early 2000s there was a growing consensus that the economic utility emphasis of these national strategies was flawed as the needs of some equity groups were not being addressed (Australian Education Union [AEU], 2001; Bowman, 2004; Marginson, 2002). Many of these concerns were addressed in Shaping our Future, a new national strategy which established a more equitable balance between the economic and social agendas for the VET sector, and TAFE in particular (G. N. McMillan, 2007).

In 2005, the Victorian Government proposed to address the skills shortage, a national priority, by focusing “on increasing pathways and engagement of early school leavers and those at risk of leaving school early” (Victorian State Government, 2005, p. 3). One result of this policy was that Victorian TAFEs were ‘encouraged’ to support any post-compulsory student (over 15 years old) who wished to “complete Year 12 or an
equivalent training qualification” (Skills Victoria, 2006, p. 26). This led to a dramatic change in the range of ages, educational and socio-economic backgrounds of the students returning to study the VCE at TAFE.

1.2.2 The Victorian Certificate of Education
The VCE is a senior secondary school certificate which is “designed to be completed by school students” (Victorian Curriculum and Assessment Authority [VCAA], 2007a, p. 2). The VCE prepares candidates to enter university, TAFE institutes, the workplace, and for other life roles (Australian Qualifications Framework Advisory Board, 2007). From 1991, the VCE replaced all previous Year 12 courses, such as the Higher School Certificate (HSC) and the TAFE Tertiary Orientation Program (TOP).

During the 1980s retention to Year 12 had increased significantly. This was probably due to the decline in full-time employment opportunities for youth and a range of Commonwealth government policies aimed at addressing this issue (Burke & Spaull, 2001). By the mid-1980s a significant proportion of the student population gained access to higher education via the TAFE Tertiary Orientation Program. The designers of the VCE sought to rationalise the variations in curriculum and assessment between the different Year 12 courses. The intention was to provide all students with a pathway to further education through a culturally sensitive school based curriculum. However, what was implemented was a “standardised, externally-examined and moderated curriculum” which favoured elite schools and “left the educationally disadvantaged worse off than before” (Marginson, 2002, pp. 9-10). Since the introduction of the VCE a number of alternate programs and strategies have been implemented in an effort to improve Year 12 retention and equity outcomes. For example, the Victorian Certificate of Applied Learning (VCAL) (Pritchard & Anderson, 2009) and VET in Schools (McDonald, 2010).

In 2001, Victorian TAFEs piloted programs for including school aged students in the ‘adult’ VCE program and within two years 3,763 young adults were doing the VCE at TAFE (Long, 2005, p. 7). Thus, students who study the VCE at TAFE now have a wide variety of educational backgrounds and goals. These students are sometimes referred to as ‘second chance’ learners (Ross & Gray, 2005, p. 113) and include:
1. Adult Students – students who are over 18 years old and who have left fulltime secondary schooling (VCAA, 2007a, p. 8). Most of these students are now typically in their twenties.

2. Continuing students – any school age student, usually aged 16-19, who is not classified as an adult student by the VCAA (p. 184). Including students, under 18 years old, who have completed the TAFE Certificates in General Education for Adults (CGEA), a literacy and numeracy program for early school leavers who have not completed Year 10.

3. VCE completers – who are repeating subjects to improve their Equivalent National Tertiary Entrance Rank (ENTER) or studying additional subjects to meet university prerequisites.

4. International Students – there is an increasing number of full fee paying students undertaking the VCE.

1.2.3 Why VCE Mathematics?
Mathematics remains one of the access subjects to further education which can improve “young peoples’ life chances” (Thomas, 2000, p. 1). Marginson (2002) asserts that, in terms of social disadvantage, exclusion from school through early school leaving is only part of the story:

Even among those that remain at school, there are pronounced inequalities of scholastic achievement, between students from different suburbs and regions, between students from government schools and students from independent private schools, and fundamentally, between students from different SES backgrounds as measured by parental income and employment (p. 12).

One of the most pronounced area of inequalities is scholastic achievement in the ‘hard’ subjects, especially mathematics and the physical sciences. For example “students from independent private schools (boys 61% girls 48%) are much more likely than high school students (boys 37% girls 26%) to enrol in preparatory mathematics, much more likely to pass and much more likely to achieve honours grades” (p. 12). Also, while few Year 12 subjects have prerequisites it is recommended that students should successfully completed Year 11 mathematics before attempting the equivalent Year 12 subject (VCAA, 2005, p. 12). Adults returning to study a Year 12 Mathematics subject at TAFE may experience additional problems not experienced by continuing students. Such as
adjusting to a fully prescribed course with a demanding workload and balancing school, work and family commitments (Bennison, 1998)

Earlier studies on adults returning to TAFE to study Mathematics at the senior secondary certificate level have concentrated on how the teaching could change to suit the needs of mature adult students (for example Bennison, 2002; FitzSimons, 1994). These studies focused on the ‘successful’ students – the students who remained in the class for the duration of the study.

There has been little research focused on retention/attrition issues related to second chance learners, both youth and adult, returning to study senior secondary mathematics at TAFE (or other further education setting). The non-completion rate for students enrolled in a Senior Secondary Certificate of Education (SSCE), such as the VCE, in TAFE across Australia during 2000 was 34.8% (Shah & Burke, 2003, p. 10). However, in my experience the non-completion rate for VCE Mathematics students can be as high as 50%. If we are to truly improve young peoples’ life chances then we need to look at the whole cohort, not just those who successfully make the transition from early school leaver to student, but also those who do not persist.

1.2.4 Outer Melbourne Institute of TAFE

This study was undertaken within a specific local context, the Outer Melbourne Institute of TAFE (OMIT). As an ongoing staff member at OMIT I have an extensive knowledge of the Institute’s learning culture, processes and procedures. The objectives of this study fit well with the long term strategic direction outlined by the OMIT’s board of directors. I have lived and worked within OMITs catchment since early childhood. Hence, I also have an intimate understanding of the social, cultural and historical context for the study.

OMIT is a large multi-campus TAFE situated on the outer suburban fringe of Melbourne. The VCE is currently taught on the two largest campuses. Each is situated near major retail hubs and well served by public transport. Most students live close to the campus they attend. However, some students may spend up to 2 hours travelling to and from the campus.
In the year of the study 146 students were enrolled in a Year 12 Mathematics class, 116 in Further Mathematics and 30 in Mathematical Methods. Each campus ran two Further Mathematics classes and one Mathematical Methods class.

1.3 The Research Question

The goal of this study is to develop a deeper understanding of the affective, cognitive and conative factors that influenced the learning trajectories of these second chance learners. In particular I wanted to give a voice to the students who were unable to make the transition back into the Mathematics class in the hope that I might identify a new strategic approach for helping these students realise their goals.

This study will explore how the factors commonly associated with non-completion in the higher education and secondary sectors operate at a personal level for students enrolled in VCE Mathematics at TAFE. In particular

1. What was the decision making process that led to the student’s decision to return to study VCE Mathematics at TAFE?
2. What are the factors and triggers that lead some students to withdraw, while others persevere with VCE Mathematics?
3. What are the implications for policy makers, TAFE Managers, VCE Coordinators, and VCE Mathematics teachers at both secondary school and at TAFE?

1.4 How this Thesis is organised

Chapter two provides an outline of the literature relevant to this study. In particular it details how this study fits at the intersection of the attrition and adult learning mathematics research fields.

Chapter three is a methodological discussion of the actual course of my decision making as I adapted the study in response to issues emerging while implementing the research design.

Chapter four is an analysis of the Danielle’s interview, a case study of the only participant who had dropped out of a Year 12 Mathematics class. Written immediately after the interview the analysis and discussion assumed that it was likely that no other students would opt in to the study. Therefore it was decided to use a variety of
approaches to explore the multiple interpretations of the interview data (Kvale & Brinkmann, 2009). In this chapter I also ‘played’ with different approaches for representing the interview data which enabled the participant’s voice to be heard.

Chapter five is a case study analysis of the two participants, Ryu and David, who completed the Year 12 Mathematical Methods class. This chapter used the themes identified during the analysis of Danielle’s interview to explore the different learning trajectories of these successful second chance learners.

Chapter six discusses the similarities and differences between the three cases and includes the key findings. Briefly, I suggest that the learning trajectories and attitudes of these three students confirms that the work of Lyn Corno (2004), on work habits, and Carol Dweck (1999), on student’s self theories of intelligence, may provide strategies to improve the persistence of second chance learners who enrol in a Year 12 Mathematics subject.

Chapter seven concludes with a summary of the key findings, the limitations of the study, suggestions for the improvement of the provision learning support for second chance learners, and recommendations for future research arising from this study.
2 Literature Review

2.1 Introduction

The education and training system needs continued improvement if we are to keep up with the rest of the world. Wide variations exist in the results achieved by students of different socio-economic backgrounds, and too many students are leaving school before completing their secondary education. To participate in the modern economy, more adult Victorians need to increase their skills through further education and training (Department of the Premier and Cabinet, 2005, p. 10).

Since its inception, one of the key roles of TAFE has been to support participation in lifelong learning by all adults irrespective of their prior educational attainments. TAFE Institutes provide adults and early school leavers with a second chance to complete a SSCE (Australian Qualifications Framework Advisory Board, 2007), or equivalent, in an adult learning environment. Senior secondary school mathematics is an acknowledged gate keeper that limits young peoples’ access to further education (Thomas, 2000). Thus many second chance learners choose to study a Year 12 Mathematics subject in order to maximise their future study options. However, on average 34.8% of students who enrol in a SSCE at TAFE do not complete the course (Shah & Burke, 2003, p. 10). Thus a significant proportion of early school leavers who are returning to study the VCE are experiencing further barriers to their participation in a ‘modern economy’.

In their literature review, McInnis et al. (2000, p. 3) identified the need for research on non-completion in Australia which:

1. explores how the general ‘well known’ factors operate at a personal level,
2. attempts to identify both the process and the trigger points of withdrawal, and
3. investigates the issue of readiness for specific discipline studies.

The remainder of this chapter will build the argument for exploring the processes and trigger points experienced by adults who return to study VCE Mathematics at TAFE.

2.2 Adult Mathematics Education

The Adult Mathematics Education (AME) research field is described as a moorland which “is still in the exploratory phase of development” (Coben, 2006, p. 29). The field
itself is frequently linked with/in the “emergent” lifelong learning field (p. 19) due to mathematics role as a gate keeper for admission to many careers associated with globalisation and the knowledge society (Schlöglmann, 2006). The AME field is recognised as “genuinely interdisciplinary” and closely associated with other research fields, for example adult education, mathematics education, psychology and sociology (Wedege, Benn, & Maasz, 1999, p. 62). Coben (2006, p. 30) argues that AME research can be categorised as use-inspired basic research if it is grounded in “problems and issues arising in practice” and contributes to the “further development of the field”.

The AME research field was founded on, and maintains, strong links with practice. Prior to 1990 there were few outlets available for the dissemination of research related to adults and mathematics education. From the early 1990s a number of organisations and special interest groups have been established to facilitate the networking of practitioners and researchers working in the field (see, for example, Coben, 2003). A number of these organisations organise annual conferences which provided “a much needed common focus for discussion and dissemination of research, making the area more publicly visible” (FitzSimons & Godden, 2000, pp. 31-33).

Growing recognition of this emerging research field resulted in the establishment of Working Group 18, Adults returning to Study Mathematics, at the 8th International Congress on Mathematical Education (ICME 8), held in Sevilla in 1996. At the inaugural meeting two of the four sessions were split into two subgroups: Basic Education and Adults Returning to University. This was done for convenience while at the same time the organisers recognised the heterogeneous nature of the AME field which is “notoriously difficult to define in terms of its learners, practitioners, place, time and mode of instruction” (FitzSimons, 1997, p. 8). However, the tendency for research to focus on these two subgroups has also been noted as a more general trend in the AME field. For example, in the USA 51% of doctoral research on adults learning mathematics was conducted in undergraduate courses, most likely by university staff needing to upgrade their qualifications in order to “get tenure” or “achieve promotion”, 19% in Adult Basic Education (ABE), while only 12% was conducted on high school equivalent qualifications (Safford-Ramus, 2001, p. 41). Thus, there has been little research on adults undertaking mathematics at the upper secondary level.
2.2.1 Senior Secondary Mathematics

This section reviews the sparse literature which focuses on research related to the provision of senior secondary mathematics for adults in a non-school setting. Unlike many other OECD countries Australia does not have a clearly articulated policy on lifelong learning. Karmel (2004) argues that this is because Australia has a very open education system which has always supported part-time study and does not discriminate on the basis of age. However, the lack of an overarching policy means that there is a need to “tackle specific problems such as ensuring that all young people have a firm educational foundation” (p. 18).

For young adults under 25, successful completion of a SSCE is now considered by many to be the minimum requirement for entry into the labour market (Skills Victoria, 2010a; te Riele, 2007). At the same time it remains the main access route to higher education courses.

The economic importance of completing senior secondary education is that it is a bridge to higher or tertiary education. But, of course, it is the young people from socially advantaged backgrounds who overwhelmingly enter university, and certainly the elite courses in the elite universities (Reid, 2006, p. 554). While alternate pathways do exist, their efficacy is often ameliorated by the differing admission policies of the different universities, and different courses in the same university. Rather than act as an equity mechanism to promote social inclusion, pathways between the VET and higher education sectors tend to reinforce the status quo, deepening participation by the socially advantaged groups while having little impact on the pathways of the disadvantaged groups (Wheelahan, 2009). This is especially true in the Science, Technology, Engineering and Technology (STEM) courses where Year 12 Mathematics, or its equivalent, remains a prerequisite irrespective of the pathway chosen to access the course, especially at the elite universities. For example, the University of Melbourne advices applicants without an Australian Year 12 qualification, or equivalent, to consider “undertaking Year 12 in an adult learning environment (such as the Centre for Adult Education or a TAFE institution) or using the non-school leaver pathway” (The University of Melbourne, 2010). In Victoria, as in most other States, the tertiary selection process is dominated by the Australian Tertiary Admission Rank (ATAR) (James, Bexley, & Shearer, 2009).
From 2006 the Victorian government committed to providing a guaranteed place for any student under 20 who wished to complete their Year 12 at a TAFE institute (Skills Victoria, 2006). Similarly, in the USA there was also a growing trend for high school students to switch ‘schools’ and enrol in an alternate adult education program in order to complete their senior secondary school certificate (or its equivalent) (Maasz & Safford, 2003). Safford identified that this changing student population, “whose needs are not being studied” (p. 52), was likely to present several challenges for adult educators as younger and older adults are likely to have had different experiences of mathematics education at school. Also, the younger adults may still be grappling with motivational and behavioural issues which reduce the effectiveness of more traditional teaching strategies often used with older adults. Massz and Safford also highlight an issue that is of concern for many adult educators teaching Senior Secondary Mathematics in Australia:

In the United States, the link between adult high school equivalency programs (GED) and tertiary education is not seamless. … If workplace qualifications and the personal goals of adult students include higher education, adult mathematics educators must address this reality when designing adult high school mathematics instruction (p. 53).

In many countries the senior secondary school certificate for older adults returning to study has the same curriculum as for youth (Gustafsson & Mouwitz, 2004; Myers & De Broucker, 2006; O'Donoghue, 2003). In the typical content-heavy school mathematics curriculum there is limited time available to teach students about new concepts or how to use relatively simple ideas in unusual contexts (Hodgen & Wiliam, 2006, p. 7; McPhan, Morony, Pegg, Cooksey, & Lynch, 2008). A common problem associated with Year 12 equivalent mathematics courses is that they are often “taught to adults in traditional ways that have already failed these same adults in school” (O'Donoghue, 2003, p. 40). This perspective is supported by the anecdotal evidence reported by Bennison (1998) in a recounting of her experiences of teaching VCE Mathematical Methods to adults. The tight deadlines and condensed curriculum of the typical Year 12 Mathematics course are often cited as significant issues which contribute to the high non-completion rate of adults returning to study (Gustafsson & Mouwitz, 2004). A student’s prior level of knowledge of mathematics (Bennison, 1998; Skaalvik & Skaalvik, 2005) and the length of the time since studying the subject (Bahrick & Hall,
1991; Karsenty, 2002) have also been shown to be factors in a student’s successful return to study mathematics.

In their study of 145 adults attending high school in Norway, Skaalvik and Skaalvik (2005) concluded that an adult’s mathematics self-concept built “strongly on achievement in school years and that it is predictive of adult students’ goal orientation, intrinsic motivation, and learning strategies” (p. 1). In particular, students with a low academic self-concept were more susceptible to developing a “self-defeating ego orientation”, which in turn was associated with a “perception of help-seeking as self-threatening” (pp. 297-298). To address this issue the authors recommended that adult educators develop learning environments where “participants may feel secure, feel free to ask questions, and generate mastery expectations” (p. 298).

Bennison (1998) asserts that, in addition to the above issues, some adults may also experience feelings of isolation as they lack the established support networks which are common in mainstream schooling. It is widely accepted that “‘Talking the talk’ is an important part of learning” (Hodgen & Wiliam, 2006, p. 4) as it allows students to clarify their understanding of mathematical concepts (Bennison, 1998; Hodgen & Wiliam, 2006). For adults, a “relaxed and informal” approach, with a “heavy emphasis on group work”, was recommended as it allows students to establish new networks, develop “positive self-help skills”, and “develop self-confidence” (Bennison, 1998, p. 11). However, the change from the traditional textbook approach to group work and discussion can also be daunting for some adult students, and teachers (Hovis Rösth, 2005).

2.2.2 Bridging mathematics

As indicated earlier, there are a wide variety of courses, in different institutional settings in different countries, which can be considered as equivalent to a SSCE for adults. In Australia there are a range of alternate pathways available for higher education aspirants in each state (Galligan & Taylor, 2008). Most TAFE Institutes and Universities offer a range of preparatory and bridging courses which aim to prepare “students for successful tertiary study” (Queensland Tertiary Admissions Centre [QTAC], 2010, p. 23). These courses may include one or more units which revise the senior secondary mathematics curriculum and prepare prospective students, especially second chance learners, for
successful transition into specific tertiary courses (Gordon & Nicholas, 2010; Viskie & Petocz, 2006).

As each university controls its own admission policies it is usually the prospective student’s responsibility to navigate the “various pathways and articulation arrangements” on offer (VTAC, 2009, p. 28). A well informed adult could have up to three attempts to meet the math prerequisite for tertiary selection: first attempt the SSCE at school or TAFE, next attempt a Certificate IV in tertiary preparation course at TAFE, and lastly attempt a bridging course within a university. Second chance learners need to have well developed research and problem solving skills in order to navigate the increasingly complex tertiary selection process. Therefore, the lack of clear established pathways is likely to reinforce “some degree of social filtering” for people with a lower socioeconomic background instead of improving access (James, et al., 2009, p. 3).

TAFE provides the second chance learner with access to a “significant number of courses” which may function as a pathway to further study at university (Galligan & Taylor, 2008, p. 108). As noted by FitzSimons (2000) and Galligan and Taylor (2008), there has been little research published on the teaching and learning of mathematics within the TAFE sector in general, or within bridging courses in particular. One of the few exceptions was an investigation of a small group of adults (12 Survey responses and 5 interviewees) “enrolled in the Pure Mathematics module of the Certificate IV in Adult Tertiary Preparation” at a TAFE Institute in Queensland (Bennison, 2002). The participants in the study experienced several issues which had an impact on their ability to complete the module. These included: returning to a “traditional school mathematics classroom where students are the passive recipients of knowledge”; conflict between study and family commitments; limited prior knowledge and time to assimilate new knowledge; anxiety and feelings of isolation; and a lack of communication and connection with the teacher (pp. 117-118). Bennison concluded that adults returning to study mathematics would benefit from clearer advice about course content and expectations prior to enrolment, alternate learning experiences, and the provision of tutorial support outside of class. She also suggested that future research should include a larger group of students from different institutes and focus on “the students’ entire experience of the module” (p. 119).
As mentioned previously, many Australian universities have developed bridging courses which aim to improve access and equity for “students who previously had little chance of accessing university studies” (Taylor & Galligan, 2006, p. 12). However, unlike TAFE courses, university bridging courses are unregulated (Taylor & Galligan, 2006). Thus, university bridging courses have greater flexibility to explore approaches which “build self-confidence and motivation, and may perhaps also eliminate any residual anxiety and learning blockages about mathematics” (Gustafsson & Mouwitz, 2004, p. 4). Since the 1990s, the limited research in the bridging mathematics sector has consistently focused on four main areas: course evaluations, methods of determining students’ needs and overcoming mathematics anxiety, and investigating cognitive differences between bridging mathematics and traditional mathematics teaching (FitzSimons & Godden, 2000; Galligan & Taylor, 2008; Gordon & Nicholas, 2010; Taylor & Galligan, 2006). Galligan and Taylor (2008, p. 113) note that most of this research focuses on what the student brings with them while there “is little to no discussion of teaching practices”.

In a recent study, Gordon and Nicholas (2010) suggested that the flexibility of subject selection inherent in the SSCE in Australia has resulted in an increased need for mathematics bridging courses at university. For example, from 2001 to 2010 there was a 53% increase in the number of students enrolling in the mathematics bridging course at The University of Sydney (p. 35). Asynchronous e-interviews were used to explore the perceptions and experiences of 10 bridging mathematics teachers. Three themes emerged from the data: the challenge of teaching students with “diverse mathematical backgrounds”, how to teach “specific mathematical concepts” to these students, and how to help students “change their perceptions of themselves as mathematical learners” (pp. 37-38). A study of the perceptions and experiences of school mathematics teachers, about factors which influence a student’s decision to take a higher-level mathematics courses, noted similar challenges:

More work needs to be done in [the] area of students’ self-perception, their views of success, the nature of intelligence as it relates specifically to learning in mathematics and the type of tasks teachers provide as a learning context for students (McPhan, et al., 2008, pp. 22-23)

However, the current focus on productivity has reduced the time available for teachers at all levels to take a reflexive approach and focus on these challenging issues. Or as a
respondent in one study said: “The challenge these days is I have little down time to do improvements as I am so heavily engaged both during semester and semester breaks in teaching” (Gordon & Nicholas, 2010, p. 40)

A common issue for the bridging mathematics sector is the high dropout rate, which often occurs early in the course (see, for example Carmichael & Taylor, 2005; Viskic & Petocz, 2006). In the USA the highly structured nature of bridging, or developmental, mathematics pathways have been identified as a major source of students’ feelings of “discouragement and frustration”, which can lead to withdrawal (Hodges, 2005, p. 3). This frustration is often associated with the students’ perception of mathematics courses, which are focused on learning techniques, as “irrelevant for their future studies and professions” (Sierpinska, 2006, p. 126). Sierpinska (2006) noted that as a result of this frustration some students may “shift from the position of Learner (who is responsible for the results of one's cognitive activity) to the position of a Client, who is indignant when the expected services are not delivered” (p. 127). Hodges (2005) noted that developmental students at a community college often experience feelings of being powerless, have a low self-image, avoid doing homework, and do not “ask for help outside of the classroom” (p. 6). Clearly affective and conative issues, and related retention issues, are areas of concern for bridging and developmental mathematics teachers in the US.

In addition to their role as an access pathway for mature adults, mathematics bridging courses “have become a common method for dealing with the transition from high school to university” for unprepared school leavers (Wood, 2008, p. 89). A number of recent studies have investigated approaches for enhancing affective and motivational factors in order to create a positive learning experience and improve retention. Klinger (2006, p. 166) studied a nine week foundational mathematics course which aimed to present pre-tertiary students with a “fresh perspective of what mathematics is about”. The course focused on “de-mystifying the doing of mathematics by emphasising that mathematics is language” and reported a “measurable and significant improvement” in students’ self-efficacy beliefs, self-confidence, and “willingness to engage with mathematics learning” (p. 170). He further asserted that the implications are clear for all students wanting to access tertiary courses: “if students’ goals are blocked or their progress impeded because of their perceptions of mathematics, first challenge their...
negative attitudes, challenge their self-efficacy beliefs, and challenge their anxiety” (p. 170).

Miller-Reilly (2006) undertook a “significant long term analysis” of three successful approaches to teaching bridging programs in New Zealand (Galligan & Taylor, 2008, p. 109). The study used ‘connected teaching’, a feminist theory, as a framework for discussing the outcomes of the different teaching approaches (Miller-Reilly, 2006, pp. 30-32). For the two larger programs, a consistent outcome was the widening gap between the students who started the “course with more confident mathematics beliefs” and those at the lower end of the attitudinal scale (Miller-Reilly, 2006, p. 232). In particular, a discouraging outcome of this study was that the least confident students “reported less confidence by the end of the course than they did at the beginning” (p. 232). The third approach was an individual study program with an intellectually able man “who feared and avoided mathematics” (Miller-Reilly, 2008, p. 41). She asserted that the study of this case strongly suggests that using a connected teaching approach can improve the mathematical competence and confidence of a man who has “experienced silencing and disempowerment in his mathematics learning experiences” (p. 58). Miller-Reilly (2006) noted that while each approach met the needs of most students more attention needed to be paid to those “groups whose needs have clearly not been met” (p. 248). This includes, finding approaches for addressing the wide variety of student needs, such as limited background knowledge and motivational issues, within the limited resources available for bridging programs.

Viskic and Petocz (2004, 2006) studied the beliefs and attitudes of adults undertaking a Preparatory Mathematics course at a large university. The course used a range of pedagogical approaches to enable a diverse group of motivated students to learn, or relearn, “mathematics at the level of senior high school” (Viskic & Petocz, 2006, p. 7). A textbook (Petocz, Petocz, & Wood, 1992) had been written especially for this course, including two chapters devoted to projects. Over a ten year period “students’ reflections on the process of learning using projects” were collected (Viskic & Petocz, 2004, p. 3). While there was still some variation in the students’ conception of mathematics many students showed increased self-awareness, confidence, and a maturing understanding of mathematics and its place in their lives (pp. 5-6). However, despite the many positive
results, up to “half of the students who enrol do not finish the course, most of whom drop out early on” (Viskic & Petocz, 2006, p. 13).

Dropout rates were also a concern for a large tertiary preparatory course at the University of Southern Queensland (Carmichael & Taylor, 2005). The relationship between motivation and performance was investigated in a quantitative study using Bandura’s social cognitive theory as the underlying framework. The study also investigated the relationship between students beliefs on intelligence (Dweck, 1999), “their confidence towards mathematics and their subsequent performance” (Carmichael & Taylor, 2005, p. 713). They found a significant correlation between a student’s performance on the first assignment, mathematical self-confidence and their prior academic knowledge as measured by a maths readiness test. About half of the participants were mature aged and had not undertaken formal studies in mathematics for more than 10 years. Only 8.5% of the participants expressed a strong entity view of intelligence, the majority “indicated that they believed intelligence was incremental and that there was value in hard work” (p. 718). While the older participants tended to have a lower self-confidence in their mathematical ability, there was no significant difference on performance between the different age groups. Carmichael and Taylor suggest that there is a need for “further research on student beliefs on the value they place on learning and their enjoyment of such learning … in order to clarify the role of motivation on performance for tertiary preparatory mathematics students” (p. 719).

2.3 Transition and Persistence
Efforts to improve the retention of students have been a recurring theme in the studies reviewed so far. However, the participants for most the studies were the students who remained. With withdrawal rates from 30-50% there are a significant number of second chance learners whose needs are not being explored. While research on persistence and transition is common in the university sector, few studies have focused on mathematics courses (Merran Evans, 1999). Similarly, there has been a great deal of research into the reasons why students leave school before completing Year 12 (for example: Bushnik, Barr-Telford, & Bussière, 2004; J. McMillan & Marks, 2003). However, there has been little research on why students drop-out of further education courses (McInnis, et al.,
2000). The following sections provide a brief review of the literature related to persistence and transition, with a particular focus on second chance learners.

**2.3.1 Leaving school early**
There is a consensus amongst researchers in the field that TAFE Institutes need to understand the key factors that influence non-completion of Year 12 in order to facilitate a young person’s re-engagement with mainstream education (J. McMillan & Marks, 2003; Ross & Gray, 2005, p. 104; Volkoff, et al., 2006, p. 9). Early school leavers who subsequently withdraw from a second chance course may have their “earlier feelings of inadequacy and failure” reinforced (McGivney, 2003, p. 13). For students with negative experiences of prior schooling, early withdrawal may further damage their self-confidence and self-esteem.

In a generation, completion of Year 12 has increased to about 75%, partially due to changing economic conditions and a broadening of the senior secondary curriculum (J. McMillan & Marks, 2003; te Riele, 2007). However, many of the factors that influenced non-completion in the 1980s and 1990s are still in operation today. More recently, poor literacy and numeracy skills have been identified as having a strong influence on the early departure of low achievers (J. McMillan & Marks, 2003, p. 86).

Those with weak literacy and numeracy skills are disadvantaged not just in terms of staying on to complete school, but also in terms of post-school outcomes. Given a context where the labour market increasingly favours skilled workers, those with low literacy and numeracy skills are likely to continue to be at a disadvantage (p. 88).

In 2006, Volkoff et al. undertook a review of the literature on early school leavers’ reasons for non-completion of Year 12. They identified four broad categories describing the reasons why students leave school before completing Year 12 (p. 37).

1. The desire to enter the workforce and gain an income
2. Dissatisfaction with the school experience
3. Inability to cope with the demands of study
4. Serious life issues.
However, irrespective of the reason for leaving school when “individuals acquire new information about the benefits and costs of schooling, they may reconsider their decision and decide to return to school” (Raymond, 2008, p. 12).

There is some confusion around the definitions of terms used in the literature to describe students who leave school before completing Year 12. Earlier reports defined early school leavers as students who left before completing Year 10 while those who left before completing Year 12 were defined as later school leavers (J. McMillan & Marks, 2003, p. 1). More recently some researchers have combined these two groups into one category – non-completer (Ross & Gray, 2005, p. 105), whereas, Volkoff et al. (2006, p. 2) defined an early school leaver as any student who has not completed Year 12. To avoid further confusion I will use the term early school leaver in this study to refer to any student who has not completed Year 12 in a secondary school. This will also help to distinguish between the characteristics of students on entry to a TAFE course and subsequent non-completion of a course at TAFE.

2.3.2 Attrition and Retention in the Further education sector
In their literature review on non-completion in the VET and higher education sectors McInnis et al. indicate that while the “theory in regard to non-completion is generally undeveloped” the theoretical models developed by Tinto are still influential (2000, p. 16). In his early work on the Stages of Student Departure, adapted from Van Gennep’s classic study *The Rites of Passage*, Tinto (1988, p. 442) suggested that all students experience three major stages in their transformation to becoming a college student: separation, transition and integration. While his analysis was based on students adapting to life in residential colleges in the USA, Tinto asserts that all individuals need to adapt to “new forms of social and intellectual association” irrespective of the type of institution (p. 449). This period of adjustment is likely to be most significant at the beginning of a new course, especially if the student is an early school leaver.

McInnis et al. (2000, p. 4) also highlight that, in Australia, there are “fundamental differences”, in terms of the background and experiences of their students, between the VET and higher education sectors. Both McInnis et al. (2000) and Evans (1999, 2000) conclude that there are multiple factors, that interact in different ways for different individuals, which can potentially lead them to voluntarily withdraw from a course.
Evans concluded that although there were common themes and factors identified in the literature, there were variations in the findings which occurred “in different countries and cultures and by discipline, institutions and student categories” (1999, p. 3). In 1995 McGivney (2003) undertook a research project “involving a study of attendance and withdrawal patterns of mature students in further and higher education” (p. xiii) in the United Kingdom. McGivney concluded that it was “difficult to reach meaningful conclusions about withdrawal statistics without contextual evidence on the institution, the student profile and the range of courses, qualification levels and learning modes” (p. 61).

Volkoff et al. (2006) suggested that TAFE Institutes need to implement “different support mechanisms and interventions” (p. 37) for early school leavers with such diverse motives for disengaging with mainstream education. As a result of their consultations and the literature review they identified the main strategies which had been “developed and implemented by providers” to “address common issues and barriers” for young people returning to study (pp. 56-60). They concluded that “young people who are engaged in studying senior secondary certificates in TAFE … are likely to require quite intensive learning, career and pathway planning assistance and personal support” (pp. 3-4). As noted earlier, at least a third of students enrolled in a SSCE at TAFE do not complete the course. Are there other organisational factors that could be addressed in addition to the learning and personal support identified by Volkoff et al.? As noted in a Canadian review of second chance learners (Raymond, 2008), further work is needed to understand why many returning students are unsuccessful in their attempt to complete Year 12.

In one of the few recent studies of investigating why students discontinued a non-apprenticeship VET course, McMillan, Rothman and Wernert (2005, p. 31) identified seeking employment, poor course selection and loss of interest as the three main reasons why students deferred or withdrew. As previously outlined ‘finding a job’ and ‘disinterest in school’ were also identified as the reasons for leaving school before completing Year 12. McGivney (2003, pp. 113-114) noted that there is a widespread view amongst researchers in the U.K. that “stated reasons for withdrawal should be treated with extreme caution” as these can be influenced by follow-up surveys and respondents are most likely to give reasons “outside their own control” that “do not
threaten their self-esteem”. This view is supported by McMillan and Marks (2003) who suggest that large quantitative studies tended to conclude that early school leavers “place more weight on work-related reasons than on school-related” (p. 34) as underpinning their reasons for leaving. In-depth qualitative studies, on the other hand, reported that dissatisfaction with school was the most common reason for leaving.

McInnis et al. (2000, p. 23) note that similar problems existed with Australian studies as most used post-hoc surveys and questionnaires of withdrawn students. They concluded that to improve our understanding of the withdrawal process we collect data that measures “the quality of the total learning experience” for all participants, including non-completers (p. 61). They go on further to suggest that

Attitudinal data should also be collected from students both during their studies and after exiting their course. The data would be collected in a consistent manner, allowing comparisons between institutions, between states and over time, but it would also allow data relevant to the local context to be collected. This would allow the perspective of non-completers, as well as graduates, to be included in any evaluation of the system, thus providing a comprehensive client perspective (p. 61).

McGivney (2003, p. 81) asserts that many believe that it is better to “focus on what happens to students after enrolment” than trying to predict success at entry. As discussed earlier many of the students returning to study have had a disrupted education. Volkoff et al. (2006) suggest that these students “require a pedagogical approach which is different to that which is traditionally used in schools” (p. 50) and should benefit from participating in an adult learning environment.

McInnis et al. (2000, p. 2) also recommended that strategies need to be developed to improve the “initial student experience when adjustment and commitment are most problematic”. In order to develop effective strategies, they identified a need for institutions to collect data about “the timing and extent of non-completion” and the reasons students leave. In particular “the issue of readiness for specific discipline studies” (p. 3), such as mathematics, is of specific concern. This is supported by the research of Skaalvik and Skaalvik (2005) which suggests that prior academic achievement in mathematics is a key predictor of success for adults returning to study mathematics at high school in Norway.
However, McInnis et al. (2000, p. 2) suggest that there are indications that some students are becoming more “disengaged from their educational experience” than in the past. Students who persist in their studies and those who withdraw share the same concerns and attitudes and this “makes prediction of possible withdrawal very difficult”. They conclude that institutions need to develop strategies that “enable students to make informed choices” about their course selection and “improve the initial student experience”, particularly for the most vulnerable groups.

Tinto (2005) also argues that while external and personal factors can have a significant influence on a student’s persistence in a course they are difficult for the institution to ameliorate. He asserts that “individuals persist or do not persist within the institution” therefore it is necessary for institutions to establish conditions that enhance, rather than constrain, individual actions (p. 89). Tinto concludes that institutions should endeavour to develop educational communities where "students become involved with others in learning and engage in shared activities that promote student effort and the acquisition of skills, knowledge and the development of self-agency that in turn promotes persistence" (p. 94).

### 2.4 Key Concepts

The literature reviews relating to transition issues in the further education sector and the adult mathematics education identified a range of factors which were commonly researched in both fields. During the study the work of a number of social psychologists came to the forefront and provided a framework for a discussion of the findings. Each is briefly outlined below. A more detailed exploration of the applicability of each theory will be integrated into the coming analysis and discussion chapters.

#### 2.4.1 Bandura: Self-regulation and agency

A number of studies have used Bandura’s social cognitive theory (Bandura, 1995, 2001, 2003; Bandura & Locke, 2003; Bandura & Schunk, 1981) as a framework for studying the effect of self-efficacy beliefs and agency on course completion in general (DeWitz, Woolsey, & Walsh, 2009), and mathematics in particular (Carmichael & Taylor, 2005). For example, DeWitz et al. (2009) concluded that improvements in self-efficacy lead to an increased sense of life purpose which may result in “better performance and a more satisfying college experience” (p. 32).
For Bandura, personal agency is a core feature of “what it means to be human” (2001, p. 6). The main agentic features are: acting with intent, forward planning, self-motivation and self-regulation, and self-reflectiveness. “The core features of agency enable people to play a part in their self-development, adaptation, and self-renewal with changing times” (p. 2).

Efficacy beliefs are the foundation of human agency. Unless people believe they can produce desired results and forestall detrimental ones by their actions, they have little incentive to act or to persevere in the face of difficulties. Whatever other factors may operate as guides and motivators, they are rooted in the core belief that one has the power to produce effects by one’s actions (p. 10).

Bandura (1995) asserts that the most effective ways of developing efficacy is through “overcoming obstacles through perseverant effort”, mastery experiences, or through “seeing people similar to themselves succeed by perseverant effort, vicarious experiences (p. 3). A third way is by social persuasion where individuals are “persuaded to expend greater effort and develop self-affirming beliefs” (p. 4). Lastly, various physiological and emotional states can act as a feedback loop which helps people judge their capabilities. “Efficacy beliefs play a key role in the self-regulation of motivation” (p. 6). Therefore self-regulation was selected as one of the key themes for the analysis of the data.

2.4.2 Dweck: Self Theories of Intelligence

Dweck (1999, 2007a, 2008) asserts that a student’s self-theories of their intelligence has an impact on their willingness and capacity to expend effort on difficult task. It provides a “social-cognitive approach to motivation and self-regulation” (Kristjánsson, 2008, p. 223)

The most motivated and resilient students are not the ones who think they have a lot of fixed or innate intelligence. Instead, the most motivated and resilient students are the ones who believe that their abilities can be developed through their effort and learning (Dweck, 2007a, p. 6).

Thus, students who retain a view of intelligence as fixed at birth will give up when confronted by unforeseen obstacles and, possibly, drop out of their course (Dweck, 1999, pp. 122-123). A number of studies have investigated how student self-theories relate to their approaches (deep, surface or strategic) to study and learning (Yorke, 2004, 2006; Yorke & Knight, 2004), and its relationship to hindering the development of self-efficacy (Usher, 2009; Usher & Pajares, 2008)
2.4.3 Corno: Motivation and Volition

One criticism of Dweck’s theory is that while it does give “a central role to self-development” her proposed pedagogical insights for enabling change “are at best underdeveloped, at worst paradoxical” (Kristjánsson, 2008, p. 226). Corno (2004) work on the link between motivation and volition provides a possible approach for enabling educators to help students develop implementation mindset. Volition is primarily concerned with the “implementation of intentions” (p. 1671).

As students progress through school they are expected to have learnt how to handle the task of completing homework, which is often boring and cognitively demanding, without parental intervention (Corno & Mandinach, 2004). “When it comes to schoolwork, motivation can get students started, whereas volition gets them to follow through” (Corno, 2004, p. 1671). However, Corno asserts that students rarely receive explicit “instruction in effective strategies for implementing goals, even when goals are set by teachers” (p. 1675). Therefore, students are left to develop volitional skills and a sense of self-efficacy through mastery or vicarious experiences (Bandura, 1995). However, Corno (2004) asserts that individuals may “struggle with volitional issues well into adulthood” (p. 1671). Therefore, this is likely to be a problem experienced by some second chance learners.

2.5 Summary

Completion of a SSCE is now considered to be a cornerstone for the economic future of young people in Australia today (Skills Victoria, 2010a). However, there are still significant differences in achievement, and therefore access to higher education, between students from different socio-economic status backgrounds. One of the most pronounced areas of inequalities is in the uptake and completion of senior secondary mathematics (Marginson, 2002). The avoidance of Year 12 mathematics reduces a young person’s access to a range of tertiary courses and careers.

Second chance learners can access a range of pathways, at TAFE and university, to redress deficiencies in their educational background and improve their chances of accessing tertiary education. However, completion of prerequisite Year 12 subjects at TAFE, such as mathematics, is the preferred option for most universities in Victoria.
In Australia, most research on adults learning senior secondary level mathematics has focused on the needs of students who accessed university bridging courses. A common issue for preparatory courses, in both TAFE and higher education, is the high dropout rate. Most studies address this issue by investigating approaches for improving performance by redressing a range of affective and motivational factors for an increasingly diverse group of students. However, the participants in most studies were the students who stayed. Several studies concluded that there was a need for further research of those groups whose needs were not being met.

The research literature on attrition, retention and transition issues have noted that a range of factors often contribute a student’s decision to leave a course, including student demographic and psychological characteristics, student prior performance, social factors, and institutional factors (Merran Evans, 1999, pp. 6-16). However, students who stay and those who leave share the same concerns and attitudes and this “makes the prediction of possible withdrawal very difficult” (McInnis, et al., 2000, p. 2). There has been limited research on attrition, and adults learning mathematics, in the TAFE sector in Australia. To improve our understanding of the withdrawal process we need to collect data on the experiences of all participants prior to, during, and after exiting or completing their course. Tinto (2005, p. 94) suggests that students need to be involved in activities which promote “effort and the acquisition of skills, knowledge and the development of self-agency that in turn promotes persistence”. This study uses the work of three social psychologists (Bandura, 2001; Corno, 2004; Dweck, 1999) as a framework for exploring the affective, cognitive and conative factors which impact on a student’s successful return to study VCE Mathematics at TAFE.
3 Methodology Chapter
This chapter will detail the history and rationale of the research design. I will also provide an overview of several significant issues that were considered during the design and data collection phases. A research journal incorporating my reflections on all aspects of the research process was kept from the initial conceptualisation of the study till its completion. These entries have been used extensively throughout the data analysis and writing up ‘phases’ of this study.

3.1 Rationale of the research design
My methodological approach has developed through an organic process starting with my identification of the research question. This research has developed from my interest in supporting students who return to study the VCE at TAFE. This topic was then refined to a researchable question (Rubin & Rubin, 2005, pp. 39-41) after discussions with other colleagues participating in a Masters of Education cohort program (Research Journal, 3rd Apr 2007).

My initial research question was “What factors enable second chance learners to successfully complete a mainstream Year 12 Mathematics subject in a further education setting?” (Research Journal, 3rd Jul 2007). An initial review of the AME literature suggested that while many studies explored approaches for improving the learning experiences of second chance learners, non-completion remained a significant issue. A review of the attrition literature related to the VET sector identified that “the issue of readiness for specific discipline studies” and “the changing expectations and study careers of students” are areas of specific concern which require further investigation (McInnis, et al., 2000, p. 3). Thus I identified a more focused research question: ‘Adults returning to study VCE Mathematics – Why do they leave?’ (Research Journal, 3rd Aug 2008).

Adults who return to study senior secondary mathematics at TAFE come from an increasingly wide range of educational, ethnic and socio-economic backgrounds. Therefore, to fully explore the reasoning and/or factors that led the participant to the decision to withdraw from their mathematics class we need to utilise an instrument which is highly flexible during the data collection process.
Most Australian studies used exit surveys, or questionnaires, to investigate the reasons for students’ withdrawal from higher education and VET courses (McInnis, et al., 2000, p. 23). It is recognised that this approach has inherent weaknesses such as oversimplification of reasons for withdrawal (Yorke, 1999, p. 29) and the possibility of bias due to low response rates (McInnis, et al., 2000, p. 23).

At the institutional level, exit surveys/questionnaires miss out on the students who do not formally withdraw. A number of studies have found this to be the case with a sizeable proportion of withdrawing students (McInnis, et al., 2000, p. 15).

From my own experience even the students who do officially withdraw avoid filling in surveys when possible or provide a minimal response. In Australia, few investigations have used in-depth interviews (p. 24). A qualitative approach is less sensitive to low participation rates and allows the collection of attitudinal data which measures “the quality of the total learning experience” (p. 61) for all participants, including non-completers.

The qualitative research interview attempts to understand the world from the subjects’ points of view, to unfold the meaning of their experiences, to uncover their lived world prior to scientific explanations (Kvale & Brinkmann, 2009, p. 1)

As outlined previously, adults who return to study Year 12 Mathematics have very diverse backgrounds and aspirations. Using semi-structured interviews allows greater flexibility to follow up on “unprompted, lively, and unexpected answers from the interviewees” (Kvale & Brinkmann, 2009, p. 131). This approach will allow me to shed preconceived “opinions or ‘educated guesses’” and focus on the problem from the student’s perspective (Brougham, 1978, p. 1). The use of semi-structured interviews will allow me to investigate the participants’ reasoning and other factors involved in their decision to withdraw.

3.2 Insider Research

The practitioner-researcher undertaking research in one’s own institute must consider the issues related to insider research. One difficulty for the researcher who strongly identifies with their participants is the potential to ‘go native’ and hence be unable to maintain a “conceptual and critical distance from the subject’s accounts” (Kvale & Brinkmann, 2009, p. 270). To address this concern Paul Hodkinson (2005) suggests that
“insider researchers should attempt to discuss their position and the ways it may have affected their research” (pp. 146-147).

3.2.1 Practice-based Insider Research
As a teacher of VCE Mathematics employed by this institute I am undertaking “practice-based insider research” (Dirkx, 2006, p. 283). As a researcher my concern is with improving practice by developing a deeper understanding of the issue of student persistence in VCE mathematics classes from the perspective of the student. Having worked in this TAFE institute for several years I have an intimate knowledge of the institutional “learning culture” (Phil Hodkinson, Biesta, & James, 2007), the enrolment process for the VCE program, and a historical perspective of the issues related to the support of students returning to study, especially VCE Mathematics. Previous studies have established a clear precedent for practice-based insider research which aims to identify the reasons for withdrawal at a particular institution (Martinez & Munday, 1998, p. 162).

This study involved a balancing act between my roles as a teacher and a researcher within the institute. Asking questions about student’s experiences on issues of transition to study may undermine the self-image of some students. Thus I decided to only approach students to consider participating in the study after they had withdrawn from, or stopped attending, their Year 12 Mathematics class. Ultimately this approach proved to be the most significant limitation to this study.

3.2.2 Initial Proximity
The notion ‘insider research’ can also be used to describe “situations characterised by significant levels of initial proximity between researcher and researched” (Paul Hodkinson, 2005, p. 132). Western (1993) notes that most sociologists think Australian society is clearly stratified and that a person’s class has a major influence on all aspects of their life, including access to education (eg. Marginson, 2002; Wheelahan, 2009). While my learning journey is not unique, even for mathematicians (see for example Goudey, 2009; Hauk, 2005), it does provide me with an insider perspective on many of the issues encountered by students who struggle to make the transition back into mainstream senior secondary education. Like many of the students attending this TAFE I come from a low socio-economic status (SES) family background with limited
experience of the post-compulsory education system. The following background is provided to allow the reader a brief glimpse of the social and personal factors that led to this feeling of affinity with my students. The factors affecting my personal learning trajectory are explained in more detail in Appendix A.

**Autobiographical Context**

I experienced a disrupted early schooling due to several interstate moves as a result of my father’s ‘itchy feet’. However, when I started high school my parents bought their first house and settled for a while. My high school was located in a local government area which is still classified as one of the most socially disadvantaged in urban Melbourne, Victoria (Australian Bureau of Statistics [ABS], 2008). I attended high school during the 1970s, a period of significant social change and high youth unemployment (Burke & Spaull, 2001). Unlike most of my male peers I was unsuccessful in my attempts to find employment and so continued attending school. In general I liked school but was ambivalent towards particular subjects. I have always remembered mathematics as being a challenging subject which I struggled to pass. However, on reviewing my school reports I found a fairly consistent pattern of achievement, a C on the mid-year report would be followed by an A on the end of year report. Whereas for English, I started with A’s in Year 7 and by Year 11 I was barely passing. In Year 12 I only passed the two mathematics subjects and consequently decided to repeat as I now aspired to become a Scientist.

My post-school education was marked by a feeling of constant struggle to achieve beyond my perceived limits. After completing my B.App.Sc I withdrew from the next three courses that I attempted, a GradDip in Computing, a M.Sc in Statistics, and a GradDip in Knowledge Based Systems. In each case, I attributed my withdrawal to one of the common reasons – illness, dissatisfaction with the course, and change of career. However, on reflection there was also a definite sense of isolation and performance anxiety, a feeling that I didn’t really belong in higher education. It is this feeling of isolation and discomfort that is at the core of the affinity that I feel for my students.
3.3 Methodology in detail

3.3.1 The Institute
This study took place at a multi-campus TAFE Institute located in the outer suburbs of Melbourne, Victoria, which I refer to as OMIT (Outer Melbourne Institute of TAFE). The Institute is the major supplier of post-secondary Vocational Education and Training (VET) courses for four Local Government principalities. While the institute has several campuses the VCE is only offered at the two main campuses.

Campus 1 is located in a key industrial and manufacturing hub of Melbourne. The city and surroundings has an ethnically diverse resident population. A major growth ‘corridor’ of Melbourne is linked to this campus via metropolitan rail network.

Campus 2 is located within a major retail hub which services one of Melbourne’s growth corridors. The population of the area is mainly of European descent. The ‘intake’ for this campus includes students from both metropolitan suburbs and rural towns. Most students who travel to this campus by public transport would need to use a bus service with travel times of up to 2 hours.

3.3.2 Recruiting the participants
As outlined previously, the issue of insider research was addressed by only allowing participants to ‘opt in’ to the study after they had officially withdrawn. Students who have dropped out of, or officially withdrawn from, a Year 12 mathematics class at the 2 main campuses were sent an invitation to participate in the study by the VCE program’s administration officers. A student may be officially withdrawn from individual VCE subjects if they miss 3 consecutive weeks for a subject without communicating a reason for their absence.

The administration officers sent information packs to potential participants at a convenient time twice a term (10 weeks). Each information pack included a copy of the explanatory statement (Appendix B) outlining the purpose of the study, an invitation to participate in an interview at a time and place of their choosing, and a consent form (Appendix C). The letter included my contact details (email address and work phone number) to allow students to initiate contact.
By the end of term 1, March 2009, no students had opted to participate in the study. As a result I began considering the reasons why the response rate was lower than expected. I decided it would be best to re-evaluate the material sent to the prospective participants. This evaluation highlighted two main issues. Firstly, on re-examining the Explanatory Statement I noticed a problem with the way in which my contact details were supplied. Secondly, the information pack was sent to the potential participants in envelopes with the OMIT’s letterhead. Therefore the participants may have associated the study with the TAFE Institute rather than Monash University, despite the explanatory statement being printed on Monash University letterhead. This may be an issue as students are often “reluctant to criticise their course or institution” (McInnis, et al., 2000, p. 24).

To address these two issues the Department Manager provided a cover letter which made explicit the independent nature of the study and clarified my contact details. The information pack was then resent, with the new cover letter, to the previous recipients in the first week of April. No replies had been received by the first week of May.

Clearly I needed to expand the sample size of students who had withdrawn from a VCE Mathematics class. I will now provide some brief details about the two attempts to increase the number of potential participants during the data collection phase of the study.

**Including withdrawn students from other Institutes**

During April I approached several adult providers, offering both Further Mathematics and Mathematical Methods, by telephone to gauge their willingness to participate in the study. Interested institutes were sent an email outlining the purpose of my study, the limitations of their role in identifying likely participants and forwarding an information pack, and how I proposed to maintain the anonymity of all participants who agreed to participate in the study. Within two weeks I received written agreement from one of the institutes to participate in this study. This institute subsequently sent the explanatory statement and a cover letter to 9 students. However, none of the identified students opted into the study.

**Including students who persisted**

noted that list of reasons for students switching course “is similar to those given by students in other studies of withdrawing and discontinuing students” (p. 28). The initial analysis of Danielle’s interview provided a number of interesting insights into the experiences of an early school leaver returning to study a mainstream course, see Chapter 4. However, by October no other student had opted in so I was left wondering whether the other discontinuing students had had similar experiences.

A few Australian studies have previously “compared students who have withdrawn with those who have stayed” (McInnis, et al., 2000, p. 23). So, I decided to make one last attempt to increase the number of participants by inviting all Year 12 Mathematics students to participate. This amendment to the methodology was approved by the Monash University ethics committee in December 2009. The invitations were sent to all potential participants after classes had finished and students had completed their end of year exams. Within two days two students, who had stayed, opted into the study.

In the following sections I will discuss the issues associated with the use of qualitative semi-structured interviews as a data collection method in this particular study.

### 3.3.3 Method of collecting the data

This study used semi-structured interviews with students to allow participants flexibility in describing their experiences and perspectives. Interviewing can be seen as both a “knowledge producing activity” and a “social practice” where the researcher and the researched co-construct knowledge through conversation (Kvale & Brinkmann, 2009). The purpose of these interviews was to reconstruct the students’ experiences in chronological order, ie “from recruitment to the experience and then to departure” or completion (McInnis, et al., 2000, p. 25). This pursuit of knowledge was balanced by a strong focus on the rights of the participant (Neuman, 2003, p. 116). In particular I was concerned with establishing a supportive atmosphere for the interviewee from the outset.

The explanatory statement contained an abridged version of my interview guide. By providing the participants with an outline of the interview process, and their role as the story teller, I hoped to alleviate any anxiety and allow the participant to provide thoughtful considered stories about their experience. I hoped that this would allow them to more fully describe “their experiences and self-understandings”, and clarify and
elaborate “their own perspectives on their lived world” (Kvale & Brinkmann, 2009, p. 116).

Each participant was given the opportunity to select the location where the interview was to be conducted. All three interviews were conducted in my office at work. My office is adjacent to the classrooms which were used for a significant number of VCE classes, including Mathematical Methods. Consequently, this was a familiar environment for all three participants. Each of the participants also chose to be interviewed after classes were finished, between five and six o’clock.

The same interview guide (Appendix D) was used in each interview, with appropriate modifications to allow for non/persistence in the class. However, once the interview had commenced the participant was allowed to guide the direction of the interview to a great extent. Thus, each interview progressed differently depending on the interests of the participant. With the student’s permission the interview was recorded on audio tape. I then transcribed the interview and sent a copy of the transcript and the recording to the student for elaboration or correction. Any comments were stored with the original transcripts. All digital data was kept on a password protected personal computer which was disconnected from the internet, and any other type of network, for the duration of this study.

All interviews consist of an exchange between two people within a specific context. While the exchange can be captured in the transcript of the interview, the shared understanding of the context is not. Therefore, each of the analysis chapters will also incorporate a brief description of the interview situation unique to each case (Kvale & Brinkmann, 2009, pp. 54-55).

3.3.4 Approach to Analysing the data
Kvale and Brinkman (2009, pp. 195-196) suggest that there are six steps in the analysis of interview data. The first three steps take place during the actual interview where (i) the interviewee tells their story with “little interpretation or explanation”; (ii) then “the subjects themselves discover new relationships during the interview”; (iii) and the interviewer focuses on the meaning behind the story and asks probing questions to check their interpretation.
The exploratory nature of this study suggested that this approach would be useful. The ten interview questions were organised to assist students to explore key experiences and decisions in a chronological order of the events. I hoped that by providing a framework for the student to tell their story I could “minimize distortions, calculated omissions, and exaggerations” (Rubin & Rubin, 2005, p. 72).

My approach to analysing the data evolved from the limitations imposed by the data collection. Danielle’s interview occurred at the end of semester one. By this point I was anticipating that I would have no participants, or only one participant, for my study. The starting point of the analysis was to immerse myself “in the transcript through a process of active listening” (McCormack, 2000, p. 285). The following section outlines the transcription process which was established for Danielle’s interview and then how this was modified for David and Ryu’s interviews.

Transcribing the interviews

Through transcribing the interview myself I was intimately involved in the interpretation of the dialogue and thus aware of the myriad decisions that I needed to make in an effort to maintain the essence of Danielle’s unique story. This process also sensitised me “to the finer points of interview interaction” (Kvale & Brinkmann, 2009, p. 182).

To allow for greater flexibility while doing the analysis I decided to make a verbatim transcription of the interview. It retained the frequent repetitions, pauses, verbal utterances such as Mhm and argh, and emotional expressions like laughter. This allowed for the possibility of analysing “multiple dimensions” of the oral interview conversation (2009, p. 181). To maintain consistency and enable the “cross-comparisons of the interviews”, the same procedures were used for transcribing David and Ryu’s interview (p. 180).

The process of transcribing Danielle’s interview reinforced Kvale and Brinkman’s injunction to remember that the transcript is a tool for “interpretation of what is said during the interview” (2009, p. 192). I struggled from the outset with doing justice to Danielle’s emotionally charged interview:

It’s taking a lot longer than I expected. It’s funny. A couple of times I found myself leaning closer to the monitor as I tried to hear what was being said. […] Only very careful focus on what is actually being said is allowing me to produce
Thus, the lessons learnt during the analysis of Danielle’s interview resulted in a few minor refinements to the transcription process for David and Ryu’s interviews. The recording of pauses was standardised to enable a more consistent comparison of the pace of the conversation. The tempo at which words are spoken can convey a multitude of emotion and meaning, such as uncertainty, confusion, reflection, self-editing, etcetera. Discernable pauses less than 0.5 seconds were noted using a comma. Pauses between 0.5 and 0.9 seconds were noted using a full stop. Pauses between 1.0 and up to 2.0 seconds were noted by using an ellipsis (…). Any pause 2.0 seconds or greater were noted with a bracketed comment. The following extract from David’s interview provides an example of use of pauses in the interview transcripts:

So, Um … I mean, y’know, just looking through the book, Um (3 second pause) yeah and little. Little, um, tricks, that. Y’know, break them, break them down, um (4 second pause) what else is (3 second pause) challenging (rustling sound – looking through the book) […]

Also, laughter and other possible emotional responses were noted in a bracketed comment in the body of the text.

**Danielle’s Interview**

The lack of participants in this study led to Danielle’s interview being treated as a study of an individual case. From the start there was a disparity between the auditory record of the interview, the transcript, and my recollections of the occasion. This discomfort continued throughout the analysis of Danielle’s interview as I tried to reconcile the many apparently ambiguous or contradictory statements. Therefore, I chose to analyse Danielle’s interview using the common approach of “interview analysis as bricolage” (Kvale & Brinkmann, 2009, p. 233). I adapted an eclectic mixture of methods, techniques, and conceptual approaches to analyse the text and develop an understanding of the multiple interpretations of the meaning of the text (Kvale & Brinkmann, 2009, pp. 207-210). These approaches included: narrative analysis (Clandinin, 2006; Gudmundsdottir, 1996; Richmond, 2002), conversation analysis (Oliver, Serovich, & Mason, 2005; Perakyla, 2005; Silverman, 1993, pp. 124-141), discourse analysis (Silverman, 1993, pp. 120-124), ethnography (Ely, Anzul, Friedman, Garner, &

**Poetic representation of speech**

As I constructed Danielle’s story from her often contradictory statements I was dissatisfied with the resulting narrative structure. It was difficult to capture in text the emotive nuances that were clearly evident in the audio recording. Much of the analysis of Danielle’s interview included reconciling the written transcript with my interpretation of what was heard on the tape recording (Kvale & Brinkmann, 2009, p. 178). I tried several different approaches including visually representing selected segments of the digital waveform of the audio. Annotating the digital waveform of the audio recording provided visual cues which aided the analysis of the transcript by re-presenting small segments of the interview in depth (see also, de Graaff & Schubert, 2007). This approach helped develop sensitivity for some of the “idiosyncratic elements” of Danielle’s speech which may influence the interpretation of the transcript (Oliver, et al., 2005, p. 1). However, as a vehicle for re-presenting the nuances of Danielle’s interview this approach was still too limited to be useful.

Next, I explored the potential of poetic representation (Richardson, 1992, 1993, 2003), an experimental form of writing, for adequately conveying Danielle’s responses. Oral historian Dennis Tedlock asserts that the speech patterns of interviewees, and other storytellers, are “closer to poetry than […] to prose” (Richardson, 2003, pp. 188-189). With her frequent pauses while talking, a common poetic device (p. 189), this was especially true for Danielle. I created four poetic vignettes to represent different phases of her learning trajectory (see chapter 4). Each poem was constructed using a few simple rules which were developed after a brief review of the literature on poetic representation (Cahnmann, 2003; Clarke, Febbraro, Hatzipantelis, & Nelson, 2005; Faulkner, 2009; Furman, 2006; Glesne, 1997; Ketelle, 2004; Richardson, 2003). The poems focused on evoking the emotive context of Danielle’s reflections on her learning trajectory. This was done by using selected key phrases from the transcript to re-present her speaking rhythm. The phrases were then organised into stanzas to represent the discontinuities in her thinking and speech patterns which conveyed “the emotions that the interviews evoked in me” (Glesne, 1997, p. 206).
The four poems were then copied and shown to a number of staff at OMIT, and fellow researchers, who had never met Danielle. One VCE English Literature teacher, E.L., provided detailed feedback which validated this method. E.L. thought that collectively these poems were “a type of common language poetry” which gave a sense of the conflict experienced by TAFE students returning to study vis-à-vis preparedness (Research Journal #2, 12 Nov 2009). Thus, verifying that the poems achieved the goal of evoking an emotional and contemplative response in the reader (Richardson, 2003, p. 189). E.L’s response also validated the decision to represent Danielle’s complex and contradictory storylines as a series of short poems to “create moments of experience” which coalesce to produce “an implied narrative” (p. 190). While the construction of these poems was unplanned and ad hoc they did effectively reflect the “chronological or thematic concerns” of the interviewee and helped the “researcher see through preconceptions and biases” (p. 191).

**David and Ryu’s Interviews**

In David and Ryu’s cases, I returned to the use of prose to tell their stories. Both men provided extensive vignettes throughout their interviews which supported their assertions that they liked to tell stories about their experiences. In both cases the stories were well articulated, consistent, and required a minimum of editing to convert into prose.

In each case the interview of the students who stayed was analysed using the themes identified as a result of the literature review. In particular, the analysis focused mostly on the affective and conative factors which were brought to the foreground during the analysis of Danielle’s interview. As with Danielle, each interview was analysed as a separate case while at the same time trying to draw out some of the similarities and differences between each case. These similarities and differences were explored in more detail in the discussion chapter (chapter 6)
4 The student who left
This chapter is an analysis of a single case (Stake, 2005). In the chapter I will “adopt different perspectives and pose different questions to the same text” in an effort to develop different interpretations of the meaning of the text (Kvale & Brinkmann, 2009, p. 213). In particular, the interview may be viewed from the perspectives of the student, the teacher/researcher, the VCE program, the Institute, and society.

I bumped into Danielle (a self selected pseudonym) in the hallway near my office. Meeting Danielle was serendipitous. Prior to meeting Danielle I had assumed that all eligible students had been contacted and that none of the students who had withdrawn during term one had elected to ‘opt in’ to the study. I had not seen Danielle since she had withdrawn from my class earlier in the semester. We exchanged pleasantries and she then asked me about the progress of this study. I commented on the lack of students opting in. She informed me that she had not received an invitation to participate. As a consequence I asked the VCE Administration officer to check her records. Subsequently, an information pack was sent to Danielle, and any other student who may have been overlooked. Within days Danielle had returned the signed consent form.

Danielle’s interview was conducted 3 weeks later in my office. The time and location of the interview were chosen by Danielle. The interview took place at the end of Semester 1 in the week following the midyear exams. Danielle participated in this interview in the middle of a 14 hour day, which started with a 9AM class in the city and would finish with an evening class from six till ten.

I approached this interview with a degree of trepidation and uncertainty. Danielle had been a student in my Year 11 Mathematical Methods class in the year preceding this study. During Year 11 Danielle had presented as a very confident student capable of doing the work but apparently unwilling, or unable, to sustain the effort needed to complete the assessments and achieve a passing grade. I remember being surprised when I saw she had chosen to enrol in Year 12 Mathematical Methods. Therefore, prior to the interview I considered what steps I could take to reduce the degree to which I could influence Danielle’s responses.

As the interview was to be conducted in my office I endeavoured to reduce any factors that might inhibit Danielle’s responses during the interview. Firstly, I cleared the desks
of all paperwork associated with my role as a teacher. As shown in these two images, my office is a small narrow room just big enough for two to sit in close proximity.

As a consequence, I decided to seat Danielle near the door, allowing her the freedom to leave the room at any time, and I also adjusted her chair so that it was slightly higher in an effort to subtly encourage a feeling of equality and security.

4.1 Learning Trajectory
During the interview, and while transcribing the audio recording, I was struck by the complex nature of Danielle’s learning journey. The following ‘narrative’ is a concatenation of direct quotes (in italics) and paraphrased quotes (plain text) which have been rearranged to reflect Danielle's actual learning journey. In the following sections, direct quotes from each interview will also be formatted using italics when imbedded in the discussion (see Black, Balatti, & Falk, 2010, for example).

Danielle’s Journey

*Since Year 7, Year 8, I don’t do, haven’t done homework. I just don’t feel I can anymore. It’s hard for me to study. I don’t know what it is. Sometimes I do and I’m fine after I get into it after maybe an hour, but, I don’t know.*

The first time I did Year 9 I didn’t pass. The School asked me to either leave or repeat. I *couldn’t stand the thought of changing schools so I stayed at that school.* I repeated Year 9 and passed but I *didn’t enjoy repeating.* I said to my parents “I don’t want to go back, I don’t want to go back”.

Instead of doing Year 10 in a school I did the CGEA at TAFE *because I assumed that the equivalent of Year 10 would be the equivalent of Year 10.* If it was easy, if I knew it was easy, I probably wouldn’t have done it. I would have *gone back to school.* The course was just for the first half of the year. *I left a few weeks early because I went overseas.* My holiday lasted for four months. When I came back *I had a part-time job at a fast food franchise and I still work there.*
The next year I returned to TAFE to do the VCE because I wouldn’t enjoy working in the kind of job you can get with a Year 10 pass. And because my parents would expect that I finished my schooling. In Year 11 I did six subjects. I didn’t do well at all. I didn’t pass. I think I passed nine units. I didn’t have any real plan when I chose my subjects for Year 12. I just chose the subjects that I thought were easier – English Language, Math Methods, Psychology, Biology and Physical Education. My favourite subjects are Biology and Physical Education. I also like English Language, because it is more structured than English and Literature. I didn’t pass Math Methods in Year 11 but I knew that I could do it if I tried.

I don’t really know where I’m going. I change my mind every week. I’m interested in Nutrition at the moment so probably a Bachelor of Science or Bachelor of Arts.

This narrative highlights some of the tensions that were present throughout Danielle’s interview. Danielle is from the cohort of young early school leavers who are “particularly at risk of disengagement from education” (Volkoff, et al., 2006, p. 55). She believed that she failed Year 9 because she didn’t do homework and had an irregular attendance. The school had required her to leave or repeat. She couldn’t stand the thought of changing schools so she repeated Year 9. While she passed Year 9 she didn’t enjoy the experience and as a consequence left school. The following year Danielle enrolled in the literacy and numeracy program, CGEA, at OMIT. She had assumed that this six month course was the equivalent to Year 10. She asserted that if she had known that it was easy she probably wouldn’t have done it. She would have stayed at school to do Year 10. She left the CGEA course a few weeks early because she went overseas and then worked for the rest of the year.

The following year she decided to return to TAFE to do Year 11 because she wouldn’t enjoy working in the kind of jobs you can get with a Year 10 pass. While she initially asserted that she had always intended doing the VCE she later acknowledged that her parents’ expectations may also have influenced her decision. While doing the VCE Danielle’s career aspirations have been in a state of flux: “I don’t really know where I’m going […] I change my job decision every week”. Despite this lack of focus Danielle passed most of her Year 11 subjects, the exception being Mathematical Methods. She acknowledged that she failed because she didn’t complete all of the set tasks. However, she also asserted that she could do it if she tried because “I’m just someone who didn’t do much maths in their lessons”. She believed that if she studied out of school and focused more in class she would be able to pass Year 12 Mathematical Methods.
In Year 12 Danielle enrolled in five subjects: English Language, Mathematical Methods, Psychology, Biology and Physical Education. Danielle suggested that she was not sure why she chose these subjects except that she felt that they were easier.

4.2 Family Background

The family background of the student, “assessed in terms of income, parents education, or parents occupation”, is often cited as a significant factor in determining the student’s learning trajectory (Gorard, Rees, Fevre, & Welland, 2001, pp. 175-176). During Danielle’s discussions about her learning trajectory, as she moved between schools and courses, she offered no spontaneous information about her parent’s perspective or background. Therefore I broached the topic after a brief discussion about her vision for the future. The following extract documents the discussion that briefly focused on Danielle’s knowledge of her parents’ educational background and current employment.

Roy: Okay. So we’ve talked a little bit about schooling. […] Do you know how far your parents went through school?

Danielle: Yep, they both did Year 11 […] my mum did a hairdressing apprenticeship

Roy: Yeah … (unclear) (Laughs)

Danielle: (laughs) Um: my dad, I think, completed maybe two years of a mechanics apprenticeship. I’m not sure when though. … He did part of it. I’m not sure, I know he didn’t finish. … And my mum wouldn’t have been, was a hairdresser for a few years, not any more.

Roy: Right, so what sort of jobs are they doing now?

Danielle: My mum’s a police officer and dad, is, he works in a factory. He’s a manager, I’m not sure exactly what else, but, […] He’s a middle manag[...]

Roy: [He’s work his way up, yeah … but, you’re mum what level police officer is she?

Danielle: She’s a senior constable, yeah … but, you’re mum what level police officer is she?

Roy: Okay, so do you think University might be an option

Danielle: Yep

In this extract Danielle shows a good level of knowledge about her parents’ background. Both parents had completed Year 11 and then progressed onto vocational courses. Both parents underwent significant career changes. Thus, Danielle has a family
background where her parents could be seen to be acting as positive role models. In each case they have achieved a good level of secondary school education.

Danielle’s mother underwent the most dramatic career change – from hairdresser to police officer. As a senior constable in a position of responsibility this was obviously a successful career change. Similarly, Danielle’s father also experienced a significant career change. After dropping out of a mechanics apprenticeship he is now a middle manager in a factory.

Throughout the previous year Danielle had often mentioned that her mother was a police officer. The incongruity of the training and lifestyle choices of a ‘hairdresser’ and a ‘police officer’ temporarily shocked me out of my “attempt to achieve bracketing and empathy” (Ashworth & Lucas, 2000, p. 306) and caused me to laugh. Danielle’s responding laughter, while short, seemed to help her relax. Prior to this, Danielle’s responses had been very short and had required frequent prompting. Following this exchange, her responses tended to be more detailed and spontaneous.

4.3 Help Seeking Behaviour

“I don’t really tell people how I do at school” (Danielle)

Lawy has noted that the opportunities available to young people has resulted in their choices being “more rather than less problematic” (2002, p. 201). As with some other school aged students Danielle perceived “the TAFE environment as being a more attractive alternative to school” (Ross & Gray, 2005, p. 120). Throughout the interview I sought to develop an understanding of how advice and support from family and peers influenced Danielle’s decisions. The support of family and peers has been noted as an important factor in the persistence of some students when making the transition from secondary school to university (Merran Evans, 2000).

During the interview, and while subsequently listening to the audio recording, the discontinuities and contradictions in Danielle’s identity as an adult learner, a VCE student, and as a self-regulated learner invoked a constant feeling of confusion and frustration. However, these emotional undertones were muted in the transcript and difficult to convey using prose.
Using elements of poetry in our data collection, analysis and write-up has the potential to make our thinking clearer, fresher, and more accessible and to render the richness and complexity of the observed world (Cahnmann, 2003, p. 34). I have sought to use poetic representation to distil the essence of Danielle’s conflicting identities and hence give voice to the complexity of her lived experience.

**The Decision to stay at School**

*I went to Year 9*

*I repeated Year 9*

Why? Because *I didn’t do homework*

*Oh, and I didn’t turn up to school as well, sometimes*

*At the start of Year 9*

*When I first did Year 9*

*They either asked me to leave or repeat*

*And I chose*

*I didn’t want to change schools*

*I couldn’t stand the thought of changing schools*

*So I stayed*

*at that school*

For Danielle truancy and not completing homework were the reasons that her school asked her to either leave or repeat Year 9. In listening to the audio of the interview Danielle placed a slightly greater emphasis on the word ‘thought’, with an upward inflection in her voice, and deemphasised the phrase ‘at that school’ by lowering the volume of her voice and compressing the phrase, as if she was running out of breath.

Danielle seems to share the sense of pessimism about the benefits of moving schools which has been attributed to other early school leavers (Hodgson, 2007). It is unclear if there is any basis for this decision to stay at her current school as Danielle did not talk about any attempts to gather further information about her choices. However, after passing Year 9 she left school and enrolled in the Certificates in General Education for Adults (CGEA) at TAFE.
Why did I decide to leave?
To be honest I can’t remember.
I think I just said, to my parents,
“I don’t want to go back. I don’t want to go back”
Because I didn’t enjoy repeating
The school had probably assumed that I was coming back

I did CGEA
Because I, assumed, that the equivalent of Year 10
Would be the equivalent of Year 10
And then I travelled and worked

I didn’t know anyone who was doing it
If it was easy,
If I knew it was easy,
I probably wouldn’t have done it,
I probably actually would have gone to school

So the CGEA went for, six months
I’m not really sure
I left a few weeks early because I went overseas
For approximately four months
And then worked for the rest of the year

Instead of returning to school to do Year 10 Danielle enrolled in the CGEA because she assumed it was the equivalent of Year 10. Danielle asserts that she didn’t know anyone who was doing the CGEA. She appears to have made her decision based solely on information provided by the Institute, either in written form or by direct contact.

4.3.1 Returning to study Advice - CGEA
Volkoff et al. (2006, p. 45) note that for early school leavers “word of mouth between young ‘at risk’ peers appears to be an important conduit of information” about alternate courses. My experience as an enrolment officer for the VCE program over the past ten
years has provided anecdotal evidence that parents and previous school teachers are also key conduits of information.

During the interview I was interested in knowing what sources of information Danielle had accessed in deciding to enrol in the CGEA. The topic was first broached using an open ended query about why she chose to do the CGEA. Danielle responded that she thought it was the equivalent of Year 10. When I probed further by asking did you know other students who had done the CGEA she responded in the negative. Shortly after the following exchange took place

Danielle: (quietly, quickly) I didn’t know anyone who was doing it

Roy: So you didn’t have students telling you that it was easy [or things like that]

Danielle: [No, no, no, no]

The quietness of Danielle’s initial response suggested that she was unsure of her answer. When I probed a little further Danielle emphasised her negative response in three ways: (1) interrupting the turn taking flow of the conversation (indicated by square brackets ‘[ ]’); (2) the repetitive use of No; and (3) speaking in a distinctly raised and assertive voice.

One problem with a transcription is that you cannot tell how quickly or slowly a particular phrase is uttered. By checking the waveform of the digitised audio (figure 3) I was able to determine that Danielle’s first response (shaded), 7 words, had a duration of 0.9 seconds. While her second response of four words, “No, no, no, no”, lasted 1.5 seconds. The first No took 0.5 seconds utter was twice the volume of her initial
response. This was followed by 3 quickly repeated No’s in descending volume. Danielle’s emphatic final response has.

As further evidence of this denial that others had influenced her decision to enrol in the CGEA Danielle asserted that “If I knew it was easy ... I probably actually would have gone to school”. Danielle’s self-belief in her academic ability will be explored in more detail later. In my experience many of the students who have a strong academic self belief enrol in the VCE immediately after completing the CGEA Certificate II. Up to this point in the interview Danielle’s reflections about her learning trajectory before enrolling in the VCE suggest a general reluctance to participate. She didn’t enjoy repeating Year 9. So she changed ‘schools’ and did the CGEA. However, she then left a few weeks early to go on an overseas holiday. Each of these decisions appears to be based on a reaction to the ‘current’ situation. At each point it appears that she made little effort to seek advice to aid her decision making process. However, it is unclear whether she received unsolicited, or unacknowledged, advice. Each of the incidents described by Danielle occurred at least two years prior to the current study. So it is possible that, at the time of the interview, she didn’t remember specific examples related to the questions. I had anticipated this problem in my research, and I provided each potential interviewee with a list of topics that would be covered during the interview (see Appendix B). However, Danielle stated that she had not looked at the list of questions since her initial reading of the Explanatory Statement.

4.3.2 Returning to Study the VCE
I asked Danielle about her decision to return to study the VCE on two different occasions. I did this as a means of validating my interpretations of her responses (Kvale & Brinkmann, 2009, p. 252). I was interested in what advice or information she accessed to help inform her decision to return to study. It was the apparently contradictory nature of her responses that prompted this in-depth analysis of her help-seeking behaviour.

Each response will first be considered in context within the ebb and flow of the ‘conversation’. Danielle had just related that she had decided to continue her schooling because she felt she “wouldn’t enjoy working in the kind of job you can get with a Year 10 pass”. Danielle’s decision to return to study seems to be influenced by her
experiences in her part-time job at a fast food outlet. It is possible that her work experience supported the prevailing advice that the VCE was the minimum level of schooling needed to enable participation in the modern economy (Department of the Premier and Cabinet, 2005).

The VCE is a very flexible program which supports multiple pathways to further study “and the world of work” (VCAA, 2007b, p. 1). However, it contains an implicit assumption that the ‘student’ has, at the very least, a broad career in mind before they attempt the VCE. Early in the interview Danielle asserted that she had returned to study to improve her future employment prospects, however a little later she admits

I’m not really sure where I want to go. But probably the whole VCE, there’s really no point in doing Year 11 without Year 12 generally. […] Yeah, I don’t really know where I’m going […] I change my job decision every week

Clearly Danielle was, and still is, unsure about her future career and study options.

McInnis et al. (2000) noted that numerous studies have identified that there is a clear association between a “students’ uncertainty about their career choice” and their withdrawal from a course. A similar concern has been noted by the Managers of TAFE Access programs, which include delivery of the CGEA and VCE, who asserted that some students “have no plans about their future, or if they do have initial plans, find that they are not suited to their first choice and need help to find more appropriate pathways” (Volkoff, et al., 2006, p. 46).

However, at the conclusion of the interview she indicated that University might be an option: Bachelor of Science or Bachelor of Arts, probably. While Danielle continued to ‘hedge her bets’, Change my mind every week and not sure if my marks will get me there, there are clear indications that she does access other sources of information to help her make some decisions. In this case she indicated that the internet is a primary, possibly only, source of information about careers. Her interest in Nutrition is clearly linked to her personal interests - I like science … love food, like healthy eating. By identifying the BSc and BA courses as possible pathways she is clearly showing that she has researched this option in some depth, she didn’t just read it or something.

Danielle’s response to the further study question suggested that my initial impressions of her lack of help seeking behaviour may have been in error.
Roy: What sort of advice and things did you get about your decision about doing Year 11 or you're decision about going on and doing Year 12?

Danielle: From teachers, from?

Roy: From, anybody. [...] do you remember what kind of advice you got? And, Do you remember who was giving you advice? Well, start with Year 11

Danielle: Maybe mainly teachers just saying, doing, “do your homework” and things like that. Is that what you mean? Sort of [ ]

Roy: No, No, well I mean you left school, and you’d done the CGEA, and then you’d start working. So you decided to come back and do the VCE

Danielle: Oh, that’s what I planned on doing the whole time

Roy: Okay (20 sec pause) So was that intention of doing it the whole time, [...] was that something that your parents expected?

Danielle: Aw, That I finished school?

Roy: yeah

Danielle: Oh yeah, they would expect that I finished school [...] probably half the reason I’m here. I’m not sure.

Danielle’s response “mainly teachers just saying, “do your homework”” suggests that she did not comprehend the initial question. One interpretation of the initial exchange is that Danielle ‘heard’ – What advice did you get about doing Year 11. Thus the question has become ambiguous and Danielle could interpret the question to mean – What advice did you get while doing Year 11. This interpretation could have been reinforced by the locality in which the interview took place. Danielle was surrounded by the resources used by a Mathematics teacher. Visual cues in the landscape can evoke subtle emotional responses (Grenville, 2009) that could in turn trigger particular memories. In this case Danielle appears to have remembered the common advice to Year 11 students about the need to do your homework if you want pass the test/unit/semester/VCE.

I then rephrased the original question in terms of Danielle’s own learning trajectory: School – CGEA – Work – VCE. Danielle responded that she had always planned on returning to do the VCE. This was not the response that I was expecting. Previously she had stated the she had returned to school because she wouldn’t like the type of jobs that you can get with a Year 10 pass.

So far, during the interview, Danielle had presented herself as the sole decision making agent in control of her learning trajectory. She appears to be either unaware of, or actively avoiding, most sources of advice when making decisions related to her
education and career paths. It is possible that she has consciously, or unconsciously, recognised this trend in her responses. Her statement *Oh, that’s what I planned on doing the whole time* was expressed in a declarative tone of voice. Thus, she appears to be reclaiming a sense of personal agency through asserting her belief that she exercised “some measure of control” over her learning trajectory (Bandura, 2001, p. 10).

The above extract concludes with a few questions which probed the apparent inconsistencies between her two reasons for returning to study, i.e. ‘long term plan’ versus ‘need VCE to get a decent job’. The final question aimed to establish the level of parental support Danielle acknowledged receiving for her intention to return to study. There is a fair degree of hedging in this response from Danielle: *would expect, probably half, and not sure.* This statement could therefore be interpreted in a number of different ways. One interpretation is that this an example of analysis where “the subjects themselves discover new relationships during the interview” (Kvale & Brinkmann, 2009, p. 195, emphasis in original). To make this ‘discovery’ explicit the response could be rewritten as “The expectations of my parents were a significant factor in my returning to study”. Thus Danielle recognises that her decisions are influenced by her home environment, even if she doesn’t actively seek the advice of her parents.

An alternate interpretation for this response is that there is little communication with her parents. The use of the expression “*they would expect*” instead of ‘*they do expect*’ suggests that Danielle is making assumptions about her parent’s expectations. This assumption could be influenced by two different perspectives on the role of parents:

1. Nurturing: I’m an adult, but my parents would still want the best for me, so they would expect that I finish school so that I have more opportunities.

2. Authoritarian: Parents are part of the establishment. Society expects that everyone should complete Year 12. So this would be the expectation of my parents as well.

In either case Danielle appears to recognise that the expectation that she finished school influenced her decision to return to study. Another interpretation of this response is that Danielle is not conscious of the level of support and advice she receives from her parents.
During the remainder of the interview I revisited the issue of the degree to which she accessed support from sources within or outside the institute.

4.3.3 Student Support Services

The development of self-esteem and confidence is an important element in overcoming specific educational disadvantage and it is widely recognised that the most effective approaches for ‘at risk’ students include subject specific assistance, study skills and opportunities for changes in self-concepts (McInnis, et al., 2000, p. 46).

Tinto (2005) suggests that the provision of institutional support is one of the five key conditions “that promote student success” (p. 91) and persistence. The OMIT Student Advisory Services department provides current and prospective students with “support and information on a wide range of issues” (OMIT, 2008), including career advice. Study Skills Support is a separate program run by the Access department. Accessing these support services is at the discretion of the student.

The homework ‘issue’ was a consistent theme throughout Danielle’s learning trajectory. It is also an issue for many other students who return to study the VCE at TAFE, especially in the Mathematics subjects. Having taught Danielle throughout Year 11 I was curious to know if she had ever sought extra assistance with her study skills. During Year 11 Danielle remembers getting help with maths questions for Mathematical Methods. It is interesting that this occurred at a time when a different teacher took the class for three weeks, while I was on study leave.

Why did this change of teachers prod Danielle into seeking much needed extra assistance? Danielle’s mathematical background meant that she would have benefited from seeking help from study skills support tutors throughout Year 11. Why did Danielle emphasise that it was when she a different teacher, it wasn’t you, it was while you were away? Is she trying to avoid criticising my teaching? This is often a common methodological problem experienced by institutions when exiting students are “surveyed directly, and indeed face to face, by their teachers” (McInnis, et al., 2000, p. 24). This issue had arisen earlier in the interview when Danielle was outlining her reasons from withdrawing from the Year 12 Mathematical Methods class. Her response, “No: I’m just trying to, No: that’s Okay”, indicated that my being her teacher was not a factor in her hesitating to respond to the question. If we assume that she was indeed
comfortable with criticising my teaching, then is she criticising the teaching of the substitute teacher?

Jo (a pseudonym) was a very enthusiastic and experienced secondary school maths teacher in her late twenties. It may be that Jo’s enthusiasm engendered a desire in Danielle to achieve, an outcome I had indeed hoped for at the time. It has been noted “that students quickly pick up expectations and are influenced by the degree to which those expectations validate their presence” in the class (Tinto, 2005, p. 91). Thus, as a female maths teacher, Jo may also have acted as a positive role model for Danielle giving her the ‘permission’ to seek extra assistance as a positive, rather than negative, comment on her mathematical efficacy.

Alternatively, as a sessional teacher, Jo was not able to provide extra assistance to students outside of normal class hours. This may have prompted Danielle to seek extra assistance. However, it was clear that Danielle was unaware of the full extent of the assistance available from Study Skills Support. She was also doubtful about the long term effectiveness of the advice available from the Student Advisory Service and the Study Skills support program.

**4.3.4 Revisiting Parental Support while studying**

Throughout the interview Danielle had been vague about the level of support and advice she had received from her parents. Given Danielle’s doubts about the efficacy of the study skills support program I was interested to explore her perceptions of the level of support experienced at home.

Roy: … So, at home do you talk about how you’re going with your classes with Danielle: Nope
Roy: maths or things like that?
Danielle: Nope
Roy: You’re parents don’t ask you any questions about it?
Danielle: No
Roy: So, do they just assume that you’re taking responsibility for everything?
Danielle: I guess
Roy: Or they think that you’re doing well? …
Danielle: I’m not sure
Roy: Don’t know?
Danielle: (softly) Don’t know what they think a lot of the time
It is clear that Danielle feels that her schooling is not a topic for conversation at home.
On relistening to the audio tape her responses are emphatic: Nnnope ... Nope ... No.
While there was no change in the level of her voice, and no overt emotional overtone,
there was a distinct impression that she was closing down this thread of the
conversation. You can almost sense the arms being crossed, and the blank look on the
face, the “universal” defensive posture indicating that she was not interested in further
discussion (Pease & Garner, 1985, pp. 147-148). Once again, when pushed for an
opinion, Danielle indicates that she does not have a very clear idea of her parents’
values.

4.3.5 Advice on withdrawing from Mathematical Methods
Next, I changed the topic to explore the decision making process that led up to
Danielle’s decision to swap from Mathematical Methods to Further Mathematics. We
join the conversation at the point where Danielle discloses that she had actively sought
advice off someone. This conversation has been reproduced at length to allow Danielle’s
voice to be heard.

Roy: So straight after the first week when you missed that first class? Or: … did
you sort of struggle along a little bit and then …
Danielle: I think I might of got a bit of advice off someone, and they said “well
if you think you’re not going to do really well in that, in one subject than
you’re better of doing really well in another subject”.
Roy: Yeah. So do you remember who you went to see about that?
Danielle: Oh, it was just a family friend
 […]
Roy: So you’ve been talking about you’re studies then, to someone that’s
outside of TAFE?
Danielle: Yeah. But not my parents!
Roy: Not your parents. So you’ve been talking to friends or?
Danielle: Although, this was my … friend’s mum.
Roy: Okay … So had you been talking to her, sort of, leading up till that
Danielle: Oh, just a little bit
Roy: About how you were going, or?
Danielle: Just a little. Oh not, no no. I don’t really tell people how I do at school.
Roy: Yeah? Or that you were thinking of changing classes?
Danielle: Oh yeah, I said that I was thinking of changing classes. And she said, “Well, you’re better off rather than doing a hard subject, and not getting a good score in it, you’re better off doing one that you find easier and doing better”.
Roy: Do you know what sort of a job, or what sort of background, she has?
Danielle: She’s a Veterinarian.
Roy: She’s a Veterinarian. So she’s someone who’s been to University […] do you think that you’d get better advice from her than if you’d talked to your parents about it, or talked to someone from school about it?
Danielle: Probably. But I wouldn’t tell my parents. I just wouldn’t tell my parents.
Roy: You wouldn’t tell your parents?
Danielle: (softly) I wouldn’t tell my parents, no

A cursory reading of this passage further emphasizes the gulf in communication between Danielle and her parents which was outlined previously. It is clear that Danielle intentionally avoids talking to her parents about how she is doing at school. This could be an extreme manifestation of the common problem where adolescents are non-responsive when asked questions or “told what to do by adults” (Silverman, 2000, pp. 132-133).

Initially Danielle admitted that she got a bit of advice off someone who was just a family friend. The tone of this passage suggests that Danielle doesn’t believe this advice to be an important factor in her decision to withdraw from the Mathematical Methods class: I think I might – a bit – just. Replaying this section of the audio tape provided further support for this interpretation of the transcript. On the tape the first passage, “I think I might …”, was spoken in almost a monotone. While in the second passage “a family friend” was spoken at a much lower volume. This suggests that Danielle was trying to recall who had given her the advice.

In the following dialogue Danielle clarified that the family friend was actually her friend’s mum.

Danielle: Yeah. But not my parents!
Roy: Not your parents. So you’ve been talking to friends or?
Danielle: Although, this was my … friend’s mum.
During the interview I wondered if Danielle believed that advice from an independent source, that is not a family member, was likely to be more objective. However, relistening to this segment of the audio suggested an alternate interpretation. This passage starts with the strong declarative statement “not my parents”. The statement is spoken quickly and clearly, at an average volume. In comparison the statement “although, this was my … friend’s mum” is more thoughtful, ending in a near whisper, and also more clearly articulated. The overall impression is that Danielle had just realised that she had sought advice from a contemporary of her parents – another adult.

It appears that Danielle has two approaches to seeking assistance. As a general principle she avoids talking to anyone about her progress through her studies: I don’t really tell people how I do at school. As discussed earlier, this seems to include avoiding opportunities for accessing institutional support as well as parental support.

The instances when she has accessed some form of advice have been from low risk ‘objective’ sources where she was at liberty to ignore their advice. Such as, advice about potential career paths – Sometimes I just go on the internet and look up a certain job and opinions about specific issues – I said that I was thinking of changing classes. In these instances she was an “advice seeker” (Silverman, 2000, p. 134) actively pursuing information to help inform her decision making process.

It is also possible that this is a defence mechanism which she has developed over time to protect herself image. As an adult learner in a tertiary environment there is a general expectation that students take responsibility for their own learning, including asking for help when needed (Study Skills Support Co-ordinator, 2009). The next section will look at some of the other self-regulation issues related to the current discussion about the issues with her help-seeking behaviour.

**4.4 The Self Regulated Learner**

The VCE program at OMIT was developed to meet the needs of adult students who often have family or work commitments which preclude students’ participation in a ‘standard’ school learning program, 6-8 hours per day/ 5 days per week. Most classes are offered as one four hour class for the week, 70 hours per semester. Students are expected to be self-regulated learners, who take responsibility for their own learning,
and are only required to attend school when they have a class. Thus, “additional work and study outside class” (VCAA, 2007a, p. 111) is at the discretion of the adult learner.

The following two poems are based on Danielle’s comments about her attitude and approach to study outside class. While interviewing Danielle I had a clear sense of her experiencing an ongoing conflict between her academic self belief and her feelings that she wasn’t performing at an appropriate level. Thus ‘homework’ emerged as a significant theme during the initial reading and coding of the transcript.

**Homework**

*Since Year 7, Year 8*

*I don’t do,*

*haven’t done, homework*

*I just don’t feel I can anymore*

*It’s hard for me to study*

*I don’t know what it is.*

*I probably socialise when I should be doing homework*

*But, the amount of time I socialise - wouldn’t*

*I’ll leave time for homework*

*and I just won’t do it*

*Sometimes I do*

*And, I’m fine after I get into it*

*After, maybe an hour*

*But, I don’t know*

*I get, really bored doing it*

*I don’t have the motivation to keep on studying*

*Maybe, maybe I would sit there for an hour*

*And, I would do a little bit*

*Like, maybe a few questions*

*But I would be thinking of other things.*

*Definitely not focusing*
I might, make some food
Or, go for a walk
Or, tidy my room
Rearrange, something.

Then I wouldn’t look at it again
I’d look at it and go
“Oh I should do that ... tomorrow”
And that was it

Danielle appears to be one of the “many school-age children who struggle with volitional issues well into adulthood” (Corno, 2004, p. 1671). While she is motivated to do well, and believes that she is capable of doing the work, she clearly has not developed a “volitional mindset” (p. 1674). Danielle indicated that she recognised the importance of doing homework from the start of the interview. She previously stated that the reason she needed to repeat Year 9 was because I didn’t do homework. She also indicated that the main source of advice that she received was mainly teachers saying “do your homework”.

The VCAA expects that VCE students do “additional work and study outside class” (2007a, p. 111). OMIT also expects that adult learners in a tertiary environment are “expected to take responsibility” for their own learning and ask for help when needed (Study Skills Support Co-ordinator, 2009). It would appear that both the VCAA and OMIT are assuming that adult/senior secondary students are capable of setting goals and implementing strategies to achieve these goals. However, Danielle’s admissions suggest that this may not be the case for some early school leavers who chose to study the VCE at TAFE.

In my experience, some students seem to devalue Year 11 because a grade is not recorded and the results do not count towards an ENTER score. They see Year 11 as an opportunity to relax before starting the ‘real’ work in Year 12. Danielle also recognised some of these issues. Danielle also recognised some of these issues acknowledging that some people just have to go to TAFE, they’re not there to learn and things. However, she inferred that this wasn’t true in her case. While she acknowledged that she probably
did do more work at school than at TAFE, she suggested that the timetable, designed to suit working adults, was the main cause of her inability to focus in class during Year 11: *Four hour classes are a killer.*

For Danielle trying harder, studying out of school, and focussing more in class would enable her to make a successful transition to Year 12 Mathematical Methods. In my experience this belief is common amongst many of the students who cruise through Year 11. The following ‘poem’ uses Danielle’s words to tell the story of her transition from Year 11 to Year 12 Mathematical Methods and the subsequent transfer from Mathematical Methods to Further Mathematics. Following the poem, I address a number of features of this attitudinal data.

**Transition to Year 12 (Motivation?)**

*I didn’t pass Year 11 Math Methods  
But I knew that I could do it if I tried*

*Each year I go  
“Oh, I’ll try harder next year”  
I’ll study, out of school.  
Focus more in class*

*Over the Christmas holidays  
*I did a little bit of Maths  
I read some of my Year 11 book  
And, I did a little bit of reading for English Language.*

*Probably at the very start I would have done  
Homework for all my classes - for math methods  
And then, maybe, second class,  
I think I wouldn’t have bothered.*

*I think I was actually late  
I looked at the wrong timetable  
I think I looked at an old timetable  
I looked at the wrong time*
I don’t remember if that was the first class but
I found the classes a lot faster
I expected it to be – faster
But, because I was late it was - a bit – harder
Because, I didn’t know what was going on

We probably did more work in that class
than in Year 11
and it was more serious!
And - I don’t know.

I think just the fact that I also missed the first session I was a bit
I don’t know
I didn’t feel like I really wanted to do the work
I didn’t want to do the homework
Things like that

So I thought
I’ll just do Further Maths, because
I don’t have to do as much work in that subject
and I can focus on English more

I thought there would be less homework in - further maths
and you wouldn’t have to study as much
I probably haven’t even been doing work in class,
because it’s that boring

AND
I felt that I don’t even need maths,
for all of the careers that I have in mind
4.4.1 Reasons for Non-completion

On the surface Danielle clearly identifies some of the well established reasons for withdrawing from a course of study. Firstly, she recognises that she was unprepared “to cope with the demand of the course” (McInnis, et al., 2000, p. 29). Mathematical Methods is a challenging subject that assumes students have a good understanding of the knowledge and skills developed in the Year 11 Mathematical Methods units of study (VCAA, 2005, p. 152). Danielle had not satisfactorily completed Year 11 Mathematical Methods, and thus, was at a considerable disadvantage. Her preparation, over the Christmas break, for Year 12 was to do a little bit of Maths - I read some of my Year 11 book. In Mathematical Methods “students are expected to be able to apply techniques, routines and processes” to solve complex and sophisticated problems (p. 152). Reading a text book is unlikely to be an adequate preparation for a practical subject like Mathematics.

Danielle also identifies another of the main reasons for deciding to switch courses – “feeling overwhelmed by the pace and load of curriculum demands” (McInnis, et al., 2000, p. 28). The content of the Year 12 class was harder, the pace was faster, and the work atmosphere of the class was more serious than Year 11. Danielle clearly felt overwhelmed by the demands of the Year 12 class from start - I didn’t feel like I really wanted to do the work. The decision to change classes was not immediate. Danielle continued to attend classes for a couple of weeks, maybe the first four weeks. During that time she talked to her friend’s mother who provided advice that supported Danielle’s decision to change classes to the easier Year 12 maths subject, Further Maths. She believed that she could achieve higher grades in Further Maths with less homework and no need to study as much. Thus Danielle does not appear to relate effort with achievement. Whereas the gist of the advice that she had received was that by continuing to work hard in an easier subject she would be rewarded with higher grades – rather than doing a hard subject … you’re better of doing one that you find easier and doing better.

Lastly, “numerous studies have noted the association between withdrawal and students’ uncertainty about their career choice” (McInnis, et al., 2000, p. 26). Danielle’s postscript to her decision making process appears to be an attempt to rationalise her decision to swap classes and reduce the level of effort that she expended in class.
However, career choice and VCE Mathematics are closely intertwined (VCAA, 2005, p. 8). Thus Danielle’s decision to reduce her effort in math classes may be justified if she had recently clarified her vision of potential career paths.

### 4.4.2 Work Habits and Work Styles

The second approach to interpreting this poem is to extend the previous discussion which looked at Danielle’s approach to homework. At the start of the year Danielle was clearly motivated to do better in her Year 12 classes, especially English and Mathematical Methods. She followed through on these goals by implementing a study plan over the Christmas holidays. However, it appears that when the classes began she didn’t have the habits, strategies and tactics, which would enable her stay organised and independently manage her homework (Corno, 2004). She probably did homework in the first week of classes but by the second week her enthusiasm had waned. Danielle then decides to change to Further Mathematics because she believed there would be less homework and the less work in that subject. However, while Danielle found the content easier the work load was pretty much the same. This appears to have resulted in a reduction of effort in class. Thus, for mathematics there is an apparent downward spiral in Danielle’s self-regulation of her work habits, at least in the case of maths classes.

From this perspective, missing the first class, finding further maths boring, and not needing maths all appear to be an attempt to rationalise her decision to disengage from Mathematics as an area of study. McInnis et al. (2000) also noted that student “may feel the need to rationalise their decision to withdraw” as they “may not be willing or able to give accurate reasons for leaving” (pp. 23-24). Danielle’s responses suggest that some students may return to study without having learned the rudiments of volitional control necessary for sustained effort in an academic environment. Thus, this may be one of the hidden reasons behind withdrawal, at least for some students returning to complete the VCE. Furthermore, Corno (2004) suggests that teachers can implement strategies in their learning activities to help students develop volitional skills. “Even when there is no chance to change a prior reinforcement history with school, family values that influence students’ goals, children can be taught the rudiments of volitional control” and “qualities such as industriousness” (p. 1691).
4.4.3 Self Theories of Intelligence

The last approach to interpreting this poem is to use the work of social psychologist Carol Dweck (1999, 2007a, 2008). Dweck (2007a, pp. 7-8) identified four cardinal ‘rules’ which can limit a student’s ability to learn. Each of these ‘rules’ is evident in the two poems presented in this section:

1. Look smart at all costs – while motivating for some, most students will tend to select the familiar ‘easy’ task rather than attempt something new

The poem starts with Danielle’s assertion that I knew that I could do it if I tried. This positive perspective on her abilities was reinforced at various times throughout the interview. She then justified her change to Further Mathematics on the grounds that she would find it easy to do the work and she could focus on other subjects. The implication being, that she was smart enough to do well in Further Mathematics without doing homework. However, she then asserted that she didn’t even do work in Further Mathematics because the subject was not challenging - It’s annoying to do Further maths ... I just don’t enjoy it, it’s not challenging enough. It’s boring. This was a common assertion each time she talked about a Mathematics class that she considered ‘easy’.

2. Don’t work hard – only students with low intelligence need to work hard. Therefore, “act as though you could do well if you wanted”.

In the poem Homework, Danielle admits that she hasn’t done homework since Year 7. She asserts that she can when she wants to. It’s just that she is unmotivated and finds the process boring. Once again, any study that requires sustained effort appears to be labelled ‘boring’, she appears to be acting as though she could do well if she wanted. At the end of the poem Transition, she implies that she no longer needs to work hard in Further Mathematics because it is no longer relevant for the careers that she has in mind.

3. Ignore mistakes, don’t try to correct them. “Setbacks indicate a lack of ability and, in the fixed mindset, that lack of ability is permanent”

In the poem Transition, Danielle suggests that she found the Year 12 Mathematical Methods class harder than expected because she missed the first class. She is asserting
that this setback affected her ability to do well in this subject, and rather than work hard to catch up she ignored the ‘mistake’.

4. Don’t make mistakes – Intelligent people don’t make mistakes, so “mistakes and setbacks mean they lack ability”.

This study did not investigate student’s approaches to solving maths problems. Therefore, it is unclear if Danielle also avoided admitting that she made mistakes while solving problems. However, she did admit to liking the more logical questions, found in the Mathematical Methods textbook, rather than the boring interpretive type questions found in Further Mathematics. This suggests that she preferred questions with a defined problem solving approach which would guarantee a correct answer.

Thus, Danielle appears to exhibit the traits of a student with a ‘fixed intelligence’ mindset. Avoiding homework, not seeking assistance from study skills support, not talking to her parents about ‘school’ all fit into a possible pattern of self sabotage. It is also clear that Danielle does not appear to be aware of this pattern in her approach to schooling. She continues to have a strong belief in her own abilities in mathematics. It would seem that she has encapsulated herself in a multilayered shield of excuses that can be accessed to justify not successfully completing a task while avoiding any suggestion that she lacks ability.

### 4.5 Self-confidence in Mathematics

A consistent theme that permeated Danielle’s interview was herself reported high level of self-confidence in her Mathematical ability. This was often at odds with the self reported low level of performance in mathematics. The following is a brief summary of Danielle’s comments about her ability and performance in maths from Year 7 to Year 12.

**Transition from CGEA to VCE Year 11 Mathematical Methods**

Each year during the VCE enrolment process students who are transferring from another school, or program within OMIT, complete an assessment of their Maths knowledge and skills. When Danielle was asked to recall how she did on the Maths assessment she responded

> I don’t remember how I did. But I probably did alright, because I did alright in Maths in Year 9. I used a lot of maths Years seven, eight and nine. Probably
they were the only subjects that I tried really hard in. I don’t remember it, the maths assessment, being too hard. If it was something that I felt was important I would probably remember, like an ENTER score or a study score. I’m just someone that didn’t do much maths in their lessons in Year 11.

This contrasted with her previous comments about her schooling. She repeated Year 9 because since Year 7, Year 8 she didn’t do homework and didn’t turn up to school as well sometimes.

Previous studies identified that a school student’s “self-confidence in mathematics” had a “large positive influence” on their performance in Mathematics (McPhan, et al., 2008, p. 17). Yet while Danielle presents as a self-confident student she also admits that I’m just someone that didn’t do much maths in their lessons in Year 11. It would appear that her self confidence has not had a positive influence on her performance.

During the interview I was interested in Danielle’s perception of how much mathematical content she recalled from secondary school. Danielle initially indicated that she remembered a lot of the mathematics from Year 9. Her high level of maintenance of mathematical knowledge from high school could be attributed to repetition of Year 9.

When asked about her more recent experience of the CGEA maths classes she asserted that they were completely irrelevant to the VCE Mathematics course. The CGEA is a literacy and numeracy program for people aged fifteen and over who have not completed their Year 10. Danielle’s assertion that the CGEA numeracy classes were completely irrelevant to the VCE Mathematics course was based on her participation in the Certificate II course. In effect, she had repeated the Year 9 maths curriculum. In general, secondary school teachers suggest that students need a good background knowledge of junior mathematics and a “realistic self-perception of their ability that will then allow them to engage, and persevere, with a difficult senior course” (McPhan, et al., 2008, p. 48). She was not exposed to the more challenging algebra course covered in the Certificate III course, the basic prerequisite knowledge assumed for Year 11 Mathematical Methods. Mathematical ability is often cited as the “underlying reason for the difficulty that students face with mathematics” (Michaeldides, 2008, p. 229). However, over the years other students, who like Danielle have an inadequate prior knowledge, have successfully completed Year 12 Mathematical Methods at OMIT.
Danielle’s self-confidence in her ability to cope with an advanced maths class was unaffected by her failure during Year 11. She was realistic in her appraisal of why she failed Year 11 - *I didn’t complete all of my set tasks and I didn’t study; and I’m just someone that didn’t do much maths in their lessons.* Danielle recognised that passing Year 12 maths would require extra effort - *I knew that I could do it if I tried.* She had a viable plan for overcoming this inadequate prior knowledge and skills – revise over the Christmas break, *study out of School, and Focus more in class.* However, from the first class her determination to try harder seemed to waver. She *missed the first session.* From the start she found the content *harder,* the atmosphere *more serious,* and that she needed to do *more work* in class, *than in Year 11.* Over the *next couple of weeks* she made the decision to swap from Mathematical Methods to Further Mathematics.

The decision to swap to the easier Further Maths class was also supported by advice that she had received from her friend’s mother: “*well if you think you’re not going to do very well in that, in one subject then you’re better off doing really well in another subject*”. The Further Mathematics curriculum is “*intended to be more widely accessible*” (VCAA, 2005, p. 9). The statistics and numeracy modules of the Certificate II course, and the general problem solving skills developed during Year 11 Mathematical Methods, constitute a reasonable background for successfully completing Further Mathematics. Therefore, Danielle did have the necessary knowledge and skills to do really well.

Despite the content being easier, and the work load being the same, Danielle suggests that she finds *math methods easier than further maths.* She asserted that she found Further Maths *annoying* because *it’s boring, it’s not challenging enough,* and she doesn’t *enjoy it.* This contrasts sharply with her earlier comments that essentially she had found the Year 12 Mathematical Methods course too challenging. When asked to describe what sort of things have she had done in Further Maths so far Danielle responded: *box plots and Statistics… and the writing up, a comment, on … say, a graph and a [4 sec pause] I don’t know, just the content of the graph.* Her comments all appeared to focus on the Data Analysis applications task. They indicated a certain lack of enthusiasm about the 6-8 hour project which required the submission of a written report: *I just don’t like having to write in maths and words.*
For Danielle, writing isn’t something that she expected to be doing in a math class — *I just didn’t feel it was very mathematical*. She prefers the more logical exercise questions. Danielle appears to adhere to the common perception that mathematics is a “hard, technical subject where there is an emphasis on learning rules, constant practice and little room for creativity” and expression (McPhan, et al., 2008, p. 24). However, Danielle’s preference for the more logical, process driven, exercise type questions are at odds with many other Year 12 students who say “that there was not enough creativity in Year 12 Mathematics” (McPhan, et al., 2008, p. 23).

Despite Danielle’s dislike for writing in maths she indicated that she believed the application SAC was easy. However, she has not been doing any homework, or work in class, because the subject is boring. Thus her plunging expectations and low persistence levels suggest that she may be “classified as performance oriented based on a social cognitive approach to motivation and personality” (McPhan, et al., 2008, p. 22). Similarly her continued efforts to appear smart - the assignment was *pretty easy* despite not doing work in class – further supports the hypothesis that she has a fixed intelligence mindset.

### 4.6 Summary

The key things to emerge from this chapter were related to Danielle’s ongoing struggle to develop self-efficacy. Her responses suggest that she may be stuck in a feedback loop where her emotional states reduce, rather than enhance, the potential for the development of self-efficacy and hence improved sense of personal agency (Bandura, 1995). She acts as if she has a self-theory of intelligence as fixed (Dweck, 1999). She reports feeling high levels of self-confidence, especially in terms of her mathematics self-belief, while at the same time actively avoiding all forms of help and support. By minimising her access to social and institutional support she has limited her exposure to two of the most common ways of developing efficacy, vicarious experiences and social persuasion (Bandura, 1995). While she recognises that her volitional mindset is limiting her capacity for self-development, and is cognisant of the effective study techniques, she continues to struggle with volitional issues. Thus her volitional mindset reduces the potential for mastery experiences which are the most effective way of developing efficacy beliefs (Bandura, 1995).
In the following chapter 5, I analyse interviews with two second chance learners, David and Ryu, who stayed. While all three participants had a similar experience of dissatisfaction with their earlier schooling, the two men achieved a high level of performance in their studies of a ‘hard’ Year 12 Mathematics subject. Their interviews will be analysed using the same themes identified during the analysis of Danielle’s interview. That is prior learning trajectory and family background, help-seeking behaviour, issues related to self-regulation of the learning experience including volitional issues and self-theories of intelligence.

In chapter six I explore the similarities and differences between the experiences of the three participants.
5 The students who stayed
This chapter is an analysis of the interviews with two students, David and Ryu (pseudonyms), who successfully completed Year 12 Mathematical Methods. As with Danielle, both men selected my office as the location for the interview. In each instance the room was organised as previously described for Danielle’s interview.

5.1 David’s Interview
David was interviewed about one week after the end of year exam period. He had arrived an hour early for his interview. Just prior to attending the interview David had retrieved the last of his corrected Mathematical Methods SACs from his communication file. Before starting the interview we chatted about the SAC. He tells me that the grade is better than he expected.

5.1.1 Learning Trajectory
As with Danielle, the interview commenced with a request for David to tell me a story about his learning journey from leaving secondary school through to coming back to do further study at TAFE. The following narrative predominantly uses David’s own expressions and words (in italics) with minimal editing (in plain text) to improve the readability and flow of the text.

David’s Story
When I did my Year 12 in 1998 I probably did the easier subjects. I think I did English, Further Maths, IT, Business Management and Media. I didn’t like it! I liked some subjects. I liked IT and I didn’t mind maths, although I did find Further Maths difficult. I think I got about 40 for my TER [Tertiary Entrance Ranking]. I was pretty proud of that, to be honest with you.

So I finished school and went into a furniture factory for three years, making draws and cabinets. At the same time I went for my commercial helicopter license. So I was training for that and saving all I could. Then I worked in retail for about four years. That was fun. It was easy going, just turn up anytime. I finished the pilot license and then I decided to try and join the army. They put me in a scheme for Special Forces entry. But I had a medical condition so I didn’t go on from there. I’ve been doing the Army Reserves for the past three years. I want to progress to the police force. I put in an application but they’ve been a bit hard on me. They sort of said to me “Look, you’re capable, but we’re not looking to recruit ya”.
So then I came back and worked part-time while doing voluntary work at the airport. You turn up and say “I want to be a hanger rat” and then, maybe after a year or two, they’ll send you to Ayers Rock where you can start your flying and get your hours up. I think I did eleven months of that and I thought “gees, I’m not really getting on with everyone here”. At the same time I was offered a part-time job working with speed cameras. I thought “gees, I need the money”, so I took it.

I’ve been working on the cameras since and now I’m fulltime. Obviously, speed cameras are an engineering background. I work with Engineers. My dad’s an Engineer. My uncle’s an Engineer. I’ve got a few cousins who are Environmental Engineers, my brother he’s got a psych degree. So that’s what brought me to the course. Engineers, they make good money. It’s something I’m interested in. My dad said “it’s tough work, tough work”. I said “come on dad where’s the support?”. Oh, my dad’s in his mid seventies now. I want to start it, at least. I’ve got all these little things I want to do. I’m a little, you know, Jack of all – Master of none. I tend to like that. I thought “I’ll start it, just start it”, and then if I have too I’ll be able to do Engineering.

Well, there’s two reasons why I came to Math Methods. My number one reason is because I’m in the ADF reserves, defence forces that is, I’ve got a good chance of getting through into officer training. Better than going for the police. The ADF want a C average. So that was the main priority, and the secondary was like Engineering is good, it’s a good way of making, I might need to do something like that. So there we go, Math Methods is why I needed that. If I was going into the Defence force, I’d only want to go pilot.

David is a VCE completer who needs to complete a prerequisite subject in order to access future career or further study options. Over the past four years there have been an increasing number of students who return to study Year 12 mathematics with the goal of joining the Defence Forces as a Pilot.

David’s earlier experience of doing the VCE seems to be in the form of a “quietly subversive” (Gray, 2009, p. 652) ‘narrative of resistance’ to school. He chose the easier subjects which would require a minimum of effort. While he liked some subjects in general he didn’t like it. Initially, during the interview, I assumed that he had been referring to the VCE. However, on reflection he could equally have been referring to school or education in general. Previously, Danielle had identified her avoidance of homework as a key factor which influenced her early school leaving. I asked David if this was also a factor for him.

No, I didn’t mind doing homework. […] Actually, I did eighty percent of my work at home […] I sat in class and I just couldn’t concentrate. I was fiddling. I was thinking about, snowboarding, or motor bikes, or computer games. Talking. Oh, the teachers liked me but I was … I was still disruptive (laughs) and […]
The lives of young people today are often considered to be more complicated than in previous generations as “individuals have more potential and opportunities for self-expression and personal development” (Lawy, 2002). David’s observation that being a teenager is not the time for you to study would seem to validate this assertion. He attributes his fiddling, day dreaming and disruptive behaviour to his level of maturity, being a teenager. The concept of maturity was a core theme throughout David’s interview which will be explored in more detail later.

5.1.2 Family Background
In Australia, “family and other commitments” are consistently identified as one of the six main factors that lead to non-completion in the VET and higher education sectors (McInnis, et al., 2000, p. 25). The discussion about David’s family background was revisited several times during the interview. Each time David provided a small vignette as a natural consequence of the flow of the conversation.

As outlined previously, David comes from a family of professionals. Such a strong academic family background is very suggestive. It’s possible that David stayed at school, despite his disinterest, out of a sense of family obligation or to meet the expectations of his parents. To what extent did his family support his decision to return to study?

Before I started this course […] I said “look I want, I want to apply, I want to do an Engineering degree, I want to start it, at least”. […] So then me dad said “it’s tough work, tough work”. I said, “come on dad where’s the support?” (laughs) […] Oh, my dad’s in his mid seventies now. […] And he worked at the [city] Council for the Engineering department.

David believes that his Dad, who likes to tell him the negatives, is probably a bit on the pessimistic side, though he seems to attribute this attitude mostly to his father’s age. While David’s dad had worked as a Civil Engineer at a local city council he had not completed his engineering qualifications. As a part-time student David’s father attributed his non-completion of a professional degree to the constant need to update and integrate knowledge of the rapidly changing technology. This experience is likely to be the source of his father’s observation that Engineering is tough work. However, later
David implies that the rest of the family were more supportive. Especially his brother, who, despite living in New South Wales, offered to help him with his maths via email.

Unlike Danielle, David clearly has detailed knowledge of the academic and professional backgrounds of various members of his family. He is willing to discuss his aspirations with parents even when he knows that they may be a bit on the pessimistic side. Later in the interview, David reported that he got a lot support from family and friends because “everyone’s admirable when you’re doing something like this”.

However, his girlfriend was less enthusiastic about his study workload. In David’s case he reports that there was a difference in the expectations of the workload involved in returning to study Mathematical Methods. David’s girlfriend asserted that she “didn’t need to study as much as that” when she did Mathematical Methods at school, and that it “did affect the relationship with the girlfriend a bit [as she probably] wanted more time”.

5.1.3 Help Seeking Behaviour
After leaving school David had no ambition to go to University. As with Danielle, I was interested in whether he had investigated other options prior to returning to study Mathematical Methods at TAFE. David responded by relating a detailed story of his investigations and how he responded to the information provided by different organisations. His story has been minimally rephrased and reorganised to aid comprehension and the flow of the story.

After leaving school I had no ambition to go to University. It was only in the past year or two that I thought of doing a degree. As you mature, get a bit older. For me personally, I see how stupid people are, to be honest with ya. I’m in the army, and I’m working here, and I think “this is physically challenging, but I think I’m smarter than this”. So I rang Deakin University and she said “Look, you’re a mature student, you’ve got this and that, that’s good, that’s good, you might be able to come in and you might be able to get in”. Then she said “Oh, look we really require you to have Math methods though, if you’re doing pre-engineering maths”.

I rang her a few months later and she said “Come in and do a two week course, crash subject, and then if you pass it then we’ll consider ya. You’ve probably got a good chance”. So I thought “oh, I might be able to do that”, but then I thought “Nah, I’m going to struggle unless I do it, actually do it”. I was ringing around to do the summer courses like they’ve got up at Monash University. Then I rang the Defence Force and said “is that okay, can I do that?”. So it was the
Defence Force that said “No. We want you to have the proper calculus course. Not a crash Uni course that’s just made for Uni”.

There was an online course through Unilearn, that I can do. But I looked at the material, and coming from not even remembering Year 9 algebra. I got on the first page and said “what is this!”. So I knew I was going to take ... yonks ... then I rang them up and I said “How long does it, Um. [...] I think I’m going to take more than twelve months”. And he said “No, you can do this in three months” (laughs) and I said “if you’re a genius, (laughs), if you’ve done it before!”.

So, I just gave up then. I thought “Nup, I need to do a course”. So then I rang here and you’d been into it for two weeks and I spoke to the VCE Program Coordinator. From memory, what he said to me back in February was “The defence force. What they’re looking for is a C average but that’s sort of arbitrary. It could mean a lot of things. We don’t know yet what they mean but come in and we’ll help you out and we’ll get you started”. So, there was no issue there. He said the sensible thing would be to do both English and Mathematical Methods. I didn’t get a C average for English either so I thought “yeah, the defence force wants that and the uni’s will want it, prefer it”. So I did that.

David’s story could be interpreted as a narrative of transition (Gray, 2009). After his epiphany that he could do something more with his life he then relates a journey of self discovery and reengagement with formal education. In retelling this journey he stresses the different options that he considered and what affected his decision to accept or reject each option. In each instance the educational institution is presented as initially being encouraging, even eager, for him to consider enrolling in their course.

McInnis et al. (2000, p. 1) noted that many students are not “well-informed about the nature and demands of courses” during the recruitment and selection process. They suggest that this sets up a mismatch between the prospective students optimistic expectations of their academic ability, their capacity to handle the workload, and the institution’s expectations of reality. However, David presents a realistic evaluation of the factors limiting his capacity to make a successful transition to each formal learning environment: he would struggle with the crash course; summer courses were not acceptable; and completing an online course would be challenging.

As mentioned earlier, David is surrounded by family and work colleagues who have or other professional backgrounds. It is possible that their advice and stories also influenced David’s decision making process about the merits and potential hazards of each of the learning options that he considered. In the end David just gave up and chose
the course that both the university and the Defence Force prefer – VCE Mathematical Methods.

**Changing the Narrative of Resistance**

One of the key themes investigated throughout the interview was how David adapted to returning to study given his prior “dissatisfaction with the school experience” (Volkoff, et al., 2006, p. 38). In particular, how he dealt with the anxiety adults often feel when returning to study Mathematics (Wedege & Evans, 2006). His responses provided a detailed description of how he integrated his studies into his daily life: at school, at work and at home. We start with a description of why David chose to do English and Maths at different campuses

> Well I was working fulltime. So I worked out my timetable. I was going to do it at campus 1 but [...] I was looking for a smaller class size, and then your timetable was the two hour separated blocks. So I thought “Oh I’ll do, my English there, and do my maths here”.

> Work had to accommodate me, because it was related to work. Sometimes I’ll have a whole day free. So I’d sit on a computer and just study. Mark would sometimes say “Jesus, studying enough are you?” (laughs). Oh, everyone’s admirable when you’re doing something like this. Like the guy that I used to work with, he said “Oh, I was speaking to Kenny, you should do what David’s doing, he’s gone back to school and he’s doing this”.

> It did affect the relationship with the girlfriend a bit, ‘cause she was like “Oh I was an Ace at methods when I was at school and I didn’t need to study as much as that!” (laughs). I need, at least a Saturday to sit down and do it. Because it was demanding I did have to take more time than others. But, at the same time, I did my absolute best; I went overtime to make up for it.

> I also had to get myself a tutor. I thought “Nup, there’s no way I can to do this without a tutor, because I haven’t done Year 11”. So I got myself a tutor and I went there every Saturday morning at 10. I ended up getting another tutor, so I had two tutors on the go by the end, coming up to the exams (laughs).

> September last year was when I started to look at Maths Quest 11. I went through it and that was really straightforward. I came in thinking, I did think it was going to be difficult, and yeah I certainly found it really challenging. But, it was doable, just with practice.

> When we got a bit through the year we were looking at each other, and we was talking to each other and we were going ... And Edward (a pseudonym) was saying “I want to understand, everything. I want to understand, just by looking at that quadratic […] what’s going on with that”, and I said “No. You’ve just got to [...] just break it down. Go through the sequences that we’ve been taught and then you’ll be able to”. You know? So it was trying to, letting go of that - saying “Oh I need to understand it in depth otherwise I don’t feel confident”.

Page 74
When you learn the rules, that’s what gives you the confidence. Because you know how to break it down.

I’ll also mention Youtube’s helpful now-a-days (laughs). The technology has improved so that you can look up, y’know, MathsOnline[.com.au] and stuff, that wasn’t around when I did it in 1998. But, I’d only discovered it when we were up to, chapter 9 or 10.

Throughout the year David took advantage of serendipitous opportunities to broaden and enhance his access to alternate forms of help. At the beginning of the year he used more traditional student centred approaches such as revising the Year 11 curriculum and accessing a tutor. He also took advantage of a very supportive workplace to enhance his opportunities for study.

Some studies have noted that supportive peer networks and relations are often “associated both directly and indirectly with persistence” (McInnis, et al., 2000, p. 31) and performance. In David’s case both his employer and his work colleagues actively supported his return to study. Thus, possibly, David had a greater degree of autonomy and social integration between ‘school’ and work environments than is experienced by many other adults returning to study. By participating in an academic peer network David had the opportunity to compare and exchange strategies for coping with the demands of the course. Through extensive use of his personal networks David was actively utilising the “three types of support that promote success, namely academic, social and financial” (Tinto, 2005, p. 91). For David the academic support was provided within the institute through participation in informal study groups, and externally with the two tutors. Social support in the form of mentoring was also provided through family and work networks.

5.1.4 The Self Regulated Learner
This section is an analysis of the factors that enabled David to persist in Mathematical Methods, despite having to deal with some significant life issues. However, first I will explore some of David’s reflections on the few occasions when he has considered withdrawing from a course, including one significant issue that arose during the year of the study.

Maturity and coping with failure
Towards the end of the interview I explicitly introduced the topic of non-persistence to explore if David had contemplated dropping out at any stage during the year. He responded:

No [...] I was pretty confident. [...] as far a maths would go. I knew it was a strength. And I knew I was mature enough to, (coughs) confident enough that I’d done these past, aptitude tests, and done well on them. I’m not 18 year old anymore, and I don’t think “what’s this useful for?”. [...] I’m just trying to think of where I have felt that, where I wanted to drop out, and, to me that’s only been in the army. [...] I wasn’t passing the shoot. I couldn’t pass so I had to go back. [...] I mean, that was when I felt a bit demoralised. But as far a maths would go. No, ’cause I knew it was a strength. [...] So, you look at it as knowledge is power and think “oh let’s keep going, and let’s get this under me belt, and I’ll feel really good about it later on”

Up to this point in the interview David had outlined how challenging he had found the Mathematical Methods course. He also detailed how his extensive study regime had enabled him to successfully complete the course. From personal experience I know how draining such a heavy workload can be, especially when combined with full time employment. Therefore I was surprised by David’s instant negative response to the suggestion that he may have considered withdrawing during the year.

This time David associates maturity with self confidence and a clear understanding of how the present links with future aspirations. There is a strong sense that he sees maintaining a positive attitude as being a defining characteristic of a mature person. He was confident maths was a strength because he had done well on past aptitude tests. He also knew that if he persisted he would feel really good about it later on. This was further illustrated by his detailed story about joining the Army reserves. He asserts that this was the only time he had felt demoralised and had considered dropping out.

A little later during the interview he detailed his experience with squatters in his house during the first half of the course. This was a significant life issue which could easily have led to David’s dropping out. However, David suggests that the active participation in the Mathematical Methods class acted as a distraction from the stress. He believes that his grades were better during this period because the stress helped him focus and actively engage in his studies. Once again David talks in terms of an emotive connection to the Math class - I wanted to come here, and I wanted to keep doing it, and it was fun.
I think it’s mostly the class dynamic. And how we all keep ourselves entertained, and joke to you, and then you … joke and then it gets us interested. […] We’re not kids and we don’t go “Oh what’s he on about” (laughs) so that makes it interesting, and that comes with maturity doesn’t it … I mean that’s good, that’s enough to bring you here really. I mean, my job it sounds good, but I’m in an office where there’s one bloke that’s got the personality of a pot plant (laughs) […] And I’m in my car all day by myself dealing with traffic, and idiots, and getting abused. Which is entertaining (laughs). So it’s good to come here and mingle with young people and tell jokes and stuff. And I don’t think they appreciate that, the younger ones, because they’re young and they want to get out of school

For David another benefit of being a mature student is that he can appreciate the range of different approaches used by teachers to engage students in the learning process. McInnis et al. (2000) noted that a number of Australian studies of attrition in the VET sector had identified that the quality of the classroom experience was a key factor influencing the student’s decision to withdraw. However, as David observed, the quality of the classroom experience may also be determined by the students’ expectations. For example, the use of appropriate humour by both teachers and students enhanced the learning experience for David because he was intelligent enough to understand jokes like that. Whereas, he felt that the younger students didn’t have a similar appreciation because they’re young and they want to get out of school. The implication being that the younger students saw the use of humour in a Maths classroom as a distraction rather than an aid to learning.

As the interview progressed David’s observations of what it meant to be mature became more reflective, more analytical. At this point in the interview David’s comments suggest that he is equating age with the ability to be a strategic thinker. As an 18 year old he couldn’t be bothered with school because he couldn’t see any benefit. Whereas, now that he’s a bit older he has changed his point of view as he would like a job that is more intellectually challenging. He anticipates that in maybe in the next five years it’s possible that not having a degree could restrict his career opportunities. Thus returning to school is a natural consequence of his developing abilities as a strategic thinker as he gets a bit older.

Work Habits and Work Styles
Throughout the interview David asserted that his level of maturity was the reason why he did so well. However, as was seen in Danielle’s case, the transition into adulthood
does not necessarily lead to improved work habits (Corno, 2004). While detailing his approach to studying the various topics covered during the year David made the following observation about the link between maturity and the ‘principle of active learning’ (Hodgen & Wiliam, 2006, p. 4).

I think as you mature, I think you see patterns better. [...] And I think what helped me, because all I’ve done since Year 12 when I found Further Maths difficult, all that I’ve done [since] then is matured. I’ve been an adult in a working environment ... I haven’t had a challenging job. The only thing I can think of is I’ve done a lot of aptitude tests, in regards to the police force and the army, and I end up scoring quite well with them. But, I look through quite a few aptitude tests and that goes through a lot of patterns, and looking for attention to detail. That’s the sort of thing you learn in the army, attention to detail, and not giving up. Anything that’s difficult is worth doing. You know? You only learn that with maturity, don’t ya?

It appears that David’s efforts to join the ADF and the Police have indoctrinated him with the characteristics indicative of a deep approach to learning (Yorke, 2006, pp. 5-6). The process of completing a lot of aptitude tests has provided David with a practical understanding of what is required to improve his performance on a particular task: look for patterns, practice, attention to detail, and not giving up. This was then reinforced by David’s experiences with the Army Reserves, and possibly his earlier training for his commercial helicopter pilot licence.

As previously outlined, David has suggested that he was unfocused and disruptive when he first did the VCE. David suggests that his work habits and work style have developed as he has matured. He has learnt from the mistakes that he made in the past. He now considers himself to be a methodical learner whose preparation is meticulous, almost obsessive. In contrast to his previous experience of the VCE, David now has clearly focused goals for returning to study. Having made the commitment to return to study he moved from the motivational to the volitional state of mind.

**Self Theories of Intelligence**

David’s assertion that anything that’s difficult is worth doing suggests he has developed a “growth mindset” typical of students that “believe that their abilities can be developed” through hard work and engaging with challenging tasks (Dweck, 2007a, p. 8).

What makes students with an incremental view feel smart? Engaging fully with new tasks, exerting effort to master something, stretching their skills, and
putting their knowledge to good use, for example to help other students learn (Dweck, 1999, p. 4).

Further evidence of this mindset was provided at the end of the interview when David enquired: “Have you been able to get insight into the younger ones that were here and how they contrast with the [adults]?”. This provided an opportunity to more explicitly explore David’s self theories of intelligence

I see myself having good emotional intelligence, and physical intelligence, ‘cause I was always good at sport! And then I see other kids that are fantastic at doing maths, and they can do it like that, of the top of their head, and they’re … hopeless at sport … and I see that and I think they’re given that ability.

David sees himself as having good emotional and kinaesthetic intelligences. He clearly believes that individuals are born with certain aptitudes – I was always good at sports … other kids are fantastic at doing maths. Despite his good results during the year David doesn’t appear to include himself in the group of kids that are fantastic at doing maths. For David academic intelligence is associated with the ability to memorise facts and then intuitively develop a framework that shows how these facts are associated. This then allows you visualise mathematical problems so that you can break them down and think about the concepts involved in solving the question.

On further probing he speculated that some people may be born with the ability to enhance their intelligence over time. But that a key deciding factor would be the person’s level of interest- if it doesn’t interest them they don’t do it and then they don’t get good at it. While David seems to have an entity view of intelligence as a concept he seems to engage with different learning situations as if he held an incremental view. Perhaps this conflicting viewpoint is the difference between his lived experiences, for example training as a helicopter pilot, and what he has read or been told about the nature of intelligence.

5.1.5 Self-confidence in Mathematics
A learner’s preparedness for undertaking a particular course is often cited as one of the factors that contribute to non-completion (McInnis, et al., 2000). Academic preparedness is a particular issue for adult’s returning to study Year 12 Mathematics. David’s story provides us with the opportunity to study a case of a successful transition for an adult returning to study Year 12 Mathematical Methods without having attempted Year 11 Mathematical Methods.
Well I did probably the easier subjects in Year 12. I did my Year 12 in [19]98 … […] But, I didn’t like it! I liked some subjects. … Maths I didn’t mind, although I did find Further Maths difficult. (laughs) It goes to show coming back from then and then coming now and finding, and then completing Methods Year 12 straight away.

While David reported finding Further Maths difficult he appears to have maintained a positive attitude towards maths in general. Later in the interview he confirmed this stating that “maths was my stronger subject even though I didn’t get a good score, but I put that down to just not liking school back then”. While David didn’t specifically identify why he previously found Further Mathematics difficult he did note that in general he couldn’t concentrate in class.

Further Mathematics is an “elementary” (Forgasz, 2006, p. 3 & 7) course which is intended to be a “widely accessible” (VCAA, 2005, p. 9) preparation for careers where data analysis is important. However, Further Mathematics is not a good preparation for Mathematical Methods. There is very little overlap in the curriculum. In my experience most students report that they find Year 11 Mathematical Methods more challenging than Year 12 Further Mathematics.

Adults who choose to return to study Year 12 Mathematical Methods without having completed Year 11 usually require time to readjust to the ‘school’ learning environment (Bennison, 1998). However, David indicated that the start wasn’t as daunting as he first expected because he had been reviewing a Year 11 Mathematical Methods textbook, *Maths Quest 11* (Nolan, Phillips, Allen, Phillips, & Denney, 2006), since September last year. While David found Year 12 Mathematical Methods really challenging he concluded that it was doable with practice. He emphasised what he meant by doable:

David: Just … doing it. Y’know? […] When we got a bit through the year we were looking at each other, […] and we was talking to each other and we were going […] “I want to understand everything. I want to understand just by looking at that quadratic … what’s going on with that” […] so it was trying to, letting go of that … saying “Oh I need to understand it in depth otherwise I don’t feel confident” … and then when you learn the rules that’s what gives you the confidence. Because you know how to break it down.

Roy: yeah, so did you find as the year went through that you were getting a deeper understanding of the different concepts and things?

David: Oh yeah. Deeper understanding, but not ultimate understanding as you think you should have, but only a professor has, or people who develop
This vignette suggests that David has intentionally adopted an incremental approach to his studies. He focused on learning the background skills and knowledge and was confident that this would ultimately lead to a deeper understanding of the underlying concepts.

David’s strategic approach to learning was probed further using follow up questions about the relative difficulty of the topics covered during the year. David responded by asking if he could quickly look at the textbook, *Essential Mathematical Methods* (Michael Evans, Lipson, Jones, & Avery, 2005), which was on the bookshelf above my desk, then:

> I think most of the maths was fine. It was the extended response questions where they put in a … in a worded format … That was really daunting and it took many goes with the tutor to really understand how straight forward they were. As you break them down it’s easier to see the method of the writing. He’s asking a straight forward question and you just keep repeating it. You keep doing it over and over again and I can see the method, what he’s asking […] So, … I mean, just looking through the book (3 second pause) yeah and little tricks, that break them down, um (4 s pause) what else is (3 s pause) challenging (rustling sound – looking through the book) … Did a lot of (3 s) rates of change. I enjoyed doing those. Because you’d look at it, and it’s very complicated […] you’d look at the question at first and you’d just go “how am I going to do this?”. And then you just look at it and say “ah it’s that little technique where you’ve got to, we’ve got this rate, we’ll find that rate, and then we’ll combine”, and then you think “that was easy” … stuff like that

For David most of the maths was fine except for probability which he started learning too close to the exams. As the year progressed he realised that topics that were initially confusing, daunting, or simply hard were doable with practice.

Like Danielle, he found the worded questions more daunting than the regular exercise questions. However, once he was familiar with the style of the writing the interpretation of the math questions became straight forward as he could see how to break them down into the component parts. As noted by David, students may also struggle because of the lack of a background knowledge needed for particular topics. It has been noted that the “majority of students enrolled in the higher-level senior mathematics courses will be drawn from the top two quartiles of Year 9 achievement in numeracy and literacy” (McPhan, et al., 2008, p. 25).
Even though David found some topics very straightforward he was still often frustrated by small gaps in his knowledge. After discussing why he found some calculus topics easy he suggested that, while doing this advanced bit he was lucky not to get caught out as he was still making some very silly errors because: “I was at that very start where I was still learning most of my algebra”. While these small frustrations did result in a raised level of anxiety during class, it stressed me out even more, David also found enjoyment in developing a deeper understanding of challenging topics.

5.2 Ryu’s Interview
During each interview the participants were given the choice of selecting their own pseudonym. Ryu selected his pseudonym because he liked all things Japanese. He is in his late twenties, married and has 3 children under 5.

Ryu arrived early for his interview. He had received his exam results that morning and was in a very jubilant mood. This sense of euphoria may have led Ryu to be more uninhibited in his comments than the other two participants. Ryu talked with enthusiasm, using many colourful phrases and extensive modulation of his voice. The entire interview was a high energy, emotional, roller coaster.

5.2.1 Learning Trajectory
Like Danielle, Ryu was also an early school leaver. He left halfway through repeating Year 10 to take up an apprenticeship. However, unlike Danielle, Ryu presents a ‘warts and all’ story which is self reflective from the start. The following narrative is an outline of his response when asked to tell a story about his family background, prior experience of schooling, and the circumstances that led to his decision return to study the VCE.

**Ryu’s Story**

I was raised by religious fanatics. Up until I was about 17 I actually believed that I believed. But, to be completely honest, in hindsight it was me just trying to believe. So, yeah, I can understand why I left school as soon as possible. That was Outer Melbourne Christian College [a pseudonym] and God anyone listening to this tape – don’t send your children to that school.

I was told, don’t believe in common sense, bloody, believe in the bible and have faith. Don’t enter the world’s view, basically, don’t succumb to the world. So, yeah, nothing made sense. So I just thought “fuck them (sorry about the swearing) – got to get out of here – get a job – get a life”. I wasn’t thinking of leaving the church just try and make sense of life.
Move out. Get a place. Well, I moved out with my fiancée at the time, who is now my wife. It was a slow process but I finally actually worked out that I was brighter than the average Joe Blow. Not somebody who could be constantly considered a complete moron with no brains, because that was what I was led to believe as a child. I left school because my teachers told me I was hopeless and not worth the effort. Well, not in so many words, but ....

I left school halfway through my second shot at Year 10. The first time, I passed Year 11 Physical Education but failed all my Year 10 subjects. At the time I was working part time at the bakery and somebody offered me an apprenticeship and I said “No I want to finish VCE first”. When I failed Year 10 I just thought “Oh well, obviously school is not my strongest side at the moment”. So I went back and said “Well, I think I’ll take you up on that offer now” and they said “too bad, the jobs gone”. But a few months later they quit. So, I stopped school on Tuesday and started in the bakery on Wednesday.

So that’s why I got out of school. I mean, it was leading nowhere for me. No-one thought I had one iota of a brain cell. As soon as I got into the bakery I couldn’t understand why people couldn’t learn at the trade as efficiently as I was. After a while I was teaching them tricks. So I thought this is a bit hilarious. I guess I’ve got a bit of an attitude towards work. But after a while it just got ... terrible. I couldn’t stand it anymore. They’re very bright in their own way. But I felt like I was surrounded by people that were doing a task that anyone could do. So, that’s why I went back to study. I felt like I’m a bit brighter that the environment that I’m in. That’s the main reason. Also, all the qualified bakers I know, that’ve been in the trade longer, are just nuts. They’re on antidepressant medication and all that stuff.

Well, pretty much everything I’ve put my mind to at the moment, I’ve been able to do. So I thought “I’ll start playing golf and maybe I’ll become a pro golfer”. But it was a busy time for bakers and I didn’t have enough time to play golf. I thought this is ridiculous. Whatever energy I’m able to put in I want the benefits to build up. If I can only put in half the amount of energy then I’ll never be a pro-golfer. But if I put that energy into some study and build it up, and build it up, and build it up, well then I should be able to achieve anything.

So, that’s pretty much why I set my goals on medicine. That’s what I want. I actually called the Uni and said “is there a mature aged entry of some sort”, but the guy just pretty much laughed at me. He said “look just go back to school and do your VCE”. I just thought “hey that’s fine”. I mean, to be quite honest with myself, from my previous record at school I wasn’t that great. So even if I do half heartedly believe that I can do it - I should maybe go back and prove to other people that I’m capable of doing it. So, I’ll do part-time school.

That’s pretty much it. I’ve always liked maths. So, of course, I didn’t want to do a lower level, and it would be nice to have higher level subject like Specialist. So I thought “well if I get my English and my Maths skills up to scratch then I should be able to tackle the more difficult subjects”and I just did Psychology because I’m interested in Psychology. I want to be a Psychiatrist, that’s my fascination.
Like many other early school leavers who had returned to TAFE Ryu “identified the ‘push factor’ of negative experiences of school” as his main reason for leaving school (Wyn, Stokes, & Tyler, 2004, p. 23). The final factor that influenced his decision to withdraw was his poor results which meant that he would need to repeat Year 10. This appears to have been exacerbated by a lack of “effective learning support and encouragement” (Volkoff, et al., 2006, p. 39): *I left school because my teachers [insinuated that] I was hopeless and not worth the effort.*

Prior to attending the interview Ryu had *found a few assignments* from his *earlier years and they all said A*. While he admitted that he had *probably just kept the A’s and threw out the rest*, when considered in conjunction with his performance in a Year 11 subject, they suggest that he had the aptitude and interest required to complete the VCE. Thus validating his assertion that it was his parents’ and school’s focus on religion which forced him to leave school so he could *try and make sense of life*. Ryu also reported that the initial “pull factor” (Wyn, et al., 2004, p. 23) of the offer of an apprenticeship was negligible. However, its availability was one of the factors that influenced his eventual decision to leave school and *get a life*.

Like David, Ryu conveyed a story about personal growth since leaving school. His ‘narrative of transition’ started with his *being able to buy a house, some nice cars, and do some renovations*. Then he decided to become a *pro-golfer*. This goal was reassessed when he had the opportunity to do a significant amount of overtime. So he changed his focus to going back to school where “*whatever energy I put in will build up and I’ll be able to work myself to something better*”.

Ryu’s ultimate goal is to study Medicine and with the goal of becoming a Psychiatrist: *that’s my fascination and I guess it’s mixed up with the religious background*. Once Ryu became financially secure it appears that he started re-evaluating his career in terms of a sense of accomplishment. Possibly, he has also come back to prove to other people that he is capable of doing it – to show his parents, and former teachers, that he is an intelligent productive member of society and not *a complete moron with no brains*.

### 5.2.2 Family Background

During the interview Ryu was very animated during his discussion about two topics, his current work environment and his parents. However, there was a definite sense that Ryu
was self editing the story about his family background. The following extract is presented in a predominately verbatim format in order to convey some of the emotional atmosphere I experienced during this portion of the interview. Individual words emphasised by Ryu have been underlined. Points where Ryu significantly modulated his voice have also been identified by appropriate terms in parentheses.

I was raised by religious fanatics […] My mother just took me to every bloody Christian church there is around this around this bloody [side of Melbourne], going up to the city, everywhere, so. Don’t ask me what, one my mother classifies herself as. I don’t care! I just call her a freak now. She’s gotten used to it. Um, don’t get me wrong they’re. I get along with them, fine now … (quietly) getting used to it now, yeah now that, (louder) but yeah, no, I can understand why they still, want, my … nothing made sense … I was told “don’t believe in common sense”, bloody, “believe in the bible and have faith … don’t, enter the world’s view”, or, (quietly) something. Basically, don’t succumb to the world … So. Yeah, no, nothing made sense so I just thought fuck them, sorry about the swearing. (louder) Got to get out of here … get a job, get … get a life. I wasn’t thinking of leaving the church. Just, try and make sense of life and move out. Get a place. Got married.

This was the only instance where Ryu talked about his family background. During the remainder of this interview I chose not to pursue the issue of his family background as it was obviously still a very sensitive issue. From my perspective Ryu had been a member of a subculture which was unfamiliar to me – fundamentalist Christians. I felt that investigating this aspect of his background would require considerable empathy and consequently more time than was available in a single interview.

Ryu attended a school that espoused his parents’ values and beliefs. For Ryu being raised by religious fanatics was the reason for his early school leaving. As a child he was led to believe that he was hopeless and not worth the effort. While he clearly attributes some of these opinions to his teachers the source of others is more ambiguous: No one thought I had an iota of a brain cell. This narrative suggests that for Ryu there was no separation of school and family life.

Woven throughout Ryu’s story is the assertion that he has ‘risen’ above ‘blind’ faith to embrace a more rational, objective, ‘common sense’ view of the world. However, the oscillations between Ryu’s highly emotive reflections and his attempts to analyse and qualify his statements suggest that he is still trying to negotiate the disparity between his parents’ and his own beliefs. During the interview he suggested that understanding his
parent’s ‘religious fanaticism’ has influenced his career goals: *I want to be a Psychiatrist - that’s my fascination and I guess it’s mixed up with the religious background I have.* He gives the impression that he associates his parents’ *mind frame* with the *psychological symptoms* of a *physiological illness in the brain*. He would like to learn how to put himself in *same sort mind frame* so that he can see *ways that they can take steps to help* themselves get better.

### 5.2.3 Help Seeking Behaviour

**Returning to study Advice**

For Ryu, the decision to return to study was mainly due to a growing dissatisfaction with his current career. He decided that if he put all his available *energy into some study* then he would *be able to work* towards *something better*. Having made the decision to *go back to school part-time*, he set his *goals on Medicine*:

> Well, I actually called the Uni and said “is there a mature aged entry of some sort?”, but the guy just pretty much laughed at me (faint – unclear) And he said “look just go back to school and do your VCE”, and when I tried to ask him another question I could obviously hear the overwhelming frustration on the other end of the line, and I was like “Don’t worry about it. I’ll go do my VCE, it’s good!” (sound of thud) he hung up on me (Roy laughs) So, he wasn’t very helpful

Ryu’s vignette would suggest that the Medicine course advisor was unprepared for an enquiry about mature aged entry. Later I probed further into his prior knowledge of the prerequisites for entry into the courses he wanted to get into. Ryu acknowledged that at the time he had done *no research into it what so ever* […] *I’ve got to start doing some research into it*, adding that *that’ll have to wait until next year*. Next year, 2010, he also intended to *write up a plan and do a course on web searching* because that’s his *major weakness*.

Bandura (2001) noted that while intentionality infers the need for a plan of action “*future-directed plans are rarely specified in full detail at the outset*” (p. 6). To achieve the vision of a future goal individuals need to identify sub goals that can be used to “*guide and keep one moving ahead*” (p. 6). For Ryu, the advice of the course advisor, ‘*go back to school and do your VCE*’, was compatible with his intention to put his available *energy into some study* which would incrementally *build up* so that he *should*
be able to achieve anything. Doing well in the VCE, through part-time study, became his proximal goal for the achievement of his vision for his future.

**Returning to Study the VCE**

As outlined earlier, prospective students are able to access career and course advisors both during the recruitment process and after enrolment. All prospective students complete an English assessment, and if appropriate a Maths assessment, to help them select a study program that will both meet their future needs and is achievable.

I just thought fine well I’ll definitely need to improve on my English. That was something I was always aware of, my English was terrible … as far as writing went it wasn’t up to scratch. So I thought, well I’ve always liked Maths … I was actually wanting to go into Specialist Maths, but obviously that wasn’t an option after you gave me that first test and I had no idea […] I got four right out of … I don’t know out of how many, probably 20 or 30 … So I said “yeah, Okay, I’ll take your advice. I’ll go and do Methods” … I’m glad I took the advice too. I struggled enough with Methods!

Despite failing Maths in Year 10 he had a high level of interest in the subject, “I always like maths”, and wanted to do the most challenging Mathematics course. While most of his statements are consistent with the type of advice that would be given during the enrolment process, there are some inconsistencies in his recollections. Based on the low score for the maths assessment he was most likely advised to do Year 11 Mathematical Methods, or Year 12 Further Mathematics, rather than being advised to do Year 12 Mathematical Methods. As outlined earlier, before enrolling in the VCE Ryu had no knowledge of the prerequisites for Medicine courses. However, he did recall that there was some discussion about prerequisites during the enrolment process: *Psychology, it’s not a prerequisite for anything, that’s what you told me at the time … I know I don’t really need it for anything, but, it’s my interest.* At the end of the interview I asked Ryu about the subjects he planned taking in the coming year: *Chemistry, Biology, and Physics.* These are the difficult subjects that he intending tackling after he had improved his study skills. Once again Ryu would have been advised that all three subjects assume that students have an understanding of the Year 11 course material.

**5.2.4 The Self Regulated Learner**

**Reasons for Completion**

At the start of Ryu’s interview I identified that one of the goals of the study was to discover “if there are any times when people were thinking about dropping out of
Maths”. Ryu responded: *Oh, I panicked a bit when I got stressed by work, because I thought I was going to completely screw all my results and everything.* At the beginning of term three Ryu went through a pretty rough patch at work and *had to go on stress leave* which *made life very very interesting and stressful.*

Out of all the bakery jobs in the […] area I was probably getting the highest pay … which was what retained me there for so long … it’s just that I felt, “narr I can’t do this for the rest of my life, I’m miserable here”, and so I just left … it was just terrible, I hated it, absolutely hated it. […] I just realised. Well, I didn’t really realise, I wasn’t willing to accept, leaving. But I had too. […] I wasn’t going to stand for a formal warning when I was giving them so much extra time. And just when I try to take a little bit back they say I’m going to suffer a warning. No, I couldn’t accept that. […]Oh, I didn’t say to them that this is no longer my priority, but basically I’ve been giving you so much extra hours. I’m studying now. I’m trying to do a best job of this. I can’t, donate, all these hours to you. They just, sort of like, shrugged their shoulders and walked off really. They didn’t really answer to it. So I … started taking longer breaks, because I was always working over, and they tried to give me a warning for it.

Personal factors, especially financial, employment and family commitments, are identified as the reasons for withdrawal more frequently by “older students compared with younger students” (McInnis, et al., 2000, p. 37). Part-time students are more likely to withdraw than full time students because they often older, with significant family and employment commitments, and they are also likely to be “taking on ambitious workloads” (p. 37). Ryu is an older part-time student with a young family and an ambitious workload, both at ‘school’ and work. However, he chose to withdraw from his work place rather than ‘school’. This withdrawal process also involved a complex interplay of factors which of occurred over time. As outlined earlier, Ryu had returned to study because he wasn’t *happy with his job* as a baker. He also alluded to the stressful nature of the workplace.

In hindsight, Ryu recognised that despite his appreciation of the stressful nature of his workplace he didn’t recognise the onset of stress in himself. Ryu’s use of language to describe his current situation in the workplace, “*I didn’t really realise, I wasn’t willing to accept, leaving*”, is very similar to that used to describe his growing dissatisfaction with his religious upbringing, “*I was trying to convince myself. I actually believed that I believed*”. Ryu’s description of his workplace suggests that he had invested in a work ethic of personal excellence and mutual obligation. Bandura (2001, p. 9) asserts that “it is not uncommon for individuals to invest their self-worth so strongly in certain
convictions that they will submit to harsh and punitive treatment rather than cede to what they regard as unjust or immoral”.

I never even planned on quitting. I wanted to keep my job. Even through the first years of Uni (faint) just because I … God, I never wanted to face this sort of … (louder) situation. But now that I’m here I’m glad, because it really was running me into the dirt. (faint) It really was, I had, pain. Obviously, my doctor gave me stress leave and everything. I’ve been to a Psychologist about it. And I just realised how, really, it was running me into the ground.

While work was no longer his priority Ryu had intended to keep his job as a source of revenue to support his family while he studied. Just before the incident at work he was putting a lot more energy into his study of Mathematical Methods. Thus the combination of his study and work workloads was creating a significant amount of stress.

This conflict between his desire to study and his need to work was having a significant impact in his health and well being. With the help of a Psychologist he realised how it was running him into the ground and he made the decision to leave work and continue with his studies. It is clear that Ryu was still uncertain about the advisability of this decision until he received his exam results: “I never wanted to face this sort of situation. But now that I’m here I’m glad”.

**Work Habits and Work Styles**

Ryu attended the first class with an expectation that he would have no bloody idea what the teacher was talking about. He also had a strong belief in his own intelligence and a determination to do well. Here he reports on the phenomenal level of effort needed to acquire the requisite background knowledge and skills to achieve his goals:

> At first it was like, 4 hours a day, 5 days a week, at first almost. As it got on, I realised that I, really needed to spend a bit more time on other subjects and so it dropped quite dramatically there for a period … and then, just before … that, incident at work … I was putting a lot more energy into it. […] Toward the end of the year I realised I’d just have to start accepting the rule. Rather than … putting so many hours into trying to understand why the rule works.

While Ryu was highly motivated to learn he continued to struggle with the curriculum content for most of the first term (8-10 weeks). “Insufficient academic progress” (McInnis, et al., 2000, p. 29) can often result in students re-evaluating their motivation for learning mathematics and they eventually stop attending class. However, for most of the year Ryu’s goal was “to learn in order to understand” (Assessment Reform Group,
2002, p. 2). It was only toward the end of the year that Ryu temporarily abandoned this approach. With the proximity of the external exams Ryu realised he would need to just accept the rule for now and try and work that out later. This demonstrates a high level of “self-regulation” and “locus of control” as he clearly feels that he is in control of his own learning and able to evaluate his own work and “make choices about what to do next” (p.3).

**Self Theories of Intelligence**

Ryu’s reflections about how he approached his studies in Mathematical Methods suggest a preference for a deep approach to learning (Yorke, 2006). He wants to understand everything about each topic, not just the procedure, but the historical context and why it works. During the course of the year Ryu appears to have developed a more strategic approach to learning (Yorke, 2006). While he really wanted to understand everything, in the maths class, he had to accept that there were some things he just did not have the time to understand. The implication being that Ryu was running out of time to prepare for the end of year external exams. Ryu’s discussion of his approach to learning demonstrates all the characteristics of a student with a “growth mindset” (Dweck, 2007a, p. 8). He believes that over time his abilities will build up and through sustained effort he should be able to achieve anything.

**5.2.5 Self-confidence in Mathematics**

As with David, Ryu’s story provides us with the opportunity examine the maths background of a student who successfully re-engaged with a Year 12 Mathematics subject. As an early school leaver Ryu’s story also shares common elements with Danielle’s story. Both Ryu and Danielle left school before successfully completing Year 10. Both also professed an abiding interest in Mathematics despite their negative experience of school.

**Reflections on past experience**

During the interview Ryu reflected on his past experiences of mathematics in both the workplace and during his early schooling. It would seem that he liked maths because it was the only subject that was not ‘tainted’ by the school’s value system. It was the only thing that made sense. For Ryu his only real recollection of doing maths at school is from when he was in Year 4 or 5. He describes his sense of wonder while watching the
students in Year 6 do their speed timetables on the board at the front of the room. Ryu’s approach to learning his timetables was to work out patterns which aid instantaneous recall. Rather than memorise his timetables he developed strategies to aid the recall, or mental calculation, of the product of two values. These strategies were essentially worded algebraic equations. Ryu’s memory of these strategies was so strong that he was able to provide a detailed example of the process for the nine timetables.

Ryu reported that he had left school because he felt his teachers believed that he was hopeless and not worth the effort to teach. Despite this, when he applied for an apprenticeship he was still confident in his ability to do maths.

When I applied for the job, they said “are you good at maths”, and I said “yeah I’m good at maths, I’m always thinking about it”. Yeah and I’m sitting there thinking “great, I’m going to be working with equations each day”, (quietly) what crap that was. […] yeah, you don’t need maths to be a baker.

This vignette supports Ryu’s earlier contention that he was brighter than most of the bakers in his workplace. He provided detailed examples of how bakeries use standardised bags of premixed ingredients. Like many adults the mathematics that is implicit in Ryu’s daily work tasks is “unrecognised” or “invisible” mathematics (Wedge & Evans, 2006, p. 34) - you don’t need maths to be a baker.

**Review of current approach to learning**

As with David, I asked Ryu to tell me what he remembered about the math classes from the start of the year. He responded that he remembered the very first class and that it was:

Fantastic. I loved it. I’m sitting there thinking “I have … no bloody idea what you’re talking about. That’s cool. All these people around me might know, but they don’t have my bloody will power” […] So yeah, I remember you saying things, going “this is the Cartesian plane” […] it’s like, bloody hell. I was looking at all these things and (quietly) thinking (louder) “How do you expect me to understand this?”. Anyway, I’m jotting it down, jotting it down.

For Ryu returning to the mathematics classroom was viewed as a positive, rather than a “humiliating” (Gustafsson & Mouwitz, 2004, p. 3), experience. During this class he exhibits a high level of determination to succeed – “they don’t have my bloody will power”. While at the same time his confidence in his Mathematical ability appears to be low – “How do you expect me to understand this?”. Similarly, Carmichael and Taylor (2005) suggest that older tertiary preparatory mathematics students “may have gained
through life’s experiences a determination (as opposed to a confidence) to overcome” inadequate prior knowledge and skills and succeed (p. 718).

FitzSimons and Godden (2000, p. 19) suggest that “although adult learners tend to be highly motivated to learn, they lack confidence in their ability to do so and require continuing encouragement”. In the following extract Ryu provides a summary of his approach to the study of mathematics during the year.

I knew, as soon as I looked at it, I would always be able to see the logic of it. Because I knew from my previous academic experiences, it’s just like, well 2 plus 2 equals 4. Yeah, it makes sense. And there’s no section in maths that … if I applied enough thought to it I didn’t comprehend, didn’t make perfect sense. Now I had to accept, throughout this year, that some things I just did not have the time to understand. […] There were certain things that I just looked at it and I said “okay I just don’t get that. Just follow the rule and it should work out” […] if I use the rule that’s common sense, that … it always worked out … But, at the start of the year I just really wanted to understand everything. But I didn’t have the time.

Ryu’s definition of success is clearly located in the incremental mindset with learning goals as the primary objective of his participation in the VCE Mathematical Methods class. However, he is also capable of taking the common sense approach by using established “techniques, routines and processes” (VCAA, 2005, p. 152) to solve unfamiliar problems. Ryu also noted that during the year this common sense approach to study had some limitations. Toward the end of the year Ryu started to make links between the various topics:

I remember, probably about … coming towards the end of the term. I’m sitting there going “jeezs why didn’t you tell me this like, ages ago, and I would have understood it”. […] and then I looked back at my notes and it was written there on the first bloody page. But I didn’t realise that until after my exams (laughs).

Even after the exams Ryu was assessing the effectiveness of his learning strategies and identifying areas of future improvement. In addition to a determination to succeed he also possesses several of the key characteristics which influence a student’s motivation for learning. His incremental mindset, high levels of self-esteem and self-efficacy, underpin a strong belief in his ability to learn despite his prior disrupted schooling.
6 Discussion
In the previous chapters I analysed and discussed the insights gleaned from the interview with each individual student. In this chapter I aim to consider the wider implications of the findings by examining the similarities and differences between the three cases.

First I will present an overview of the findings using the key themes identified during the analysis of the individual stories. The next section will briefly discuss these students’ learning trajectories and their similarities to the recently documented narratives of resistance and transition noted amongst some secondary school students who struggle to stay at school (Gray, 2009). Next, I will briefly discuss how well my findings link with the well known attrition issues identified in the literature review. Finally, I focus on the two ‘new’ strategic approaches, identified in the analysis, which have the potential to improve retention by helping students become more proactive self-regulated learners. Throughout this chapter text which is quoted from a participant’s interview will be italicised.

6.1 Overview of the Findings – Learning Trajectories
For a summary of how the key themes identified from the analysis relate to the experience of leaving school and returning to study for these particular students see Appendix E.

6.1.1 Prior experience of school
Each of the participants expressed a general dislike for school which led to varying degrees of disengagement. David’s resistance to school was expressed in terms of ‘doing time’ (Zyngier, 2004). David’s reflections on his experience of schooling suggest that his persistence was due to the expectations of his professional family. David’s disengagement from school appears to go against the trend noted in the literature where the synergy between the home and school cultures would be expected to lead to increased engagement (Zyngier, 2004, p. 9).

For both Ryu and Danielle the requirement of repeating a year level appears to be the trigger for their early school leaving. Though there are significant differences in how the students define the factors that led to their decision to leave. Ryu attributes much of the
‘blame’ to the religious nature of the school culture. Like David, there is a sense that he was trying to assert control over his own destiny by reacting against the dominant home and school culture. The availability of an apprenticeship essentially acted as an escape valve in the sense that it was an alternate educational pathway that was acceptable to both himself and his parents.

In contrast to Ryu, Danielle claims ownership of the process of leaving school. Her reflections suggest an ongoing process of disengagement and alienation from school which was marked by not doing homework and truancy. She is one of the ‘at-risk’ young people who strongly assert that “they are in control” (Zyngier, 2004, p. 12). While Danielle successfully repeated Year 9 she didn’t like the experience. Rather than go to another secondary school she enrolled in the General Certificate of Adult Education at TAFE. On completion she worked for six months and then returned to TAFE to enrol in the VCE. For Danielle the reasons for returning to study appear to be a complex mix of the recognition of societal expectations, personal agency, and parental expectations. This transition narrative will be discussed in more detail in the next section.

6.1.2 Alternate pathways to work and learning

For each of the three participants disengagement from schooling was not the same as disengagement from education. Ryu’s decision to leave school was a rational choice which would have received ‘cultural support’ as an apprenticeship is an approved pathway out of compulsory schooling (Munns & McFadden, 2000). For both David and Danielle their interrupted learning trajectory “could be looked upon as a moment of ‘cultural fracture’” (Munns & McFadden, 2000, p. 60). For Danielle, there is a definite notion of education as unfinished business despite her uncertainty about the future. While for David the point of fracture was in his initial rejection of the familial cultural norm, he had no ambition to go to University.

For both David and Ryu the various work cultures helped them develop an awareness of their world view and a vision for their future. For both participants once work had enabled them to become financially secure they grew increasingly dissatisfied with the status quo. Prior to returning to study the each had concluded that while their respective jobs were physically challenging they were not intellectually stimulating. Significantly,
both David and Ryu describe a process of disengagement and alienation, from their respective work cultures, which were similar to their previous reflections on the process of disengaging from their respective school cultures. Both had engaged in a range of formal and informal learning activities prior to making the decision to return to study. The lived stories of David and Ryu provide support for the metaphor of “learning as becoming” where learning took place “through participation in many different situations” which enabled the participants to undertake a “(re)construction of their own habitus” (Phil Hodkinson, Biesta, & James, 2008, pp. 40-41). David, in particular, was cognisant of this. He attributed his comparatively higher level of engagement with the current learning context to the process of becoming a mature adult.

6.1.3 Decision to return to study the VCE

The participants’ stories about the returning to study decision process provide examples of some of the many reasons young people choose to study VCE Mathematics at TAFE. David’s return to study was supported by a well researched investigation of the alternate educational pathways available to him as a Year 12 completer. His enquiries also took into account his multilayered career aspirations. The litmus test for each alternate educational pathway was its level of legitimacy for entry into either the ADF as a pilot, an Engineering course at University, or the Police Force. Thus David has made a positive informed decision to return to study two VCE subjects with a clearly identified objective related to his future career and further study options. David also returned with the knowledge and support of his employer.

In contrast, Ryu’s return to study was more abrupt, having made the decision that education was the only viable pathway out of a job which he hated. Ryu set his goals on becoming a Psychiatrist and briefly discussed his aspirations with a course advisor at a local University. He was advised to finish his VCE before applying. He did little independent research on alternate pathways or the prerequisites needed to study Medicine. As with some other early school leavers he was effectively ‘pushed’ into the VCE at TAFE as the only viable/recognised pathway to further study at University (Volkoff, et al., 2006). However, Ryu quickly asserted ownership over the process by realigning the focus of his return to prove to other people that he was capable of doing the work.
Unlike David, Ryu selected VCE subjects which were not necessarily prerequisites for his future study aspirations. In particular, despite performing poorly on the pre-enrolment assessment he chose to study Year 12 Mathematical Methods. He justified this decision by asserting that he was *always interested in maths* and wanted to do the most challenging option available.

As outlined earlier, Danielle only experienced a short break from study after attending the CGEA at TAFE. In common with other recent early school leavers Danielle views TAFE as legitimate alternative to school where she will be treated as an adult and has autonomy (Volkoff, et al., 2006, p. 45). Unlike David and Ryu, and similar to other young early school leavers (p. 46), Danielle continued to study VCE despite having no plan for her future other than a vague dislike for the type of jobs you can get with a Year 10 pass. Like Ryu, she chose to study Year 12 Mathematical Methods, despite failing the subject in Year 11, because she had always liked maths. It was the only subject she *tried really hard* in while at school and she *knew* that she was capable of doing it in Year 12 if she tried.

### 6.1.4 Adult Learner of Mathematics

All three participants indicated that they had left school with a general dislike for the learning culture of their respective secondary schools. However, at the same time they also reported a positive experience of learning mathematics while at school. This finding was unexpected. I had expected that the participants would see previous “negative experiences” of school mathematics as having “a strong inhibiting effect” on their current studies (Gustafsson & Mouwitz, 2004, p. 4). However, it does support previous observations that a student’s “sense of belonging” to the learning culture has little influence on their performance in secondary school mathematics (McPhan, et al., 2008, p. 17).

What is clear from the findings is that “the self-perception of the learner about their ability to learn” (FitzSimons & Godden, 2000, p. 17) does appear to have a positive influence on their persistence and performance. The findings also confirm that an adult’s “motivation to learn is a crucial component of their foreground” (p. 19). A significant difference between Danielle and the students who persisted was her reluctance to do homework and a lack of clarity about her future career/study options.
As outlined in the methodology chapter this study is limited to the experiences of three students who attended my Mathematical Methods class. A further limitation is that we don’t have the full story for Danielle. She was interviewed in mid-course, after she had swapped to the Further Mathematics class, while the men were interviewed after the end of year exams. Thus we don’t know if Danielle successfully completed the easier Further Mathematics course. However, four potentially fruitful avenues of further enquiry are identified and discussed in the following sections.

6.1.5 Narratives of Resistance and Transition
All three participants relate ‘narratives of resistance’ (Gray, 2009) when reflecting on their earlier experience of secondary school. For Danielle the avoidance of homework escalated into an avoidance of school. She failed Year 9 because she didn’t do homework and truancy. She left school because she didn’t enjoy repeating Year 9. Similarly, Ryu left school after failing Year 10 because it was leading nowhere – ‘because my teachers told me I was hopeless and not worth the effort’. While David actually completed his VCE he chose the easier subjects. Like Danielle and Ryu, he also had a negative attitude towards school - I didn’t like it.

Each participant also relates a ‘narrative of transition’ (Gray, 2009) where they “attempt to prove to themselves and others that they could return to education and succeed” (p. 653). For Ryu, this was stated explicitly: even if I do half heartedly believe that I can do it - I should maybe go back and prove to other people that I’m capable of doing it. For David this transition can be seen in his work history where he has moved from easy going routine jobs to a more interesting and challenging workplace. It is clear that he also sees learning as a worthwhile goal rather than just a means to an end: I’ve got all these little things I want to do. I’m a little ... Jack of all – Master of none. I tend to like that. Danielle’s ‘narrative of transition’ was more subtle. She initially attributed her return to study to a desire to avoid working in the kind of job you can get with a Year 10 pass. Later, she asserted that it was what she planned on doing the whole time. On further probing, she realised that probably half the reason she returned to study was due to her parents’ expectation that she finish school.

Both Ryu and David convey a clear sense of the ownership for their transition narrative. For them the emphasis is on proving to themselves that they can succeed, whereas for
Danielle the transition narrative itself is in a state of transition. While Danielle believes that she is capable of completing Mathematical Methods, *I knew I could do it if I tried*, she also recognises that her approach to study isn’t very effective, *it’s hard for me to study I don’t know what it is*. Transferring from Mathematical Methods to the easier Further Mathematics subject suggests that she is also starting to assert ownership over her learning journey.

A difference between the men and Danielle was the clarity of their “personal vision” (Hodges, 2005) for their future. Both Ryu and David had returned to study the VCE after investigating alternate pathways to achieve their primary career goals. In contrast, for Danielle her future was in a constant state of flux: I’m *not really planning it, just sort of gunna go with the flow*. However, there was also evidence of a recent change to a clearer personal vision for her future: from “*I don’t really know where I’m going*” to “*I’m interested in Nutrition at the moment*”.

This tendency for some students to have “no plans about their future” is a common ‘problem’ for managers of Access programs (Volkoff, et al., 2006, p. 46). McInnis et al. (2000, p. 2) also noted that this is a more general trend with students in the VET and higher education sectors “becoming disengaged from their educational experience”. In his reflections on his past experience of schooling David observed that when he was 18 he couldn’t be bothered working hard at school because he couldn’t see a reason for it. He also observed similar attitudes amongst of his current classmates which he attributed to they’re being young and wanting to *get out of school*. Whereas, now, he has returned to school in a more matured state, where he has learnt from past mistakes, and now his *preparation is meticulous*.

### 6.2 Well known Attrition Issues

The main reasons for students leaving secondary school before completing Year 12 relate to: the desire for financial independence; not liking school; poor academic progress; and serious life issues (Volkoff, et al., 2006, pp. 37-38). The reasons for non-completion in the VET and higher education sectors, in Australia, have been categorised as: poor career/course choices; unpreparedness for study workload; institutional factors; competing financial and family commitments; and goal fulfilment (McInnis, et al., 2000, pp. 25-40).
Danielle used common attrition ‘factors’ to rationalise her withdrawal from the Year 12 Mathematical Methods class which appeared to contradict her earlier assertion that poor work habits were the primary issue. While discussing her experience of the maths class she initially indicated that the class was more serious than expected. Also, she didn’t want to do the homework. Thus she identified that an immediate awareness of being unprepared for the study workload was one of the factors which led her to consider switching to an easier mathematics subject. This sense of “feeling overwhelmed by the pace” and workload of a mathematics course has also been noted as one of the main reasons for switching decision in undergraduate courses (McInnis, et al., 2000, p. 28).

However, Danielle ultimately asserted that she switched courses because she didn’t need maths as prerequisite for any of the careers she was considering. McInnis et al. (2000, p. 24) noted that there is some evidence to suggest that students in previous studies felt the need to simplify and “rationalise their decision to withdraw”. Danielle’s reflections on her complex decision making process suggest that she is acutely aware of the impact of her study habits on her academic performance. She had also indicated that prior to commencing Year 12 she had had no clear plans for her future. Rather than being a rationalisation of her decision to switch courses, Danielle’s identification of a potential career path is a positive factor which will support her on-going engagement with learning.

However, Danielle’s reticence to seek advice from her parents, or institutional staff, was clearly a contributing factor which retarded her decision making process about future career options and appropriate subject selection. Danielle’s experience supports the observation that there may be a link between age and certainty in career planning (McInnis, et al., 2000, p. 26). This is further supported by the observation that “young people, particularly those ‘at risk’ frequently change their ideas about personal and career directions so pathway planning support needs to be available in an ongoing, threaded way throughout the entire program” (Volkoff, et al., 2006, p. 51). Thus, it is clear that some VCE students, especially during Year 11, would benefit from a more structured approach to accessing institutional career planning support services.

In contrast to Danielle, both David and Ryu experienced “factors beyond the control of the institute” (McInnis, et al., 2000, p. 4) which were potentially more likely to lead to
withdrawal. However, this appears to be balanced by self-determination, motivation, and rigorous work habits which appear to be underpinned by an incremental mindset. These findings support some of the results of studies of adult students in tertiary preparatory mathematics courses (for example Carmichael & Taylor, 2005).

Both Danielle and David had revised appropriate background knowledge and skills prior to attempting Year 12 Mathematical Methods. Thus they had started the course with a realistic chance of completing the course without undue stress. In contrast, ‘on paper’ at the start of the year I would have expected that Ryu was more likely to withdraw from Mathematical Methods. Like Danielle, he had only successfully completed Year 9 Mathematics at Secondary school before he left. He had had a significant break from study and was working in a job where the mathematics was “invisible” (Coben, 2000, p. 55). He enrolled in Year 12 Mathematical Methods without completing any of the prerequisite course material. He also had significant family and work commitments, problems with his employment, and a heavy study workload. These are all common factors that have been identified as contributing to non-completion in the VET and higher education sectors in Australian studies (McInnis, et al., 2000).

In my experience, when there has been a conflict between the time demands of paid work and school work it is generally paid work which is given priority. In this respect Ryu is unusual. During first semester the tension caused by the workload at both school and work led to his eventual decision to quit work and continue with his studies. Ryu had initially decided to return to study because he wasn’t happy at work. It appears that while Ryu found his studies challenging he also found them stimulating.

David also experienced a significant personal issue which could have had a major impact on his ability to study. In order to study at Year 12 Mathematical Methods David had changed residence so that he lived closer to the TAFE institute. For the most of first semester he was unable to lease his former residence due to squatters, suffering significant stress and financial loss in the process. However, the effect of this situation on his ability to study was significantly ameliorated by his extensive support network. In particular the support of his workplace is, in my experience, very unusual for students studying a non-trade certificate. His employer not only encouraged David’s
return to study; he also provided active support by allowing David to spend time studying while at work.

A core policy of the Victorian State Government is that every young person should “complete Year 12 or its equivalent (such as an apprenticeship or traineeship) as a foundation qualification for stable and rewarding employment” (Department of the Premier and Cabinet, 2005, p. 11). Thus from this ‘economic’ policy perspective the three participants in this study would be considered successful students. In particular, Danielle was not lost to the institute. Swapping from Mathematical Methods to the ‘easier’ Further Mathematics class meant that Danielle would still be able to successfully complete the VCE.

More recently, through its Skills Reform, the Victorian Government has implemented far-reaching “structural changes in the way the training system works” (Skills Victoria, 2008, p. 7) to enable more people to obtain a post-school qualification. One significant change has been the increased competition between all providers within the VET sector for “students eligible for a government subsidised place” (p. 22). Thus, for some TAFE institutes, there is a greater emphasis on attrition as an economic issue as funding is directly tied to student module completion, rather than enrolment. Therefore, from the institute’s perspective, the retention of Danielle would be deemed a success as the student was enrolled in the same number of modules.

However, from the perspective of the student swapping to an easier mathematics subject is potentially problematic. Mathematics remains one of the access subjects for people who wish to work in many of the “services and knowledge industries” which are now major economic drivers for Victoria (Skills Victoria, 2008, p. 5). By swapping to an easier Mathematics subject Danielle may be limiting her future career options (Australian Council for Educational Research [ACER], 2005, p. 4). David’s prior experience of completing the VCE also highlights how the choice of a school mathematics subject can have an impact on future career choices.

The similarities between Danielle’s current experience and David’s prior experience of the VCE suggest that the early development of “good work habits” (Corno, 2004, p. 1671) may be a significant factor influencing a student’s persistence when returning to study.
6.3 Motivation and Volition

Since Year 7, Year 8, I don’t do, haven’t done, homework. I just don’t feel I can anymore. It’s hard for me to study. I don’t know what it is. (Danielle)

For each of the three participants the most significant factor which led to non/persistence in Year 12 Mathematical Methods was the student’s approach to study. In particular, an inability to do homework was a major theme throughout Danielle’s reflections on her learning journey.

Danielle found the Year 12 Mathematical Methods class was a lot faster, harder, and more serious than expected. As a result she felt that she didn’t want to do the class work and the homework and so elected to swap to the easier Further Mathematics class. Her experience confirmed the contention that “it is a myth that students do schoolwork ‘of their own volition’” (Corno, 2004, p. 1673). Students need help to develop good study skills in addition to being motivated and maintaining a positive attitude towards study.

Danielle’s experience suggests that the work habits learned during secondary school may persist when students decide to re-engage with education. This conjecture is supported by David’s reflections of his prior experience of school. While disengaged from the learning environment of the school he had successfully completed his VCE by doing most of his work at home. However, this embryonic volitional mindset was more fully developed by his consistent efforts to gain the skills needed for acceptance into the Australian Defence Force Academy as a trainee pilot: That’s the sort of thing you learn in the army, attention to detail, and not giving up.

It has been noted that an early school leaver’s disengagement from school is usually due to an accumulation of factors. For example, low academic achievement may lead to low self-esteem, entrenched failure, and hence dissatisfaction with the school experience (Volkoff, et al., 2006). Corno (2004) notes that good work habits are an essential skill for completing academic tasks at every age range. However, “effective work habits and work styles remain elusive for many school-age children who struggle with volitional issues well into adulthood” (p. 1671). As with Danielle, this is likely to be a problem for many early school leavers who return to study at a TAFE institute.

For students who are sufficiently motivated Corno (2004) suggests a number of strategies that could be used by teachers to help student develop a volitional mindset. For example, for a particular assignment students may be “asked to envision a game
plan for completing it – that is, to think through when and where they could get down to work” (p. 1675). From the perspective of the teaching program at TAFE the main issue with the recommended strategies is the time between implementation and the cumulative effect on a student’s work habits during Year 12. Since the most needful students may decide to leave the Mathematics class before realising the benefits of this approach. However, for those early school leavers who are under 18, and therefore required to complete Year 11, this approach may prepare students to better cope with the demands of an academic subject during Year 12.

Corno also noted that there is a strong link between volitional control and a motivational orientation towards deep or surface approach to learning.

The deep approach reflects an ability to handle complexity in combination with mindful effort, a work ethic, and action control. The surface approach reflects a susceptibility to anxieties that undermine success in complex tasks (Corno, 2004, p. 1683).

The significance of these approaches to learning will be considered in more detail in the following section.

6.4 Self-theories of Intelligence

Adherence to adult learning principles is considered to be an essential component of good practice in providing learning opportunities for all young people engaged in study at TAFE (Volkoff, et al., 2006, p. 50). However, it was also recognised that young people who are studying SSCEs at TAFE “are likely to require quite intensive learning support … particularly when compared to the support needs of young people engaged in mainstream VET programs” (p. 63). This conjecture was supported by Danielle’s interview responses.

Danielle clearly identified her inability to focus in class and do homework as the main causes of her lack of performance in Mathematics. She also indicated an awareness of, and a desire to implement, a range of strategies and approaches which are commonly associated with the development of good work habits (Corno, 2004). However, when she attempted to put these strategies into practice she quickly became disillusioned and reverted to her previous approach to study. This conflict between her awareness of the need for developing good work habits and her emotional response to the act of doing homework suggested that there was a piece missing from the puzzle.
A query to the motivation group on a social networking site for early career researchers, www.graduatejunction.com, produced three leads: Self-determination theory (Deci, Vallerand, Pelletier, & Ryan, 1991), Self-Theories (Dweck, 1999), and Self-concept theory (Marsh, 2006). Each of these theories clearly provides a potential framework for discussing Danielle’s expectations and actions. However, as a non-psychologist, Dweck’s work on Self-Theories of intelligence seemed to resonate for me most strongly with Danielle’s reflections of her learning trajectory. This theory suggested an approach for understanding why some “students are becoming disengaged from their educational experience” and withdrawing from their course while others with similar concerns and attitudes persist (McInnis, et al., 2000, p. 2).

The students who return to study VCE Mathematics at OMIT are a very diverse group. Some, like Danielle, may have previously developed work habits which allow them to feel smart while at the same time providing a ready supply of excuses for their lack of achievement (Dweck, 1999, p. 131). Dweck (2007a) suggested that these students tend to believe that intelligence is fixed at birth. She further suggested that this fixed mindset could be changed to a growth mindset through an initial intervention workshop and appropriate ongoing classroom support which encourages effort rather than results (Dweck, 2007b).

The efficacy of this approach is supported by the reflections and achievements of Ryu and David. The reflections of both men suggested that while at school they had also developed a resistant approach to their studies. This suggests that, at the time, they may also have had a fixed mindset. However, in both cases this mindset seems to have undergone a transformation shortly after leaving school. Experiential learning in the workplace, and through extracurricular activities, helped them to develop an incremental mindset which recognised the benefits of effort and developed a more resilient approach to study.

In particular, David identified that his lack of effort while at school was due to a perception that the VCE curriculum had little relevance to life outside of school and his vision for his future. Whereas now

I’m a methodical learner and as I’ve matured I’ve got to the point where my preparation is […] meticulous. I think “O geez I’ll regret it if I don’t do this and I don’t do that”. I made that mistake in the past. (David)
This supports a similar observation from a study of tertiary preparatory mathematics students which concluded that older students “may have gained through life’s experiences a determination” to succeed and this allows them to overcome inadequate prior knowledge and skills (Carmichael & Taylor, 2005, p. 718). Conversely, while reflecting on his experience of the VCE Mathematical Methods classroom culture, David observed that for some of his classmates it’s being a teenager that is the problem - it’s just not the time for you to study.

This dichotomisation of the characteristics of early school leavers according to age is also prevalent in the literature. For example, an earlier study on the needs of young VCAL students, a vocationally oriented alternative to the VCE, noted that the teaching methodologies utilised at OMIT tended “to suit the needs of mature-aged learners” rather than the needs of disadvantaged young learners (Pritchard & Anderson, 2009, p. 22). Therefore, they suggest, TAFE teachers who routinely work with early school leavers “would benefit from exposure to pedagogical theories and approaches explicitly designed to re-engage young learners who have been disadvantaged by prior educational experiences” (p. 35).

However, the experiences of Danielle, David and Ryu suggests that all students, both young and older, engaged in the study of an academic subject like VCE Mathematics would benefit from a pedagogical approach which explicitly teaches volitional skills. For early school leavers, who return to study motivated to succeed, enabling them to consciously acquire volitional skills may help them to develop resilience which in turn will improve their chances of completing the second chance schooling.
7 Conclusion

TAFE and its predecessors have a long history of providing the disenfranchised with a second chance to complete their secondary school education. Since 2001 there has been an increased blurring of the boundaries between the VET and secondary school sectors due to the implementation of range of policy initiatives to improve school completion rates to Year 12 or its equivalent. Most recently, in 2006, the Victorian government introduced the Youth Guarantee program “to support all young Victorians … aged less than 20 years, to complete Year 12 or an equivalent training qualification in a TAFE institute” (Skills Victoria, 2006, p. 26). This change meant that TAFE VCE teachers needed to adjust their pedagogy from one aimed at a predominantly adult cohort to one which catered for a more diverse range of ages, backgrounds, interests and attitudes towards learning.

Within the VCE one of the most pronounced areas of inequalities, in terms of scholastic achievement, between students from different socio-economic backgrounds is in the ‘hard’ subjects such as mathematics (Marginson, 2002). A review of the literature on adults learning mathematics identified that most studies which investigated the experiences of students in preparatory courses (numeracy, senior secondary, tertiary preparation and bridging courses) focused on the students who persisted in the mathematics class. However, several of these studies identified that the dropout rate for these courses was as high as 50% (for example, Bennison, 2002; Carmichael & Taylor, 2005).

The aim of this study was to develop a clearer understanding of the factors that influence persistence and non-persistence of adults undertaking a Year 12 Mathematics subject in a Further Education setting. An underlying assumption of this study was that teaching VCE Mathematics in TAFE was “likely to be more effective when teachers understand who their students are, their backgrounds, the contexts they bring with them, and their reasons and purposes” for returning to study (Swain, 2005, pp. 317-318).

Before discussing the main findings of the study I will briefly outline and discuss some of the key issues associated with the methodology used in this study.
7.1 Reflections on the Methodology

The methodological approach was influenced by the need to balance the practical realities of undertaking research in the Victorian TAFE sector, the ethical considerations of doing insider research, and the desire to pay attention to the voice of these non-mainstream participants.

Previous studies of preparatory students doing mathematics (for example, Bennison, 2002; Hodges, 2005) highlighted the need for a methodological approach which was both flexible and could cope with low participation rates. The diversity in the backgrounds of the small number of students who undertake VCE Mathematics at TAFE was also a factor. The decision to use semi-structured interviews has been rewarded by the diversity in the learning trajectories of the three participants.

The decision to focus on one research site, OMIT, was influenced by my perception of the likelihood of cooperation from other RTOs in Melbourne. The TAFE sector in Victoria is unusual in that many of its early institutes have “survived as autonomous institutions” (Goozee, 2001, p. 13). While each TAFE attracts most students from the adjacent suburbs they are not limited to the local area. In 2008, at the start of this study, the Victorian government proposed to implement changes to the governance of TAFE institutes to “help them operate in the new environment, with a greater focus on demand-driven, customer focused provision” (Skills Victoria, 2008, p. 28). I felt that it was unlikely that management of other TAFE institutes would agree to participate in a study conducted by a researcher who was also a current staff member at one of their competitors. While other VET providers were subsequently invited to participate, as a consequence of the initial low participation rate at OMIT, only one other provider opted into the study. However, as autonomous institutes each Victorian TAFE has its own ethics approval process and therefore the time needed to consider and respond to my request may have been a factor in their apparent lack of response.

The decision to undertake research at my place of employment created two clear ethical issues. As I was likely to be teaching students who were also potential participants a significant ethical issue needed to be addressed. There were also the many pros and cons associated with insider research (Paul Hodkinson, 2005). Consideration of these issues led to the decision to only inform potential participants of the study, and invite
participation, after they had been officially deemed to have withdrawn from a Year 12 VCE Mathematics class.

No students opted into the study in the first ten weeks, the original projected data collection period and by the end of the first semester only one withdrawn student had volunteered to participate. Danielle’s interview was analysed during semester two. To increase the number of potential participants in the study I decided to expand the intake to include all students who had been enrolled in a Year 12 Mathematics subject during 2009. As a consequence two more students elected to participate.

All three participants were from my Year 12 Mathematics class. This suggests that the initial rapport developed during class may have mediated any student concerns about issues related to the student-teacher power relationships. This confirmed Paul Hodkinson’s (2005, p. 139) assertion that a degree of cultural proximity, between researcher and participant, may be an asset in interview situations involving the study of youth cultures.

A more detailed discussion of the limitations of the study will be outlined later in the chapter. In the following section I will outline some of the main findings and their implications.

7.2 Main findings and implications

The general conclusions outlined in this chapter are necessarily limited due to the small number of participants in the study. However, the diversity in the backgrounds of the participants, and their differing affective responses to a ‘hard’ school mathematics, provided some interesting insights. The effect of these insights on my current practice as a VCE teacher will be outlined later in the chapter.

The main findings are linked to the three research questions outlined in the Introduction chapter.

1. What was the decision making process that led to the student’s decision to return to study VCE Mathematics at TAFE?

The three students interviewed for this study provide a cross section of the diversity of students who return to study VCE Mathematics at TAFE. Within the further education sector there is an assumption that students who return do so intentionally and have
clearly defined aspirations. The stories narrated by my participants suggest that, for many students, returning to study the VCE is not a voluntary or well researched pathway.

While each participant asserted ownership of their decision to return to study the VCE, this decision was often the result of choices which were limited by external factors. Their narratives of transition from schooling to work to reengaging with formal education highlight the success of government policies which promote the desirability of completing the VCE and lifelong learning.

While each participant experienced schooling differently their reflections generally focused on their perception of the irrelevance of schooling as a pathway into future careers. Leaving school and experiencing the world of work resulted in a re-evaluation of this attitude. Each participant asserted that while they often experienced work as physically challenging it wasn’t intellectually challenging. For David and Ryu, unlike Danielle, leaving school coincided with leaving home and becoming independent. Thus establishing a degree of financial security trumped the desire to return to study. For both Ryu and David there was an interplay between the desire for financial security, a growing sense of agency and self belief, and dissatisfaction with the culture of their workplace. Eventually the pursuit of intellectual stimulation through extra curricula activities tipped the balance in favour of pursuing further studies. For each participant the VCE was presented as the only viable pathway which would enable them to achieve their career, and higher education, aspirations.

2. What are the factors and triggers that lead some students to withdraw, while others persevere with VCE Mathematics?

Having acted on the decision to return to study the VCE the student’s successful reengagement with Mathematics is the next hurdle to be overcome. Previous research in the adults learning mathematics field highlights that interaction of affective, cognitive and conative factors which influence an adult’s view of mathematics are complex and different for each student. This study identified that, for these students, a number of these factors have a greater influence on the transition process than others.

Unlike some previous studies, each of the participants self identified as being a person who liked, and was good at, school mathematics. They each professed to enjoy the
challenge and intellectual stimulation of doing a ‘hard’ mathematics subject. Subsequent discussions with Ryu indicate that he has continued to actively pursue his interest in mathematics after completing the Year 12 Mathematics subject.

Each of the participants identified that poor work habits had been a major factor in their lack of success in their previous schooling. This was also identified by Danielle as a key factor in her decision to swap to an easier Year 12 mathematics subject. In comparison both David and Ryu had returned to study with a strong sense of agency and were prepared to devote significant effort to skills development outside of class. In addition the men actively sought to develop a support network amongst their peers, colleagues and family. In comparison, Danielle responses suggested that she was isolated from most of her peers and family - “I don’t really tell people how I do at school”. This lack of support was compounded by a lack of other help seeking behaviours which are commonly associated with academic success.

The analysis and discussion of the participants’ interviews identified that the work of Carol Dweck (2007b, 2010), on self theories of intelligence, may provide some useful approaches for further improving teaching strategies for some second chance learners. Since leaving school both David and Ryu appear to have developed the incremental mindset where challenges are expected, and accepted, as part of a learning process that rewards effort. Each of the men persisted and succeeded in their studies despite encountering significant personal issues during the year, whereas, Danielle appears to have a fixed mindset. She attributes her lack of performance in either Year 12 Mathematics subject to various factors, for instance, a persistent inability to do homework; a preference for concrete rather than investigative type question; and the reduced relevance of mathematics for her changing career prospects.

Thus one recommendation of this study is that mathematics teachers need to help students to consciously develop an incremental self-theory of intelligence. An earlier study noted that most adult students doing a Tertiary Preparatory Mathematics Course, at the University of Queensland, already displayed an incremental mindset and so “this issue is probably not relevant in an adult education context” (Carmichael & Taylor, 2005, p. 718). However, as the median age was 29 years it is likely that, like David and Ryu, these students developed their incremental mindset through a process of maturing
and ongoing adjustment to the workplace. In contrast, many TAFE VCE students are like Danielle. They are early school leavers who may have had limited exposure to the type of work and extra curricula experiences which provided the more mature students with their experiential learning opportunities.

As noted by Yorke and Knight (2004), the development of an incremental mindset is unlikely to be a rapid process for most students. Therefore this approach is likely to be more successful for those early school leavers who need to complete the full two year VCE program. However, I believe that if students are consciously aware of the objectives of this pedagogical approach then the transition may happen more rapidly for some students.

Both David and Ryu demonstrated that having an incremental mindset enabled them to pursue a strategic approach to learning mathematics despite significant gaps in their background knowledge. This has implications for teachers in secondary schools. If students have a greater awareness of approaches to learning and have developed the associated work habits then future attempts to reengage with education are likely to be more successful.

During 2010 I tested this hypothesis by changing the way I taught my Mathematical Methods classes at both Year 11 and 12. I provided students with a sample study timetable and encouraged reflection and discussion about what impact different approaches to study had on learning and performance. While this approach had little effect on student attrition for both classes, the students who remained in the Year 11 class remained more engaged throughout the year. This suggests that there is some merit in the idea that it is possible to help students develop resilience and hence promote a growth mindset (Dweck, 2007b).

3. What are the implications for policy makers?

For each participant the VCE was presented as the only viable pathway which would enable them to achieve their career, and higher education, aspirations. This has implications when considered in conjunction with the changes to the eligibility for government funded places in the VET sector which will affect VCE students from 2011. Under the Victorian Training Guarantee students are only eligible for a government supported place if they are under 20 or are enrolling in a course higher than their current
highest qualification (Skills Victoria, 2010b). The VCE is listed as a Skills Creation course at the same level as VET Certificate II courses (Victorian Skills Commission, 2010, p. 63). Therefore it is likely that many adult students, like Ryu and David, who need to complete or update their VCE credentials will be required to pay full fees, about $1,000 per subject compared to about $250 for a government supported place. The VCE dominates the selection process to Victorian universities, accounting for about 75% of offers (James, et al., 2009), therefore a student’s potential to access higher education is improved by first attempting the VCE and keeping the TAFE Diploma pathway in reserve as a safety net.

7.3 Limitations of the study
McInnis et al. (2000, pp. 23-24) highlighted a number of “methodological issue in researching non-completion” in the higher education and VET sectors, including possible bias due to low response rates to surveys and a student’s tendency to simplify their reason for leaving.

For this study the low response rate was the most prevalent and significant issue. The following information was provided by OMIT in the year following the data collection. In total there were 146 students enrolled in a Year 12 Mathematics subject during the study, 116 in Further Mathematics and 30 in Mathematical Methods. The overall withdrawal rate for Year 12 Mathematics for 2009 at OMIT was about 22% (32 students – 24 Further Maths and 8 Mathematical Methods). This was significantly lower than previous rates of withdrawal at OMIT, 37% in 2007 and 45% in 2008. However, the trend in withdrawals throughout the year adhered to the expected pattern with the majority of students, 27 out of 32, withdrawing during the first semester, the period from February to May.

Only one of these students, Danielle, opted into the study. Early school leavers who subsequently withdraw from a second chance to complete a desired VCE subject may have their “earlier feelings of inadequacy and failure” reinforced (McGivney, 2003, p. 13). The emotive atmosphere of Danielle’s interviews suggests that, for students with negative experiences of prior schooling, this is a likely explanation for the low participation rate in this study. In addition to this low response rate it should be noted that all participants in this study were from my Mathematical Methods class.
As a result of the low participation rate all Year 12 Mathematics students were sent an invitation to participate in the study after the end of the year exams. A further two ‘successful’ students opted into the study. McInnis et al. (2000) assert that students who are interviewed by their teachers about their reasons for withdrawing are often reluctant to criticise the course, the institution, or “the teaching they experienced” (p. 24). However, Danielle, David, and Ryu’s participation in this study suggests that a student’s willingness to participate could also be influenced by their perception of the degree of connectedness with the researcher. To what extent can they be confident that their voice will be heard, valued and respected? During class I often share anecdotes from my own learning journey which probably established a sense of familiarity and shared values. However, establishing this connection with TAFE students is difficult due to the annual nature of enrolment in the VCE.

The part-time nature of the TAFE VCE course means that many students have competing demands for their time. Participating in a study ostensibly connected to their previous life was probably a low priority. Relaxing, working, and worrying about their future career and study options probably had a greater priority. While this is only conjecture, I feel that the low response rate for students who ‘drop out’ also may be due to similar reasons. For some students schooling has an identity which is “separate and removed from the reality of everyday life” (Lawy, 2002, p. 205). So when a student decides to withdraw from a course they are conceivably disposing of a ‘product’ that no longer has any relevance to their day to day life, and therefore there is no impetus to reflect on their experience. Therefore, if they have decided that the course is no longer relevant then a withdrawn student is likely to ignore any unsolicited communication such as the invitation to participate in the study.

Tinto (2005) suggests that a clear institutional commitment to enhancing student success is directly associated with student persistence. Similarly, my experience during this study suggests that students who have established this connection with an Institute are more likely to participate in studies about their experience of returning to study. Therefore, in any future research on this topic I would endeavour to establish a more substantial personal connection with any potential participants. However, to avoid potential ethical issues, I would recommend that this approach is only used with adult students who are over 18 years old. Firstly notify all enrolling students that a study
investigating the quality of the student experience will be inviting voluntary participants during the year. Then present a brief outline of the goals of the project at an information session. This would allow students to make a ‘personal’ connection with the person conducting the study without needing to initiate contact. Hopefully, this approach would establish a sense of commitment and improve the response rate.

7.4 **Key Strengths**
The outcomes of this study, while small scale, are important for a few reasons. The study contributes to the under-researched field of adults returning to study mathematics at senior secondary level. The study highlights how affective, cognitive and conative factors can interact to influence a student’s successful reengagement with a ‘hard’ Year 12 Mathematics subject. The data analysis suggests that one’s self-theory of intelligence may influence one’s ability to study effectively (see Dweck, 1999). Students with a clear sense of agency, who have developed a volitional mindset and a strategic approach to learning, are able to overcome significant deficits of prior knowledge and successfully complete an academic year 12 subject.

The study also contributes to the debate on equity issues related to lifelong learning in light of the recent, 2010, punitive education policies of the Australian State and Commonwealth governments. The experiences of all three participants suggest that time is a critical factor in the development of an incremental mindset, and the associated sense of agency, especially for second chance learners who experienced school as problematic. For some adults this process may take years.

Using an approach informed by the attrition, retention and transition research field provided a brief glimpse of the “the quality of the total learning experience” for all participants, including one non-completer (McInnis, et al., 2000, p. 61). Thus, this study was able to represent the perspective of one of the “groups whose needs have clearly not been met” (Miller-Reilly, 2006, p. 248), those who drop out early in the course, and who have been missed in previous studies.

7.5 **Recommendations for future work**
One of the underlying goals for this study was to develop an understanding of the factors that influence persistence and non-persistence of adults undertaking a Year 12 Mathematics subject in a Further Education setting. In particular, I wanted to focus on
the unsuccessful second chance learners as the experiences of these students are an under-researched.

This study has provided some limited insights which need to be investigated and verified using a larger number of senior secondary students who do not persist in their studies. A mixed method approach, such as using surveys to inform students about the goals of the study before approaching them to participate in a follow up interviews, may be more successful in achieving an appropriate sample size. This may also be achieved by broadening the current study design to include any student who withdraws from a VCE subject, not just mathematics.

In the discussion chapter I noted how the life experiences of Ryu and David, the successful second chance learners, appeared to help them develop an incremental mindset. Within most Victorian TAFEs there is a potential pathway for early school leavers to progress to undergraduate study at university: CGEA (literacy and numeracy course), to the SSCE (such as the VCE or a Certificate IV equivalent), to a Diploma. As the majority of these students are often from socially or economically disadvantaged backgrounds there is considerable scope to explore how the metaphor of “learning as becoming” (Phil Hodkinson, et al., 2008) could inform the development of a pedagogy that could meet the needs of the many educationally disadvantaged student who have academic rather than vocational aspirations.
8 References


Appendix A – Researcher’s learning trajectory

Family background

Like most Australians in the 1950s (Marginson, 1993, p. 11) my parents left school at about fifteen to find full time work. My mother was born and raised in the western districts of Victoria, where her father was a farmer. She commenced her schooling in suburban Melbourne during World War II. In 1952 her family moved to a Soldier Settlement Block near Hawkesdale where she continued her schooling in a small one room rural school until she completed grade 8. My father was born in Mackay, Queensland. His father worked in factories and labouring jobs. The family moved frequently between Queensland and Victoria, looking for work during the depression and World War II. As a result my father left school at age 14 with a grade 4 education. He started work as a labourer and factory worker. In 1958 he joined the State Electricity Commission of Victoria (SECV) where he worked as a Linesman and then an Operator.

Ken Dempsey, in a study of Australian country towns, found that while there is a definite class structure based on occupation (Dempsey, 1990, pp. 160-172) most country people “see themselves as resourceful, hard-working achievers, loyal, hospitable, and egalitarian; a people who pull together, look after those in trouble, and strive to repel threats from outside to their community’s survival” (p. 1). As a child and a teenager I had no real concept of a class structure. I thought it was normal to live in a weatherboard house with outside plumbing, an outside toilet, an open fire place for heating and a wood fired stove for cooking. My mother made our clothes, she was an excellent seamstress, and could knit a jumper in a week while relaxing and watching TV.

My parents were heavily involved in community service organisations. My father was a volunteer ambulance driver and a fireman in the CFA. Education, and learning in general, was also valued by my parents. During my time at high school my mother attended every parent teacher interview. For several years she was also the secretary of the Parents and Friends Association and the School Council. She participated in many fund raising activities and was a volunteer with the school canteen.

In many ways I had an idyllic childhood. I experienced a comprehensive experiential learning environment outside of school. I spent most of my weekends cycling in the
surrounding countryside. Like my parents, I was also heavily involved with community service organisations: the Scouts, the junior CFA, helping out at the local Op Shop, and from the age of 16 I was as an adult member of St John Ambulance Brigade.

My family background, and my involvement in the scouting movement, provided me with significant opportunities and the necessary support to develop a deep sense of self-efficacy (Bandura, 2003) as well as self-esteem.

Common Background: OMIT is located on the fringes of Melbourne where the creeping urban sprawl meets well established country townships and their rural environs. Thus some students returning to study the VCE in an adult environment will potentially share a common ‘country’ background with me.

Initial Schooling

Gorard et al. (2001, pp. 178-179) identified that a person’s experiences of initial schooling is a determinant for participation in further education. They noted that later attitudes towards learning were influenced by such factors as the type of school attended and the good and bad experiences of school, and the “clearest simple indicator of success at school is family background”.

I started my schooling at Berwick preschool in 1965. My earliest memories of school are:– sitting in a car, travelling down a steep hill, through a shady tunnel created by an avenue of huge trees, probably Oaks, on a bright sunny day. I can still taste the excitement and anticipation. At the bottom of the hill is my ‘school’.

The remainder of my early schooling was very fragmented. From 1966 to 1972, I attended five, or six, different Primary Schools. The schools were located in both rural and urban towns in Queensland, New South Wales, and Victoria. Hence, there was little continuity in the instruction that I received.

In 1967 we moved to rural NSW where I started grade 1 at a large State Primary School in a nice red brick building with high ceilings. We wore a school uniform and were provided with free milk at recess. We had weekly homework memorising the spelling of words like ‘electricity’ and ‘elephant’. I remember at least one occasion where we all stood on benches at the back of our room and were tested on our proficiency in reading aloud by the Principal or Head Teacher.
Moving to rural Victoria was a significant change. Officer Primary School was a small rural weatherboard school. In 1971, when I as in Grade 5, there were 30 students in grades 3 to 6, a composite class which was taught by the head teacher. There were no school uniforms. The first day at school I got the strap for catching a football thrown at me in the school corridor. The school had one swing, one set of monkey bars and a small garden. We learnt contemporary sixties songs by Simon and Garfunkle, round dancing and square dancing from the ABC radio schools broadcasts, and how to play rounders.

The most significant memory is the trouble I used to have in learning my times tables. I still don’t know most of them! During grade 5 and 6 there was a weekly/monthly timetables competition. A student at the front of the room would answer a question asked by each student in the class. If the answer was wrong then the students would exchange places and the questioning continued. I remember one occasion when a student answered my question incorrectly, something like what is 1 times 1. I went up the front and I got the very next question wrong.

Revision: For years this powerful memory was my only memory of doing maths in Primary School. When I struggled with maths in later years, both at Secondary school and University, I always took comfort in the fact that I had always struggled with maths. While writing this account I found some old school reports. Mathematics: Class 1A – 145/200; Class 2M – B, Grade 6 – C-B. It appears that my claims of being a ‘late starter’ in Mathematics have been grossly exaggerated. Why did this happen? Is this also a problem for the students who withdraw from Math classes?

**Secondary School**

In June of 1972 my parents bought their first house and we moved to NeW Suburb, a rural town caught up in the creeping suburbanisation of Melbourne (Berry, 1984, p. 51) . Thus I spent the last semester of grade 6 in a new Primary School. As a consequence I started Year 7 at Outer Melbourne High School (OMHS), about 6km from NeW Suburb, with no close friends.

---

1 Both NeW Suburb and Outer Melbourne High School are geographically associated with OMIT and so pseudonyms have been used to protect the anonymity of all individual and institutional participants in this study.
OMHS is located in a low socio-economic area of Melbourne where the norm was to leave school and join the workforce as soon as possible. Only one third of my Year 7 class successfully completed year twelve, about ten boys and forty girls. Initially the students came from a range of rural and urban areas from both working class and middle class families. By the 1975 students from the outlying middle class suburbs were able to attend newly constructed local schools.

OMHS was a school of extremes. On the one hand it was a new school with young teachers and a progressive curriculum. At the same time it was tough school with a culture of aggressive behaviour, including a pecking order amongst the boys based on organised lunchtime fights and bullying in general. For many students, especially the boys, this meant the school was not a very pleasant experience. I claimed I was a pacifist and refused to participate! Apart from the normal teasing (sic) that occurs amongst teenage boys I was rarely singled out.

While I enjoyed learning at school I don’t remember doing much homework in the early years. My teachers generally liked me but often suggested that I needed to focus more on my studies.

The 1970’s was a period of intense modernisation of the education sector and the introduction of universal secondary education for all (Burke & Spaull, 2001, Universal secondary education?). The curriculum and teaching in Australian secondary schools was extensively restructured, including “the abolition of external exams except for the final year” and the provision for teachers to “develop curricula that were responsive to the range of abilities, interests and destinations of students.

So in addition to moving from a very small rural primary school to a large metropolitan secondary school I also experienced some of the experiments in curriculum delivery and design. These were most evident in the Maths and English classes. When I started at OMHS I enjoyed English and struggled at Maths. By the time I reach Year 12 I excelled at Maths and struggled with English.

My problems started in English when, in year 8, my teachers refused to accept book reports about the Science Fiction books that I liked to read. Then during Year 9 and 10 they introduced American spelling and grammar into the curriculum. By Year 11 they had switched back to ‘standard’ English and preparation for the HSC exams. The
Following extracts from my high school end of year reports exemplify the downward proficiency in English Expression: from in Year 7 – ‘writes extremely well’, to Year 10 where ‘the standard of his work is inconsistent (marks for work handed in range from A to D-)’, and finally by Year 12 – ‘his willingness to work is impressive; however he is held back by his inability to work quickly’. My results for English dropped from a B in Year 7 to a D+ in Year 12, and an F on the external end of year exam. My results for Maths were mostly B’s from Year 7 to 12.

Whereas for Maths, Year 7 and 8 was a time where the teachers were ‘experimenting’ with self paced learning. We worked at our own pace through the textbook and, when we felt we were ready, we sat the test. If we were successful we moved on to the next topic. By the end of Year 8 I had only completed half of the Year 8 text. In Year 9 the school returned to teacher led instruction and my progress improved dramatically, achieving an A by the end of the year. From Year 10 I was enrolled in both ‘general’ and ‘advanced’ maths. In contrast to the English teachers I remember my Maths teachers as being very supportive and consistently providing positive encouragement.

The 1970s was a period of rising unemployment (Australian Bureau of Statistics [ABS], 2001), especially youth unemployment (15-19 years) which rose to a high of 18% in 1977 (Encel, 1984, p. 105). Despite their appreciation of the high level of youth unemployment (OMHS, 1977, p. 3) many of my classmates left full time education during Year 10 and 11. After making three attempts to find full-time employment I decided to remain at school and do my HSC. I remember my HSC as one of the best years at high school. By this time all of the ‘trouble makers’ had left to find jobs.

In Year 12, as the senior students in the school we had our own common room. We also had free periods for private study. These two conditions combined to produce a highly social atmosphere. This led to me neglecting my studies at a time when I should have been increasing my efforts. One of the major education reforms during the 1970s was the abolition of external examinations except for the final year (Burke & Spaull, 2001). As a result I had little prior experience in preparing for the external HSC exams. Some students were able to negotiate this hurdle more easily than others. I struggled. My slow thoughtful writing process meant that I was unable to write more than two of the four...
essays in the three hour English exam. Hence I was unable to achieve a pass mark in English and was therefore unable to meet a prerequisite for entry to university.

This impediment to further study has been reduced in the Victoria by the introduction of the Victorian Certificate of Education (VCE). In the VCE both school based assessment and external exams are used to determine the ENTER score. I believe that I would have achieved better results under the VCE. This in turn would have made my transition to university easier.

**Transition to post secondary education**

In the first year I attempted the HSC I only passed the two Mathematics subjects, with a C and a D. Despite my poor results I received an unsolicited offer for a place in a Bachelor of Mathematics at the Footscray Institute of Technology. I rejected the offer on the grounds that a school that offered places to students with such poor results mustn’t be very good. Years later I found out that the course was of a very high quality and its graduates were highly sought after.

I decided to repeat Year 12, against the advice of some teachers in the school. With a clearer understanding of my goals I was more focused. I significantly improved my study scores for all subjects except English, which was still an F (30-39%). I also investigated my future study options more thoroughly.

In 1980 I started a Bachelor of Applied Science at the Ballarat College of Advanced Education (BCAE). I selected this course because it did not require English as a prerequisite (Ballarat College of Advanced Education, 1981, pp. 452-453) and it had a general first year that would allow me the time to decide on my majors.

By third year I knew that I had made the wrong decision. I should have chosen Geology instead of Physics. Third year Physics had no computing modules and each Physics module had a complementary module in the other Physics major. As a result I had to work extremely hard to get mostly average grades.

I persevered and completed the course. As one of the first in my family to make it to ‘university’ I was determined to successfully complete the course and make my parents proud. But after completing the course I couldn’t stand the thought of further study. I wanted to work!
Personal Experience of factors affecting perseverance

In April 1983 I secured a position at the CSIRO Division of Building Research. My role as an Experimental Scientist involved virtually continuous on-the-job training as well as participation in employer funded external ‘short courses’. This boosted both my self-esteem and self-efficacy.

One result of this improved self image was a changed attitude towards further study. The extensive use of computers within the division heightened my awareness of programming as a future career path. With the support of management, in 1985 I decided to undertake a Graduate Diploma in Computing at the University of Melbourne. Just prior to commencing the course I developed tenosynovitis, a form of Repetitive Strain Injury (RSI). The first impact was to cause my ‘dropping out’ of the Graduate Diploma after only two months. I couldn’t handle the combined typing workload of both work and study.

The following year I enrolled in a Masters in Statistics at the Key Centre for Statistical Sciences (edit check name), La Trobe University. Enrolment in this course was primarily in response to the RSI. I was trying to broaden my options for future employment at CSIRO if my RSI worsened, which at the time was considered to be very likely.

I withdrew after only one year of the four year. This course required a lot of driving in city traffic. While I passed three of the four classes I didn’t find the topics as interesting as I had hoped. At the same time work was becoming increasingly more interesting and demanding which led to a feeling that I was wasting my time doing the Masters.

Gallacher, Crossan, Field and Merrill (2002, pp. 502-505) identified that institutional factors are a key determinant in adults returning to study. In this case the location of the La Trobe University was ‘the straw that broke the camel’s back’. If the course had been located closer to home I may have been able to continue.

Next, in 1987, I enrolled in the Graduate Diploma in Knowledge Based Systems at RMIT. As with the prior computing course this course was directly related to my current work. Half way through the first year of the course I resigned from the CSIRO. Within a week I was offered a position with the IT department of the State Electricity Commission of Victoria (SECV).
As a consequence I was unable to keep up with the work load of the Graduate Diploma and barely passed the subjects. Also, in 1987 fees were reintroduced for the first time in thirteen years (Marginson, 1993, p. 181). Thus, as in the study into young people’s learning careers by Bloomer and Hodkinson (2000) my reasons for dropping out were complex. This was the start of significant pause in my formal learning career.

While at the SECV I worked with a number of ex-teachers who had retrained as programmers. So when my RSI flared up and the SECV started offering retrenchment packages I took the opportunity to go back to University and get my Graduate Diploma in Education (Dip.Ed.).

I was offered one of two metropolitan positions at the start of 1992 at a Western Suburbs Secondary College. As a means of improving my students’ learning I became interested in the Project to Enhance Effective Learning (PEEL) which was initiated at Laverton SC in 1984 (Mitchell, Mitchell, & Rijneveld, 1995).

By 1994 I was exhausted from the travelling to and from school, 1.5 hours each way, so I reduced my hours and enrolled in the Graduate Diploma in Computer Education at Melbourne University. My involvement in PEEL had led to a desire to become a more effective teacher. Also, I thought that having a formal qualification in Computer Education would enhance my future career opportunities.

Once again further study was a positive enjoyable experience for me. I completed the course in 1996 despite moving to a new school, closer to my home, which required me to travel further to attend classes. I achieved very high grades in the majority of my subjects. This encouraged me to enrol in a Masters in Education by Research (M.Ed.) at the University of Melbourne in 1997.

In 2000 after becoming disenchanted with working in a Secondary school environment I obtained a teaching position with OMIT. I was now teaching in an adult environment close to my home. I also finished my M.Ed. but only by converting to coursework. The tale of woe includes problems with supervisor support which was then compounded by a severe chronic illness.
Explanatory Statement

Title: Adults returning to study VCE Mathematics – Why do they leave?

This information sheet is for you to keep.

My name is Roy Smalley and I am conducting a research project towards a Master of Education degree at Monash University. This project is being supervised by Dr Anita Devos, a Senior Lecturer in the Faculty of Education Centre for Work and Learning Studies. This means that I will be writing a thesis which is the equivalent of a small book.

Why did you choose this particular person/group as participants?
You have been sent this letter on my behalf by the administration staff of the VCE program at [the TAFE Institute]. You were chosen because you were enrolled in a Year 12 VCE Mathematics subject and have recently withdrawn or stopped attending the class.

The aim/purpose of the research
I am conducting this research to find out what prompted you to return to ‘school’ to study VCE Mathematics and why you have subsequently withdrawn or dropped out of the class.

Possible benefits
Mathematics remains one of the key subjects for access to further education. TAFE provides students with a second chance to complete a VCE Mathematics subject and so improve their life chances. TAFE Institutes need to understand the key factors that influence people’s decisions to return to study, and their decision to withdraw in order to facilitate an individual’s re-engagement with mainstream education.

By reflecting on the problems you encountered in returning to study you may be able to develop strategies that will help you and others return to study successfully in the future.

What does the research involve?
I am asking you to agree to one interview with me to take place between February and July 2009. This interview should take about 45-60 minutes, and will be at a time and place to suit you. To comply with the Occupational Health and Safety policies of
Monash University the interview will take place in a seminar room or library at a campus of Monash University or [the] Institute, or another public location such as a municipal library.

The interview will be recorded on audiotape and then transcribed. The transcript will then be sent to you for your comments, possible changes, and final approval.

I believe that every individual has a unique story to tell about why they returned to study and the issues they encountered. During the interview I will ask you a series of questions that will guide you through the process of telling your story. The main ‘topics’ these questions will focus on are:

1. A little bit about your background and motivation for returning to study. Nothing that you consider too personal. Just the basics.
2. Who or what influenced your decision to return to study.
3. Your experiences of becoming a student again.
4. Your experiences of studying Mathematics at TAFE.
5. How you balanced study, home duties, recreation and work commitments.
6. The process of deciding to ‘drop’ a class is different for each person. What was it like for you?

At the end of the interview you are welcome to talk about your plans for the future and ask any questions about any other issues involved in returning to study, career pathways, etc.

After the interview, at your discretion, you may choose to send further written comments and reflections to Roy (see contact details below) during the data collection phase of the study, i.e. from February till July 2009.

Inconvenience/discomfort
You are under no obligation to answer any question during the interview that makes you feel uncomfortable. [The] Institute Student Support Services is aware of the nature of this study and are able to offer you support and counselling if you get upset.

Payment
No payment or reward is being offered, financial or otherwise.

Can I withdraw from the research?
Being in this study is voluntary and you are under no obligation to consent to participation. You can stop the interview at any time. You may withdraw from the study at anytime prior to having approved the final transcript of the interview.

Confidentiality
No information collected during the interview will be disclosed to any other person with the exception of my supervisor, Dr Anita Devos. To ensure the confidentiality or anonymity of the data collected I will post the transcript of the interview to the address you will provide during the interview.
All identifying information will be de-identified before publication of the thesis. This will include changing the name of each person, school and business to a single unidentifiable name, for example Roy Smalley could be changed to Researcher 1. If you wish you can choose a suitable pseudonym or false name to be used in my thesis.

Storage of data
Storage of the data collected will adhere to the University regulations and kept on University premises in a locked cupboard/filing cabinet for 5 years. A report of the study may be submitted for publication, but individual participants will not be identifiable in such a report.

At the end of this period the Interview transcripts will be shredded or placed in a confidential bin and the Audiotapes of the interviews will be erased and then disposed of.

Results
If you would like to be informed of the aggregate research finding, please contact Roy Smalley on [contact information] or email [contact information] or [Institute email address provided to participants]. The findings are accessible for 12 months after the thesis has been submitted and passed, about July 2010 to July 2011.

<table>
<thead>
<tr>
<th>If you would like to contact the researchers about any aspect of this study, please contact the Chief Investigator:</th>
<th>If you have a complaint concerning the manner in which this research CF08/2674 - 2008001339 is being conducted, please contact:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr Anita Devos</td>
<td>Executive Officer</td>
</tr>
<tr>
<td>Mail Building 6, Faculty of Education, Clayton Monash University, VIC, 3800</td>
<td>Standing Committee on Ethics in Research Involving Humans (SCERH)</td>
</tr>
<tr>
<td>Voice [contact information]</td>
<td>Building 3e Room 111</td>
</tr>
<tr>
<td>Fax [contact information]</td>
<td>Research Office</td>
</tr>
<tr>
<td>Email [contact information]</td>
<td>Monash University VIC 3800</td>
</tr>
<tr>
<td></td>
<td>Tel: +61 3 9905 2052  Fax: +61 3 9905 1420</td>
</tr>
<tr>
<td></td>
<td>Email: <a href="mailto:scerh@adm.monash.edu.au">scerh@adm.monash.edu.au</a></td>
</tr>
</tbody>
</table>

Thank you.

Roy Smalley

Note: [text] – represents text replaced to secure the anonymity of the particular TAFE Institute and the participants.
Appendix C - Consent Form

Consent Form
For students who have withdrawn from VCE Mathematics at [OMIT] during Semester 1, 2009

Title: Adults returning to study VCE Mathematics – Why do they leave?

NOTE: This consent form will remain with the Monash University researcher for their records

I agree to take part in the Monash University research project specified above. I have had the project explained to me, and I have read the Explanatory Statement, which I keep for my records. I understand that agreeing to take part means that:

1. I agree to be interviewed by the researcher  □ Yes
2. I agree to allow the interview to be audio-taped  □ Yes
3. I agree to make myself available for a further interview if required  □ Yes

I understand that I will be given a transcript of data concerning me for my comments, possible changes, and final approval before it is included in the write up of the research.

I understand that my participation is voluntary, that I can choose not to participate in part or all of the project, and that I can withdraw at any stage of the project up to the final transcript without being penalised or disadvantaged in any way.

I understand that any data that the researcher extracts from the interview for use in reports or published findings will not, under any circumstances, contain names or identifying characteristics.

I understand that data from the interview will be kept in a secure storage and will be accessible only to the researchers. I also understand that the data will be destroyed after a 5 year period unless I consent to it being used in future research.

Participant’s name

Signature

Date

Note: [text] – represents text replaced to secure the anonymity of the particular TAFE Institute and its students
Appendix D - Interview Guide

Interview Guide

Title: *Adults returning to study VCE Mathematics – Why do they leave?*

As outlined in the explanatory statement I’m interested in understanding your experiences in returning to study VCE Mathematics at TAFE and why you subsequently dropped out or withdrew from the class.

I believe that every individual has a unique story to tell about why they returned to study and the issues they encountered. I have a series of questions that will guide you through the process of telling your story. But feel free to add or correct information about your experiences as you remember them.

1. To help me understand your story I would like you tell me a little bit about yourself, your background, and your motivation for returning to study. Nothing that you consider too personal. Just the basics.
2. Did you receive any advice while you were making the decision to return to study? Was it useful? Was it confusing? Who provided the advice?
3. Now I’d like you to tell me about your experiences of returning to study from your initial enquiry through to the interview. What did you like? Did you find anything annoying or frustrating? What advice or assistance did you receive? How useful was it? Why?
4. Now remember your first mathematics class. What was it like? Was it what you expected? Can you describe your experience? How did you feel? Did this feeling continue or change in later classes? How? Why?
5. How did your experience of returning to study Mathematics at TAFE compare to your previous experience of studying Mathematics? Did it meet your expectations, in terms of the content and the teaching? Why or why not?
6. What was your experience of becoming a student once again? What did you like most about returning to study? What did you like least?
7. I am going to ask you to reflect on some of the tensions or difficulties that you experienced at home/ in class/ with work commitments/ study/ travel etc.  
   a. To what extent did your studies disrupt your family, social and working life? Or vice versa.
   b. Did you talk to anyone about the difficulties that you experienced in returning to study?
   c. Were you aware of what type of assistance was available to you as a TAFE student? Can you give me some examples? Did you use any of these support services? Did they help you?
8. The process of deciding to drop out or withdraw from a class is different for each person.  
   a. What was it like for you? Was it painful? Was it quick or drawn out? Why?
   b. When you look back what kinds of things most influenced your decision?
9. Did you withdraw from the entire course or just the maths class? Why? Do you have any plans for study in the future? What kind of things might influence your decision?

10. Would you like to talk further about any of the issues involved in returning to study:
    a. studying mathematics
    b. pathways to further education
    c. possible career pathways and qualifications needed
    d. etc?

Thank You
## Appendix E – Summary of Findings

<table>
<thead>
<tr>
<th>Theme</th>
<th>Danielle</th>
<th>Ryu</th>
<th>David</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Previous Schooling</strong></td>
<td>Young (15-19 years) Early School Leaver – Year 9 Pass</td>
<td>Adult (25+ years) Early School Leaver – Year 9 Pass</td>
<td>Adult (25+ years) Year 12 Completer</td>
</tr>
<tr>
<td><strong>Family Background</strong></td>
<td>Parents – Middle management</td>
<td>Parents – Religious (Fundamentalist Christian)</td>
<td>Father – Professional Engineer, local council</td>
</tr>
<tr>
<td></td>
<td>Qualifications – Early School Leavers, VET certificate or Diploma</td>
<td>No further information</td>
<td>Extended family – Professionals</td>
</tr>
<tr>
<td></td>
<td>Little communication about ‘school’ with parents</td>
<td>Ryu – agnostic?</td>
<td>Open communication</td>
</tr>
<tr>
<td><strong>Factors influencing School Leaving or Staying</strong></td>
<td>Didn’t do Homework Truancy</td>
<td>Failed Year 10 Lack of support and Encouragement from teachers</td>
<td>Chose easiest Year 12 Subjects. Minimum effort in class. 80% of work completed at home Didn’t like it</td>
</tr>
<tr>
<td></td>
<td>Didn’t like experience of repeating Year 9</td>
<td>Availability of an Apprenticeship</td>
<td></td>
</tr>
<tr>
<td><strong>Attitude towards school</strong></td>
<td>Has a neutral attitude towards school</td>
<td>On reflection doesn’t think the school was a good learning environment</td>
<td>Attributes not liking school to being a teenager – it’s not the right time to study</td>
</tr>
<tr>
<td><strong>Experience of School Mathematics</strong></td>
<td>Used a lot of maths in Year 7 to 9 Maths was the only subject where she tried really hard</td>
<td>Always liked Maths Was the only subject <em>that made sense</em> – logical, free of school values</td>
<td>Didn’t mind Maths Found Year 12 Further Maths difficult</td>
</tr>
<tr>
<td><strong>Post School Experience</strong></td>
<td>Enrolled in CGEA Certificate II Worked and travelled for six months Returned to TAFE following year to complete Year 11</td>
<td>Apprenticeship Working for supermarket chain Doesn’t like work environment</td>
<td>Furniture Factory Retail Store Sales person Speed Camera Operator Supportive work environment</td>
</tr>
<tr>
<td><strong>Pre Year 12 learning experiences</strong></td>
<td>Formal learning CGEA – didn’t learn a thing. Easy Year 11 – passed most</td>
<td>Informal learning Work experience and Experiential learning – Effort = success</td>
<td>Formal and Informal learning Helicopter license</td>
</tr>
<tr>
<td>Pre Year 12 Vision</td>
<td>Didn’t want to do the jobs you can get with a Year 10 pass</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------</td>
<td>-----------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No future plans – change job decision every week</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Realised is smarter than the average Joe Blow.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Study Medicine, specialising in Psychiatry</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Work is Physically challenging but not intellectually stimulating.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Multiple goals – Defence Force Pilot, Engineer, Police</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pre Year 12 recruitment advice and help seeking behaviour</th>
<th>Nil</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Doesn’t talk to any one about school. Especially Parents</td>
</tr>
<tr>
<td></td>
<td>However, acknowledges that parental expectations were probably half the reason she returned to study.</td>
</tr>
<tr>
<td></td>
<td>Did some revision of Year 11 Mathematical Methods textbook during school holidays</td>
</tr>
<tr>
<td></td>
<td>Minimal</td>
</tr>
<tr>
<td></td>
<td>One enquiry at local University just prior to VCE enrolment</td>
</tr>
<tr>
<td></td>
<td>Advised to do VCE</td>
</tr>
<tr>
<td></td>
<td>Little independent research on prerequisites etc</td>
</tr>
<tr>
<td></td>
<td>Need to prove to other people he is capable of doing the work</td>
</tr>
<tr>
<td></td>
<td>Extensive</td>
</tr>
<tr>
<td></td>
<td>Advice from Universities about Mature aged entry</td>
</tr>
<tr>
<td></td>
<td>Evaluated options</td>
</tr>
<tr>
<td></td>
<td>Investigated alternate courses</td>
</tr>
<tr>
<td></td>
<td>Conferrer with Defence Force regarding prerequisites</td>
</tr>
<tr>
<td></td>
<td>Self study – Year 11 Mathematical Methods text book</td>
</tr>
<tr>
<td></td>
<td>Opted for VCE as best option for meeting all prerequisites</td>
</tr>
</tbody>
</table>

| Year 12 recruitment advice and subject selection | Is not sure why she chose subjects. |
|------------------------------------------------| Selected Year 12 Mathematical Methods because she did it in Year 11 |
|                                                | Selected ‘easiest’ subjects |
|                                                | Selected subjects he was confident he could pass. |
|                                                | Selected Maths because he believed he was good at it |
|                                                | Opted for most challenging Maths class despite lack of prerequisite knowledge |
|                                                | Believed Maths was he strongest subject. |
|                                                | Selected Mathematical Methods and English to meet range of prerequisites |

<table>
<thead>
<tr>
<th>Study Mode</th>
<th>Full time Study</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5 Subjects – 3 at</td>
</tr>
<tr>
<td></td>
<td>Part time study</td>
</tr>
<tr>
<td></td>
<td>Part time study</td>
</tr>
<tr>
<td>Experience of Year 12 Mathematics class</td>
<td>OMIT, 2 elsewhere</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Year 12 Mathematical Methods</td>
<td>3 subjects</td>
</tr>
<tr>
<td>Missed first class</td>
<td></td>
</tr>
<tr>
<td>Did some homework after first class and then didn’t bother</td>
<td></td>
</tr>
<tr>
<td>Classes were faster, the work was harder and more serious than Year 11.</td>
<td></td>
</tr>
<tr>
<td>Didn’t want to do the work.</td>
<td></td>
</tr>
<tr>
<td>Didn’t want to do the homework.</td>
<td></td>
</tr>
<tr>
<td>Change to easier Further Maths.</td>
<td></td>
</tr>
<tr>
<td>Work is too easy = boring. Is not doing the work in class or at home</td>
<td></td>
</tr>
<tr>
<td>Decision – Doesn’t need maths for career options</td>
<td></td>
</tr>
<tr>
<td>Expected class to be difficult.</td>
<td></td>
</tr>
<tr>
<td>Found it to be really challenging, but doable with practice.</td>
<td></td>
</tr>
<tr>
<td>Weekly meeting with a Tutor</td>
<td></td>
</tr>
<tr>
<td>Sympathetic workplace which allowed extra study time during work hours</td>
<td></td>
</tr>
<tr>
<td>Peer support outside of class</td>
<td></td>
</tr>
<tr>
<td>Use of technology to support learning – MathsOnline and Youtube</td>
<td></td>
</tr>
<tr>
<td>Enjoyed classroom environment</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Personal factors affecting study</th>
<th>Problems with Employer</th>
<th></th>
<th>Significant life issue</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Created significant levels of stress which affected his health and ability to focus on studies.</td>
<td></td>
<td>Moved house to be closer to TAFE</td>
</tr>
<tr>
<td></td>
<td>“I thought I was going to completely screw all my results”</td>
<td></td>
<td>Friends refused to move out of his house so he could rent it out.</td>
</tr>
<tr>
<td></td>
<td>Result – quit work</td>
<td></td>
<td>Ongoing legal battle for most of first semester.</td>
</tr>
<tr>
<td></td>
<td>Modified approach to learning to rein in ambitious workload</td>
<td></td>
<td>Believes study helped him handle the stress.</td>
</tr>
</tbody>
</table>