Paving the Way for Girls into Male-Dominated Trades:

Reducing Gender Segregation in the Trades

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Abstract

Action to reduce gender segregation in the male-dominated trades has been elevated in the past five years in Australia and other developed nations. However, there is little evidence to indicate that this has translated to a significant increase in female participation in the male-dominated trades. For example, the female composition of trades in the manufacturing, automotive, electro-technology and construction industries in Australia has remained stagnant at under 2%. This has consequences for the country’s economic growth and for the economic security of women. This study pursues two areas of inquiry: (1) it assesses the extent of the gender segregation of the trades over the past two decades in Australia; and (2) it explores the reasons why this gender segregation has been entrenched and what action can be taken to rectify the situation.

In this research I adopt a critical social science methodology in which the process of social inquiry seeks to understand and challenge inequality in social and economic relations (Neuman, 2006, p. 95). I apply systems theory (Friedman & Allen, 2011; Ford & Lerner, 1992; Healy, 2014) as an organising framework to analyse the structural and individual level factors that contribute to gender segregation of the trades. Within this framework, I have also specifically examined three career development theories. These are: the meta-theory, Systems Theory Framework of Career Development (McMahon, 2014; McMahon, Patton & Watson, 2004; Patton & McMahon 2006); Social Cognitive Career Theory (Lent & Brown, 1996; Rogers & Creed, 2011) and Gottfredson’s theory of circumscription and compromise (Gottfredson, 1981, 2002). These three are selected as examples of career theories that provide significant insights into the external influences as well as the cognitive processes, such as self-efficacy and confidence, that impact on career decisions.
In the first phase of the research, the Australian Bureau of Statistics (ABS) labour force trade composition data from 1994 to 2014 was disaggregated by gender, which confirmed the entrenched nature of gender segregation in the trades. The findings showed no significant positive increase in the numbers or proportion of female trade workers in male-dominated trades since 1994. Furthermore, there is not a significant increase in females in the supply pipeline to the male-dominated trades. The disaggregation by gender of National Centre for Vocational Education Research (NCVER) data for the period 2000–2014 showed that the number of female students enrolled in school-based and post-school male-dominated trade courses is very low.

In the second phase of the research, interviews were conducted with 68 secondary students aged 15–18 years and 17 staff at four schools, as well as 11 educators and industry personnel in career advice, vocational education or trades around Australia. The aim of this phase was to examine the views of students and adults in education and industry to better understand the influences on the career decisions of students, the barriers they identify that limit female participation in the male-dominated trades, and their suggestions for ways to increase female participation in the male-dominated trades. In addition, to gathering the views of students, the interviews enabled me as researcher to inform participants of the extent of gender segregation in the trades; provide helpful information and resources to them. Through the interviews there was a strong view that female students are capable of the doing the male-dominated trades, but gender stereotypes and feelings of intimidation deter girls from these trades. In addition, the economic benefits of reducing gender segregation in the male-dominated trades and the higher rewards and earnings attached to these trades relative to female-dominated trades, such as hairdressing, were known to adult participants but not widely recognised by students.
The barriers that limit female entry to these trades are compounded as few people have identified the lack of female representation in the male-dominated trades as problem that needs to be fixed. Yet this research shows that when informed about this issue, participants agreed it is a problem and they were forthcoming with ideas for action. Consistent with the systems theory framework (Friedman & Allen, 2011; Ford & Lerner, 1992) the Social Ecological Model (UNICEF, 2015) is applied to identify systemic actions to address gender segregation of the trades.

In recognising that the advocacy and action on this issue is largely adult-driven and piecemeal, this study concludes that the success of future change will depend on (1) the extent to which actions can be systemic, enduring and resourced adequately, and (2) the extent to which young people can become more aware of the benefits of reduced gender segregation of the trades, and more effectively engaged in the change process.

(756 words)
Statement of Originality

This work has not previously been submitted for a degree or diploma in any university. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made in the thesis itself.

(Signed) ____________________________________________

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**Terminology**

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<th>Term</th>
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<td>Career development</td>
<td>The ongoing process of a person managing their life, learning and work over their lifespan. It involves developing the skills and knowledge that enable individuals to plan and make informed decisions about education, training and career choices (Australian Government, 2013).</td>
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<td>Career guidance</td>
<td>The services and activities intended to assist individuals, of any age and at any point in their lives, to make educational, training and occupational choices and to manage their careers. The activities may take place on an individual or group basis, and may be face-to-face or at a distance, including telephone help lines and web-based services (OECD cited in Hooley et al., 2010, p. 3).</td>
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<td>Gender analysis</td>
<td>The methodology for collecting and processing information about gender. It provides disaggregated data by sex, and an understanding of the social construction of gender roles, how labour is divided and valued (World Bank, 2015, p. 1).</td>
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<td>Gender blind</td>
<td>A failure to recognise that gender is an essential determinant of social outcomes impacting on projects and policies. A gender-blind approach assumes gender is not an influencing factor in projects, programs or policy (World Bank, 2015, p. 1).</td>
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<tr>
<td>Gender equality</td>
<td>The result of the absence of discrimination on the basis of a person’s sex in opportunities and the equal allocation of resources or benefits or in access to services (World Bank, 2015, p. 1).</td>
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<td>Gender equity</td>
<td>Entails the provision of fairness and justice in the distribution of benefits and responsibilities between women and men. The concept recognises that women and men have different needs and power and that these differences should be identified and addressed in a manner that rectifies the imbalances between the sexes policy (World Bank, 2015, p. 1).</td>
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<td>Gender mainstreaming</td>
<td>Mainstreaming a gender perspective is the process of assessing the implications for women and men of any planned action, including legislation, policies or programmes in all areas and at all levels. It is a strategy for making women’s as well as men’s concerns and experiences an integral dimension of the design, implementation, monitoring and evaluation of policies and programmes in all political, economic and societal spheres, so that women and men benefit equally, and that inequality is not perpetuated (UN Economic and Social Council, 1997, cited in UNESCO, 2015, p. 4).</td>
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<td>Gender-specific programs</td>
<td>Gender-specific programs aim to reduce specific inequalities faced by women or men, girls or boys, in a particular situation. The aim of this approach is to address specific and significant instances of discrimination and to reduce inequalities through support to a particular group (UNESCO, 2015, p. 4).</td>
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<td>Male-Dominated occupation</td>
<td>A “non-traditional” or male-dominated industry or occupation contains 25% or less women in total employment (US Department of Labor, Women’s Bureau, 2009).</td>
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Vocational Education and Training (VET) The Australian system that enables students to acquire workplace skills through nationally recognised training delivered within an industry-developed training package or an accredited course. The achievement of a VET qualification signifies that a student has demonstrated competency against the skills and knowledge required to perform effectively in the workplace (Educational Council, 2014, p. iii). Other countries have their own terminology for the vocational education and training systems.

Abbreviations

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<td>ACTU</td>
<td>Australian Council of Trade Unions</td>
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<td>eS4W and eSecurity4Women</td>
<td>economicSecurity4Women</td>
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<tr>
<td>IPPR</td>
<td>Institute of Public Policy Research</td>
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<td>LSAY</td>
<td>Longitudinal Surveys of Australian Youth</td>
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<td>NCDS</td>
<td>National Career Development Strategy</td>
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<td>NCVER</td>
<td>National Centre for Vocational Education Research</td>
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<td>STEM</td>
<td>Science, Technology, Engineering and Maths</td>
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<tr>
<td>TUC</td>
<td>Trade Union Congress (UK)</td>
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<td>UKCES</td>
<td>UK Commission for Employment and Skills</td>
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<tr>
<td>UN</td>
<td>United Nations</td>
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<td>UNESCO</td>
<td>United Nations Educational, Scientific and Cultural Organisation</td>
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<td>WGEA</td>
<td>Workplace Gender Equality Agency</td>
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Chapter 1: Introduction

Few young women pursue careers in male-dominated trades, and the gender segregation of the trades is not an issue that captures their interest. They appear to know little about the male-dominated trades, including the wages or required skills involved. In general, action to reduce gender-based occupational segregation has focussed more on the white-collar than the blue-collar workforce, particularly in terms of advancing women in leadership, management and the professions. Gender segregation in the trade workforce has not received consistent public attention, and change has been minimal. Any action to reduce this gender segregation has been led by adults with a passion for gender equality. This research explores the barriers that have entrenched gender segregation in trade occupations, including the lack of engagement of young people in efforts to rectify this situation. To offer new insights to the occupational segregation field, this research focusses attention on the attitudes and career decisions of young people; in particular, the factors that can engage young women in better understanding and becoming interested in trade careers.

While all career options should be available to all people, gendered stereotypes of work roles continue to influence and limit career selection, and can limit economic opportunities for young women. The primary aim of this research is to identify ways to increase the proportion of young women working in traditionally male-dominated trades. The rationale for this is that these trades can offer improved economic returns relative to female-dominated vocations for young women who do not aspire to, nor attain, a university education. Trades in the construction, electro-technology, automotive, manufacturing and mining industries are examples of occupations that can offer well-paid, secure employment for young people, yet the gender composition of these trades is almost exclusively male in all
countries. Female-dominated trades, such as hairdressing, are relatively lower paid than the male-dominated trades (Department of Education and Training, 2015).

A “non-traditional” or “male-dominated industry” or occupation is defined as one that has 25% or less women in total employment (US Department of Labor, 2009). “Occupational segregation by gender” refers to the extent to which women and men are differently distributed across occupations than is consistent with their overall shares of employment. “Vertical segregation” refers to the under-representation of women in high-status occupations and over-representation in low-status occupations; “horizontal segregation” denotes unequal proportion of men and women in occupations of similar status (Estevez-Abe, 2006; Sikora & Saha, 2011; Watts, 2003). Evidence shows that the extent of occupational segregation by gender has been declining in developed nations in recent decades, but this is mostly evident in white-collar rather than blue-collar occupations and it relates mostly to vertical segregation (Blau, Brummond & Yung-Hsu, 2013).

To improve economic security for women in the non-professional labour force, two courses of action are being pursued by gender-equality advocates: (1) ongoing industrial action to increase the remuneration and value of female-dominated occupations; and (2) action to increase women’s participation in the higher paid, traditionally male-dominated occupations. The focus of this research is on the latter.

This research draws on available data to show the persistent nature of gender segregation in the trades. Government-held data sources in Australia, such as the Australian Bureau of Statistics (ABS) and National Centre for Vocational Education Research (NCVER), are comprehensive, yet their public reports do not routinely publish gender-disaggregated data. A key component of this research is its focus on exploring such data and disaggregating it by gender. This component is described in the methodology section, and
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data are reported in the findings section. Industry reports that supplement the ABS and NCVER collections are also cited, as they also draw on their own workplace surveys.

Women and girls are concentrated in the typically female fields of work and training, where their post-training employment outcomes attract lower incomes than men’s and are less likely to be full-time positions (Miles & Rickert, 2009; Rothman et al., 2013). Vocational education and occupations can help to break the cycle of disadvantage that many people face, yet Vocational Education Training (VET) in Australia is still not equitable, especially for women and girls. While young women deserve opportunities to pursue male-dominated trades and their associated economic benefits, they face many well-documented barriers, such as the impact of gender stereotypes in fostering views on what “men’s” and “women’s” work is; historical and prolonged efforts to deter women from so-called male trades; and workplace hostility to women in male-dominated trades (Workplace Gender Equality Agency, 2014; economicSecurity4Women, 2014).

Male dominance of the higher-paying trades is problematic because it contributes to the following: labour market rigidity and economic inefficiency, including skills shortages; limited and stereotyped career choices for women and men; under-utilisation of the skills and talents of women; and an ongoing gender pay gap, with women continuing to receive lower remuneration relative to men. In addition, the labour markets that young people experience throughout the world are characterised by high levels of casual work and unemployment, and gendered segregation (International Labour Organisation, 2009). Careers in the traditionally male-dominated trades can offer secure economic prospects for all young people, including women.

In this study the interconnectedness of race, gender and other dimensions of inequality in Australia and internationally are acknowledged. However, its focus is on gender
differences in the trade occupations and the economic inequality that results for Australian women and girls. This inequality is compounded by race, ethnicity, experiences of forced removal from homes and homelands, disability, and other significant life experiences. While experiences and outcomes for women and girls are the focus of this research, it is recognised that men and boys will also benefit from access to a wide range of career options.

1.1 Young People and Career Exploration

Gender essentialist views, which see women as being innately more competent than men in services, nurturance and social interaction and men as being more adept at problem-solving, analytical skills and complex abstract reasoning than women (Charles & Grusky, 2004, cited in Sikora & Pokropek 2012, p. 236), are embedded in Western culture. These views reinforce perceptions of what men’s or women’s work encompasses. As a result, most female school students have limited knowledge of the male-dominated trades and they primarily pursue careers in the female-dominated pathways of health, education, community services, hair and beauty. While many female students seem to believe that they can do any job, their interest in typically male trades is low (Fuller, Beck & Unwin, 2006). Far fewer female than male students complete advanced level mathematics at school, and are consequently less likely to pursue male-dominated science, technology, engineering, maths (STEM) post-school courses or careers (Correll, 2001; Sikora & Pokropek, 2012).

High level action to enhance vocational and technical skills of young people is occurring in developing nations but the first critical step is to give girls access to primary education. A report by the International Centre for Technical and Vocational Education and Training and United Nations Educational, Scientific and Cultural Organisation (UNESCO) (2012) identified barriers to female entry to VET, stating:
Where TVET courses are specifically offered for women, this is typically limited to traditional female tasks in the garment, food, health and service sectors. In some developing countries, the lack of a social acceptance for women to work alongside men determines that technical, mechanical or engineering roles are more or less off limits. Moreover, even in countries where gender equality is more advanced, women can also encounter resistance against their inclusion in technical fields within TVET.

(p. 7)

Career guidance approaches for young people in all countries may be perpetuating, rather than challenging, gender stereotypes of occupations (Butler & Ferrier, 2006; economic Security4Women, 2014; Fuller, Beck & Unwin, 2005). In addition, there may be limited promotion of the full range of trade careers to male and female students. There is evidence of this in Australia (eSecurity4Women, 2014). High-school students participating in an international careers study expressed a strong preference for gaining professional employment—a preference that was significantly stronger among girls than boys (Sikora & Saha, 2011). While this aspiration is to be encouraged, not all students will achieve this goal. Students can benefit from career interventions in which a wide range of career options are available to them.

1.2 Research Motivations and Aims

My motivation to pursue this research began during my time as a social worker where I was disturbed by the extent to which economic inequalities experienced by many women led them into poverty, housing distress, violent relationships and many other areas of vulnerability and disadvantage. For example, I met many women who were enduring violent relationships because they were not economically secure enough to leave. From 2009 to 2012, I served as a Cabinet Minister for Community Services, Housing and Women in local
government. In this role, I had an opportunity to respond to the social needs of women through advancing their economic status through particular strategies (Department of Communities, 2011). Central to this was the Girls in Hard Hats program, aimed at increasing the female composition of male-dominated industries. As part of this program, I visited many secondary schools where I met hundreds of female students to discuss the benefits of careers in male-dominated trades. Despite the enthusiasm and interest shown by the participants in this and other similar activities occurring around Australia, few female students enrol in male-dominated trade courses and apprenticeships. My interest in raising public awareness of gender segregation in the trades—through research and action—is to heighten public attention on the needs of “working class” young women and to expand their opportunities for economic security. I therefore commenced this research with the following aims:

- To determine whether female participation in any of the male-dominated trades is increasing;
- To explore, primarily from the perspective of young women, why so few of them pursue male-dominated trades;
- To identify and facilitate new action to increase female participation in the male-dominated trades.

1.3 Research Problem

The proposition under examination in this study is that more female participation in male-dominated trades would occur if the barriers that limit participation could be overcome and if greater interest in this issue could be generated among young people, parents and carers, educators, policy makers and employers. This in turn would have economic benefits for girls and women. This is not a new proposition. Despite determined efforts over past decades by community leaders, researchers and activists in many nations to raise awareness...
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of and reduce the gender segregation of the trades, the segregation remains firmly entrenched. For those seeking change to be successful in “claims-making” on an issue—that is, to successfully influence decision makers—they must be persistent and (among a number of actions) provide evidence that a social problem exists, as well as of the economic benefits that can be derived from addressing it (Loseke, 2003, cited in Wanna, Butcher & Freyens, 2010, p. 64). This research seeks to strengthen the claims that the removal of structural barriers contributing to gender segregation of the trades requires renewed, high-level action.

My past work experience, policy development and activism has shown me how important it is for claims makers (external to, or within, government) to achieve enduring change. This occurs through high-level policy and/or legislative change and ongoing, long-term resource allocations to respond to the systemic factors contributing to an identified problem. Enduring change is most likely to result when advocates are persistent, use evidence-based research and are able to capture widespread attention and public support. From my experience in social work and as a former Member of Parliament and Minister in the Queensland State Government, that change will be more effective when the people affected by the issue—in this case, young people—are central to its resolution.

To identify the extent of gender segregation in the trades in Australia and how it can be reduced, the following three research questions were set:

1. What is the extent of gender segregation in vocational education and training (VET) and male-dominated trades in Australia?
2. Why do very few female students choose typically male-dominated trades as their job pathway?
3. What can be done, particularly in the education and training sectors, to increase female interest in, and take-up of, these trades?
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The responses to these questions aim to produce current evidence to strengthen the claim for change.

1.4 Structure of the Research

This research examined the gender segregation of the male-dominated trades in two phases. In the first phase, the extent of gender segregation in the male-dominated trades in Australia was identified through completing a gender disaggregation of secondary data sources on the labour force from the ABS and vocational education data from the NCVER. In the second phase, the views of secondary students, educators and industry personnel were sought to identify why so few females pursue male-dominated trade careers and what more can be done to pave the way for increased female representation in these trades.

1.5 Significance of the Study

Unfortunately, the individuals and organisations—both local and international—who have advocated for reduced gender segregation in trades have not produced enduring change. The significance of this research is that it will provide impetus and empirical support to the current field of research, policy, and action on occupational segregation in the trades to shift it from the one-off, “champion-led” model of change to enduring change that captures more widespread public attention and action. This research aims to achieve this by analysing the following: (1) the current gender composition of trade occupations, including VET courses and VET in schools courses (VETiS) in Australia over the past two decades; (2) the economic impact of this and benefits of reduced segregation; (3) the contemporary perspectives of Australian secondary students and staff to help understand, from their perspective, why few female students pursue male-dominated trade careers; and (4) the system-wide barriers to, and the enablers of, change. Importantly, it will also seek to identify the role young people may take in the movement for change.
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The significant contribution of this research is the system-wide, enduring approach to action that it recommends. The research draws on systems theory as an organising framework for understanding and reporting on the issues in this research. Systems theory helps to understand and analyse the dynamic and interconnected nature of individual and structural influences that determine human behaviour (Ford & Lerner, 1992; Friedman & Allen, 2011). It provides a way to understand “the individual in relation to a larger social context” (Friedman & Allen, 2011, p. 3). In relation to youth and career decisions, systems theory helps us to understand the individual in relation to their environment of family dynamics, social networks, institutions, culture and social and economic structures (Friedman & Allen, 2011).

To achieve multi-level analysis in this research, theories that help us to understand the individual behaviours and cultural and structural influences on gender segregation of the trades are canvassed. To better understand the process of attitude and behaviour change with young people, this research also draws from the Social Ecological Model (SEM) of Change (UNICEF, 2014) and the Youth Choice and Change Model (Maddaleno & Beinhauer, 2005). Both of these models have been applied primarily in the field of youth public health and safety in developing nations. Career-development theories are also incorporated, particularly the Systems Theory Framework on Career Development (STF) as it offers useful insights into the systemic factors that influence young people’s career decisions. In this research, systems theory provides the framework for analysis, while SEM provides the tool to guide systemic action.

The research outcomes will also be timely, as interest and action to reduce gender-based segregation in particular industries have been building worldwide. In Australia, this has been led by women’s organisations, trade union activists, industry associations, and the
Human Rights Commission. National leadership was also provided from the former Australian Federal Labor Government through the introduction of legislation requiring large employers to report on the gender composition in their workforce and through the establishment of the Workplace Gender Equality Agency (WGEA). Nevertheless, research on the views of young people, educators and career-guidance staff regarding male-dominated trades is minimal. During the latter stages of this research, economicSecurity4Women (eSecurity4Women) (2014) conducted a research project that explored the career processes and barriers limiting the entry of young women into male-dominated occupations. Their recommendations for action were constructive and have been drawn on in this research. The combination of quantitative data with the qualitative analysis of student and adult interviews in this research will contribute new information and systemic strategies aimed at advancing the movement for change that is gathering momentum.

1.6 Limitations of, and Impetus from, Existing Research

This study seeks to respond to the following three main limitations, or gaps, in the research: the lack of routine reporting of a gendered analysis of labour force data and VET data (eSecurity4Women, 2012); the lack of research on young people’s views of the male-dominated trades as career choices; and the limited analysis, including gender analysis, of career guidance in schools (Bimrose, 2014), particularly as it relates to gender differences in occupational choices. These gaps provide impetus for ways in which this research can respond to and fill gaps in research and practice.

Secondary students’ views on the trades have been reported (Fuller, Beck & Unwin, 2005; Labour and Workforce Development, 2010; O’Donnell; 2008), but these and related studies have predominantly been conducted in the UK, USA and Canada. In Australia, the Association of Women Educators and eSecurity4Women conducted research on the views of
secondary students (Delaney & Ralston, 2010) and these organisations have maintained their interest and action on this issue. Limited research is available that specifically examines career guidance practice as it relates to non-traditional occupations, including the trades. Research evaluating students’ views on career guidance generally has indicated that limited options are being presented to female students, with many feeling discouraged in pursuing subject and occupational choices that do not match what is typically expected of their gender (Fuller et al., 2005; O’Donnell, 2008; Shewring, 2009). Certain researchers who have examined the experience of women in the trades have reported on women's capabilities and positive views of the trades, as well as their views on factors that limit the entry of more women (Shewring, 2009; Wright, 2011). Wright’s research (2011), based in the UK, was grounded in a concern about gender inequality at work and “how class position and dominant heterosexuality intersect with gender in women's experience of work” (p. 113). Wright (2011) did not focus on secondary students, but her recognition of the multi-dimensional nature of inequality on women’s labour force participation has been instructive for the present study.

The Longitudinal Surveys of Australian Youth (LSAY) to which NCVER provides analytical and reporting services are comprehensive in identifying post-school education and training pathways, but not attitudes of youth. They offer data that track the education, occupation and income of young people post-school, which are available to researchers for online analysis. LSAY also have a generic question about career-guidance information but the survey does not aim to explore the attitudes of youth or career guidance staff to trades specifically.

In the past decade, a number of feminist researchers within the emerging “Girl Studies” discipline have explored the attitudes of girls to feminism, their gender and their
aspirations, including work by Harris (2004), McRobbie (2000) and Zaslow (2009). In her ethnographic study on girls’ attitudes to feminism, including gender stereotypes of women’s roles and work, Zaslow (2009) found that girls tended to say that they could pursue any career they wanted, and that they were more equal with males than in the past. Numerous forums where female students have had their say on trades and try-a-trade events have been organised Australia wide, with recent examples being the Girls in Trades Forums run by eS4W and events run by the Offices for Women in various states in partnership with industry and training providers. As mentioned above, I participated in many of these activities in my former ministerial role (2009–12), promoting the Girls in Hard Hats program through which I met over 500 students. I saw some female students react with amusement, some with disinterest, but many responded favourably to “hard hat” careers, as evidenced by their interest in follow-up careers information and/or work experience (Struthers, 2011). However, the reports that were generated from these were informal, and not of the standard required for peer-reviewed publication. In contrast, this present study is conducted with more formal analysis and rigour. The interviews I have undertaken with secondary students and staff in this research have enabled in-depth discussion on their views on male-dominated trades and their experiences of career information, support and decisions-making and how occupations and subject choices are dealt with in these processes.

In regard to the data analysis phase of this research, the ABS and NCVER data collections are comprehensive. It is of concern, however, that a gender analysis and disaggregation of trade occupation and course composition data is not routinely reported. For example, NCVER’s *Australian Vocational Education and Training Statistics: Apprentices and Trainees* is reported quarterly. It provides a gender breakdown on the aggregate numbers of apprentices and trainees, but it does not disaggregate within occupational groups or
industry training packages. In order to explore the gender breakdown of apprentices and trainees within specific occupations, registered users of NCVER data can use online tools to analyse its collections and generate tables.

This gender disaggregation is a task undertaken in this research. The findings reported in this research will be beneficial in providing data current at the time of its collection and inclusive of the following three elements: the gender composition by selected occupation or industry training package of VET course data; VET in schools; and the trade occupations in the workforce. This research will focus on the nature of gender segregation in the trades in the Australian context. It will build on the existing reported views of young people, and extend the dialogue to include staff involved in career guidance and VET. In doing so, it will report on ways to increase the participation of female students in manual trades and their VET pathways. This combination of quantitative data with the qualitative analysis of student and staff interviews is a new contribution to Australian research and debate on this topical issue.

1.7 Structure of the Thesis

This thesis comprises seven chapters. This introductory chapter has provided an overview of key issues in the research, my motivation as researcher, the research questions and significance of the research. The literature review is presented in two parts, and forms Chapters 2 and 3.

Chapter 2 considers the extent of gender segregation in the trades; the reasons why gender segregation of the trades is a problem; the barriers causing this segregation to become entrenched, particularly as they relate to the education and training sectors; and theories explaining why it persists. As detailed above, this research applies systems theory (Ford & Lerner, 1992; Meyer, 1983, cited in Friedman & Allen, 2011) as an organising framework for
the analysis and reporting on findings, and the SEM (UNICEF, 2014) provides a structure and guide for action arising from the findings.

Chapter 3 canvasses the career decision-making of students in relation to the male-dominated trades; career development theory; and youth participation and behaviour change. Occupational segregation is such a broad area of inquiry, and I have selected these two areas of inquiry (hence being divided into Chapters 2 and 3) to focus on the education and training sectors, career and youth development. Until now, the low female composition of the male-dominated trades has not been subject to widespread scholarly attention or research in the career and youth development fields. By featuring the education sector, careers development, and approaches to youth change, this research and the actions arising from it are intended to contribute to a relatively under-developed area of scholarly attention.

Chapter 4 discusses the research methodology, research questions, and the mixed methods approach, which enable the macro factors (i.e., large-scale features of the segregated workforce) to be better understood by examining the micro factors (i.e., behavioural and attitudinal influences on occupational choice by young people). In particular, I combined a gender disaggregation of existing labour force and vocational education data collections (quantitative) with interviews with secondary students and stakeholders (qualitative).

Chapter 5 presents the findings from the quantitative data analysis that respond to research question one, and affirm the entrenched nature of the gender segregation of the trades in Australia. This is followed by a thematic analysis of the participant interviews in which 16 themes are extracted to respond to all three research questions. A common thread to these themes is the powerful impact of gender stereotypes on young people’s career decisions and on the views of the adults who influence those decisions.
In Chapter 6, the findings of the study are discussed in relation to current evidence and theoretical perspectives relevant to the three fields of inquiry selected as the focus of this study. A systems model of change is proposed to shift from the current sporadic process of one-off, adult-led actions. This lack of system-wide enduring change is resulting in a limited impact on gender segregation in certain trades. Through the course of this research, it also became clear that a systems approach must be informed by a gender analysis of education, career development and the work and principles of effective youth engagement.

The conclusion presented in Chapter 7 includes recommendations for action that engage industry, government, education services and young people in a systemic, enduring change process. Systems theory and the models for change derived from it provide guidance on how multi-level action across sectors can facilitate change. Increasingly, advocates for greater female composition within the traditionally male-dominated trades are recognising the need for cross-sector planning and implementing ideas for action. Importantly, the conclusion of this thesis reaffirms that future actions need to be creative and effective in engaging young people.
Chapter 2: Literature Relating to the Nature and Extent of Gender Segregation in the Trades

2.1 Introduction

This chapter begins by explaining the search processes used in the literature review phase of this research. It then explores issues within the first area of inquiry: the nature and extent of gender segregation of the trades. Using publicly available data, it shows the extent of gender segregation in the male-dominated trades and wage differentials in the trades in Australia and internationally. It considers why this gender segregation is a problem—particularly as it relates to the education and training sectors—and canvasses theories explaining why it persists. This chapter also explains the use of systems theory as an organising framework for this research.

This chapter will demonstrate the enormous breadth and complexity of the literature relating to occupational segregation and the factors contributing specifically to gender segregation of the male-dominated trades. As it will show, these factors have been operating at an individual level, and have been embedded in the social, cultural and economic structures to shape the gendered nature of work, education and career development for young people. The literature is generally grounded in either an economic theoretical foundation or in a feminist or advocacy approach, aimed at extending government and industry action on gender segregation. The latter body of literature has informed much of the developments in equal employment and anti-discrimination legislation. This part of the literature review is presented under the following headings:

- Search methods used for the literature review;
- The current system of trade training for secondary students and school leavers;
- Low female composition of the traditionally male-dominated trades;
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- Low female participation in trades across nations;
- Why male dominance of the trades is a problem;
- Barriers that entrench gender segregation in the trades;
- Systems theory as an organising framework;
- Economic theories on occupational segregation by gender;
- Feminist theories on the economy and institutions; and
- Theory of gender formation.

2.2 Search Methods Used for the Literature Review

Well-defined literature search strategies enhance the context of knowledge in which studies are framed and enhance the rigour of research (Whittemore & Knafl, 2005). The following databases were searched to identify the breadth of literature needed to inform this study: the Vocational Education database (VOCED), which is managed by the NCVER; the Education Resources Information Center (ERIC), sponsored by the US Department of Education; Informit, including Australian Public Affairs Index (APAIS); ProQuest Career and Technical Information; Dissertation Abstracts International; and more. Search terms developed as the study progressed and these covered the two areas of inquiry that became central to this research (and that form this chapter and the next). To retrieve results for the first area, the nature and extent of gender segregation in the trades and the barriers entrenching this segregation, I used the following search terms: “women and trades”, “male-dominated trades”, “gender segregation and trades”, “occupational segregation”, “occupational segregation and theory”, and “gender and work theory”.

To retrieve results for the second area, the career development and decision-making of students in relation the male-dominated trades and youth behaviour change, I used the following search terms: “career development theory”, “youth and careers”, “young people
and work”, “career guidance and youth”, “career systems theory”, “girls and careers”, “indigenous girls and work”, “youth change theory”, “social change and youth”, “youth behaviour change”, “youth-led change”, and “public health and youth”.

The searches were restricted to the English language and were mostly from the period 2004 onwards to both manage the volume of available literature and to focus on the recent decade. However, to explore the history of the gender pay gap and the historical exclusion of women from male-dominated work, searches that pre-dated 2004 were also conducted. Studies from Latin America, UK, USA, Africa, Europe and India were located and were of particular interest in order to assess inter-country and cultural differences of female participation in male-dominated trades. Grey literature in the form of government reports, conference reports and media provided a contemporary context to the research as many new initiatives and research have emerged since the commencement of this research in October 2012. To complement the computer-based searching, manual searching of peer-reviewed journals and websites in the topics of interest were also undertaken. This was useful in identifying people with relevant research expertise and interests with whom I was able to connect and request further information and/or an informal interview.

2.3 The Current System of Trade Training in Australia for Secondary Students and School Leavers

2.3.1 Overview. In recent decades, there has been a major shift in the apprenticeship and traineeship system in Australia from one that was almost exclusively for young male school-leavers to one that covers people of all ages, including a much higher proportion of females. The system includes two major components that will be discussed below: (1) a national framework for apprenticeships, called the National Apprenticeship Assistance Scheme (NAAS); and (2) a Vocational Education and Training (VET) system. Until recently,
a distinct VET in Schools (VETiS) system applied, but this has now become part of the one VET system (Education Council, 2014). The current schools-based apprenticeship or traineeship enables a qualification pathway that combines paid employment as an apprentice or a trainee, off-the-job vocational training and senior secondary school studies (Education Council, 2014). There has also been an unprecedented expansion of trade training centres in schools or in partnerships, with the Trade Training Centres in Schools Program providing $2.5 billion from 2008 to 2018 to enable eligible secondary schools across Australia to establish Trade Training Centres (Department of Education, Employment and Workplace Relations, 2012).

2.3.2 National Apprenticeship Assistance Scheme. The NAAS was introduced in 1973, when the Australian Government became active in labour market policy and programs, including the provision of large-scale government payments to apprentices and their employers. This payment of incentives, including payroll tax incentives and subsidies to apprentices to off-set their low training wages, appears to be unique to Australia (Knight, 2012). School-based apprenticeships and traineeships were introduced in 1996, enabling young people to start a part-time apprenticeship or traineeship while still attending secondary school.

The apprenticeship system has moved from “one that was intended to provide entry-level training and paid employment to young males in the trades, to one that provides both entry-level and continuing training, and paid employment, to people of all ages and both sexes” (Knight, 2012, p. 18). Key changes as at 2009 were reported as follows:

- 41% of the commencements in trade occupations, and 70% in non-trade occupations, were adults aged 20 years or older, and
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- 16% of the commencements in trade occupations, and 54% in non-trade occupations, were females (Knight, 2012, p. 26).

Major changes in the occupational mix have also been observed:

- In 1963, 42% of commencements were in metal and vehicle trades. By 2009, although the number had almost doubled, from 9,400 to 18,200, it only represented 24% of trade commencements.

- A fourfold increase in building trade commencements took place, from 4,200 in 1963 to 17,500 in 2009, representing 23% of trade commencements.

- The “other trades” category, which includes hairdressers and others, had also grown (3,700 to 20,700), holding the same weight as building trade commencements.

- Food trade commencements grew by a factor of six (1,600 to 9,300) and represented 12% of commencements in 2009 (Knight, 2012, p. 24).

2.3.3 Vocational Education and Training. VET enables students to acquire workplace skills through nationally recognised training delivered through an industry-developed training package or an accredited course. A VET qualification is issued by a registered training organisation (RTO). The achievement of a VET qualification signifies that a student has demonstrated competency against the skills and knowledge required to perform effectively in the workplace (Educational Council, 2014, p. iii). VET provides for students to undertake nationally recognised vocational education and training as part of the senior school certificate. This enables successful students to attain a senior school certificate as well as a VET qualification or statement of attainment (Knight, 2009). VET delivered to secondary students is the same as all other VET, and the same quality standards apply (Educational Council, 2014).
With the labour markets demanding ever-increasing levels of skills, changes have occurred in VET, including apprenticeships. While previously, many early school leavers may have obtained work without the successful completion of Year 12, it is now an entry requirement for many occupations. Jobs that were previously accessible to Year 12 graduates now often require post-school qualifications. The emergence of “Learning or Earning” policies and targets around Australia in recent years has set the minimum school-leaving age at 17 (with few exceptions). VET in schools has been expanded to provide training to an increasing number of secondary students who now stay on to Year 12, with more than 90% of Australian schools now delivering or providing access to some form of vocational education (Education Council, 2014; Nguyen, 2010, cited in Clarke, 2014).

The federal Department of Employment undertakes routine, comprehensive analyses of skills shortages and vacancies across Australia to guide industries, educators and the public to help better match the skills and education paths that people pursue to employment opportunities. In Australia, the shortages experienced in trade apprenticeships are variable. In the period 2012–2013, there was growth in commencements for electro-technology and telecommunications trades workers (up by 32.9%), while construction trades commencements remained at low levels (Department of Employment, 2014). In this period, commencements decreased for engineering, ICT and science technicians (down by 14.5%). Commencements in automotive and engineering trade workers were also down by 13.2% (Department of Employment, 2014).

Concerns about low apprentice and trainee numbers have been raised by a number of employers surveyed by the Department of Employment, as well as the Master Builders Australia and the Australian Chamber of Commerce and Industry (Department of Employment, 2014, p. 9). Despite fluctuations in skills shortages, there are significant
training and employment opportunities for women and girls who may want to pursue an apprenticeship in a male-dominated trade in Australia, the female participation rates remain consistently low.

### 2.4 The Low Female Composition of the Male-Dominated Trades

The proportion of female apprentices and those who are trade qualified (commonly described as being ‘on the tools’) in male-dominated trades has been consistently low in Australia. It is difficult to obtain accurate data on female composition of the trades and trade training courses as there is some variance between industry data sources (including employer surveys) and national data collections, such as the ABS. In addition, not all available data on training courses and trade occupations are disaggregated by gender. As a result, this study incorporates a quantitative element to obtain a more accurate gender disaggregation of trade composition data in Australia. The findings of this are reported in Chapter 5.

According to publicly available industry and government-held data, the female composition of male-dominated trades ranges from 1% to 6% of the total tradespersons in each trade in Australia (Australian Bureau of Statistics, 2014; Auto Skills Australia, 2015; Manufacturing Skills Australia, 2014). The industry data generally reflect a higher female composition, as non-trade-qualified female employees are sometimes included. Trade occupations, as defined by Australia and New Zealand Classification of Occupations (ANZCO) 2006, have maintained high levels of male composition over the 1996–2012 period for which data in Australia have been comparable. In mining and construction trades in 1996, male composition was 96% and 99% respectively and remained almost exclusively male at 99% and 98% in 2012, with manufacturing at 92% and 93% (Australian Bureau of Statistics, 2013b).
Vocational education (VET) data also show the low representation of females in the male-dominated trades, some of which are represented in Table 1. Males comprised more than 98% of participants in three trade occupations: automotive and engineering; construction; and electro-technology. By contrast, community and personal service workers recorded the highest share of female participants at 34,325 (72%). This pattern is consistent with other data sources. For example, the Year 12 Victoria school leavers destination survey reported that 8.7% of males entered an apprenticeship, compared with 1.5% of females (Rothman & Underwood, 2012). The highest female enrolments were in building and construction and electrical and electronic trades, with the enrolment overwhelmingly male at 98.6% and 99.2% respectively. The metal and engineering courses were also male-dominated at 98.2%.

Despite the efforts by industry, unions and government to encourage female take-up of the male-dominated trades in recent years, the growth in female enrolments in the male-dominated courses remains at least minimal, and in some instances has declined. I am aware from my experience in working with many of these determined advocates in trade unions, government, industry and the education sector, how discouraging it is to feel that strategies to increase female interest in, and take-up of careers in electro-technology, automotive, construction and manufacturing and other typically male trades are having little positive impact. To maintain momentum on this issue, the motivation of these advocates needs to be maintained. It is important that new, innovative approaches to this issue can be adopted. There is little comfort for these advocates that the Australian situation of entrenched low female composition of the male-dominated trades is on par with international experience.
PAVING THE WAY FOR GIRLS INTO MALE-DOMINATED TRADES

Table 1

*Selected Apprentices and Trainees in Training by Occupation, March 31 2010*

<table>
<thead>
<tr>
<th>Course</th>
<th>Male No.</th>
<th>Female No.</th>
<th>Total</th>
<th>Female %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automotive and engineering</td>
<td>49,392</td>
<td>970</td>
<td>50,364</td>
<td>1.9</td>
</tr>
<tr>
<td>Construction</td>
<td>54,314</td>
<td>534</td>
<td>54,849</td>
<td>1.0</td>
</tr>
<tr>
<td>Electro-technology and communications</td>
<td>33,100</td>
<td>643</td>
<td>33,744</td>
<td>1.9</td>
</tr>
<tr>
<td>Community and personal service</td>
<td>13,416</td>
<td>34,325</td>
<td>47,741</td>
<td>72.0</td>
</tr>
</tbody>
</table>


2.5 Low Female Participation in Trades Internationally

Gender segregation has been a longstanding feature of trades and apprenticeship programs in countries around the world (Berik & Bilginsoy, 2006; Equal Opportunities Commission, 2004; Fuller, Beck & Unwin, 2005; van der Meulen Rodgers & Boyer, 2006). In applying the International Standard Classification of Occupations (ISCO-08), a large proportion of the trade workforce internationally is broadly identified under the “craft and related trade worker” category. In examining the female share of this occupational category for 2013, the results for selected countries were as follows: Australia 4.5%; Germany 10.7%; Turkey 11.6%; and UK 5.8% (International Labour Organization, 2015). As this data include trades and related areas of work, it is not precise in singling out qualified trade workers. It indicates that female composition is low in this category only across nations where the data are available. Anomalies were shown in Latin American countries, such as Ecuador and El
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Salvador, where the female share of employment in the “craft and related trades worker” category was 21.5% and 32% respectively. There is no indication that women have defied cultural norms to move into male-dominated trades in huge numbers. On the contrary, it has been reported that while female labour force participation has doubled: “Women are concentrated in few underpaid occupations including education, health or social services, and are socially undervalued” (Trade Chile, 2015).

In the US, women constituted less than 2% of construction apprentices in 1992. Despite a US Department of Labor objective that contractors pursue best effort policies to hire women for 6.9% of the labour hours in federal construction jobs from 1980, by 2003, the “women’s share in the ten largest trades had only increased to 2.4%” (Berek & Bilingsoy, 2006, p. 325). It was reported that despite ongoing action to reduce segregation of the trades in the US since 1977 when the Department of Education conducted compliance reviews and found that students were “concentrated in programs traditionally intended for them” (Eardley & Manvell, 2006, p. 397), there has been little change. The low female representation in male-dominated trades has also prompted the UK to adopt programs aimed at increasing female representation. In 2015, Women in Construction (WiC) reported that women represent only 11% of the construction workforce in the UK and most of these jobs are office based, with only 2% of women working in manual jobs. Women comprised 2% of all apprenticeship starts in the construction, electro-technical and vehicle-maintenance-and-repair sectors, and less than 4% in the engineering and driving vehicles sectors. Yet more than nine in 10 apprentices (92.2%) who started in the hairdressing sector were women (Trade Union Congress, 2013).

The available data show that the male domination of the auto, construction, electro-technology and manufacturing trades, and their pre-requisite VET courses, has been
entrenched for decades. The male domination of these trades appears resistant to change. Watts’ (2003) forecast that the tradesperson occupational group in Australia, which has become more segregated over time, had “little prospect of the skilled blue collar occupations exhibiting gender integration in the future” (p. 645) is proving to be accurate. In a longitudinal study conducted in the US spanning 1970 to 2009, Blau, Brummond, and Yung-Hsu Liu (2013) reported declining segregation in white-collar occupations, but there was “no evidence of similar female gains in blue collar occupations” (p. 489). These researchers stated that: "...many traditionally male professions moved out of the heavily male category, including lawyers, physicians and surgeons, architects, economists, and veterinarians . . . The remaining heavily male professional jobs tend to be in science, technology, engineering, and mathematics (the STEM fields)." (p. 486)

These researchers also found that, by the 2000s, the decrease in segregation had become modest. The reductions in occupational segregation were attributed primarily to women entering white-collar and service jobs where men had predominated, rather than movement of men into predominantly female occupations. There was also a high correlation between occupational segregation and education, “with the largest decreases among college graduates and very little change in the extent of occupational segregation among high school dropouts” (Blau et al., 2013, p. 489). The researchers concluded that it was difficult to predict when “a more robust decrease in segregation will resume” (Blau et al., 2013, p. 489). To achieve greater desegregation, Blau et al. (2013) proposed that the following changes would be required:

- Women would need to make significant inroads into predominantly male blue-collar jobs, and continue to build on their gains in the STEM fields.
• Men would need to enter predominantly female occupations in much larger numbers than they have in the past. It was acknowledged that men have little incentive to take on ‘women’s work’ due to the lower pay in female-dominated jobs.

• Young women and girls would need to be the target of policies that enhance their performance in mathematics. (pp. 489–491)

2.6 Why Male Dominance of the Trades Is a Problem

2.6.1 Overview. Gender segregation of the trades matters to industry, the economy and advocates of gender equality. The negative impacts on the economy, and for women in particular, are key concerns. Low female workforce participation rates, and the segregation of women into existing female-dominated industries contributes to labour market rigidity, sub-optimal productivity, and economic inefficiency due to the lack of utilisation of the skills of women (Employment Opportunities Commission, 2004; Human Rights Commission, 2014; Toohey, Boak & Borkin, 2014; UK Commission for Employment and Skills, 2011), and increased labour costs due to skills shortages (Minerals Council of Australia, 2013). While strong economic and equity claims justify the need for change, research by Fuller et al. (2005) has found that young people generally lack concern over the gender segregation of trades and that there was “little indication from the ‘formal sources’ of influence on young people that the issue of occupational segregation and sex stereotyping were considered areas in need of their active and immediate attention at the institutional level” (p. 307). Therefore, it seems that the higher earnings and skills demands in male-dominated trades may not be widely recognised by young people when making their career decisions. Clearly, this issue is high on the agenda for interested community and industry leaders, but it does not have a groundswell of support from young people or the wider public.
2.6.2 Economic benefits of reduced gender segregation in the trades. The benefits that could accrue from increased representation of women in male-dominated industries are summarised well by Toohey, Boak and Borkin (2014), who state:

Accessing the talent of highly educated and skilled labour already resident in Australia should help lift aggregate productivity, contain wage growth, assist in lowering the future strains on the pension system and importantly help engender a more diverse workplace and a fairer society. (p. 9)

The benefits of increasing female participation in the labour force, including the trades, are supported in current economic modelling. It is estimated in Australia that “should the female labour force participation rate move closer to the male participation rate, the potential economic benefits would exceed 11% of GDP” (Toohey, Boak & Borkin, 2014, p. 15).

2.6.3 Skills shortages exist. Skills shortages are evident or are projected in many trade areas in Australia and overseas. Skill shortages exist “when employers are unable to fill or have considerable difficulty filling vacancies for an occupation, at current levels of remuneration and conditions of employment, and reasonably accessible location” (Department of Employment, 2014, p. 26). Attracting and retaining underutilised sources of talent, including women, are recognised strategies to address skills shortages (Auto Skills Australia, 2014; Manpower Group, 2013; Minerals Council of Australia, 2013; Toohey, Boak & Borkin, 2014). In their analysis, Toohey et al. (2014, p. 7) reported that increasing female participation in industries that have historically relied on men to fill roles, including the mining, construction and utilities industries, would derive significant economic benefit from greater female representation. Yet, they noted that the vast majority of employment growth
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for females since 2009 has been concentrated in health and education where females are over-represented.

With the support of governments and trade unions, some employers in the mining, manufacturing, construction, energy, and automotive industries have recently been actively encouraging female employment in these sectors through the creative use of social media and trade work experiences for female students (AutoSkills Australia, 2014; Minerals Council of Australia, 2013). The mining and energy sector is growing within Australia, characterised by high average incomes and significant skills shortages. Women comprise 13% of this industry, but this includes non-trade workers, project managers, health and safety personnel and others (Mining Council of Australia, 2013). In their workforce diversity statement, the Australian Mining and Minerals Association (AMMA, 2015) supports the development of the Australian Women in Resources Association, which is:

Dedicated to drive business productivity and innovation through integrating a diverse mix of skills, AWRA seeks to build women’s workforce participation in the resource, allied and related construction sectors to 25% by 2020. (para. 2)

The construction sector has fluctuating skills shortages and an ageing male-dominated workforce (Marchant, 2013). Female composition is low at 12% (Master Builders Australia, 2015), yet only a small proportion of these pursue trade opportunities in these sectors despite the economic opportunities they offer and the encouragement from trade union and industry bodies, such as the National Association of Women in Construction.

With rapidly expanding technology, trades like auto mechanics require people with high-level electronic diagnostic and computer skills. Auto Skills Australia (2014) has claimed that their industry required 21,800 additional skilled workers nationally, and is calling for female trade workers to help fill this skills shortage. The Minerals Council of Australia
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(MCA) (2013) has reported that national skills shortages unnecessarily raise business costs, place upward pressure on wages in growth sectors and create a sub-optimal investment climate for the mining sector: “It is economically sound to expand the labour pool by tapping into underrepresented groups such as female and indigenous workers” (p. 4). Similarly, PWC (2012) reported on the mining sector in Australia, noting that employment of women at all levels increases a company’s pool of skills, yet the mining sector “lags other industries in employing skilled women, with only 18% of roles filled by women. Entrenched and outmoded attitudes towards women’s roles and career prospects remain” (p. 9).

The disparity between what employers need and what available employees have to offer is claimed to affect 35% of employers globally (Manpower, 2013). In response to skills shortages, there has been heightened emphasis on accurate, industry-based measurement of skills deficits and matching this with enhanced training initiatives. In addition, over the past two decades, “the world’s top immigrant-destination countries have been granting entry to increasing numbers of highly-skilled immigrants in response to changes in global labour supply and demand” (Lowell, 2008, cited in Irving, 2013, p. 3). Using foreign workers rather than maximising the employment of local people, including women and young people, has generated much debate in Australia and overseas. An example is the recent policy debate in the US over whether to admit more foreign workers highly skilled in science, technology and mathematics to meet critical high-tech skills shortages (Irving, 2013). Like the debates in Australia, the question is raised: Why can’t local women and young people be trained to fill skills shortages? The Construction, Forestry, Mining, Engineering Union (CFMEU) has campaigned against increasing immigrant workers on 457 visas in Australia, citing the following data to support the argument that young local people, and women in particular, ought to be trained to meet skills shortages.
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- There are 110,280 workers in Australia on a 457 visa as at September 2013, an increase of 12% from the previous year.

- At least 50% of all 457 visas sought in 2013–2014 were for foreign nationals under the age of thirty, a total of 40,400.

- The number of workers on 457 visas employed in the Australian construction sector was 13,440 in September 2013, a 5% increase from the previous year (CMFEU, 2013).

The observations that Shewring (2009) made about migrant trade workers may have been superseded by new practices and regulations, but at that time she noted “many migrant workers who enter Australia on the strength of their trade qualification discover that their trade certificates are not recognised by the Department of Fair Trading for the purpose of gaining Australian trade licences, so they are forced to return to training or work as unqualified labour” (Shewring, 2009, p. 24). In her view, women were being ignored as a potential workforce despite skill shortages.

2.6.4 Youth unemployment and under-employment. There may not be much to be gained from an equity perspective by pitting foreign workers against local workers. It is, however, problematic that far too many young people exist on the fringes of the labour market in unsecure, low-paid work, or not in the labour market at all, while skilled labour is in demand. Recent figures reported that 46% of young women under 25 years of age in Australia were in part-time or casual work (Mission Australia, 2012) and 49% of Aboriginal and Torres Strait Islander women aged 15–24 years were not participating in the labour force (Australian Bureau of Statistics, 2011). This has been partly attributed to the parenting responsibilities of some of these young women (Australian Bureau of Statistics, 2012; Mission Australia, 2012), but may also reflect the lower pay and status of their occupations.
relative to men, and the limited occupational choices many have, especially Indigenous women in remote areas. It has been reported that Indigenous students lack basic knowledge about requirements for particular ambitions and many did not know how to go about achieving their goals (Craven et al., 2005). Few young Indigenous women, particularly in remote and regional centres that lack economic activity, would know of or have the opportunity to pursue a male-dominated trade. The Indigenous women who have pursued careers in the mining industry cited jealousy from men and cultural implications of needing to care for country as barriers to female entry into, and retention in, the mining industry (Parmenter, 2011).

Research has shown that certain international agencies have directed significant policy attention and action towards improving the educational standards, work opportunities and economic status of girls who are not accessing acceptable standards of education and work (International Labour Organization, 2014b; UNEVOC & UNESCO, 2011). Reportedly, the highest youth unemployment rates are found in the Middle East and North African regions, where nearly one in three young people in the labour force are unable to find work. Young women in particular are struggling to find work in these regions, with unemployment rates approaching 45%, and many only able to find work in the informal economy, without the regulatory protection of decent wages and conditions (International Labour Organization, 2014, p. 5). There does not appear to be a prominent focus on training young women in the male-dominated trades in developing nations. This may be because giving girls access to basic education is a priority in these countries. In the future, the economic benefits to women and developing nations of training more females in the male-dominated trades may gain greater recognition and action.
2.6.5 A middle-class story of progress. The gendered occupational segregation of the trades is not consistent with the trends in professional and para-professional occupations, where female representation has been increasing in many male-dominated occupations. These encouraging trends are occurring in many nations. However, the UK-based Institute for Public Policy and Research (IPPR) (2013) suggests that this is “a middle class story of progress” at the top end of the labour market (p. 51). Feminist scholars and others have long argued the fundamental principles that both men and women must access quality education; that they are capable of any kinds of work and training; and that no job should be specifically male or female (Anker, 1997; Butler & Wooley, 2011; Byrne, 1983; Ford, 2011; Game & Pringle, 1983). These principles have underpinned the achievements of contemporary equal-employment opportunity legislation, sex-discrimination legislation and related programs in tackling the barriers entrenched in occupational segregation in the white-collar workforce.

While many women have been breaking through the “glass ceiling”, graduating from university and embarking on professional careers in areas such as law, medicine, accounting, and management roles (Blau et al., 2012; Metz & Kulik, 2012; Preston & Whitehouse, 2004; Strachan, 2012; Strachan & French, 2008), no similar movement exists in the trade occupations. Career choices remain narrow and stereotyped, with the skills and talents of both genders not being fully utilised (Fuller et al., 2005; WGEA, 2013a).

The enrolment of female university students in previously male-dominated areas is trending upwards in Australia. For example, in architecture, female enrolment is around 44% (Matthewson, Stead & Burns, 2010), and, in engineering, female enrolment is around 15%, although it has reached 22% at the University of New South Wales (UNSW, 2014). Young women who do not pursue a professional pathway risk working in a vocational occupation with a higher-than-average gender pay gap. Many women and girls with lower educational
qualifications and skills continue to endure economic insecurity or hardship (IPPR, 2013). I consider the public policy focus on women in management and professions is essential, yet I support IPPR (2013) in arguing that “gender justice at the top is not enough”, and the drive for gender equality must include efforts to do away with low pay and to increase the quality and status of jobs that women at the lower end of the labour market perform (IPPR, 2013, p. 51). Ringrose (2007) made a similar claim, stating that: “Liberal feminism’s gender only analysis has culminated in measures of equity through gendered test results, which violently obscures socio-economic difference” (p. 486). The multiple influences and interconnectedness or “intersectionality” of gender, race, class, sexuality and other factors in determining women’s labour market experiences must be understood and addressed in order for gender equality to be achieved. The way in which life experiences and attributes, including sexual preference, can compound inequity and indifference in male-dominated trade workplaces, was comprehensively analysed in Wright’s (2011) UK-based research. Wright argued that these compounding factors have acted as a deterrent to female-entry of the male-dominated trades.

Indigenous women in Australia continue to face barriers to entry into the male-dominated trades due to the compounding factors of gender, race, historical displacement and racism. The research on Indigenous women in the Australian mining industry led Parmenter (2011) to state that:

- gender should not be considered in isolation of other intersecting factors, such as race and understanding the experiences of Indigenous women is important in contributing to long term positive outcomes for Indigenous communities. (p. 2)
2.6.6 Gender inequity in wages. The gendered segregation of the trades perpetuates the gender pay gap and limits the economic security of women (Butler & Wooley, 2011; Fuller et al., 2005; Marks, 2008; McIntosh, 2007; UK Commission for Employment and Skills, 2011; WGEA, 2013a). In 2014, the average weekly earnings for female and male technicians and trade workers in Australia was $917 and $1304 respectively, representing a 29.7% gender pay gap (Workplace Gender Equality Agency, 2014). The higher rates of pay in selected male-dominated trades are shown in Table 2. The average weekly earnings in the female-dominated occupation of Hairdresser ($688 per week) are lower than the male-dominated trades of Carpenter ($1160 per week), Light Vehicle Mechanic ($966 per week), Electrician ($1365 per week) and Engineering Tradesperson–Fabrication ($1331 per week). Beauty therapy is the other common career choice for female students, and the MyFuture careers website shows that this occupation attracts slightly higher average weekly earnings than the trade of hairdressing at $714, and an average annual salary of $37,128 (Department of Education, 2015). In fact, the earnings for hairdressing are just above the minimum wage in Australia: $640.90 per week for a 38-hour week (Fair Work Australia, 2015).

In the UK, the gender pay gap for apprentices is greater than that in the wider labour market, with females earning on average 21% less than male apprentices (TUC & YWCA, 2010, p. 6). From his analysis of wage returns on UK apprenticeships, McIntosh (2007) also found generally lower wage returns for women compared to men. The lower average earnings in the female-dominated trades establish women in an unequal economic position relative to men early in their careers. This is compounded as their careers progress, because of their lower accumulated superannuation earnings.
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Table 2

*Earnings in Selected Trades: Australia*

<table>
<thead>
<tr>
<th>Trade</th>
<th>Average Weekly Earnings</th>
<th>Average Annual Salary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hairdresser</td>
<td>$688</td>
<td>$35,776</td>
</tr>
<tr>
<td>Carpenter</td>
<td>$1160</td>
<td>$60,320</td>
</tr>
<tr>
<td>Light Vehicle Mechanic</td>
<td>$966</td>
<td>$50,232</td>
</tr>
<tr>
<td>Electrician</td>
<td>$1365</td>
<td>$70,980</td>
</tr>
<tr>
<td>Engineering Tradesperson—</td>
<td>$1331</td>
<td>$69,212</td>
</tr>
<tr>
<td>Fabrication</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


The research on gender-based income differentials for youth is not extensive, but the post-school analyses by Marks (2008) in Australia and McIntosh (2007) in the UK are notable. Marks (2008, p. 42) showed that apprenticeships had a major impact on earnings; on average, it increased weekly earnings by about 20%, with this effect stronger among young men than women. Overall, Marks (2008, p. 42) found that immediately post-school and 10 years on, the average weekly earnings of young men were about 20% higher than those of young women. This was consistent with UK apprenticeships research that reported generally lower wage returns for women who undertook apprenticeships and traineeships when compared with men (McIntosh, 2007, p. 21). The UK Commission for Employment and Skills (UKCES) (2011, p. 8) noted that despite women performing better than men on many educational measures, women are earning 21% less than men in median hourly pay (and 13% less than men when working full-time). The same pattern occurs in apprenticeships where women are poorly represented, or in some cases entirely absent, from well-paid
apprenticeships such as car manufacturing, engineering and construction (Trade Union Congress & YWCA, 2010; UKCES, 2011, p. 9).

2.7 Barriers That Entrench Gender Segregation in the Trades

2.7.1 Overview. The barriers that entrench gender segregation in the traditionally male-dominated trades include those that are (1) structural and institutional over which an individual has limited control; and (2) individual barriers, where responsibility rests primarily with individuals and their families. The former include the longstanding impact of male-dominated culture and institutions, and are the focus of this section. The latter include the gender differences in subject choices that limit female entry into male-dominated occupations, and girls and women’s lack of understanding and exposure to the trades. These barriers, which relate more specifically to the career decisions of young people, will be analysed in the next chapter.

Labour force barriers that limit female entry to the male-dominated trades can also be categorised as those that focus on labour supply or labour demand factors. According to Anker (1997), labour supply arguments tend to focus on why women “prefer” certain types of occupations, while labour demand explanations focus on why employers tend to “prefer” to hire women and men for different jobs and why career development differs on the basis of gender. Importantly, Anker (1997) qualified the use of “prefer” to recognise that preference and choice are “influenced by learned and cultural social values that often discriminate against women (and sometimes men) and stereotype occupations as ‘male or female’” (p. 316). This analysis discusses the lack of occupational choice women have by canvassing the following key barriers: the influence of patriarchy on work; the attitudes and practices of employers; the difficulty women have in combining work and family; the impact of gender stereotypes; and the lack of gender awareness in education that compounds barriers.
2.7.2 The historical influence of patriarchy in defining male-dominated trades as “men’s work”. As a system of male dominance, patriarchy has operated in interaction with class and race relations to maintain women in lower paid work relative to men. Patriarchy is defined as a system of social structures and practices in which men dominate, oppress and exploit women (Walby, 1986). Occupational segregation has been identified by some commentators as a mechanism in capitalist societies that maintains the superiority of men over women (Blau, Ferber & Winkler, 2006; Cockburn, 1991; Hartmann, 1982; Walby, 1986). In a patriarchal system, “ideology and tradition play a role in defining which skills are valuable, desirable and profitable within a given society” (Perales, 2013, p. 601). Male-dominated occupations have traditionally been deemed more skilful and more valuable and therefore paid at a higher rate than female occupations.

Women have historically been blocked from entering the higher value jobs. In their account of the UK construction industry, Clark and Wall (2006) noted that as early as the 1840s, women artisans in construction were seen as a threat to men’s rates and conditions. Women’s access to jobs had been limited and “the family wage was openly espoused as a wage paid to a married male worker adequate to raise a family, so emphasising patriarchal control of the productive resources” (Clark & Wall, 2006, p. 41). Men have been seen as the primary breadwinner in cultures throughout the world. While women have comprised an essential workforce in some occupations, their paid work has been “regarded as subsidiary to that of men, as women’s primary role . . . [is seen to be] that of housewife and mother” (Strachan, 2010, p. 118).

A landmark Australian case, the Jobs for Women Campaign against Broken Hill Pty Ltd (BHP) from 1980–1989 (Gorton & Brewer, 2015), exposed active discrimination against women at the BHP steelworks at Port Kembla. Between 1977 and 1980, only 58 women were
employed as steelworkers, despite many women applying for work there. After a successful
campaign, the New South Wales Equal Opportunity Tribunal found in favour of the women,
and Australian Iron and Steel (AIS), a subsidiary of BHP, was ordered to pay compensation to
the women and remove its discriminatory work practices (Gorton & Brewer, 2015).

A thorough analysis of gender relations over time is integral to any explanation of
gender segregation in the labour force, including trades. The resistance to campaigns for
equal pay and equal work value for “women’s work” shows the powerful forces of patriarchy
at play to maintain women’s subjugation in the labour market. For example, the industrial
system—industrial laws, associations, employers and trade unions through the 19th and 20th
centuries in European countries and Australia—acted to keep women away from “men’s
work”. With the formation of male-dominated unions, apprenticeships were mostly confined
to men, with an early trade union and community view being that women should not enjoy
the status of artisan and that skill was essentially a masculine quality (Simonton, 2004). This
was described in historical accounts:

Where men more frequently saw women as threats to their position and honour, guild
members sharply curtailed women’s trading opportunities, diminishing the value of
female apprenticeship. In Germany, girls were no longer formally apprenticed, and
girls’ participation was under challenge in France and Britain . . . Many ‘female’ jobs
did not take apprentices, and if most girls expected to marry and work alongside a
husband, apprenticeship gained her very little . . . they were not placed in trades
equally with boys, and clearly grouped into three areas: agriculture, housewifery and
textiles. (Simonton, 2004, pp. 377–378)

In the past, Australian employers actively discouraged and suppressed unionism and
access to the male-dominated trades for women (Ryan & Conlon, 1989). Records from 1897,
cited by Ryan and Conlon (1989), show that almost equal numbers of girls (608) and boys (640) were apprenticed, yet by 1912, women were denied apprenticeships in numerous trades, including the following: bakers, boot makers, butchers, coach making, colliers, electricians, plumbers, woodworkers, miners, tilers and more (p. 44). These historical accounts showed that trade unions were concerned with protecting men’s jobs from the so-called “gentle invaders” of male territory—the term Henry Bournes Higgins, President of the Court of Conciliation and Arbitration, used for women in 1919, when presiding over the Clothing Trades Dispute (cited in Ryan & Conlon, 1989). The differences in pay rates between women and men were not based on work value alone—they were the result of the continuous systematic downgrading of women’s work and resistance to female entry to the male-dominated trades and equal pay (Ryan & Conlon, 1989; Simonton, 1988). While the war experiences in Australia, Europe and the US demonstrated how successful and capable women were in carrying out manual and technical work, the post-war period showed how powerful the patriarchal system (male-dominated governments, industry and unions) was in driving women back into home-based duties and traditional female work. These institutions reinforced gender-based job segregation, classifying specific jobs as women’s jobs, to be paid at a lower rate than men (Ryan & Conlon, 1989). The wartime experience, however, had profoundly positive labour market impacts, with market forces determining both a future economic reliance on women’s participation in these industries, and a consequent upward pressure on their wages (Hart, 2007).

The economic reliance on women in non-traditional industries and women’s own economic need for this work is evident in many developing countries. For example, it is estimated that “more than half of the 31 million construction workers in India are women” (Government of India, 2008, cited in Barnabas & Anbarasu, 2009, p. 122). Yet, the
discrimination against women there prevents them from being trained and paid at a trade level as masons in the industry despite the fact that “they have the competency, capability, ability, skills and work culture . . . [Furthermore] most of the women want to become masons (Barnabas & Anbarasu, 2009, p. 127). In Zimbabwe, in 1999, women comprised 6.3% of the construction sector, although they were mainly “operating mostly at the menial level”, due to the cultural attitudes that act as a barrier to women’s participation (Central Statistics Office, 2002, cited in Muganiwa, Mutandwa & Sigauke, 2008, p. 258). Steps were taken in Zimbabwe through the National Gender Policy 2001 to encourage greater participation of women as construction work enhances women’s self-confidence and supplements their income (Muganiwa et al., 2008, p. 265). The impact of this policy was not able to be determined in this research.

Trade unions, government and industry are adopting piecemeal action to support women in male-dominated trades. With leadership from the Australian Council of Trade Unions (ACTU), many campaigns have sought equal pay for women, to end discrimination against women, and to recruit women to trade positions (Australian Council of Unions, 2015; Australian Manufacturing Workers Union, 2015). Murray and Peetz’s (2008) analysis of the recent, yet gradual, entry of women into the mining industry in Queensland illustrates the way in which gender barriers are being overcome with the support of the mining union and industry leaders. Since 1979, women have been recruited as labourers, machinery operators and later as tradespeople, engineers and geologists. However, the stories from women in the industry showed that physical and sexual harassment towards them continues (Murray & Peetz, 2011); reportedly, these women have had to deal with issues arising from social constructions of their gender and sexuality—sometimes defending themselves against harassment, overcoming old
prejudices about the role of women from supervisors and workers, and confronting the sexual insecurity of fellow women outside the mines. (p. 11)

The impact of the historical development of the trades as men’s work on the current attitudes of men and women—including parents, teachers and guidance officers, and boys and girls—appears profound. From their cross-national studies of youth, Sikora and Pokropek (2012) concluded that the gender segregation in education that impacts on subject and career choices is unlikely to be determined solely by local cultural and institutional forces. They attribute it more to a global trend of entrenched definitions of masculinity and femininity. Some commentators have suggested that the culture of male dominance is in itself resistant to change because men are resistant to change it (Connell, 2011; Cockburn, 1991). According to Connell (2011), some men accept change in principle but in practice still act in ways that sustain gender inequalities and defend male supremacy, with the gender division of labour remaining intransigent (Connell, 2011, p. 24). By introducing equal employment–opportunity legislation, anti-discrimination legislation and the Workplace Gender Equality Act 2012, progressive governments within Australia have acknowledged that change to entrenched occupational segregation will not occur without a solid legislative framework that promotes gender quality and diversity in the workplace.

2.7.3 Employer attitudes. Negative attitudes and behaviours towards women that some employers display continue as a barrier to increasing female participation in the male-dominated trades. This includes the discretionary and often discriminatory hiring practices of employers and managers; put-downs and hostility to women; and direct emotional or sexual harassment (Beck & Unwin, 2005; Bimrose, 2004; Shewring, 2009; Women in Male Dominated Industries, 2010). From her interviews with lesbians in the construction and transport industries in the UK, Wright (2011) reported that these women experienced feelings
of indifference and negativity from some employers and peers, but “the problems faced by
women in male-dominated work were said to stem from the behaviour of a small number of
men, while relations with the majority were good” (p. 182). This is encouraging given the
power dynamics in an apprentice–employer relationship, “which gains an added dimension
when the trainee or apprentice is female” (Wright, 2011, p. 184). Female apprentices who
have had supportive employers have been more likely to succeed in, and complete, their
apprenticeship than those in an unsupportive workplace (Shewring, 2009; Wright, 2014).
Both the perception and experience of sexual harassment by male employers in workplaces
has been recognised as a barrier to females choosing a male-dominated trade career
(Bimrose, 2004; Women in Male Dominated Industries, 2010). In their survey of employers,
Fuller et al. (2005, p. 304) reported that 76% of employers do not have difficulties in
recruiting apprentices and employers are more willing to consider female apprentices than in
the past, but they noted that barriers still exist. They proposed that as a result of high demand
from male applicants, there is little incentive for them to recruit from under-represented
groups.

One of the keys to success identified in the evaluation of the Women in Construction
(WiC) employment and training initiative in the UK was employers who have a commitment
to diversity in the workforce. While employers (generally, large companies) were supportive
of the WiC program, some recognised that they stand to gain a competitive edge in future
contracts by meeting public sector regulatory requirements for gender and racial diversity
targets (Wright, 2014). The latter position indicates that, in some cases, recruitment and
support for female trade workers in male-dominated industries may need the incentive
provided by regulatory frameworks.
2.7.4 Difficulty combining family and work. Historically female careers were considered temporary and part-time as the domestic and caring roles have fallen predominantly on women. The dual nature of women’s work as care work and market work has led to lower workforce participation rates for women relative to men, and it has impacted on career opportunities for women (Patton, 2013; Richardson & Schaeffer, 2013). Patton (2013, p.7) has acknowledged that “…the traditional linear development and hierarchical conception of career in the vocational literature is not adequate to explain women’s perceptions and experiences of their working lives.” The analysis proposed by Astin (1984) to explain women’s career development incorporates four major constructs: motivation, work expectations, sex role socialisation and the structure of opportunity. While career motivation is similar for men and women the early socialisation of women and girls into caring responsibilities and other gender-based roles, leads them to make different choices. This contributes to occupation segregation and gender inequality in the labour force (Astin, 1984).

In arguing the case “to undo gender” Richardson and Schaeffer (2013) suggest that when the genderisation and devaluation of women’s unpaid and paid work is reduced, career opportunities for women will not be so limited. These authors also suggest that the dual responsibilities of care and market work is one of the factors that explain why “…the gender desegregation of middle class and professional occupations is not matched by a comparable desegregation of working class jobs” (Richardson & Schaeffer, 2013, p.22). This thesis supports more research and scholarly attention being directed at these “working class” segments of the labour market to increase their rates of desegregation.

To ensure “that each individual’s life construction is at the centre of the career development process…” Patton (2013, p.14) advocates a Systems Theory Framework (STF) in career development. This enables the factors that impact on the structure of opportunity for
women – sex typing of jobs, discrimination, reproductive technology, family and work responsibilities – to be incorporated in the understanding of women’s career expectations and pathways relative to men. The concept of STF as developed by (Patton & McMahon, 2014; McMahon, Patton, & Watson, 2005) is explored more fully in the career theory section of this thesis.

A workforce with higher rates of labour market participation by women has more workers with responsibilities for care external to work. These workers face the challenge of combining caring responsibilities with paid work. To maintain high levels of productivity and participation of women in the workforce, flexible working arrangements, accessible affordable child care and parental leave are required for working carers (Work and Family Roundtable, 2013). The male-dominated trades have traditionally had, or are perceived to have, rigid hours with few opportunities for part-time work or job-sharing. In the UK, it was found that “the working hours in operational roles in the transport sector were seen as one of the main barriers to increasing the numbers of women” (Wright, 2011 p. 184). Yet, it was noted that private sector employers may be reluctant to offer flexible working hours unless they were contractually obliged to do so (Wright, 2011). In examining reasons why Year 12 female students did not choose a male-dominated career path, Frome, Alfeld, Eccles and Barber (2006) reported that young women “who had male-dominated occupational aspirations in 12th grade, who had low desire for a job that would allow flexibility, and placed high intrinsic value on physical science were less likely to ‘leak out’ of the math/physical science pipeline” compared to those who believe that they will receive little support for home-based duties in their future paid work (Frome et al., 2006, pp. 368–369).

A commonly held discriminatory view among employers is that there is no point in training women because they will get pregnant and leave (Shewring, 2009). Interestingly,
Shewring (2009) reported that “when women work for their own families in trades . . . the family is very supportive of flexible hours. . . . For others, the lure of self-employment enables them to manage their commitments and control their environment” (p. 31). A number of industry associations have acknowledged that in order to attract women to non-traditional jobs, they must continue to meet their responsibility to workers with family responsibilities. The MCA recognised women’s family responsibilities as a particular barrier to the recruitment and retention of women in the resources sector (MCA, 2013). It has encouraged mining sector employers to adopt more family-friendly practices in order to attract women to their workforce (MCA, 2013). There have been welcome changes in some areas of mining where women are given work shifts to accommodate school times (Shewring, 2009, p. 21).

A study of youth attitudes to work and family roles reported that while young people believed that bringing up children was a joint responsibility, women “may have more difficulty getting jobs because employers would be expecting that they would get pregnant and leave” (Tinklin, Croxford, Ducklin & Frame, 2005, p. 136). The young people in the study also expressed concern about how to successfully combine work and family roles.

2.7.5 Impact of gender role stereotypes in limiting occupational aspirations and choice. The occupational aspirations and expectations of adolescents are considered significant determinants of both educational and career choices (Lent, Brown & Hackett, 1994; Patton & Creed, 2007). Aspirations are considered to be an expression of the individual’s ideal career goals - differentiated from expectations which reflect the realistic or likely career goals (Rojewski, 2005). Career aspirations of young people are influenced by gender, race/ethnicity, socio-economic status (Archer, DeWitt & Wong, 2013; Howard et al., 2010; Lent, Brown & Hackett, 1994; Patton & Creed, 2007). The analysis of these context and environmental influences are important elements in many career theories and research.
According to Social Cognitive Career Theory (SCCT; Lent et al., 1994) contextual support or barrier variables (gender, race/ethnicity and socio-economic status) interact with personal variables (self-efficacy, outcome expectations, interests, goals) to influence career aspirations and attainment (Lent et al., 1994; Patton & Creed, 2007; Shoffner et al., 2015). These aspirations are moderated by perceived barriers and supports as well as the contextual factors (Lent, Brown & Hackett, 2000; Patton & Creed, 2007).

Occupational aspirations for adolescents are influenced by the social and environmental contexts, including socialisation of gender roles, that they are exposed to and the extent to which they internalise these (Patton & Creed, 2007). Patton & Creed (2007) applied the RIASEC occupational categories developed by Holland to explore the career aspirations of young people. Their findings were consistent with other research in showing that the largest proportion of males aspired to and expected jobs in the realistic category (which includes engineering, mechanical, technical roles) with the equivalent proportion of females relating to the social category (Patton & Creed, 2007, p.142). Given the significance of career theory, such as SCCT to the analysis of career aspirations and decision-making of young people, it will feature in Chapter 3 of this thesis.

Children base career aspirations and decisions on both the gender role ascribed to occupations and the prestige of occupations, with the typically male-dominated occupations attracting higher prestige (Gadassi & Gati, 2009; Teig & Susskind, 2008). In their study, Teig and Susskind (2008) found that girls preferred feminine occupations to the higher status male-dominated occupations, leading them to suggest that girls’ desire for male-dominated occupations may be limited to those that offer a level of prestige above what can be acquired with a feminine occupation. This may help to explain why architecture or engineering, for example, may be more appealing to young women than a male-dominated trade that is
considered of lower status than other professions. It has been reported that the influence of gender stereotyping of occupations on children declines when aspects of occupations (such as prestige and team work) were described rather than occupational title alone (Gadassi & Gati, 2009). Due to this effect, Gadassi and Gati (2009) proposed that children should consider questions such as “What activities do you enjoy?” or “What are you looking for in your future career?” rather than “What do you want to be when you grow up?” Children may then be “less likely to base their decision on occupational stereotypes and will consider a wider range of occupations instead of pursuing common gender stereotype–based career choices” (Gadassi & Gati, 2009, p. 918).

A call for educators to diversify and inform student aspirations, rather than simply raise aspirations – “to create a level playing field” - arose from research with young people aged 12/13 (Archer, DeWitt & Wong, 2013, p.77). This research affirmed that efforts to raise career aspirations will reproduce privilege and disadvantage unless “…schools are to play a greater role in challenging, rather than reproducing, inequalities in aspirations” (Archer et al., 2013, p.77).

While not intending to diminish the importance of race/ethnicity and class this research focuses on the impact of gender on career development. The persistent division of work along gender lines continues to be reinforced in the labour market and education sectors by the pervasive influence of gender role stereotyping in popular media and culture (Deemer, Thoman, Chase & Smith, 2014; Gadassi & Gati, 2009; Sikora & Pokropek, 2012; Smith, Choueiti, Prescott & Pieper, 2012). The influence of gender has been considered influential in the career aspirations and pathways of young people with gender differences in subject and career choice identified in research (Sikora & Pokropek, 2012; Betz & Hackett, 1997; Patton & Creed, 2007).
In examining career plans of young people across fifty countries, Sikora and Pokropek (2012) suggested that gender-essentialist beliefs, combined with self-expressive values, perpetuate the sorting of men and women into different areas of education and employment. Gender-essentialist beliefs are defined as those that view women as innately more competent than men in service, nurturance and social interaction and men as naturally more adept at problem solving, analytical tasks and complex abstract reasoning (Charles & Grusky, 2004, cited in Sikora & Pokropek, 2012). From their findings, Sikora and Pokropek (2012) stated:

We find a pattern of cross-national variation in students’ career plans, which suggests that the construction of gendered identity operates similarly across many different cultures, institutional and economic settings. We argue that this ubiquity is nurtured by the operation of gender essentialist values. (p. 256)

The “girl-nerd” factor was also raised by Sikora (cited in Rowbotham, 2012) as a concern; that is, girls choosing humanities and social sciences over subjects and careers in computing, engineering or mathematics partly due to the risk of those being seen as more for boys. It has been found that girls’ confidence in their Maths and Science abilities is important for them to pursue career opportunities into traditionally male-dominated areas (Sikora & Pokropek, 2012; Schmader, Johns & Barquissau, 2004). Research has shown that women who tended to endorse gender stereotypes were found to hold more negative self-perceptions of maths competence and less interest in continuing study in a Maths/Science field, and they were more susceptible to the negative effects of stereotype threat on their Math test performance (Schmader et al., 2004). Furthermore, boys can be unwilling to try female-dominated occupations for fear of being teased (Fuller et al., 2005). In this way, gender stereotypes can also limit choices for boys.
The profound, early influence of gender stereotypes on career decisions was exposed by Sikora and Saha (2011), who reported that: “There is little doubt by the time students are in Year 10, and two years later, their career expectations are gender segregated” (p. 29). The career expectations of girls commonly include child care, psychology, tourism, journalism and nursing, with boys commonly expecting careers in computing, engineering or mechanical trades. A study on youth attitudes (Tinklin et al., 2005) reported that while young people believed males and females should have the same opportunities and expectations in their future work and family lives, their behaviour was still gender-typical in their subject choices and career aspirations. It has been suggested that “gender stereotyping and perceptions about subjects and career options ‘suitable’ for young women are often reinforced in schools and families” (eSecurity4Women, 2014, p. 2). Clearly, gender stereotypes influence the segregation of occupations, which limits opportunities for males and females.

Calls for gender equality in education, career guidance and training have been proclaimed at major international forums. The International Labour Organization (ILO) (2009) acknowledged that:

Young women, particularly in developing countries, are often unable to take advantage of training opportunities due to barriers to entry, discrimination in selection and gender stereotyping. Stereotyping is frequently found in vocational guidance and counselling on the part of school staff or employment services, and it discourages young women from taking training programmes that would lead them to higher long-term earnings and improved employability. In many countries, for example, young women are encouraged to train in relatively low-skilled and poorly paid “feminine” occupations with little prospect of upward mobility. (p. 27)
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This is likely to perpetuate, rather than reduce gender inequality and gender segregation of work.

As a major UN entity, UNESCO has set as one of its priority actions as promoting positive gender images in the media order to promote gender equality. UNESCO (2014) stated:

The persistence of stereotypical representations of masculinity and femininity which underlie and reinforce unequal power relations and structures between women and men is a continuing problem. These stereotypes exist in all UNESCO’s domains of competence; for example, stereotypes within media representations or in school textbooks, or stereotypes regarding women’s participation in the sciences. We will thus work to analyse such stereotypes, to try to deconstruct them and to replace them with more gender equal representations. (p. 6)

In their research on media, Smith et al. (2012) also found that its portrayal of occupations is gendered. For example, they reported that “across computer science and engineering, the ratio of males to females in these arenas is 14.25 to 1 in family films and 5.4 to 1 in prime time” (p. 5). In order to foster more gender equality in the media, UN Women and UNESCO sponsor the Global Media Monitoring Project (GMMP). Research conducted through GMMP (2010) spanned more than 100 countries and found that 46% of news stories, in print and on radio and television, upheld gender stereotypes. Only 6% highlighted gender equality. In images that portrayed science or technology professionals, engineers, technicians, computer specialist science professionals/engineers, only 10% were female: a decrease of 12% since 2000. Images of women workers in agriculture, mining or forestry roles also decreased in that period from 15% to 13% (GMMP, 2010, p. 10). The fact that media monitoring projects such
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as GMMP are sponsored by UN entities indicates the importance of investment in media change processes as one strategy to overcome gender stereotypes.

2.7.6 The lack of gender awareness in policy and programs. In recent decades, gender equity policies and units have had a central role in governments in Australia, focusing attention on overcoming the economic and social barriers and marginalisation experienced by women and girls as a whole. With these gender-aware approaches, sex-disaggregated data collection has occurred routinely, and progress against set targets for women and girls has been monitored. Without these approaches, the barriers women and girls face in education and training are compounded. For example, a major concern is that while participation rates for women in VET are now greater than 50%, women remain segregated in the highly feminised, lower paid, lower status educational pathways and jobs (Butler & Ferrier, 2006; Rothman et al., 2013). In post-VET employment, “men appear to have benefited more . . . They more frequently than women moved into full-time employment, into jobs with higher salaries and into jobs that offered leave and other entitlements” (Rothman et al., 2013, p. 140). There was some recognition in the decade 1990 to 2000 that distinct gender equity units were required as evidenced by their emergence in a number of state and federal jurisdictions. However, Butler and Ferrier (2006) have suggested that the decline of gender equity policy occurred because “the problem of women has been deemed fixed” (p. 579). Gender mainstreaming and diversity (with no distinct separation of policy and practice on the basis of gender as an equity category) emerged as the approach (Butler & Ferrier, 2006, p. 581). My experience within government supports this claim that the situation of women has improved to a point where specific actions for women may be considered unfair to men and boys. Gender-equity units in line departments, such as Education, were established in the 1990s, but as the status of women and girls improved, these specific units and strategies for women
and girls and the requirement for women’s impact statements on Cabinet policy submissions, diminished (Delaney, 2009; Sharpe & Broomhill 2013). It is argued that gender-responsive budgeting—which aims to elevate the role of gender in economic policies by more fully taking into account how budget expenditures and revenues impact on women’s economic and social position and gender equality—is an essential tool for governments to be more accountable for achieving gender equality (Sharpe & Broomhill 2013, 7; Stotsky, 2007). To be most effective gender responsive budgeting must ensure that policy and funding commitments to women are "integrated across the budget cycle", not relegated to a women's unit only (Sharpe & Broomhill 2013, 21).

In the school sector in Australia, some advocates sought to reinstate gender equity policy and structures through the concept of “engendering education” (Delaney, 2009; Association of Women Educators, 2014). In describing this concept, Delaney (2009) stated that it involves:

identifying genuine issues of gender disadvantage through asking “which girls?” or “which boys?” and understanding the ways power structures privilege males and “the masculine” both culturally and economically, to decrease the differentiated behaviours that constrain girls’ and boys’ schooling and post-school success. A focus on gender-just teaching and learning requires that teachers critically examine their own assumptions and behaviours and acquire a deep and critical understanding of how gender is constructed so as to identify and challenge (rather than reinscribe) the structure and practices that normalise and perpetuate gender inequity. (p. 4)

The UN promotes a model to maintain a fair, yet distinct, focus on gender equality for women. The UN adopts both gender-mainstreaming, gender-specific programs and gender-responsive budgeting. “Gender mainstreaming” is defined as “the process of assessing the
implications for women and men of any planned action, including legislation, policies or programmes in all areas and at all levels” (UN Economic and Social Council 1997, cited in UNESCO, 2015, p. 4). Gender-specific programs aim to address specific instances of discrimination and to reduce inequalities through supporting a particular group (UNESCO, 2015). To achieve this gender equality, priorities and plans are currently adopted to improve education and economic outcomes for women and girls; to reduce the harm caused by gendered violence; and to monitor progress through gender disaggregation of data (UN Women, 2015). The UN also collects and reports gender-disaggregated data.

In Australia, gender disaggregation of VET data is a research task, rather than being included in routine public reports. This practice in itself is identified as a barrier to advancing the interests of women. The claim is that if the differential outcomes for men and women are not readily known, action to identify and rectify inequity will not be undertaken (eSecurity4Women, 2012). In requesting that the NCVER provide data disaggregated by gender, eSecurity4Women (2012), on behalf of its membership with Women in Adult and Vocational Education (WAVE) and the Association of Graduate Women, stated:

we note that the Apprentice and Trainee Statistics for the September quarter 2011 do include some data disaggregated by gender and some that is not. Most of these tables are not sufficiently detailed and rarely disaggregated by gender—only the Total attending/enrolled for each table is listed. This is of little use for monitoring of gender trends by field of education and level of course. In addition, no graphs or commentary have a gender analysis. (eSecurity4Women, 2012, p. 2)

This section identifies the many structural and individual barriers that entrench gender segregation in the male-dominated trades. It also provides insights on how government planning mechanisms, such as gender-responsive budgeting to allocate funding and
responsibility for increasing female composition of the male-dominated trades, and routine access to gender disaggregated occupation and industry workforce composition data can help to overcome these barriers.

2.8 Systems Theory as an Organising Framework

In order to understand the complex, systemic factors that contribute to the entrenched gender segregation of trades this research uses systems theory (Healy, 2014; Friedman & Allen, 2011) and Systems Theory Framework of career development (STF; Patton & McMahon, 2014) as organising frameworks and analytical tools. An intervention tool to guide recommended actions arising from this research is the youth focussed model for social change — Social Ecological Model (SEM) (UNICEF, 2015).

The use of an organising framework for theories, rather than testing particular theories aligns with the interpretivist methodological approach of this research in which meaning and concepts are primarily derived from the accounts of participants in the research (Neuman, 2006). A systems framework enables theories from the three fields selected in this study—occupational segregation, career development, and social change and participation with youth—to be analysed and interconnected to better understand the persistent gender segregation of the trades. My interest in systems theory is derived from my professional discipline of social work but it has been widely applied in other human services, such as career development as well as science based disciplines, including ecology. It focuses attention on the interrelatedness of factors at individual through to broad structural levels that contribute to inequality, hardship and social phenomenon. Systems theories provides a:

…focus on interactions within and across multiple social systems which can include the interpersonal system of family and friendship ties, neighbourhood systems,
organisation systems, social policy systems and social structural systems (Healy, 2014 p.115).

Applied in this manner systems theory does not dictate theories that underpin social problems; rather, it helps to identify and organise the many theories, targeted at structural and individual levels of analysis and action, to help in the understanding of problems (Healy, 2014; Meyer, 1983, cited in Friedman & Allen, 2011). Systems theory sets out the macro-level of societal structures, the meso-level of institutions, and the micro-level of family home and social networks that interact with and contribute to an issue (Healy, 2014; Meyer, 1993, cited in Healy, 2005). In more contemporary work on systems theory, an approach described as complexity theory has emerged in which people are not considered victims of their social context, nor are they entirely free agents “…rather there is a complex interaction between the person and their environment” (Doll & Trueit, 2010 cited in Healy, 2014, p.130). The systems theories in social work commonly apply ecosystems metaphors to encourage social workers “…recognise complexity and avoid reductionism in assessment…” (Healy, 2014, p.116).

One of the complexities recognised in this research is that gender segregation of the trades is not widely acknowledged as a social or economic problem. In recognising that “…different social systems can be expected to construct social problems according to their own functions and codes,” Michailakis & Schirmer (2014, p.431) advocate the use of systems theory in identifying the points of view from all observers and in responding to the plurality and complexity of responses arising from this. This is another benefit of applying systems theory as a meta-theory or organising framework.

During the course of this research Systems Theory Framework of career development greatly assisted my understanding of the complexity of systemic influences on the career aspirations and decisions of young people and the breadth of career development theory. It
therefore became a useful analytical tool within the broad systems framework adopted in this research. To inform systemic intervention two youth focussed models for social change — Social Ecological Model (SEM) (UNICEF, 2015) described in some detail in Table 3 and Youth: Choices and Change (Maddaleno & Beinhauer, 2005) refer to Appendix A—are applied. These models capture the complexity and guide the wide-ranging actions needed to overcome the barriers that limit their career decisions for young people. UNICEF has adapted the SEM in developing nations to harness youth responses to health and safety problems impacting on their lives. The Youth: Choices and Change model is based on evidence indicating that the behaviour change programs with youth have been most successful when following three levels of influence are targeted simultaneously: interpersonal, community and policy (Bartholomew, Parcel, Kok, & Gottlieb, 2001; Maddaleno & Beinhauer, 2005). While primarily used in public health, these models can be adapted readily to apply across other contexts, and they are inclusive of the influences of gender, culture and the developmental stages of youth. Importantly, SEM and the Youth: Choices and Change model seek to engage actively with young people, placing them at the centre of research, policy and action. While both models have informed the conceptual framework guiding this research, SEM will be the model I apply to develop the framework for action arising from this research.

In sum, the major reasons why this research applies systems theory as a meta-theory and organising framework is to: (1) capture the wide range of contributing factors to gender segregation of the trades at the macro, meso and micro levels; (2) identify the conflicting views stakeholders may have across education, industry and government systems as to whether or not gender segregation of the trades is a social problem worthy of elevated action, and (3) create a logical flow of ideas and actions that will arise from this research. Theories from many disciplines are worthy of examination to develop a comprehensive understanding
of why gender segregation of the trades is persistent and resistant to change. The following section analyses the macro-level structural and economic influences on the labour market, on gender roles and identity that contribute to gender segregation of the trades. This includes a focus on feminist theory given the role this body of theory serves in analysing the inequalities and injustices that women experience in male-dominated social, economic and political contexts. A range of theories that examine the meso-level of school and family, along with career development theory are discussed separately in Chapter 3.

2.9 Economic Theories on Occupational Segregation by Gender

A range of economic theories have been advanced to explain occupational gender segregation, including the factors that have led to its persistence, and continue to have a profound influence on this area of scholarly endeavour. They can be divided into two broad categories: (1) neo-classical economic theories, human capital and labour-market segmentation theories; and (2) feminist or gender theories, including theories on gender sex role stereotyping, identity and formation. While those in the first category are canvassed in this section, this research is more concerned with those in the second category, as well as theory on career development and behaviour change with youth.

Neo-classical theorists tend to accept the rationality and efficiency of the capitalist market system, and are not generally concerned with inequality or differential gender impacts, such as occupational segregation. From these perspectives, the division of labour has arisen from individuals’ differing levels of investment in human capital and rewards for their investment and risks. According to human capital theorists (Becker, 1993; Polacheck, 2004), employers’ and employees’ investments in training and skills development raise the productivity of workers as well as their future income and lifetime earnings. Occupational choice and associated wage outcomes are viewed as the outcome of rational human capital
investment decisions based on the different gender roles in social reproduction. Human capital theorists have concluded that incentives to invest in training are directly proportional to the time one expects to work over one’s lifetime, and that expected lifetime work is the most important motivating ingredient in one’s ability to eventually achieve high earnings (Becker, 1993; Polachek, 2004).

The human capital perspective argues that women exercise a choice for female-dominated occupations and intermittent employment to enable them flexibility in meeting family responsibilities (Mincer & Polachek, 1974). This is a not necessarily a free choice, however, as it is generally influenced by men’s reluctance to share domestic responsibilities more equally with their partners. It is also suggested that the gender composition of an occupation has no direct effect on wages—that the low wages observed in female-dominated occupations are caused by their lack of skill specialisation (Tam, 1997, cited in Perales, 2013).

The assumption underpinning institutional theories of occupational segregation is that labour markets are segmented, and large institutions such as those in welfare states, large enterprises and unions, have a role in influencing recruitment and workforce composition. In a dual labour market model, the imperatives of technology and skill acquisition through on-the-job training, the class and educational backgrounds of workers, and the challenge of female workers managing family and work responsibilities are said to give rise to primary (higher-skilled, higher-paid, primarily male) and secondary (lower-skilled, lower-paid) labour markets (Doeringer & Piore, 1971, cited in Anker, 1997). In making reference to skill atrophy theory (in which some occupations require skills that need to be frequently updated), Estevez-Abe (2006) proposed that occupations requiring firm-specific skills and industry-specific apprenticeship training are the most disadvantageous for women because their
acquisition involves employers who are likely to be biased against women on the basis of economic cost calculations (i.e., because women are expected to eventually leave the workforce to assume domestic responsibilities).

Within an institutional model on occupational segregation, some scholars have specifically analysed the role of large welfare states, and family-friendly policies in advanced economies. In her preference theory, Hakim (2002) has argued that gendered patterns of work arise largely from the legitimate choices of women. According to Hakim (2002), the decline of manufacturing work and the growth of the service industries have produced more attractive options for women, and that women make choices between family work and market work, and that many choose to pursue white-collar rather than blue-collar jobs. Many women will also choose not to work full time in order to meet their home-based caring responsibilities. Preference theory has been challenged on the basis that it conceptualises women into categories based on their work commitment, thereby failing to analyse the barriers and demands on women (particularly non-labour market factors) that limit the choices of women (Bergmann, 2011; Preston & Whitehouse, 2004).

A major limit to economic theories on occupational segregation has been their failure to explain or critique gender-based inequality and norms, or to explain why occupational segregation has persisted despite substantial changes, particularly in advanced economies (Anker, 1997; England, 1982; Game & Pringle, 1983; Wright, 2011; Watts, 2003). It has been argued that “gender theories provide the most compelling explanations for the sex segregation of occupations”, as economic theories alone do not explain the impact of sex stereotyping (Anker, 1997, p. 336). It is apparent that an analysis of gender roles and relations is integral to any explanation of the persistent gender segregation in the labour force. The next section focuses on gender through the lens of feminist theory.
2.10 Feminist Theories on the Economy and Institutions

2.10.1 Overview. While not exclusive to it, a gender analysis of social and economic relations is central to feminism. A gender analysis of the labour force refers to “The methodology for collecting and processing information about gender. It provides disaggregated data by sex, and an understanding of the social construction of gender roles, how labour is divided and valued” (World Bank, 2015). While feminist theorists differ among themselves in their analysis of gender relations, the following two key elements distinguish and help to define feminist perspectives: (1) the critique of mainstream social, economic and political thought for commonly accepting and confirming women’s subordinate position, including the placing of men at the centre of the analysis, often marginalising women; and (2) the aim to eliminate the subordination, oppression, inequalities and injustices that women suffer because of their sex through change in the social, economic and political order (Beasley, 1999; Cockburn, 1991).

A distinction can be made between a gender analysis and a feminist analysis. This research will use the term “gender analysis”. In comparing gender and feminist analyses, Beesley (1999) argued that a feminist analysis applies information from a gender analysis to challenge or eliminate the subordinate position of women and inequalities endured by women. In making this distinction, the terms “gender analysis” and “feminist analysis” will be used separately in this research.

I have adopted a feminist lens throughout my adult life through which I view all issues. My feminism draws on a wide range of literature, including feminist standpoint theory, which focuses attention on the relations between political and social power and knowledge, and argues that the experiences of women as an oppressed group must be central to social inquiry and knowledge development (Harding, 2004; Hekman, 1997). In relation to
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this research, my primary interest is improved economic opportunities for young women who
risk being in low-paid occupations on the fringes of the labour market.

From a feminist view, male superiority in the capitalist labour market has been
sustained through the restriction of women in the labour market to a relatively limited
number of predominantly female jobs and by maintaining the domestic labour role for
women (Figart, 2003; Cockburn, 1991). Occupational segregation has been described as the
primary mechanism in capitalist society that maintains the superiority of men over women
(Hartmann, 1982). Lower wages for women has kept women economically dependent on
men, thereby retaining male superiority (Blau et al., 2006; Evans, 1995; Hartmann, 1982).
The hierarchy and control that established women’s domestic role was replicated in the sex-
ordered division of labour in the wage labour system of capitalism. It is considered to be a
major barrier to women participating more fully and equally in the labour market (Adkins,

Gender identities are considered to be more than psychological states or attributes of
sex. Feminist theorists have argued that the power men have over women, including in
sexuality and sexual relations, is integral to gender identity and work relations (Adkins, 1994;
Game & Pringle, 1983). It has been further argued that both men and women have been
damaged by capitalism and patriarchy; in order for working men and women to escape class
oppression, occupational segregation and the traditional division of labour in the household
will both have to end and men will need to join with women to end patriarchal capitalism
(Cockburn, 1991; Connell, 2011; Evans, 1995). It follows that achieving equality at work
requires a dual path for change: (1) women joining with working men to improve conditions
of employment for all low valued workers; and (2) women and men co-operating to end the
sexual division of labour that stereotypes jobs and specifically contributes to the under-valuing of women’s work and the gender pay gap.

It has also been argued that women are not “free wage earners” in the same way as men, in that prior demands are made on their labour, especially in the family, and that women are unable to sell their labour at the same rate as men (Cockburn, 1991). In earlier work, Cockburn (1981) also suggested that “men’s physical advantage and the power it confers is socially constructed and politically organised” (p. 44). This has resulted in the following: (1) the exclusion of women from male-dominated occupations and from the control of technology as men have been able to turn their bodily advantage over women into their social and economic advantage; and (2) men designing the requirements of physical strength and technical competence with which they are only socially endowed into occupations (Cockburn, 1981). The role of male-dominated unions in the historical exclusion of women from the manual trades supports Cockburn’s proposition.

The gender inequities that need to be addressed in the labour market and in education require “transforming notions of masculinity as much as it does modernising femininity” and recognising that “schools have a duty to prepare young people for social change, not just social order” (Arnot, 2010, pp. 2–3). This would include challenging gender stereotypes and avoiding the gender competition in education in which it is claimed feminism is unnecessary or “that girls and women have too much power” (Taft, 2004, cited in Ringrose, 2007, p. 481). In relation to gender debates in schooling success, Ringrose (2007) has called for recognition of class, race and gender as important influences on educational success, suggesting that there has been:

- a general failure to conceive of gender as a relational category, and a refusal among policy-makers to differentiate gender analysis and categories of girl/women and
boy/man so that resources could be allocated to economically and/or racially
marginalised girls who fall outside the convenient rhetoric of girl’s success and boy’s
failure. (p. 481)

Feminism, in its many varieties, has at times been criticised for largely benefitting middle
class women and for failing to take account of multiple forms of inequality—class, culture,
disability and more (Ringrose, 2007). It has been argued that mainstream debates on gender
and work “must also grapple with how to address increased insecurity at the bottom end of
the labour market for women and men as well-paid jobs in manufacturing have been replaced
by relatively low level, low paid jobs in the private services sector staffed by a cheap, flexible
and largely female workforce” (IPPR, 2013, p. 4). In addition, IPPR (2013) expressed
concern that while popular culture has promoted the idea that women can be whatever they
want to be, the reality is that it “promotes an increasingly narrow way to be a girl or woman”
(p. 43).

2.10.2 Young women and feminism. Contemporary research has indicated that girls
generally do not commonly identify with feminism. It is reported that girls do not like what it
represents to them, yet they have a sense of an individual freedom and to choose what they
want (Harris, 2005; Olson et al., 2008; Zaslow, 2009). Understanding trends in this area of
thinking among girls can be helpful in understanding influences on their career choices.
There is also an emergence of “popfeminism” in which consumer pleasures and femininity
are celebrated and academic feminists are shunned. One critic of the proliferation of
“popfeminism” in Germany has claimed that it is: “Shifting feminism’s focus away from
public-political concerns demanding collective action . . . toward issues that matter in the
private, individual lives of middle-class white, ethnically German, heterosexual women”
(Baer, 2012, p. 358). In interviews with young women, Olson et al. (2008) identified a
continuum along which some young women either embraced, reframed, denounced or resisted the label feminist. Despite the divergent discourse about feminism, these young women generally had an acceptance of “women are equal to men” mentality. This was commonly expressed in phrases like “women have achieved equal rights” or “I’m all for equal rights but don’t call me a feminist” (Olson et al., 2008, p. 108).

There is a concern that notions of “girl power” and educational achievements of girls are used to justify redirection of resources to programs aimed at boys’ educational success (Keddie, 2005; Ringrose, 2007). This can mask a reality “that underlies the socio-economic and cultural sub-ordination of females as a group” (Keddie, 2005, p. 100). Concern has also been expressed that that the language of “girl power”, and the modern marketing machine that sells it, can foster in young women a post-feminist, neo-liberal individualism (based in competitive, self-interest values) rather than any pro-feminist, collective action to reduce gender inequality (Baer, 2012; McRobbie, 2004; Zaslow, 2009).

2.11 Theory of Gender Formation

Research shows that early-years gender development and differentiation have a powerful impact on the formation of gender stereotypes and the work pathways for girls. There is evidence that gender stereotyping of jobs is reinforced by the environment, including significant adults and institutions such as church and media (Martin & Little, 1990, cited in Martin, Ruble, & Szkrybalo, 2002; Martin, Ruble, & Szkrybalo, 2002). Children aged 35–45 months understood gender labels for themselves and others (Martin & Little, 1990, cited in Martin, Ruble, & Szkrybalo, 2002). Pre-schoolers are known to be influenced by gender stereotyping of occupations, leading to their reluctance to cross gender work roles (Levy, Sadovsky, Troseth, 2000). Similarly, it has been reported that four- to five-year-old children generally articulated sex-stereotyping of career aspirations; girls favoured typically female
occupations and boys tended to express interest in typically male occupations (Care, Deans & Brown, 2007; Trice & Rush, 1995).

The role of toys, television and media on gender stereotypes has also been widely researched. Male characters are more likely to be defined by their workforce occupations and appear in the media more often than females as corporate heads or political leaders (Blau, Ferber & Winkler, 2006). These researchers proposed that from an early age, boys and girls are taught to aspire to and train for gender-appropriate lines of work and that few toys for girls show a career connection (or non-traditional career connection). It is suggested that there is very limited discussion in the literature of career aspirations for primary-school-aged children, yet pre-schoolers demonstrate a significant knowledge of gender stereotyping of occupations and are reluctant to indicate an interest in non-conventional gender work roles (Department of Education, 2010; National Union of Teachers, 2012).

2.12 Conclusion

This chapter has shown the diverse and multi-level factors contributing to gender segregation of the trades. Systems theory, as a meta-theory, is used to identify the range of theories that explain the factors that contribute to gender segregation of the trades. Through the discussion of macro-level theories, such as, human capital theories, to behavioural theories targeting the meso and micro levels of community life, the analysis in this Chapter shows that there any many factors, beyond any one individual, that influence occupational pathways. While theories from many disciplines are examined in this thesis, the central and recurrent element of this analysis is the differential, and unequal experiences males and females have of education and the labour market. Feminist theories are therefore featured to explain these gender differences inequalities. To better understand how these structural, cultural and individual factors influence the career decision-making processes of young
people, the next chapter examines theory and practice on career development, youth participation and social change. Of particular relevance to this research are models and principles for working with young people as agents of change. This field of scholarly endeavour will aid the understanding of Research Question 3, which asks what can be done to increase the participation of young women in the male-dominated trades. Systems theory continues to feature in chapter 3 as the application of systems theory, as a meta-theory and organising framework, enables a comprehensive analysis of the individual and structural influences on career development and youth participation in social change in a manner consistent with the application of systems theory to the labour market dynamics explored in this chapter.
Chapter 3: Career Development, Youth Participation and Behaviour Change: Literature Review

3.1 Introduction

This section of the literature review specifically focuses on the career development and decision-making of young people, and the change theories and models relevant to them. The literature reveals that multiple factors influence their career aspirations and outcomes. In addition, multiple areas of disadvantage can impact on the career options available to young people, with gender stereotypes being one factor limiting these options. This research aims to ensure that girls and boys can see, and be free to choose from, all careers, rather than the gendered range that has been cultivated in books, media screens, toys and magazines. The Geena Davis Institute on Gender in Media (2015) promotes the statement: “If she can’t see it, she can’t be it” (p. 1). This is a contemporary adaptation of the statement “You can’t be what you can’t see”, which is attributed to the well-known African-American children’s activist, Marian Wright Edelman (Children’s Defense Fund, 2015). Wright Edelman claimed that marginalised children have limited career opportunities largely because they cannot see wide-ranging role models and opportunities in their oppressive environment. Wright Edelman was primarily referring to students who were marginalised due to the compounding factors of income, status, health, race and gender. Her work was driven by a desire to improve the livelihoods of children by overcoming racial inequality and socio-economic disadvantages. While all these factors are relevant, gender is the specific focus of this literature review.

It was evident prior to the pursuit of this research and throughout, that little scholarly or policy attention has been directed at the male-dominated trades as a career option for young women. The well-developed body of career development theory offers evidence – based insights into the influences on career aspirations and pathways of young people, including gender differences in these. These aspects of career theory became a useful area of
inquiry for this research. In particular the Systems Theory Framework (STF) as a meta-theory aligned well with the systems theory organising framework adopted in this thesis. This chapter explores career development practice and vocational learning systems in Australia; barriers related to education and career decision-making that may limit female students’ choice of male-dominated trade careers; the importance of Maths; and selected career development theories that explain influences on the career decisions of young people.

This chapter selects particular career and youth change theories in so far as they explain the systemic influences on career aspirations and decisions of young people that lead to low female participation in the male-dominated trades. The discussion of theory is exploratory and selective, rather than comprehensive. Central concerns underpinning this research are how to expose young women to new career opportunities and information, and engage them in positive social change. Until now most of the action and interest to reduce the gender segregation in the male-dominated trades has been led by adults.

3.2 Career Development and Decision-Making of Students in Relation to the Male-Dominated Trades

3.2.1 Career development practice: A snapshot of Australia. The Australian Blueprint for Career Development is the national framework for designing, implementing and evaluating career development programs for young people and adults. The primary aim of the Blueprint is to:

… enable teachers, parents, career development practitioners, employment service providers, employers or others who are in a position to support people’s careers and transitions, to work with a nationally consistent set of career management competencies which will help all Australians to better manage their lives, learning and work (https://www.education.gov.au/australian-blueprint-career-development).
In their contribution to the development of the *Blueprint*, McMahon, Patton & Tatham (nd) provided the rationale for a lifespan career development framework to guide policy and practice nationally. Among their suite of recommendations, they advocated for access to career development learning services at multiple points across the lifespan and at multiple sites; enhanced education, competencies and qualifications of career development personnel, and a mechanism for guiding career information and career development services nationally. The Career Industry Council of Australia (CICA, 2012) also supported a life-long focus on careers, advocating for a national careers service and national standards for professional career development practitioners.

Many new initiatives and additional funding emerged with the implementation of the *Blueprint*. One example being the establishment of the national online career information service *MyFuture*. *MyFuture* makes available comprehensive information on occupations, skills required, skill demands and earnings. The *Blueprint* has also led to the development of improved national standards, competencies, accountability mechanisms and professional resources with one example for schools being the School Career Development Benchmarking Resource (2014) introduced by CICA (https://cica.org.au/wp-content/uploads/CICA-School-Career-Benchmarking-Resource1.pdf). This resource can be used as a quality assurance tool for schools as it includes benchmarking guides for best practice for career services in schools.

With a change of government at the federal level in 2013, career development initiatives and funding have been reduced. The Career Development Association Australia (CDAA; 2015) publicly stated its concern that the Australia 2014 Federal Budget cuts affecting popular career planning resources Job Guide and *MyFuture*, have negatively impacted both career development practitioners and jobseekers. CDAA (2015) also stated:
It is time to rejoin as a global contributor and participator in worldwide Career Development forums…referring to the recent 2015 Symposium for the International Centre for Career Development and Public Policy (ICCDPP), where Australia attended only as an observer.

In Australia, it is recognised by career industry associations that careers advice in schools, in particular, needs to be expanded. The announcement by the Queensland Government of additional funding for career guidance officers in Queensland was acknowledged by industry body Careers Industry Council of Australia (CICA) (2015) as “…an important step in recognising that guidance officers in schools need to be provided with appropriate resources to build and strengthen links with local employers” (p. 1). This comment affirmed that while traditionally career advisers or guidance officers in schools have a career support or counselling focus, they are increasingly responsible for building industry links beyond the school to support the career development and vocational learning of students. As noted by Patton & McMahon, (2014, p 326) a prevailing feature of career guidance for students has been its location primarily in secondary schools with an emphasis on transition from schools and “…its neglect of career programs for primary school children.”

To ensure national career strategies and programs in schools are more responsive to the needs of girls and women, eSecurity4Women (2014) proposed that “the Federal Government commission the development of models for best practice careers’ guidance for secondary school girls and that this advice build on elements of successful programs from Australia and around the world” (p. 2). Two of the other proposals specific to trades included “that highly visible female role models, mentors and support networks for young women in STEM and non-traditional workplaces be recognised as integral to future strategies”, and that
“widespread partnerships between schools, educational institutions, industries and communities to assist girls and young women to access non-traditional and STEM study and work placements” be developed (eSecurity4Women, 2014, p. 6).

3.2.2 Early careers learning. Career advice and planning are important through adolescence, as significant career information, subject choice and planning take place during this life stage (Rogers & Creed, 2011). There have also been long-standing calls to implement career exploration and information for students from the primary school years of education (Broadley, 2015; Patton & Mc Mahon, 2014; Department of Education and Communities, 2014; Ford, 2011; Hooley, 2015b; McMahon & Carroll, 2001). As early childhood is considered to be removed from decision making about work, it can be discounted as a time to begin career development learning. The contrasting view is that this is a time when important vocational identities are being formed and the foundations of career learning can be strengthened (Patton & McMahon, 2014, p.326). This view is shared as noted in the commentary by Hartung, Porfeli & Vondracek (2005):

The extant vocational literature reflects society’s desire to separate children wholly from work and labor in the spirit of letting children be children, free from the responsibilities and concerns ascribed to later age periods; a phenomenon described as the cultural moratorium of childhood (Zinnecker, 1995). It also reflects a prevailing bias to study adolescent and adult vocational behavior and development that, in effect, fails to adequately consider and make linkages to childhood dimensions of life-span vocational development (Vondracek, 2001a) (p.385).

The arguments in favour of early careers exploration include the reality that children are forming ideas and thinking about careers at a young age; career exploration may engage children more in their learning; and early intervention may help to overcome the impact of
gender stereotypes on children’s understanding of occupations. In their review of research, Hartung et al., (2005) reported significant differences in career aspirations, choices and career maturity based on gender and other factors and that these form early in life, leading them to conclude that: “Vocational development begins much earlier in the life span than generally assumed, and what children learn about work and occupations has a profound effect on the choices they make as adolescents and young adults, and ultimately, on their occupational careers.” (p.415). This view is supported by Hooley, (2015b):

There are strong reasons for starting career education early which relate to social equity. Primary career education has a long history, albeit one that is often interrupted by frequent lurches in policy. In general, educators have developed primary career education programmes from the age of seven and where they have been evaluated this has been found to be effective and to fit well into the wider primary curriculum. (para. 16)

The Pathfinder careers project in the UK has reported positive results in helping students to overcome the limiting influence of gender stereotypes (Department of Education, 2012) through early-years careers intervention. The National Union of Teachers (2012) in the UK has also developed classroom materials to help teachers overcome gender stereotyping of careers in early primary students in selected UK schools.

Another argument in favour of early-years careers learning is to overcome the decline in girls’ enrolment of Science and Maths between the middle primary years and the end of secondary school. According to Broadley (2015), career advisers concentrate their efforts on students from Years 9 to 12, “but this focus needs to be broadened to capture primary school girls before they disengage” (p. 33).

Given the generally low levels of resourcing devoted to career development in Australia, it may be difficult to enlist government support for the additional resourcing
required to introduce early-years career learning, even though the National Career Development Strategy (2013) stated as an objective: “fostering the development of career skills through the school curriculum, from the early years through to the post-compulsory years” (p. 8). The findings of a national survey of career development practitioners commissioned by CICA (2015) revealed that “more than 4 in 5 (80%) schools have 1 or less fulltime equivalent career practitioners. Research shows that over the past three years, career practitioners have been 1.75 times more likely to have had their time decreased rather than increased.”

3.2.3 Vocational learning. Vocational learning is significant to young people’s career development. Vocational learning is delivered within the broader curriculum at schools and is defined as follows:

Vocational learning includes career education programs, through which secondary students explore the world of work, identify career options and pathways, and build career development skills . . . Career exploration needs to begin early in secondary school, if not before, while students are still forming their sense of identity, their beliefs about work and their ideas about their own future possibilities. Vocational learning also includes subjects that allow secondary students to undertake general work-related curriculum, or explore particular occupations or industries . . . Vocational learning includes opportunities for students to ‘taste’ the world of work through one-off events, initiatives such as enterprise learning, or spending time in a real or simulated workplace. (Education Council, 2014, p. 6)

Even if secondary students in Australia do not undertake vocational education courses, they may be involved in some form of vocational learning, such as work experience.
3.2.4 Career surveys. Career surveys of youths provide little sign that gender segregation in the trades is likely to change in the near future. In their study based on the LSAY between 1998 and 2008, Sikora and Saha (2011) applied gender imbalance indicators to the career expectations expressed by youth, finding significant divergence in views between female and male students. Their indicators were obtained by subtracting the proportion of females from the proportion of males in each of the four-digit-level ASCO 2 occupational groups (Sikora & Saha, 2011, p. 30). This produced gender imbalance indicators ranging from -1 to +1, where -1 represents occupations entirely dominated by women; 0 denotes occupations with equal proportions of men and women; and +1 signifies occupations entirely dominated by men. Legal, professional, accountancy, illustration or graphic design careers were equally attractive to both genders (rated at 0), while others diverged significantly. For example, the other building and engineering professionals category rated at 0.75; carpentry and joinery tradespersons rated at 0.98; and electricians rated at 0.98 (Sikora & Saha, 2011). These very high indicators of male dominance for these trades affirmed their entrenched nature in both the practice and minds of young people.

In summary, it is well recognised that career and vocational learning are important and worthy of greater prominence in school-based curriculum. In addition, this learning is most effective when incorporated in early primary school years and when it challenges, rather than endorses gender stereotypes of occupations.

3.3 Barriers Related to Career Development That Entrench Gender Segregation in the Trades

3.3.1 Overview. The NCDS states: “career development is important to the Government’s agendas in workforce participation, productivity, social inclusion, equity and closing the gap between Indigenous and non-indigenous education and employment” (2013,
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This section on barriers outlines how, despite the NCDS’s (2013) recognition of equity objectives, career interventions in schools are limited in their capacity to facilitate students to “see” all careers.

3.3.2 Career guidance and STEM: Overcoming gender stereotyping of jobs.

International and local studies have reported that career options presented to female students are narrow and discourage the pursuit of non-traditional subject and occupational choices (eSecurity4Women, 2014; Fuller et al., 2005; International Labour Organization, 2009; Shewring, 2009; YWCA & TUC, 2005). In Australia there has been substantial public attention and policy action to promote science, technology, maths and engineering for both boys and girls. It has been a focus of the Office of the Chief Scientist (2014), the Workplace Gender Equality Agency (2013a), women’s policy units in government and numerous education and industry bodies. Yet there is a commonly expressed view summed up well by Spearman & Watt (2013, p.125) that: “Despite numerous government-led initiatives to balance gendered participation in the STEM workforce, the gender disparity has remained a persistent trend over many years.” These scholars propose three key areas of attention to explain why girls either “drop-out of” or do not pursue STEM related subject and careers through school and beyond. These are ability, socialisation and motivation. It is now widely accepted that boys and girls perform similarly in STEM subjects in OECD nations “…and that explanations beyond ability must be pursued” (Spearman & Watt, p.177). Socialisation has greater currency and it impacts on motivation for particular career paths. It is recognised that children develop a gender schema of appropriate masculine and feminine behaviours that they learn and that if girls valued and were encouraged in to male-dominated STEM subjects and careers at an early age, “…their self-efficacy for these subjects will improve” (Spearman & Watt, p.178).
Studies have suggested that career guidance approaches and theory are problematic because they do not respond well to cultural and gender differences (Bimrose et al., 2014; Butler & Ferrier, 2006; Cassie & Chen, 2012; Juutilainen & Puukari, 2007; McMahon & Watson, 2005) or adequately challenge gender stereotypes (Correll, 2001; EOC, 2004; O’Donnell, 2008). In UK research, it has been found that while students all receive some sort of careers input and work experience, “the gender dimensions to this were apparently not being addressed through the curriculum or careers advice and guidance” (Fuller et al., 2005, p. 307). In their study, Francis & Prosser (2012) reported that career counsellors perceived construction work to be a better career option for young men than young women, which influenced their advice. This led these researchers to recommend that “an educative model, whereby young people, parents and career counsellors are able to access current information about construction first-hand from people working in the industry, may counter negative gender stereotypes associated with this area of work” (Francis & Prosser, 2012, pp. 80-81).

Professional development resources have been produced to promote gender analysis and gender awareness in career guidance. One example is the EQUAL project partnership of four European countries (Denmark, Finland, Italy and Spain), which established CHOICES to foster culture and gender-sensitive guidance and counselling, with the aim of achieving “equality in the labour market” (Juutilainen & Puukari, 2007). “Gender-sensitivity” is described as a model for school-based counsellors to follow in applying theoretical knowledge of gender socialisation, the gender system and gender legislation to show how the world, and workplaces in particular, is different for men and women (Juutilainen, 2007, pp. 7–9). Another resource that aims to build gender awareness and reduce the limiting impact of stereotypes is the guide to challenging gender stereotypes for primary schools titled Boys’ Things and Girls’ Things developed by the UK’s National Union of Teachers (2012). It is
intended to be used within existing classroom activities without the need for investment in new curricula and resources. One of the positive outcomes reported following the application of this guide was a broadening of children’s thinking about jobs (National Union of Teachers, 2012).

There has been a call for “emancipatory career development practices” to overcome the inequity associated with girls’ and women’s under-representation in science, technology, maths and engineering (STEM) related courses and careers (Broadley, 2015, p. 33). To do so, career advisers are suggested to undertake the following: introduce more non-traditional role models and mentors to female students; saturate schools with STEM images for girls; target work experience to non-traditional areas; and engage with parents and families to build understanding of the importance of STEM subjects to girls (Broadley, 2015).

To improve career advice provided to young women making their transitions from school to VET, Butler and Wooley (2006) called on VET to “get real” with young women, and help them to avoid career decisions that “perpetuate fragmented working biographies, insecurity and low pay” (p. 591). In their view, young women tend not to have realistic views on the nature of work, job availability or rates of pay in their chosen field of work. In also seeking to improve career outcomes for women, Bimrose and Brown (2014) suggested that career approaches proved more valuable with women of all ages “when based on stories and experiences from the women”, rather than more conventional linear decision-making models and assessment focussed on traits (p. 85). These calls for more focussed career intervention with young women are time and resource consuming, which probably accounts for why more intensive career support is not in common use.

3.3.3 Weaknesses in VET schools-to-work transition. It is also apparent from the literature that barriers to the male-dominated trades within schools are compounded by the
low perceptions and value placed on VET as well as weaknesses in the school-to-work transitions of students enrolled in VET. This impacts on the career choices of male and female students. For example, it has been reported that secondary school students in Australia receive more advice on university pathways relative to advice on vocational pathways, providing an unbalanced view of post-school opportunities (Clarke, 2012).

The benefits of VET for students in schools are the retention and engagement of students who may not succeed in academic pathways and a means of developing skilled workers for the labour market. Yet, the identified weaknesses of VET in schools led to a review by the Education Council in 2014. Of particular concern is the claim that the vast majority of qualifications undertaken are foundational or entry level, with limited employment outcomes (Clarke & Polesel, 2013, p. 4). In exposing problems in the efficacy of VET in schools to create pathways into work for students, Clarke and Polesel (2013) called for VET in schools to be considered as a beginning point for post-school education and training, rather than an endpoint, and for more effective career guidance methods, so as to reduce the flow of VET school graduates “into weak and hostile labour markets” (p. 13).

3.3.4 The importance of Maths. Gender differences in subject choices and pathways through education are significant. Performance in Maths is considered to be one of the most important factors for females in facilitating a choice of a more gender-neutral occupation (Blau et al., 2012; Correll, 2001; eSecurity4Women, 2014; Frome et al., 2006; Sikora & Saha, 2011). Male-dominated trades are not jobs for low academic achievers; entry to and success in them require mathematical and computer skills. In studies, girls who performed well in Maths and had confidence in their numeracy skills were more likely to plan to work in occupations with a higher representation of men (Correll, 2001; Sikora & Saha, 2011).
However, widely held cultural beliefs that males are more competent at Maths lead females to feel less confident about their mathematical abilities and their need to pursue the subject at school (Correll, 2001; Frome et al., 2006; Levy, Sadovsky, Troseth, 2000; Sikora & Pokropek, 2012). As males tend to rate their mathematical abilities more highly than females, they are “more likely to pursue activities leading down a path toward a career in science, math and engineering” (Correll, 2001, p. 1716). The cultural beliefs model described by Correll (2001) showed “how gender beliefs bias self-perceptions of competence” (p. 1716). This is used to explain the “supply networks of workers for occupations that have clear and stable gender beliefs in their culture” (Correll, 2001, p. 1717).

There appear to be no significant differences in mathematical abilities across gender, yet, even where girls perform as well as boys in Maths, they report less self-belief in their own skills, and higher levels of anxiety about the subject (Bench et al., 2015; Broadley, 2015; Levy, Sadovsky, Troseth, 2000; Sikora & Pokropek, 2012). It has been suggested that gender disparities in “drive, motivation and self-beliefs about mathematics are more pervasive and more firmly entrenched than differences in mathematics performance” (Broadley, 2015, p. 28). This lack of mathematical confidence in girls seems to be compounded over the school years. The Group of Eight Universities (2012), a coalition of universities in Australia that distinguishes themselves by claims of depth and breadth in research, raised concern that advanced Maths course completions by Year 12 students in Australia in 2010 were dominated by male students, at 60.2%, representing minimal change since 2005 (p. 8). The average percentage of 15-year-olds who expected to be working in a computing, engineering or mathematical field by the time they reached 30 years of age was 20.7% for boys and 6.7% for girls (Sikora & Pokropek, 2012).
The majority of children decide whether to follow a STEM-related career “before the age of 14” (Tytler et al., 2008, p. 86) or by Year 10 (Sikora & Pokropek, 2012). To counter the early elimination of girls from STEM courses and to broaden their career choices, eSecurity4Women (2014) have stated that “it was important that STEM subjects were made relevant to girls from an early age” (p. 5). As girls have sufficient encouragement, family support or self-belief to pursue STEM beyond the middle years of secondary school, it is therefore important for targeted support to increase the STEM participation of women, disadvantaged and marginalised students, including Indigenous students (Broadley, 2015; eSecurity4Women (2014)).

3.3.5 Lack of understanding of male-dominated-trades and lack of support from peers and parents. Support from families has emerged as a major factor in the entry and success of women and girls in non-traditional vocational pathways. The majority of tradeswomen in Shewring’s (2009) study identified family support, particularly from their fathers, as a main factor in their entry into the trades, with almost all participants from families with strong trade backgrounds (pp. 18–20). The findings from Fuller et al. (2005, p. 307) showed that the strongest influence on young people’s occupational aspirations could be located in the informal sphere of family and friends, yet young people were embedded in environments where mothers, fathers, relatives and friends did not transcend or question traditional occupational boundaries. In the Youth Decision Survey Report (2010), only 2% of the youth participants thought their parents would like them to become an apprentice, yet almost all parents (90%), teachers (97%) and students (74%) agreed or strongly agreed that women are capable of working in the skilled trades.

Reportedly, girls have limited or inaccurate knowledge of the male-dominated trades (Byrne, 1983; O’Donnell, 2008; Shewring, 2009). When the young women in O’Donnell’s
(2008) study were asked what they thought of working in non-traditional jobs, almost all of them gave strong negative responses. This view was attributed to a concern about the manual work and inaccurate and negative perceptions of this work. Byrne (1983, p. 17) has suggested that a very practical obstacle to girls is that they have not generally been encouraged to handle tools. Recognising that women and girls continue to have limited experience of trades, Support and Linking Tradeswomen Australia (SALT) have introduced a mobile tool van for women to try out tools (SALT, 2013), and a number of vocational training organisations are providing Try-a-Trade opportunities for female students.

3.3.6 The myth that girls do not really want those jobs. The question of whether or not female students are interested in pursuing work in the male-dominated trades arises more in the non-peer-reviewed literature (such as government reports and media) rather than in peer-reviewed literature. The Youth Decision Survey Report (2010) provided some indication of youth views on apprenticeships; 15% of females and 47% of males said it was likely/very likely they would consider working in the skilled trades when finishing high school, and 63% of females and 73% of males said they knew what an apprentice was. The Association of Women Educators (AWE) in Australia promotes the need to reduce gender segregation in the trades. In 2010, AWE hosted a “Girls into Trades” career seminar for female secondary students in Brisbane to increase their understanding of the male-dominated trades. Delaney and Ralston (2010) reported on “the positive feeling about careers in the trades” that female students expressed in this seminar. In the study by Fuller et al. (2005, p. 306), 76% of girls compared to 59% of boys were particularly attracted to the idea of being able to try out a male-dominated occupation before committing themselves to a decision. This interest among girls and women in trying a trade experience was also evident in the study by Shewring
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(2009). Thus, rather than female students having a dislike for the male-dominated trades, it seems that they know little about them and face barriers in gaining exposure to them.

It has been suggested that: “Only when discrimination is considerably reduced will we be able to have a fair test of the hypothesis . . . that very few women really want those kinds of jobs” (Bergmann, 2011, p. 93). In pursuing this research topic, I have been conscious of my own interest (and potential for bias) in wanting to see benefits accrue to young women through reduced gender segregation of the male-dominated trades. I have been aware of the need to find out from girls whether they like the male-dominated trades, if they can do them, and if they want to do them. These areas of investigation are under-developed in the Australian and international research.

3.4 Career Development Theory

Career development theory provides an understanding of the cognitive processes of young people and the influences and barriers that impact their career exploration and decisions. It is a highly developed area of research and scholarly endeavour – one that contributes to the understanding of gender differences in career aspirations and pathways. It is singled out as an area of inquiry as this thesis sets out to understand and make meaning of gender segregation of the trades from multiple perspectives - with a specific focus on the motivations and views of young people. Consistent with the interpretivist approach (Neuman, 2006), rather than testing any particular theory this thesis explores many. A benefit of featuring career development theory as it relates to young people is to better understand gender-based differences in career aspirations and decisions of young people that may contribute to low female participation in male-dominated trade careers.

Rather than providing an exhaustive analysis of career theory, this section selects and discusses three examples of career theories. This selection is made on the basis that these
three theories: (1) describe external influences and individual agency on career development for young people and (2) provide analysis of gender differences in their career pathways. The three theories selected for discussion are the meta-theory, Systems Theory Framework (STF) of Career Development (McMahon, 2014; McMahon, Patton & Watson, 2005; Patton & McMahon 2006); Social Cognitive Career Theory (SCCT) and Gottfredson’s theory of circumscription and compromise (Gottfredson, 1981, 2002).

An extensive international research and scholarly discipline in career development has emerged. Contemporary approaches to career development are based on the constructivist worldview with its emphasis on personal meaning, subjectivity and recursiveness between influences (Patton & McMahon, 2014). Some approaches adopt ethnographic research, suggesting that career choice can be understood in the personal accounts and stories of individuals. Qualitative and quantitative research models are adopted to assess personal histories, experiences, perceptions and the influence of socio-economic and cultural pressures (McMahon, 2014; McMahon, Patton & Watson, 2004).

Early career theory developments were principally based in a quantitative, positivist view of research with its emphasis on objective data and rational process. Career assessment tools were developed to match the qualities of individuals to careers (McMahon, 2014). In raising limitations of early career theory development, Patton & McMahon, (2014) reported that it:

…focused on the individual as operating quite separately from context, a reflection of the industrial era ethos of autonomy and choice…it was the development of social cognitive theory (SCCT, Lent et al., 1994) and developmental contextualism (Vondracek et al., 1986) which introduced the relevance of context to understanding career (p. 21-22).
Growing recognition of the recursiveness between individuals and the environmental-societal context – their work, mental and physical health, family responsibilities and life options, government policy and more – has led to the emergence of a meta-theoretical framework - Systems Theory Framework of career development (Patton & McMahon, 2014; McMahon, 2014; McMahon, Patton & Watson, 2004; Patton & McMahon 2006).

- Systems Theory Framework (STF) of Career Development

The STF of Career Development is a meta-theoretical framework that aims to identify the many environmental, institutional and individual influences on career decisions (Patton & McMahon, 2014; McMahon, Patton & Creed, 2007). It draws on the well-established application of systems theory from human services, ecology and other disciplines. It is consistent with the systems theory framework that has its origins in my early professional discipline of social work and which supports the overall organising framework for this research referred to in Chapter 2. The aim is to apply STF as an analytical framework to explore the complexity of factors that contribute to gender segregation in career decisions of young people. This will complement the use of systems theory broadly as an analytical tool to explore economic, social and cultural factors that impact on gender segregation of the trades.

STF is “…broadly based and is able to take into account the diversity and complexity of the influences on career development” (Patton & McMahon, 2014, p.22). As a meta-theory it accommodates the many theories that explain behaviour at an individual or macro-level (McMahon, Patton & Watson, 2004, p. 8). Systems theory depicts “…the recursiveness, or ongoing relationship between elements or subsystems of the system and the changes that occur over time as a result of these continual interactions (Patton & Mc Mahon, 2014). In promoting the utility of STF Patton & McMahon (2014) stated that the application of systems theory “does not make the existing theories redundant…rather each are viewed in the context
of available theory…not one single theory can explain the complexity of career behaviour” (p.24). The individual is considered a system in his or her own right, comprising intrapersonal influences such as gender, interests, age, abilities, personality and sexual orientation, while social and broader societal systems contain influences from family, peers, educational institutions, media, the economy and more.

The STF depicts the dynamic and interactive nature of career development and how the influences change over time, including by chance (McMahon, Patton & Watson, 2004, p. 9). At the macro-level, the influence of the labour market conditions, cultural norms and geographic location is seen to apply to most people. At the social system level, peers, family, teachers and school are important influencers. In order to enable individuals to explore their unique interests and influences, including culture, McMahon & Watson (2010, cited in McMahon, 2014, p. 22) encourage the use of storytelling in career interventions. Through the individual’s own narrative, insights will emerge for the individual and for those providing career advice, which will help to guide the career decision-making process. As well as the many individual and structural factors shaping career decisions, “random occurrences”—that is, the element of chance—“may [also] irreversibly change the life and career of an individual” (McMahon, 2014, p. 22). The role of chance is important, but favourable random occurrences are more likely to emerge where individuals have taken action to build new relationships, establish networks, and gain exposure to new work experiences.

To understand the gender segregation of the trades, the multi-level influences on career development need to be considered. The STF of Career Development provides a very helpful organising framework for understanding these influences. Other theories, such as Social Cognitive Career Theory (SCCT) and Gottfredson's theory and circumscription and
compromise, complement this with more detailed explanation of behavioural and environmental aspects of influences on career exploration.

- **Social Cognitive Career Theory**

  SCCT proposes that a variety of personal, environmental and behavioural variables influence the career choice process. Proponents of SCCT focus on the following three key variables that influence career-related actions (such as career exploration and planning): self-efficacy (people’s judgements of their capabilities to organise and execute courses of action); outcome expectations (expected consequences of actions); and career goals or aspirations (Lent & Brown, 1996; Rogers & Creed, 2011). Rogers and Creed (2011, p. 163) reported that contextual influences also play an important role in the development of occupational interests; for example, life barriers, gender, leaving home, and parental influences. In better understanding the career aspirations of young people relevant to this research, SCCT is useful as it focuses on “…the interaction between the adolescent’s cognitive-personal variables and the contexts that may limit or encourage personal agency in his or her career development” (Patton & Creed, 2007, p.129). More recently Lent & Brown (2015, p.558) have complemented the original SCCT model with a social cognitive model of career management which “…emphasizes the factors that lead people to enact behaviours that aid their own educational and occupational progress.” This builds on the experiential and contextual factors of the original model that promote pursuit of particular occupational paths (Lent & Brown, 2015, p.558).

  Gender is acknowledged by Patton and Creed (2007) within the SCCT model as a significant factor in career development of adolescents. In suggesting that research has reported conflicting results with respect to gender in career aspirations, Howard et al., (2010, p.99) recognised that gender differences exist in occupational choices, yet “…the historical
trend of girls’ occupational aspirations being reliably and consistently lower than boys is no longer typical.” These researchers found “clear gender differences” in 16 of the 20 top occupations and compared to boys, girls identified occupations that demanded higher educational attainment but would result in similar media salaries (Howard et al., 2010, p.107). Similarly, Patton & Creed (2007) found significant gender differences with the largest proportion of males aspiring to jobs in the realistic category of the RIASEC (Holland 1997) model (which are technical and manual jobs), with the largest proportion of females aspiring to the social category. It is reported that male and female seventh grade students expressed higher self-efficacy “…when they believed their aspirations matched their gender (Lapan et al., 2000 cited in Patton & Creed, 2007, p.131). Further Patton & Creed (2007) reported:

Occupational aspirations and expectations have been regarded as reflective of career self-efficacy in SCCT (Lent et al., 2002; Rojewski & Hill, 1998) with Post, Williams and Brubaker hypothesizing that higher levels of self-efficacy would relate to less gender-traditional occupations (p.131).

Other research has found that girls can limit their aspirations at a young age if they feel that male-dominated jobs conflict with their self-concept as a female (Brown., Oritz-Nunez & Taylor, 2011, Cassie and Chen, 2011; Correll, 2001). Early exposure to tasks and the positive reinforcement that may result from this could help young women to gain confidence in their abilities (Betz & Hackett, 1997; Creed, Patton, & Prideaux, 2007).

The influence of gender on self-efficacy was apparent in Sikora & Pokropek’s (2012) research that examined the impact of career-related self-concept (the ability to cope with demands of the future career) and career-related self-efficacy on students across 50 countries. This research concluded that girls have a lower Maths and Science self-concept than boys even if their academic performance matched that of their male peers. This lower self-concept
in Maths and Science can deter female students from choosing these subjects. This limits their career options (Sikora & Pokropek, 2012).

- Gottfredson’s theory

Another frequently used theory aimed at explaining the development of children’s career aspirations is Gottfredson’s theory of circumscription and compromise (Gottfredson, 1981, 2002). This theory emphasises the role of socialisation (and the influence of gender, race and social class) on circumscription, specifically referring to the process by which people eliminate career options that conflict with how they view themselves. Aspirations are then further limited by what people perceive as being more realistic choices. According to Gottfredson (1981, 2002) compromise is governed by a hierarchy in which interests, followed by prestige, then sex-type selection occurs, with children eliminating occupational alternatives that conflict with their self-concepts. Middle-school children understand their social status and they aspire to occupations within their status group, limiting occupation choice by gender roles and sex type. The research indicated that females often prematurely eliminate potential career paths based on gender stereotypes (Gottfredson, 1981).

In view of this limiting process, early exposure to non-traditional roles and acceptance of these as viable options for both male and females appears important. In a study of 14- to 17-year-olds, early work experience was associated with future changes in career planning and exploration. Conversely, no early work experience was associated with stagnation in career planning and exploration (Creed, Patton & Prideaux, 2007). It has also been reported that increasing an individual’s career decision-making self-efficacy may reverse premature elimination of occupations (Cassie & Chen, 2012). Discussion, self-reflection and feedback from career interventions have been shown to foster self-efficacy, leading Cassie and Chen (2012) to suggest that educators should invite young women succeeding in non-traditional
work roles to participate as mentors to female students in order to encourage their exploration of non-traditional occupational roles.

While growing attention is being paid to issues of diversity and social justice in career theory, it is suggested that the role of gender remains under-developed in career theory in that it “fails to address adequately the complex and relational nature of women’s career development that is distinct from that of men” (Bimrose et al. 2014, p. 77). Researchers acknowledge that career trajectories and choices differ for boys and girls and that gender plays a pivotal role in explaining career expectations (Sikora & Pokropek, 2012; Sikora & Saha, 2011; Brown, Ortiz-Nunez & Taylor, 201; Gottfredson, 1981). Bimrose & Brown (2011) offered a number of suggestions that could improve the response of career practice practitioners to the needs of women and girls, including the following: (1) challenging circumscription and enhancing people’s competitiveness; (2) enhancing the self-efficacy of girls by challenging stereotypes and promoting male-dominated occupations and STEM subjects in schools; and (3) using feminist careers counselling to promote diversity in career development. This would include determining how women and girls have experienced gender-role socialisation in recognition that “social structures and societal prescriptions have moulded and limited women’s career development, experiences and opportunities” (Bimrose & Brown, 2011, p. 9). More recently, Bimrose et al. (2014) have suggested that qualitative, narrative-based research with women, and incorporating stories of women’s experiences in career theory and models, will better “accommodate both the unique and relational nature of women’s careers” (p. 85).

The NCDS (2013) in Australia is informed by contemporary theory, evidence and practice, yet it does not explicitly distinguish the needs and experiences of females from males. It aims to foster social inclusion and equity, but it does not set out policy and actions
to respond to gender differences. Consistent with concerns raised by Bimrose and Brown (2011), this lack of gender analysis and differentiation in the NCDS, is likely to compromise its capacity to meet gender-equity objectives. This would include ensuring that access to careers is not limited by gender.

3.5 Theories of Social Change and Youth Behaviour Change Relevant to Career Decisions

3.5.1 Applying a systems framework to social and behavioural change theories.

Young people function within a complex environment of external influences, supports and pressures, and intrapersonal attitudes, values and behaviours. The intervention models applied in the international field of public health with youth, such as the Social Ecological Model (SEM) (UNICEF, 2014) and Youth: Choices and Change model (Maddaleno & Beinhauer, 2005) aim to understand the structural (macro-level) and interactive determinants of behaviour (operating at the meso and micro-levels). There are significant findings from this body of research and action that can apply to behaviour and social change theories to reduce gender segregation in the trades and to enhance youth career decision-making. As the views of young people are a distinctive feature of this research, and as this research seeks to change the career decision-making of young people, social and behavioural change theories relevant to young people are canvassed in this section.

To understand and influence the behaviour and attitudes of young people in relation to their career choices, it is important to recognise their social context of relationships with peers, teachers, parents, carers and employers, as well as the institutional, economic and cultural influences on them. Consequently, systems theory as an organising framework also applies to social change theories and models described in this section. This analysis
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acknowledges the importance of understanding and targeting action at the social interactions between individuals as well as their interactions with social structures or systems.

Consistent with this systems approach, change theories appear to be most successful in practice when multiple levels of influence are targeted simultaneously (Bartholomew, Parcel, Kok & Gottlieb, 2001; End Violence Against Women Now, 2014; Maddaleno & Beinhauer, 2005; UNICEF, 2014). Table 3 shows the five levels of the SEM: individual, interpersonal, community, organisational, and policy/enabling environment. This table is adapted from the UNICEF model to make it relevant to gender segregation of the trades.

Behaviour change theories and models tend to focus on individual attitudes, knowledge, and behaviours as the locus of change, and explain how determinants of behaviour (beliefs, values, self-efficacy) can be altered, reinforced or introduced to achieve change in actions (Maddaleno & Beinhauer, 2005; UNICEF, 2015). By contrast, social change theories and models tend to focus on the community as the unit of change (UNICEF, 2015). According to UNICEF (2015), social change is:

a process of transformation in the way society is organised, within social and political institutions, and in the distribution of power within those institutions. For behaviours to change on a large scale, certain harmful cultural practices, societal norms and structural inequalities have to be taken into consideration. (p. 1)
Table 3

A Description of Social Ecological Model (SEM) Levels as Applied to Gender Segregation of the Male-Dominated Trades

<table>
<thead>
<tr>
<th>SEM Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual</td>
<td>Characteristics of an individual that influence behaviour change, including knowledge, attitudes, behaviour, self-efficacy, developmental history, gender, age, religious identity, racial/ethnic identity, sexual orientation, economic status, financial resources, values, goals, expectations, literacy, stigma, and others.</td>
</tr>
<tr>
<td>Interpersonal</td>
<td>Formal (and informal) social networks and social support systems that can influence individual behaviours, including family, friends, peers, co-workers, customs or traditions.</td>
</tr>
<tr>
<td>Community</td>
<td>Relationships among organisations, institutions, and informational networks.</td>
</tr>
<tr>
<td>Organizational</td>
<td>Organisations or social institutions with rules and regulations for operations that affect how, or how well; for example, careers and trade services are provided to an individual or group.</td>
</tr>
<tr>
<td>Policy/Enabling Environment</td>
<td>Local, state, national and global laws and policies, including policies regarding the allocation of resources for education, VET, industry and labour.</td>
</tr>
</tbody>
</table>


The multi-level SEM captures the interaction of individual characteristics, such as gender, with wider social networks, relationships, organisational and cultural practices in understanding and responding to issues. The SEM also captures the importance of enabling factors—the policies and resources—that need to be harnessed to effect change. To implement SEM in its international work, UNICEF (2014) also applies a Communication for Development (C4D) approach, which uses: “information- and dialogue-based processes and mechanisms to empower populations, especially those that are marginalized and vulnerable,
and to facilitate and build collective efficacy and actions” (p. 1). C4D makes use of advocacy and social mobilisation with population groups and social- and behavioural-change communication strategies. The UNICEF programs use culturally specific communication channels, including social media, to encourage dialogue and action among young people.

Interventions aimed at specifically influencing young people are claimed to be most successful when they acknowledge that “young people are part of the solution . . . not merely a problem to be resolved by others” (UN, 2003, p. 271). There is little evidence that young people themselves are actively raising concern about or seeking change in relation to the male domination of the trades via social media, within schools or youth networks. Rather, it is industry leaders and advocates who have identified the issues and sought change for young people.

The following section provides a brief overview of a selection of behavioural and social change theories. They are selected due to their relevance in explaining the career exploration and processes of social change relevant to young people that operate at the five levels of SEM. This selection is illustrative, not comprehensive. Many theories can be applied to understand the behavioural and social change that is required to overcome the barriers that entrench gender segregation in the male-dominated trades. If any one theory is used in isolation, the analysis and action on gender segregation of the trades, will not be comprehensive. As a result, their application in a combined manner, at all levels within a systems framework, will strengthen the analysis and required action.

3.5.2 Individual level theories.

- Theory of reasoned action
The theory of reasoned action developed by Ajzen & Fishbein (1980, cited in Maddaleno & Beinhauer, 2005, p. 71) proposed that behaviour is determined by two major factors: (1) beliefs about the outcomes of that behaviour and the value of those outcomes; and (2) the person’s motivation to comply with what other people think (Maddaleno & Beinhauer, 2005). This theory can be helpful in explaining that some young people will ‘weigh up’ the likely income and status to be gained from particular occupations. This theory is limited in its relevance to youth and careers as it assumes that individuals are rational actors and it does not fully take into account external influences (as identified in career development theories), including media and socio-economic conditions, that an individual may have little control over.

- Social Cognitive Theory

Central to SCT is the premise that behaviour is influenced by socio-environmental and personal factors and mediated via personal cognitions, including an individual’s level of confidence in performing a particular activity; that is, self-efficacy (Bandura, 1986). In applying SCT to encourage female interest in the male-dominated trades, it follows that young people are likely to make personal choices based on expectations of those outcomes and their confidence or self-efficacy. Researchers have proposed that the effective repetition of tasks and the reinforcement this will enable people to gain expectations of success, and they may then change their behaviour (Bandura, 1986; Betz & Hackett, 1997; Creed, Patton, & Prideaux, 2007). To improve self-efficacy this body of theory suggests that early exposure to mentors to build confidence in trades for girls; the use of trade tools, and success in constructing or repairing objects may be a positive reinforcement of trades for girls. SCT is adapted and applied extensively to career development through proponents of Social Cognitive Career Theory (SCCT; Lent & Brown, 1996; Patton & Creed, 2007).
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- Social Networks and Social Support Theories

With early work pioneered by Bauman & Ennett (1996), social networks and social support theories seek to understand the way in which peer and other social networks influence behaviour and attitudes among people. It has been shown, for example, that young people who were not part of a social network were at higher risk of smoking (Bauman & Ennett, 1996). This led the researchers to suggest that while it can be important for young people to resist peer influence on harmful behaviours, the social support from peer networks is important for healthy youth development (Bauman & Ennett, 1996). Given the apparent significance of the influence of peers and youth networks, questions on peer influence were included in the interview schedule for this study to explore their application to career decision-making of young people.

- Authoritative parent model

Much attention in the career development literature has been focussed on parenting practices and influences on young people. A typology of four different parenting styles, based on the demand and responsiveness levels of parents has been developed (Maccoby & Martin, 1983, cited in Maddaleno & Beinhauer, 2005). It is claimed that studies using this typology have shown a positive relationship between parental responsiveness to adolescent needs and their psychosocial adjustment. These typologies have been used to further propose attributes of effective parenting, including fair exercise of authority (Maddaleno & Beinhauer, 2005, p. 155). Parental influence, particularly the significance of fathers in supporting daughters into a trade, emerged as significant in the literature review. It is canvassed in the interviews in this study.

These more individual focussed theories help to explain the influences on career decisions of young people that operate and a micro and meso level. In the next sections
macro level factors are explored to show that a comprehensive analysis of gender segregation of the trades must include a combination of factors operating at all levels of the system.

3.5.3 Community level theories.

- Community Organisation and Community Building Models

In general, community organising and community development theories describe ways in which community members identify needs, goals and community strengths to mobilise to achieve goals. These models are based on concepts such as empowerment (a process through which individuals take control to improve their quality of life); building community capacity; and active participation by citizens (Maddaleno & Breinhauer, 2005). This is a particularly significant field of scholarly activity in informing good practice principles in engaging and empowering youth in change processes. It is acknowledged that youth participation in decision-making leads to better decisions and outcomes, and promotes the development of young people (UN, 2003). These community level theories can help to show how young people can be better informed and inspired to act on issues such as occupational segregation.

- Diffusion of Innovations theory

The Diffusion of Innovations (DOI) theory helps to explain how the behaviour of community members as a whole, can be changed, particularly if it is promoted widely and people see significant gains from the change or proposal. DOI was pioneered in the early 1980s to explain the way in which new ideas and practices spread within and between communities (Rogers, 2003). Key elements of this theory that are of relevance to this research are as follows: the significance of interpersonal communication in spreading innovation; the importance of peer–peer conversations and peer networks, and opinion leaders; and understanding the needs of different stakeholder groups (Robinson, 2009;
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Rogers, 2003). From the perspective of this theory, change is primarily about “the evolution or reinvention of products and behaviours so they become better for the needs of individuals and groups”, with less focus on persuading individuals to change (Robinson, 2003, p. 3). Diffusion scholars recognise five qualities that determine the success of an innovation, which are as follows:

1. Relative advantage: An innovation will be more readily adopted if it is perceived as providing economic gain, prestige and other benefits.
2. Compatibility with existing values and practices: An idea that is incompatible with the prevailing values or practices will not be adopted as rapidly as an innovation that is compatible.
3. Simplicity and ease of use: New ideas that are easier to understand are taken up more readily.
4. Trialability: An innovation that can be trialled, to reduce risk to new adopters of the idea, may be more likely to be considered.
5. Observable results: Visible results lower uncertainty and also stimulate peer discussion of a new idea. The adoption process relies on a high profile, trusted innovators. Many diffusion-style campaigns then consciously attempt to utilise peer networks or various social media “viral marketing” methods (Robinson, 2009).

While having a basis in marketing theory, DOI theory has been successfully applied to public-health promotion campaigns with youth (Maddaleno & Beinhauer, 2005). These communication strategies could be instructive in promoting male-dominated trades to women and girls.

3.5.4 Policy level theories.

- Agenda-Building Theory and Policy Development Model
In order to understand how to shape industry and education policies to increase the female composition of the trades, it is useful to understand theories of how policy is developed and how to impact on the policy process. Policy is a framework that guides decision-making and behaviour. It can include statements of goals and actions. It is generally operationalised by laws and regulations, procedures and standards. Underpinning policy development are theories about power and influence. According to Wanna, Butcher & Freyens (2010), policy emerges through contested ideas. It is both socially and politically constructed from dynamic, interactive experiences. Social issues can gain recognition as social problems, that warrant public action and policy, when they are considered "troublesome and in need of repair" (Loseke, 2003, p.14 cited in Wanna et al., 2010, p.64).

The definition of a social condition as a problem changes over time depending on "prevailing values, norms, beliefs, attitudes and understandings" (Wanna et al., 2010, p.64). For example, low female participation in Science, Technology, Engineering and Maths (STEM) has been recognised in recent times as a social problem, due to the significance of STEM to economic productivity and women's economic equality.

Agenda-building theory (Cobb & Elder, 1983, cited in Maddaleno & Beinhauer, 2005) explains how policy can be initiated from within the government as well as through the mobilisation of people external to the government. It explains how public interest in issues can be generated, particularly through media, to mount pressure and elicit action from decision-makers. This body of theory is relevant to the aim of this research to mobilise public interest and influence education and industry policy.

In summary, a main premise of this section is that no one theory, at any one level can explain why so few girls pursue careers in the male-dominated trades. Furthermore, no one theory can guide action to interest more girls in male-dominated trades. It is the system of
influences on young people that matter. It is the system of influences that must be targeted for change to occur.

3.6 Youth Participation and Alternative Means of Engagement

The literature on youth participation models and principles was canvassed for this research to better understand how the research process itself could be inclusive of young people and to inform actions with youth that could increase the representation of young women in the male-dominated trades. There is a commonly held view (possibly based more on assumption than evidence) that young people are generally disengaged from community issues. A deficit model of youth focusses on youth problems, such as substance abuse and delinquency (Bakshi & Joshi, 2014), while an asset model of youth views young people as “resources to be developed, rather than problems to be managed” (Roth & Brooks-Gunn, 2003, cited in Bakshi & Joshi, 2014). The United Nations (2003) apply an asset model, stating that better outcomes occur when “young people are part of the solution to the difficulties they face, not merely a problem to be resolved by others” (p. 271). Others have noted that, rather than being apathetic, many young people are “cause-oriented”, directing their efforts towards specific issues that are of relevance to them (Beadle, 2011, cited Youth Affairs Council, Victoria, 2011, p. 8; Harris, 2001; Harris, Wyn & Younes, 2007, pp. 19–20; World Youth Report, 2005). Young people have their say on matters of interest to them through different creative mediums, such as popular culture, music, online petitions and social media (Baer, 2012; United Nations, 2005; Youth Affairs Council, Victoria, 2011, p. 5). This includes young women using “zines” and the internet “to enact feminist change within particular communities on specific issues” (Harris, 2001, p. 5).

While many youth organisations and programs promote youth participation principles, these are difficult to put into practice. The involvement of young people is nil or at
times tokenistic. This was evident in my role as a government minister responsible for youth affairs, where my own youth advisory councils were more tokenistic, than actively engaging young people in decision-making. The least participatory efforts to engage young people can include the manipulation of young people. To achieve a high standard on youth participation, the United Nations (2005) recommended that it is necessary to:

- provide adequate funding, introduce innovative ways to spread information, furnish training to facilitate intergenerational collaboration, and create organizational structures that welcome new voices. Strategies for youth participation must move away from ad hoc, activity-based approaches and focus instead on making youth input a central component of social structures, institutions and processes. Efforts should be undertaken to foster intergenerational relationships and strengthen the capacity of young people to participate meaningfully and equally with other generations in programmes and activities that affect them. Girls and young women, in particular, may need additional support to overcome social, cultural, and economic barriers to full participation. (pp. 72–73)

The most active participation strategies are where young people initiate and/or share decision-making and responsibility with adults. This active involvement is considered to provide significant benefits to young people and to facilitate the success of youth projects (Hart, 1992; Rimmer, 2012). The common goal in youth participation models is expressed well by the Centre for the Study of Social Policy (2007), which states that young people need to “become agents of change instead of targets to be changed” (p. 5).

The United Nations (2005, p. 74) has reported positively on the involvement of youth in media-driven transnational activism through new forms of creative, open and non-hierarchical channels of cyber-participation. This included internet-based activity involving
the exchange of ideas and information and the coordination of plans and programs for localised action, cross-boundary websites, tele- and video-conferencing, chat boards and webcams. The United Nations’ *World Youth Report* (2005) described the participation in social and public health matters of young people:

not as members of a “youth social movement” but as cross-generational partners with adults and sometimes leaders . . . at least some young people are asserting their (global) citizenship in the present not only by becoming but by actually being political actors. (p. 72)

Many young people—particularly those who are least resourceful or disengaged from support systems—are likely to require mentoring and support from adults and peers to engage in change. Mentoring and role models for youths are also promoted as a way of engaging youth in action and change. It is recognised that “relationships with mentors may open doors to activities, resources, and educational or occupational opportunities on which youth can to construct their sense of identity” (Darling, Hamilton, Toyokawa, & Matsuda, 2002, cited in DuBois, Portillo, Rhodes, Silverthorn, & Valentine, 2011, p. 60). Available evidence has suggested that the greatest benefit of mentoring is obtained when youth experience longer-term, personal connections with mentors (DuBois & Rhodes, 2006; Grossman, Chan, Schwartz, & Rhodes, 2011; cited in DuBois et al., 2011, p. 62). For example, in relation to sports mentors for youth, Payne, Reynolds, Brown and Fleming (2002) reported that despite the limited evidence available to support the belief that sports role model programs have a positive effect, “there is ample theoretical evidence to support role model programs”, with the most effective being those that focus on developing a long-term, mentor relationship (p. 44).
3.7 Change Strategies Employed to Reduce Gender Segregation in the Trades

3.7.1 Overview. This section examines ways in which theory has been applied in practice within government, industry and the education sector to promote gender equality in the male-dominated trades. Actions are being applied at the individual, community and policy levels to tackle the barriers that operate at each of them. However, these actions are predominantly isolated and one-off, rather than being part of a multi-level system response consistent with the models that have been described earlier in this chapter (i.e., the UNICEF SEM model [2014] and Maddaleno & Breinbauer’s Youth: Choices and Change model [2005]). In assessing the examples described below, it is evident that each has sought to interest, inspire and capture the attention and participation of women in the male-dominated trades. Yet, predominantly, the actions have not engaged youth in the terms suggested in youth participation models (Hart, 1992; Treseder, 1997, cited in Kellett, 2011). Current strategies can be grouped into three main categories: tri-partite leadership from government, trade unions and industry; women taking action; and action in the education sector.

3.7.2 Tri-partite leadership. Significant legislative and policy action have occurred at the national level in Australia and many developed nations that are aimed at reducing occupational segregation, including equal-employment and anti-discrimination legislation. In Australia, gender-related affirmative action and equity principles have been enshrined in laws, such as the Sex Discrimination Act (1984), the Equal Opportunity for Women in the Workplace (1999), Workplace Gender Equality Act (2012), and more. They have all been implemented to tackle structural barriers that have led to the subordination of women in many areas of social, cultural and economic life. Despite decades of legislative and policy action, women are still “working for the man” (Strachan, 2010). Given the slow progress in Australia, more targeted legislative responses have been introduced to prompt positive action.
from employers. The ground-breaking Workplace Gender Equality Act (2012) requires non-
public sector organisations with 100 or more employees to annually report to the WGEA on
their workplace gender-equality performance. Employers are required to report on the
workplace profile of their organisation, including information on the number of employees by
gender; base salary and total remuneration data by employment status; and manager and
non-manager occupational categories (Department of Employment, 2014a, p. 4). In a review
of the reporting arrangements (Department of Employment, 2014a), it was acknowledged that
gender-equality advocates argued for the retention of the reporting regime, noting that the Act:

- enables the collection of meaningful gendered data sets on workforce composition;
- provides a unique data set that is not available through any other sources;
- provides reporting organisations with customised benchmark reports that will allow them
to compare their gender equality performance with organisations in the same industry and
of a similar size; and
- provides the Workplace Gender Equality Agency with data that will enable it to develop
targeted educational and advisory initiatives and materials to better support employers. (p.
7)

Employers expressed overall concern about the difficulties and costs (average $2,000
annually) they experienced in meeting the reporting requirements (Department of
Employment, 2014a). The review has ignited debate on whether the conservative federal
government may dilute the reporting requirements in response to concerns expressed by
industry (Equal Rights Alliance, 2015).
Central to this debate is the issue of whether legislation, rather than voluntary action, is required to increase female participation in the male-dominated trades. Some commentators support stronger legislative action and enforcement of anti-sex-discrimination laws (Bergmann, 2011; Eardley & Manvell, 2006). In arguing the case for more legal remedies to address sex discrimination in education and non-traditional courses, Eardley and Manvell (2006) cited support for Californian laws that require that “…any school employee who provides career or course counselling to a student must affirmatively explore non-traditional course and career options with the student” (p. 407). As a national organisation with significant legislative power, the Human Rights Commission in Australia has taken a keen interest in gender segregation of the trades. In 2014, it released a Women in Trades toolkit as a resource to employers, but no new legislative powers have been introduced. The New South Wales Government (2015) has developed a Women in Trades program of action, including school-based career resources and an industry pledge. The Australian Air Force has continued to target advertising at young men and women, with images of both. The advertisements include enticements, such as competitions and prizes, including a chance to get inside the cockpit of a jet simulator.

The Australian actions described above are creative but they rely on voluntary take-up by industry and other stakeholders, rather than any legally binding action. In addition, they are not part of a nationally dedicated plan of action. While the recent initiatives in the UK are also not part of an overall national plan, they do tackle structural issues, including historically negative and discriminatory practices by employers. Further, the UK Government is implementing procurement policies. In January 2015, the British Employment Minister launched a social media campaign using the hashtag #notjustforboys (McVey, 2015). The aim is to attract industry interest in the message that male-dominated trades can be for girls
and women too. However, it appears to be primarily an awareness-raising campaign directed at industry, rather than young people themselves.

The previously mentioned WiC Project was established in the UK in 2008 to provide opportunities for women to work on the construction of the Olympic Park in London so as to redress women’s longstanding under-representation in the construction industry. Targets were introduced by government for the employment of equity groups. They were established from the start by the Olympic Delivery Authority in the tendering process for contracts (ODA, 2007; Wright, 2014). The project provides outreach and recruits women, preparing, training and brokering them into employment, as well as offering ongoing support to women participants and employers (Wright, 2014). It receives financial support from the industry skills body CITB and is hosted by a company called Be Onsite (Wright, 2014). According to Wright (2014), the WiC project has been successful in training 450 women, and placing 135 into work placements and 195 into employment, approximately half of whom are in the manual trades and half in professional construction occupations. Of the women who have found work through the project, 78% were previously unemployed, split evenly between those who were and were not claiming benefits (Wright, 2014, p. 22).

The evaluation report of WiC (Wright, 2014) noted the importance of public procurement processes to driving commitment to equality actions. Support for procurement policies as an incentive to employ women in non-traditional occupations was also raised by a report by the Parliament of UK, Business Innovation and Skills Committee (2013): “The Government should actively consider how they can promote better gender representation in their procurement policies, building on existing best practice as shown in the ‘Women in [sic] Construction’ project at the Olympic site” (p. 67).
In contrast to the UK procurement initiative, a US procurement policy was subject to weak enforcement and, reportedly, the “high hopes of the 1970’s for gender integration of the construction trades in the US have not been realised” (Berik & Bilginsoy, 2006, p. 335). This statement refers to the fact that in the 1970s, women in the US were encouraged into the non-traditional trades through the support of government policy. In 1978, the US Department of Labor implemented a federal regulation that required federal contractors and apprenticeship programs set goals and timetabling for hiring women in the trades and apprenticeships.

In more recent times in Australia, a number of trade unionists, including Women in Male-Dominated Industries (WIMDOI; 2010), and industry leaders in the manufacturing, construction, plumbing and electrical industries have supported gender equality in those male-dominated trade areas. Some employer associations, such as Auto Skills Australia (2015), the MCA (MCA, 2013) and Master Builders Association (2015) have also recognised the business case of more skilled tradeswomen to expand the labour pool in areas of skills shortages. In particular, Auto Skills Australia (2015) has been using social media extensively to reach young women and has been offering scholarships and training.

3.7.3 Action by women. In the past decade, numerous women and women’s organisations have adopted leadership roles to raise the profile of gender segregation in the male-dominated trades. At the risk of omitting many efforts, several noteworthy examples include the research by Fiona Shewring (2009); the establishment of the mobile tool handling service, SALT; TradeUp Australia, which runs manual trade workshops in schools and men’s sheds for girls and women; the National Association of Women in Construction (NAWIC), which promotes role models, industry awards and recognition for women; and Women’s units within government that have established innovative programs, such as the Women in Trades (NSW) and the former Women in Hard Hats and Girls in Hard Hats programs.
(Queensland). In addition, the national women’s network eSecurity4Women has undertaken research on the gender segregation of the trades and has recently launched an role model website for girls and women. The value of role models has been reported in the previous section, and many programs in Australia and overseas are expanding access to industry role models for women. In the US, various non-government organisations have been mentoring and supporting women, such as Chicago Women in Trades, Tradeswomen Now and Tomorrow; in the UK, Women and Manual Trades have also been a source of industry mentoring, training and support for women.

It is also useful to draw parallels with the adoption of affirmative action policies in political parties to show how quotas have been applied to reduce gender inequality in political representation. Women led the debate in the Australian Labor Party (ALP) for affirmative action and the use of targets. In 1994, the ALP set a target that 35% of all winnable state and federal seats had to have female candidates. This was later raised to 40%. While targets are hotly contested in all contexts, it is apparent that the ALP targets contributed significantly to the increase in Labor women federally from 14.5% in 1994 to 38.2% in 2015 (Emily’s List Australia, 2015). This is in significant contrast with the Liberal Party, which does not support quotas or affirmative action; the percentage of Liberal women has only increased from 13.9 to 23.2% in the same period. Emily’s List (2015) claims that “Labor’s affirmative action rules transformed the Australian Parliament, increasing women’s representation by 110% and delivering a raft of public policy reforms that have benefited Australian women” (p. 1). From my experience as an advocate for and beneficiary of affirmative action in the ALP, it is fair to say that targets alone will not be effective. The mentoring and support of Emily’s List was invaluable to the success of female candidates and the achievement of greater gender equality in political representation.
3.7.4 Education sector. Numerous technical and Further Education (TAFE) Institutes and Skills Centres in Queensland have offered Try-a-Trade initiatives and welding and other trade-based courses to women. These hands-on experience activities are supported in the research as building the self-efficacy of students (Creed, Patton & Prideaux, 2007). The rationale for these activities is that the more that girls gain exposure to trade skills, the more likely their confidence and self-efficacy is to grow. It is suggested that career advisers who actively promote male-dominated trades to female students, such as the Girls in Trades Ambassadors (NSW, 2013b), and who encourage hands-on experience of a wide range of occupational choices for all students can help to overcome the gender stereotypes that are deterring students from non-traditional pathways (Fuller et al., 2006; NSW Government, 2013b; Shewring 2009). The need for permanent school-based programs to attract young women into male-dominated trades has been recommended (eSecurity4Women, 2014, p. 7).

In order to elevate the status of, and encourage intelligent students into, vocational qualifications, the UK Government has introduced a Technical Baccalaureate. This encompasses high-quality vocational courses recognised by employers, studying Maths at level 3 and doing an extended project (Department of Education, 2013). More formal recognition and articulation of apprenticeship pathways into university degrees may be one way to enhance the status of apprenticeships in Australia (Steedman & Hupkau, 2015).

There has been significant action to encourage more students to pursue Science and Maths subjects, particularly female students. In September 2010, gender equity in these subjects was a major item for discussion and action at the Asia-Pacific Economic Co-operation forum (APEC, 2010). The publication for this forum noted that economic opportunities for women and their full participation in economic life are limited by not pursuing Science and Maths at school/university. This is consistent with Sikora and Saha’s
(2011) analysis, previously mentioned, that performance in Maths facilitates a choice of a more gender-neutral occupation.

The arguments in favour of early-years career education have been discussed earlier in this thesis. The New South Wales Government, through the Department of Education and Communities (2014), has been leading on this area in Australia. The Department recognised the need for early-years career education “to improve student aspiration, engagement, achievement and future wellbeing that accrue through a planned, integrated commitment to career related learning” (p. 1). The Department released a discussion paper inviting principals of primary schools to examine the case for implementing career-related learning within their school context. This will be an important development to monitor, particularly whether it has a future impact on breaking down gender stereotypes among young children.

A key to the future success of programs aimed at achieving gender equality appears to be permanency. To date, programs across Australia and internationally have been one-off rather than enduring, poorly funded rather than well resourced. They have not been enacted within an overall systemic response that has the capacity to simultaneously tackle individual, community, and structural barriers.

3.8 Conclusion

This literature review chapter has applied systems theory as an organising framework to canvass the wide range of career and social change related theory and practice that seeks to explain why so few female students pursue careers in male-dominated trades. The utility of the STF of career development as a meta-theory to expose the wide-range of career influences on people, including culture, media, parents, peers and more, was also shown to be a useful analytical tool. The manner in which career theories, such as SCCT and Gottfredson's theory of circumscription and compromise can be applied within the meta
systems framework to explain specific aspects of behaviour such as confidence and self-efficacy in career exploration and gender differences, were also explored.

The examination of theories in this chapter that explain social change and participation processes with young people, revealed that these processes can be most effective when individual and community-wide influences on young people are understood, and targeted for action. This reaffirmed the significance of systems theory and frameworks, such as the SEM model to this research. The importance of early years career learning; overcoming gender stereotypes; the expansion of Maths enrolment for female students, and more will have much more positive impact if applied systematically, not singularly.

The next chapter explores the critical social science methodology, with its focus on social change and the mixed methods approach to data collection. This approach includes the disaggregation by gender of labour force and vocational education data (a quantitative method) combined with the views of secondary students, educators, career advisers, and industry representatives gathered through interviews (a qualitative method). To maintain the consistent application of a systems framework, the interview processes are designed to elicit the views of the research participants on individual factors and structural factors that influence their career pathways. The specific research questions and adherence to high standards of quality and ethics in this research are also canvassed in in Chapter 4.
Chapter 4: Methodology

4.1 Introduction

This chapter explains the methodological framework guiding this research and how evidence was gathered to respond to each of the research questions. It provides the rationale for the mixed methods approach that was used. This approach included quantitative data on the extent of gender segregation in the male-dominated trades in Australia over the past two decades. In this phase of the research secondary data was sourced from the Australian Bureau of Statistics and the National Centre for Vocational Education Research and then disaggregated by gender. In the qualitative phase, group interviews were conducted with students and staff at four secondary schools in Queensland and with adult educators, career advisors and industry representatives. The initial quantitative data was presented to participants to help them understand the research problem and the qualitative data helped to explain the extent of gender segregation identified in the ABS and NCVER data. The aim of the interviews was to hear the participant views on the research questions and to obtain their ideas for action to reduce gender segregation of the trades. In addition, the interviews enabled me as researcher to inform participants of the extent of gender segregation in the trades and to provide helpful information and resources to participants. These multiple aims are consistent with the critical social science methodology adopted in this research - a methodology that seeks to both study the world and change it.

It is important that openness and accountability is embedded throughout the research process to foster credibility. Therefore, this chapter also describes how elements of quality research have been applied as well as good practice principles and ethical considerations in working with youth. The scope of this research and its limitations are also identified in this chapter.
4.2 Research Questions

To identify the extent of gender segregation in the trades in Australia and how it can be reduced, I set the following three research questions:

1. What is the extent of gender segregation in vocational education and training (VET) and typically male-dominated trades in Australia?
2. Why do very few female students choose male-dominated trades as their job pathway?
3. What can be done, particularly in the education and training sectors, to increase female interest in, and take-up of, the male-dominated trades?

During the research process, the terminology I used in these questions shifted from an interchangeable use of “skilled manual trades” and “male-dominated trades” to the sole use of “male-dominated”, as it became clear that the terms are not synonymous. For example, the female-dominated trade of hairdressing is considered a skilled manual trade. The term “skilled manual trade” appeared in the interview schedules and other materials provided to participating schools and research participants, but it is not used in this thesis nor will it appear in future publications arising from the research.

4.3 Critical Social Science as a Methodological Approach to this Research

This research is motivated by the existing social and economic conditions in Australia that produce gender segregation in the trades, limit career choices for young women, and contribute to the gender gap in earnings. This brings the research within the ambit of critical social science: a process of social inquiry that “challenges unequal access to power and resources in social and economic relations, and has as an aim, not simply to study the world but change it, and has a research goal to empower people” (Neuman, 2006, p. 95). Critical social science can enable the objective–subjective divide to be bridged “with a factual reality requiring interpretation from within a framework of values, theory and meaning of
participants and the researcher” (Neuman, 2006, p. 99). In this research, the objective reality of the gender composition of trade occupations and VET, and the related gender inequality in income, was identified and measured in a quantitative manner. The quantitative data analysis set a context that could then be critically examined. The examination occurred through a review of the literature and through the subjective element of exploring the views and experiences of particular people on gender segregation. My task as a researcher was to interpret and give meaning to these views. As a result, my accounts as researcher are constructions rather than being definitive. This is consistent with an ontological position of constructionism that considers social phenomena as being socially constructed; that is, produced and constantly changing through social interactions and meaning assigned by observers (Bryman, 2010).

The research tasks in the qualitative phase involved inductive reasoning, interpretation and continual reflection on the interview data. In focussing on the socially constructed nature of the gender segregation in the trades through the meaning that people apply to explain its occurrence, this research predominantly adopted an interpretivist approach (Creswell, 2009; Denzin & Lincoln, 2003; Neuman, 2006). Rather than offering definitive conclusions, this research interprets existing social conditions and makes proposals for future social change, based on the data collected.

This research began with a broad hypothesis that Australian female participation in the male-dominated trades will remain low while barriers, particularly gender stereotypes of trade occupations, continue to influence the career decisions of young people. The existing theory and literature revealed that major barriers limit female participation in male-dominated trades. Examining this proposition as a starting point, the research initially adopted a deductive approach to theory development. Deductive reasoning is more focussed than
inductive approaches as it is concerned with testing or confirming hypotheses (Bryman, 2010; Charmaz, 2000). To assess change in female participation over time, I analysed quantitative occupational and student VET enrolment data. Barriers and related issues identified in the literature were then raised with participants to seek their views. It was hoped and anticipated that new ideas and theories would be derived from the data in a more inductive manner. Inductive reasoning is more open-ended and exploratory than the deductive approach (Bryman, 2010; Charmaz, 2000). However, during the research process, there was a merging of deductive and inductive approaches. For example, prior to starting this research, I was unaware of a systems approach to career development, and I had not sought to assess and apply a systems approach to this study. The significance of systems approaches became clearer in the latter stages of the research. The actions proposed from the research were consequently described within a systems theory framework.

4.4 Methodology through a Feminist Lens

4.4.1 Overview. As depicted in Figure 1, this research is informed by an analysis of unequal gender relations and a desire to reduce this inequality. The ways in which all aspects of the research process are viewed through this feminist lens are described in this section.
4.4.2 Researcher values and motivation. Gender and power relations permeate all spheres of social life, including the labour market and research culture itself. Gender has been recognised as a pervasive influence in culture that shapes basic beliefs and values in the social processes of scientific inquiry (Harding, 2004; Ramazanoglu & Holland, 2002). Qualitative researchers claim that there is greater openness about the influence of researcher values in such research, while quantitative researchers within a positivist tradition tend to claim their work is completed through a value-free framework (Denzin & Lincoln, 2005, p. 13; Ramazanoglu & Holland, 2002, p. 45). Research is influenced by researcher values, including their social position, access to resources, gendered experiences, and political views (Ramazanoglu & Holland, 2002). Feminist standpoint theorists value the experiences of women in social inquiry and knowledge development. In particular, they advocate for greater...
understanding of the experiences of the most marginalised women and for gender equality (Harding, 2004; Hekman, 1997). According to Hekman (1997), feminist standpoint theory has been criticised unfairly and prematurely “as a quaint relic of feminism’s less sophisticated past” (p. 341). Through my working life, the importance of viewing all aspects of social, economic and political relations through a feminist lens has continued to grow rather than diminish. My use of the concept of a feminist lens has been my way of encompassing a broad view on feminism, rather than being entangled in debates centred on difference in feminist perspectives. My work in the mid-1980s focussed on action to raise public awareness of domestic violence and then broadened to incorporate economic, political and other forms of inequality endured by women. The high value I place on economic security and opportunity for young women is at the heart of my conduct in all aspects of this research. I am motivated by a strong desire to improve the economic status of women and reducing gender segregation of the trades is one way to open economic opportunities for women.

While I am not an insider in this research process – I simply have policy and decision-making experience on non-traditional occupations for women from my role as Minister for Women – I am conscious of the risk of moderator bias (Roller & Lavrakas, 2015, p. 144) in my role as interviewer of research participants in groups. This can occur where the views, values and/or behaviour of the interviewer/ researcher can negatively impact on the quality of the data. To mitigate this risk, the first step is being aware it it. I also intend working alongside school staff in the conduct of my interviews with students.

4.4.3 Connecting objective reality with subjective experience. The feminist analysis guiding this research led me to disaggregate data by gender. While I accept the limitations of a gender-specific analysis, it was not within the scope of this research to
disaggregate this data by culture, socio-economic status or other variables. My focus was on
the unmasking of gender differences and associated inequities that result from data that are
not disaggregated by gender (Butler & Ferrier, 2006). The qualitative phase of the research
sought to understand this objective reality from the subjective experience of students (mostly
female), educators and industry representatives. I adopted a position that is aligned with
feminist research principles in which the views and experiences of the female participants
were deemed central to my research. While male students and adult participants were
welcome and participated in the research, I was primarily interested in the opinions and
experiences of women and girls.

4.4.4 Impact on change. As a former State Government Minister with a portfolio
aimed to advance women’s economic security, I was responsible for implementing a specific
program aimed at increasing women’s participation in the trades. To implement this program,
I met with hundreds of students, educators and industry leaders around Queensland. I
witnessed the very positive activity that was occurring within schools, training, and industry
sectors aimed at increasing female participation in the trades. Yet, this activity has not
resulted in large numbers of girls and women signing up to pursue a career in the male-
dominated trades as affirmed in earlier comments (Spearman & Watt, 2013;
eSecurity4Women, 2014) cited in this research.

4.5 Research Design

4.5.1 Overview. The research process was not linear; while major features of the
research design are depicted in Figure 2, the process was subject to continuous reflection and
change. The quantitative and qualitative phases were distinct yet complementary, and action
within each phase occurred concurrently at times. This section provides an outline of the
steps in the research process. It describes the rationale for, and the application of, mixed methods in this research.

Figure 2. The elements of the research design.

4.5.2 The literature review. The literature review was continually updated to explore emerging issues and to maintain currency of information. The initial literature review canvassed the following: (1) the abundant Australian and international research on occupational segregation, and the less abundant trades-specific literature; (2) feminist literature on women, work and gender stereotypes; (3) research methods with youth; and (4) youth career development theory and practice. As the research progressed, I sought to better
understand factors that contribute to cultural and behavioural change in youth. I then focussed on literature on social change theory and behaviour change theory with youth.

4.5.3 Data collection and analysis: Rationale for a mixed methods design. Two limitations in the literature review prompted my decision to employ a mixed methods design for this research. First, the literature lacked current, longitudinal gender-disaggregated information on student enrolment in trade courses. Second, there were few published accounts from female students about their perspectives on trade careers. A clear picture of the extent of gender segregation in the male-dominated trades and VET trade courses was needed as a starting point. In order to understand and formulate actions to address gender segregation in the trades, it was imperative to hear from and engage with students and educators.

The study applied mixed methods as an explanatory design—that is, a two-phase design in which qualitative data helped to explain and build upon initial quantitative results (Creswell & Plano Clark, 2007). This approach is also similar to the facilitation approach in which one research strategy aids the other (Hammersley, 1996, cited in Bryman, 2010). The quantitative phase of this research—the analysis of the gender composition of trades and trade courses—commenced prior to the interviews. The initial data provided an informed context with which to attract the interest and participation of educators and students in interviews: the qualitative phase. For example, by including the quantitative data in participant information sheets, research invitations and notices, I could illustrate the low female participation in male-dominated trades and the higher average incomes that applied to these trades. This helped to gain the interest of potential participants. While some researchers consider there to be epistemological or ontological weaknesses or impediments to the combination of methods, I was persuaded by Bryman’s (2010) arguments that the two research methods are compatible and can be of service to each other.
This study also connected the data in a manner that enabled the macro factors (i.e., large-scale features of the segregated workforce) to be better understood by examining the micro factors (i.e. behavioural and attitudinal influences on occupational choice by young people). This macro–micro integration is one way in which mixed methods have been integrated in research to maximise the strengths over the weaknesses of each (Bryman, 1992). In this research, the connection occurred at two levels: (1) the gender disaggregation of workforce data was used to engage, inform and seek responses from participants in the study at the commencement of their interviews; and (2) the detailed data were used to inform the participants and wider public of the extent of the disaggregation and its persistent and entrenched nature. The qualitative data produced views and participant judgements on whether this segregation was problematic and, if so, why and how it could be remedied. Both the quantitative data and the participants’ views and ideas for action were sought to assist in the social-change agenda of this research, since decision-makers can be influenced by the extent of an issue and the views from people on the nature of the problem and their suggestions for change.

The features of qualitative research that made it desirable to use in exploring the views of students and staff in this study are as follows:

- Capacity to assess multiple realities:

  Qualitative researchers attempt to make sense of, or to interpret, phenomena from the meanings people bring to them (Creswell, 2009; Denzin & Lincoln, 2003). This requires identification of an in-depth understanding of the phenomena, a commitment to participants' viewpoints, and reporting findings in a literary style rich in participant commentaries (Denzin & Lincoln, 2003; Streubert, Speziale & Carpenter, 2007, cited in Vaismoradi, Turunen, & Bondas, 2013).
• Capacity to explore ideas in depth:

The aspect of this research that differentiates it from much of the previous research on this topic area is the input from students. It was important to explore their experiences and views in depth; in particular, the influences on their career decision-making. Seeking access to schools and participants and conducting and analysing interviews required a greater commitment of time and public input than the quantitative element. Therefore, I devoted more time and placed more emphasis on the qualitative element of this research (Creswell & Plano Clark, 2007).

4.5.4 Seeking impact through the conclusions and action. The research was specifically designed to enable mutual learning and for actions to occur through the research process and at its conclusion. The aims were to prompt the participants’ interests and actions by exposing them to the quantitative data and through the exchanges I had with them during in the interviews. In addition, as a researcher, my understanding of the issues and experiences grew through the process. I sought, and was able to take, small-scale actions to promote the research aims during the process. The final element of the research design was to identify actions from the findings to impact on change following the completion of the research.

4.6 Methods

4.6.1 Overview. The following sections outline the procedures employed in the research across Phases 1 and 2. This includes data collection, management and analysis; participant sampling methods; achieving quality and integrity in the research; and applying good practice principles with young people.

4.6.2 Quantitative data collection, management and analysis: Phases 1 and 2. The quantitative data analysis in this research involved disaggregating existing secondary data by gender. These phases are described together since the same procedures were applied. The
difference was that in Phase 1 of the quantitative analysis (undertaken throughout 2013), preliminary data were gathered, while a more detailed and current analysis of the same secondary data collection was undertaken in Phase 2 (July–October 2014). The data were sourced from collections held by the following two government-funded organisations:

- Australian Bureau of Statistics (ABS): The data were from Labour Force Australia’s detailed quarterly series 6291.0.55.00. This enabled access to time series data; specifically, *ABS data from E08 – Employed persons by Occupation (ANZSCO occupation), State and Territory, Status in Employment and Sex*, from August 1991 onwards. This is the period from which occupational categories are comparable.

- National Centre for Vocational Education Research (NCVER): I participated in a course offered by the NCVER in 2014 that assisted my ability to analyse statistical collections on apprentices and trainees and student course outcomes.

The data from each of these organisations are of high quality and reliability; they offer comprehensive, longitudinal data sets. The cost to access them is nil or low, depending on any organisational assistance that may be required. However, neither organisations report the gender breakdown of occupation and courses over a longitudinal period of time. Data disaggregated by gender are collected by the organisations, but researchers identify and disaggregate required data using the statistical tools available through the organisations.

From a feminist standpoint, it is concerning that national data sets such as those held by NCVER collect information by gender, but their routine public reporting data are not disaggregated by gender. As noted earlier in this thesis, economicSecurity4Women (2012), on behalf of its membership with Women in Adult and Vocational Education (WAVE) and the Association of Graduate Women, requested that the NCVER provide data disaggregated by gender, expressing concern that the non-segregated data “is of little use for monitoring of
gender trends by field of education and level of course”. When NCVER invited public feedback on their data collections in November 2014, I took the opportunity to request, by email, that they include gender disaggregation in their routine reporting of student vocational data.

The data analysis did not involve examining relationships among variables or seeking causal factors. The data were not disaggregated by age. Furthermore, the analysis was not localised to particular regions or training and educational settings; it was based on Australia-wide data. While NCVER collects data from institutions and localities, strict privacy requirements and approvals apply to access data that are institution- or location-specific. A localised analysis may have identified whether trade initiatives for female students in a particular region are increasing trade enrolments for female students, however, such an analysis was not within the scope of this research. Disaggregation by age would also separate the post-school students from the mature-aged women who enrol in apprenticeships and traineeships. This was not done, but both these are tasks worthy of future research. The data were disaggregated by the variables, gender, selected occupation, and trade course, and at selected time intervals over a 10- to 20-year period. The aim was to identify the proportion of women in male-dominated trades and trade courses, and to identify if the female composition had changed over time. This information was then generated in frequency tables to show the number and proportion of females in male-dominated trade occupations and courses over time relative to males.

The ABS Labour Force series documents the composition of occupational groups by gender, enabling identification and analysis of specific trades composition each year. Data can then be structured into a reporting format relevant to this research. To analyse and construct tables on the gender composition of trades, I used the ABS SuperTABLE tool, and
to disaggregate the NCVER data sets, I used the statistical analysis tool VOCSTATS. Registered users of VOCSTATS can freely extract data and report on it as per an agreement with the conditions set out by NCVER. With each publication release, NCVER also releases supplementary information, such as Excel spreadsheets and data cubes. These data cubes allow users to manipulate a small number of fields contained in the publication, as I have done with the gender variable. I selected the major industry skills council as a filter to extract and categorise the data from the NCVER database, as it provided a useful group of male-dominated occupations (rather than multiple single occupations) to compare with the female-dominated health and community services category. No variables were linked or compared through the use of any other statistical analysis tools or software external to NCVER. As with the ABS data analysis, I simply constructed frequency tables based on the number and proportion of females in the selected occupational and trade course categories.

I checked the tables that were extracted from the quantitative data sets held by ABS and NCVER for accuracy numerous times, including manual calculations of aggregate data to percentages (this also was checked for accuracy). Guidelines apply to the reporting and use of this data from both the ABS and NCVER. These guidelines have been adhered to, including correct referencing of the data sources. All quantitative data have been stored on a password-protected personal computer. However, the information is not confidential.

4.6.3 Qualitative phase 1 (Interviews with adults external to participating schools). The first phase of interviews was conducted with 11 educators and industry representatives external to the participating schools. This enabled me to trial the interview schedules prior to gaining access to schools. I was aware that approvals to access schools would take longer and be more difficult than access to individual adults external to schools. The decision to interview approximately 30 key educational personnel, such as career
guidance counsellors and VET co-ordinators at the participating schools and others from related professional associations, was considered important in this research. This is because such feedback would provide an additional context to the experiences of students; program and policy ideas for follow-up action; and would aid in the triangulation of data obtained from the group interviews with students (see 4.7). I sought stakeholders from education, career guidance and industry. It was not essential that they had trade experience – it was important that they had connections to students and their career learning.

Adult participants were recruited through national professional associations and industry bodies from which I requested assistance. The Career Development Association of Australia (CCDA), Queensland Guidance and Counselling Association, and the Career Advisers Association of New South Wales and Northern Territory agreed to promote a brief email inviting their members to participate in the study. I appreciate the helpful support of these associations. The invitations included information sheets that outlined the research aims, methods and ethics. Those who agreed to participate signed consent forms (Appendix D). While the invitations elicited responses from only six participants, they were knowledgeable and informative. Furthermore, they were dispersed throughout the country—residing in Western Australia, NSW, Victoria and Queensland—and it was helpful to receive perspectives from states other than Queensland.

I made an additional request to the Ethics Committee, Griffith University, for approval to send direct email invitations to career advisors in schools in the Macarthur Network of career advisors in NSW. These staff members were part of a public network with publicly accessible individual email addresses, and I had located their network through an internet search. The direct approach to these staff received ethics approval. Three of these career advisers participated directly in the research. Several others provided helpful
information by telephone or email, but their limited time appeared to inhibit their commitment to a more structured interview with pre-signed consent. This did, however, provide insights into an innovative student career-advice network that they had developed. No network of this kind appeared to exist in Queensland. Two other Queensland-based participants were recommended by others in the study and they accepted my invitation to participate. Descriptions of the 11 participants, including codes and method of interview, are set out in Table 4.

### Table 4

*Characteristics of Adult Participants External to Participating Colleges*

<table>
<thead>
<tr>
<th>Code</th>
<th>Gender</th>
<th>Role and Location</th>
<th>Method of Contact</th>
<th>Type of Interview</th>
</tr>
</thead>
<tbody>
<tr>
<td>CV1</td>
<td>Female</td>
<td>Career advice and VET, WA (CDAA) Member Newsletter</td>
<td>Telephone interview and email follow-up</td>
<td></td>
</tr>
<tr>
<td>CV2</td>
<td>Male</td>
<td>Career advice and VET, Vic. CDAA Member Newsletter</td>
<td>Telephone interview and email follow-up</td>
<td></td>
</tr>
<tr>
<td>CV4</td>
<td>Female</td>
<td>TAFE counsellor, Qld CDAA Member Newsletter</td>
<td>Telephone interview</td>
<td></td>
</tr>
<tr>
<td>CVI6</td>
<td>Female</td>
<td>Career VET and industry, WA CDAA Member Newsletter</td>
<td>Telephone interview and email follow-up</td>
<td></td>
</tr>
<tr>
<td>ED5</td>
<td>Female</td>
<td>Career Development, Vic. CDAA Member Newsletter</td>
<td>Telephone interview</td>
<td></td>
</tr>
<tr>
<td>ED8</td>
<td>Female</td>
<td>Education, Qld Macarthur Parents Email invitation</td>
<td>Face-to-face interview</td>
<td></td>
</tr>
<tr>
<td>C9</td>
<td>Female</td>
<td>Careers advice, NSW Macarthur Parents</td>
<td>Face-to-face interview and Telephone interview</td>
<td></td>
</tr>
<tr>
<td>C10</td>
<td>Female</td>
<td>Careers advice, NSW Macarthur Parents</td>
<td>Telephone interview</td>
<td></td>
</tr>
<tr>
<td>C12</td>
<td>Female</td>
<td>Careers advice, NSW Macarthur Parents</td>
<td>Telephone interview</td>
<td></td>
</tr>
<tr>
<td>C30</td>
<td>Female</td>
<td>Career Advice, Qld Email invitation</td>
<td>Face-to-face interview</td>
<td></td>
</tr>
<tr>
<td>IV3</td>
<td>Male</td>
<td>Industry and VET, Vic. CDAA Member Newsletter</td>
<td>Face-to-face interview and email follow-up</td>
<td></td>
</tr>
</tbody>
</table>
PAVING THE WAY FOR GIRLS INTO MALE-DOMINATED TRADES

Note: Participant Codes: V = Vocational Education and Training role; ED = Education - included teachers or former teachers; C = Career Advice/Guidance - current or former career advisers or guidance officer, and I = Industry - employed in an industry body in a skills development or VET role. Some participants were assigned two codes to reflect their dual roles.

The adult participants were offered the choice of a face-to-face or a telephone interview. Three accepted the former and eight the latter; three of the eight followed up their interviews by completing an online response sheet. It was evident that this group of participants were very time poor, yet their input was informative and their interest in the research topic was high. Staff at two of the career associations suggested that a higher response rate might have been received if an online survey was used rather than a request for an interview.

The interview schedule (see Appendix E) appeared to be well received by the participants, as they answered questions readily and comprehensively. The schedule was specifically structured to seek responses to the three research questions, with topics that canvassed the following: (1) knowledge of the male-dominated trades, including female participation levels; (2) understanding of the barriers to female participation in the male-dominated trades; (3) influences on student career choices; and (4) ideas for future action to reduce gender segregation of the trades. Questions varied within each group, but typical questions included the following:

- What do you know about the male-dominated trades?
- What influences students’ career choices?
- What career advice do students receive?
- Do you think girls want to do male-dominated trades, such as electrical and auto-mechanic?
- Are these trades for girls too?
PAVING THE WAY FOR GIRLS INTO MALE-DOMINATED TRADES

- What stops girls from doing the male-dominated trades?
- What can be done to encourage more girls into male-dominated trades?

The schedule was only intended as a guide for the interviews, yet, for the most part, the interviews did not deviate from the pre-arranged questions.

4.6.4 Qualitative phase 2 (Interviews with students and staff in participating schools). The Catholic school system in Queensland was selected for this research as it has well-functioning VET programs incorporating school-based apprenticeships, a publicly stated policy of supporting research that advances teaching and learning for students, and an accessible and clear process for seeking research approval. As the Catholic school system is large and diverse, it enabled a suitable range of participants to be included in the study. I sought and obtained ethics approval from executive directors, in the dioceses of Brisbane and Rockhampton, to invite schools in the Catholic Education system to participate in the research. In the four participating schools, the VET or careers co-ordinator was my point of contact. The support of these staff, the College Principals, and the Catholic Education in Brisbane and Rockhampton was critical to success of the qualitative research phase. A separate research request was made to the independent Aboriginal and Torres Strait Islander School at Acacia Ridge, Brisbane, in April 2014 to seek the inclusion of perspectives and experiences of Indigenous staff and students. Despite a follow-up telephone call and email, a reply was not received.

The student sample. There appear to be no firm rules of sample size in qualitative research, particularly because it is difficult to anticipate how many participants are needed before data saturation has occurred, that is, the interviews required to get a sense of thematic exhaustion and variability within the data set (Guest et al., 2006, cited in Bryman, 2010, p. 462). I read other research studies with youths as a guide, and determined from these
examples that 120 students and 15–20 staff at four schools in a mix of urban and regional areas was likely to provide an adequate range of views from the schools. I set this as a starting point that could be reviewed through the process.

In order to achieve the stated aim of interviewing students and staff at four schools, invitations were extended to 10 schools within a six-month period. One of the participating schools required follow-up over several months before approval was granted. Three schools either declined to participate or did not reply to the invitation to participate. I accessed schools within a short time of them accepting my invitation. A purposive sample of students was applied in this research, who were selected by staff on the basis that they possessed qualities relevant to the research questions (Bryman, 2004, p. 334). The preferred criteria for participants that were given to the VET co-ordinators at each school for them to invite student participants were as follows: required age 14–18 years; written parental/carer and student consent; VET enrolment underway or under consideration; and (mostly) female (although a few males were also included). These staff ensured that only students who had signed consent forms could participate, as this was a clear requirement of the research ethics approval. An information sheet (Appendix C) outlining the research was provided to all invited students by school staff and passed on to parent/s and carer/s of these students. The information to students makes it clear that participation is voluntary and can be withdrawn at any time without explanation or penalty and that anonymity of participants throughout the research process will be maintained. Staff accepted the consent requirements but expressed difficulty in getting students to return signed forms. They suggested this may have reduced the numbers of available student participants. They also indicated few boys were interested.

The schools in the sample were designated as colleges. They were spread across geographic areas with all but one (inner-metropolitan) sharing a similar socio-demographic
area. All had a student population between 850 and 950. The Catholic secondary colleges that I visited allowed me to meet with students aged 14–18 years, as well as staff engaged in VET, career advice or teaching roles. Table 5 provides codes (numbered from 1 to 4) to de-identify the schools and outlines their features.

Given the difficulty I had in accessing schools, my supervisors and I agreed that the 68 students and 17 staff from the four schools who accepted my invitation to participate would provide an adequate sample. Combined with the 11 external participants, this made a total of 28 adult participants. The adequacy of the sample was made on the basis that the contributions from the students were expansive with some repetition. In my assessment, a level of theoretical saturation had been achieved. Saturation has been described as when “you have covered the breadth of your data . . . From this spread of data nothing new is coming up” (Richards, 2009, p. 145). This saturation did not apply to school-based staff, but more participants were being sought beyond the schools. While not wanting to diminish the unique contribution of each student, staff member and school, and the benefit of visiting more schools to hear evidence of their VET programs, the qualitative data provided a rich source of information in response to the research questions.
### Table 5

*Participating Colleges: Codes and Characteristics*

<table>
<thead>
<tr>
<th>Code</th>
<th>College</th>
<th>Region</th>
<th>Students</th>
<th>VET Programs</th>
<th>Career Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Inner-Metropolitan Brisbane</td>
<td>Co-educational; mixed socio-economic status</td>
<td>Range of construction and technical courses, hospitality and more at school and TAFE for males and females</td>
<td>Career guidance officer promoting opportunities, inc. Structured Work Placement. Students must exit with a qualification.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Outer-Metropolitan, North of Brisbane</td>
<td>Co-educational; low–medium socio-economic status</td>
<td>Range of construction and technical courses, hospitality and more at school and TAFE for males and females. State of the art hospitality and hairdressing facilities.</td>
<td>Yr 8 students undertake Career Education Unit; Yrs 9–10 Career immersion days; Yr 10 Work experience and career expo.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Regional, Central Queensland</td>
<td>Co-educational; mixed socio-economic statuses</td>
<td>Range of construction and technical courses, hospitality and more. Reliance on TAFE facilities. All Yr 8’s do Industrial Technology and Design</td>
<td>Career preparation Yr 10, inc. up to 5 days’ work experience</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>South-East Queensland</td>
<td>Co-educational; low–medium socio-economic statuses</td>
<td>Range of construction and technical courses, hospitality and more. Specialist trade training centre, inc. auto-trades and construction.</td>
<td>Careers support; Work experience; Try-A-Trade days</td>
<td></td>
</tr>
</tbody>
</table>

*School-based interviews with students.* Given the limited time available in each of the schools, the field work was mostly an information-gathering exercise through group
interviews at each of the four schools. The number of students in the four groups ranged from 13 to 23, with 68 students in total (see Table 6). Secondary aims of the group interviews were as follows: (1) leaving useful information with participants; and (2) being a catalyst for them to consider further action to increase female take-up of the male-dominated trades.

A semi-structured interview schedule was used that was consistent with the adult schedule. It was similarly structured to seek responses to the three research questions: in particular, questions were posed that probed the students’ knowledge of the trades, including how many girls pursued the male-dominated trades; the influence of gender stereotypes on their career choices; and the influence of adults, educators, career advisers, and peers on their career and subject choices, including the significance of Maths to male-dominated career paths. It was evident in their contribution to the focus groups that the invited students were diverse in their levels of academic attainment, VET experience, interest in the research topic and confidence. Very few of these students were pursuing a male-dominated trade course.

The group interview method was favoured over individual interviews for a number of reasons. The reality is that schools were unlikely to have the time to facilitate my access to students on an individual basis, and I wanted to minimise reasons for schools to decline my research request. The group interview style offers three features favourable to my research: (1) it allows the researcher to observe collective human interaction and listen to people and learn from them; (2) it may reduce the influence of the interviewer by tilting the balance of power toward the group (which may be particularly relevant for young people, as participants may gain support from each other as peers in the process); and (3) the group interview may be both a data-gathering technique as well as a consciousness-raising process through which human sharing and interaction take place (Madriz, 2005). In advocating for their interests of children in research Kellet (2011, p.12) reported that one benefit of a group interview is that
“…sometimes the response of one child may awaken the subconscious of another…”.

Enabling peers to support each other was guiding the use of the group interview method in this research.

Table 6
Features of Student Focus Group Discussions

<table>
<thead>
<tr>
<th>College</th>
<th>Number of Students</th>
<th>Gender</th>
<th>Participation in VET Programs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Inner-Metropolitan, Brisbane</td>
<td>11</td>
<td>Female</td>
<td>Not all student participants enrolled in VET. A mix of vocational and academic (OP).</td>
</tr>
<tr>
<td>2 Outer-Metropolitan, North of Brisbane</td>
<td>23</td>
<td>19 Females, 4 Males</td>
<td>Not all student participants enrolled in VET. A mix of vocational and academic (OP).</td>
</tr>
<tr>
<td>3 Central Qld</td>
<td>12</td>
<td>Female</td>
<td>Not all student participants enrolled in VET. Several in male-dominated apprenticeships.</td>
</tr>
<tr>
<td>4 South-East Qld</td>
<td>22</td>
<td>Female</td>
<td>Not all student participants enrolled in VET. Only 1 in specialist auto-trades facility.</td>
</tr>
</tbody>
</table>

At the beginning of the interview, students were provided with quantitative data on the gender composition of the trades and male earnings relative to female earnings through an informal quiz format. This was so as to engage the young people and set the scene for the
discussion. The aim was to seek informed views from the students on the gender segregation of the trades, and this approach appeared effective, initiating lively discussions. In each of the four student group discussions, an expected pattern emerged where several students spoke readily and some needed prompting.

Mostly, discussions were animated for the 50-minute duration of the interview, yet they occurred predominantly through me acting as the facilitator of the discussion rather than the students “bouncing” ideas off each other. In each group, I spoke more than I had intended to. This can be attributed to me filling the “pause” moments where the discussions lagged momentarily and to my interest in leaving students with helpful information and follow-up contacts. On reviewing the transcripts, I realised that I should have prompted and probed the students more to get them to respond to one another, as this may have elicited more divergent views.

**Interviews with adults from participating schools.** The invitations to staff in the participating schools were made by the contact person provided to me. The instruction I gave was to invite whoever had the time and interest in the research. Staff chose to be interviewed individually or with other staff in small groups, with interviews averaging 45 minutes. Each process was useful. The main difference was the lively interaction in Colleges 2 and 3 where staff fed off each other in group interviews. Information on the features of the interviews with adults in participating schools is outlined in Table 7.
Table 7

*Interviews with Adults from Participating Schools: College and Features*

<table>
<thead>
<tr>
<th>College</th>
<th>Features of Interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of Adults</td>
</tr>
<tr>
<td>1 Inner-Metropolitan, Brisbane</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Outer-Metropolitan - North of Brisbane</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Regional, Central Qld</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>4 South-East Qld</td>
<td>1</td>
</tr>
</tbody>
</table>

**4.6.5 Data management: Qualitative phases 1 and 2.** The written records of the interviews from Phases 1 and 2, including transcriptions of recorded group interviews and researcher memos from the qualitative phase of the research, are stored on a password-protected computer. As the researcher, I manually transcribed all of the records. I chose not to use any computer data-management programs as the data were not viewed as excessive, and were acquired from different methods (the four group interviews, adult group interviews, and individual interviews). Due to some cross-conversation, it was difficult to consistently
ascribe comments to each individual in the group interviews, and therefore difficult to quantify the frequency of comments. I made simple assessments (low, medium, high) in my research notes based on the frequency with which a phrase or comment was made.

4.6.6 Data analysis: Qualitative phases 1 and 2. While interviews occurred at different stages, the qualitative data from all interview transcripts were analysed together. Thematic analysis was the primary data analysis technique of the narrative data acquired through the interviews. It is defined as an independent qualitative descriptive approach that provides a method for identifying, analysing and reporting patterns (themes) within data (Braun & Clarke, 2006, p. 79; Vaismoradi et al., 2013). Two perspectives that greatly influenced the qualitative data analysis in this study were as follows: (1) “qualitative research works up from the data . . . theories do not emerge, they have to be extracted” (Richards, 2009, pp. 73-74); and (2) that themes come “from both data (an inductive approach) and from our prior theoretical understanding; an a priori or deductive approach” (Bernard & Ryan, 2010, p. 55). In this research I applied deductive and inductive approaches.

How themes, concepts and categories were derived from the data. I commenced the data analysis with a firm understanding of the occupational segregation and broad feminist literature, but only a developing knowledge of career development theory. I also had a relatively well-developed understanding of the VET sector, but not of career guidance services in schools. My aim in analysing the data was to remain open to new learning that could contribute to new theoretical approaches and actions to enhance economic opportunities for young women. From the interviews, and my observations at each college, I was also able to gain knowledge to supplement the quantitative data for Research Question 1. While this was not enrolment data, participant information would give an indication of enrolment levels.
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The selection of themes was made primarily by identifying those that were commonly expressed and/or those that were of theoretical significance. These are two of the techniques suggested to identify themes in the initial analysis of qualitative data (Bernard & Ryan, 2010, pp. 56–63). The selection of themes for the final analysis in this research was made on the basis of their repetitive nature and strength of the views they captured and the novel or significant way in which they could advance the research aims. I remained cautious about not simply finding familiar themes, or what I may have been looking for (Bernard & Ryan, 2010, p. 63), or cleaning, streamlining and collapsing data in non-contradictory accounts (Denzin & Lincoln, 2005, p. 87). Instead, effort was made to make continual connections between the data and research questions and to find the divergent or contradictory views. I was also mindful of the proposition that “concepts do not miraculously emerge from text. Detecting and naming concepts text takes a lot of ‘effort, ingenuity and creativity’” (Lincoln & Guba, 1985, cited in Bernard & Ryan, 2010, p. 274). To investigate the data thoroughly, I kept the following three key questions at the forefront of my mind as I analysed the transcripts:

1. How does this comment explain why so few girls pursue male-dominated trades?
2. What does it say about the barriers limiting female participation in trades?
3. How does it contribute new or novel ideas for change?

I tried to achieve a balanced analysis by reporting on themes that I was not so familiar with. Two of these proved to be significant to the new theoretical insights arising from the research and in identifying future actions, and are as follows:

- The career development approach of encouraging, not influencing, students.

This theme was commonly raised in the study by adult participants from the four schools and those who had school experience. Prior to the field work stage, I was unaware of the strength
of this and the theoretical context on which it appeared to be based. It stood out as significant area to pursue through the research.

- The breakthrough in reduced gender segregation in hospitality and sport at the schools.

This theme was raised in two focus groups—an adult discussion and one student focus group. It did not feature in discussions, nor in the literature reviewed prior to the field work stage. It captured my interest as a researcher given that it was an example of how positive change to gender stereotypes was occurring. It seemed applicable to the research on trades and worthy of further exploration.

The thematic analysis occurred in the following two stages:

Stage 1: It began in a manner that was more descriptive, rather than interpretive, of participant views. I allowed my prior knowledge and favoured topics to determine my initial coding of significant words and phrases from the data. In this way, the coding was concept driven, with pre-determined categories drawn from the literature and interview schedule (Gibbs, 2007). Tables were developed that listed 23 themes, with sample text relevant to these themes. The themes were tightly structured to correspond to questions and categories within the interviews. An extract of my researcher notes in Appendix 5 provides an example of three of the themes derived from the student interview transcripts. These themes gave me an initial way of organising and describing issues raised in the interviews, but my selection and analysis of themes needed to be linked more to theory.

Stage 2: In this stage, I became more open to identifying data-driven coding and themes. Advocates of grounded theory recommend the formulation of codes that are more theoretical or analytical to generate new theory from the data (Charmaz, 2000; Corbin & Strauss, 1997). My initial thematic list was refined, as I found more differences and contradictions in the data. I developed tables that listed themes and codes, including memos to explain points of
interest with questions to be explored through further analysis. In identifying codes within the transcripts, I was extracting a word or short phrase that symbolically assigns an attribute for a portion of language-based data (Charmaz, 2000). The tables I developed identified a relevant text, theme and a memo with questions that would guide more detailed analysis. Using these processes, themes were refined to a fewer number.

The final 16 themes, which are reported in the findings and discussion chapters of this thesis, are as follows: four themes from student responses on barriers limiting female participation in male-dominated trades; four similar themes from adult responses on these barriers; and four themes each from students and adults exploring actions required to increase female participation in the male-dominated trades. The use of barriers and required actions to categorise the themes has been adopted to respond to Research Questions 2 and 3. The responses of adults external to schools differed in some respects from those of adults in the participating schools. While they are included together in the thematic categories, the analysis identifies points of difference.

4.7 Achieving Quality of the Research

4.7.1. Overview. Research participants and peer review researchers may well arrive at different conclusions from the researcher when analysing data—particularly more subjective, qualitative data (Bryman, 2010; Ramazanoglu & Holland, 2002). A high degree of reliability is essential to high quality research. Reliability is defined as “the degree of consistency with which instances are assigned in the same category by different observers or by the same observer on different occasions” (Silverman, 2013, p. 302). As the sole researcher on this project, I accept that a limitation of this research may be the unitary lens through which the qualitative data has been analysed. The task for me as a sole researcher was to document the procedures comprehensively and accurately so that an external assessment would show that
that themes and categories have been authentically and consistently used. Care was taken to record and report direct participant quotations to provide an authentic foundation from which analysis could occur. In addition, a number of steps were taken to maintain the integrity and quality of the research process and data, which are detailed below.

4.7.2 Development and maintenance of transcripts and records. I was aware that I needed to show comprehensive data treatment; grounds for selecting information over others must be provided and the original form of materials must be available (Silverman, 2013, p. 301). The research process is described in detail in this thesis, and records will be kept for a minimum of two years after submission of the thesis.

4.7.3 Achievement of credibility and validity in the analysis. Validity refers to “the credibility of our interpretations” (Silverman, 2013, p. 285). The guiding principle is “whether or not the inferences that the researcher makes are supported by the data, and sensible in relation to earlier research” (Parakyla, 2011, cited in Silverman, 2013, p. 285). In relation to the accuracy of findings in qualitative research, factors such as authenticity, credibility and trustworthiness of findings are essential (Creswell, 2009; Bryman, 2004). This research has primarily been a solo activity, with quality academic supervision. Thus, it was important to include the views of adult participants (in schools and external to the schools) to enable some useful comparisons (and cross-checking) between adults and between adults and student participants. This and other validity strategies applied in this research included the following:

(1) Triangulation. The use of different data sources to determine whether common themes exist is a form of triangulation, which is a recommended validity strategy (Bryman, 2004; Creswell, 2009; Teddlie & Tashakkori, 2009). The use of separate group interviews with students and staff was designed to enable some degree of triangulation of
data. In this study, the capacity to cross-check and compare the student and staff
descriptions of school-based opportunities, influences and programs relevant to trades and
career choices was applied as a form of triangulation. Some contradictions and divergent
views between student and adult participants were identified, and are discussed in the
findings section.

(2) Presentation of negative or discrepant information that runs counter to themes.
Qualitative research data is more authentic if it is “not cleaned and streamlined and
collapsed in non-contradictory accounts” (Denzin & Lincoln, 2005, p. 87). In the
thematic analysis, attention was paid to the inclusion of contradictory or variable
findings.

(3) Comprehensive data treatment to avoid anecdotalism. Researchers have been urged
to avoid reliance on anecdote in which: “Brief conversations, snippets from unstructured
interviews . . . are used to provide evidence of a particular contention” (Bryman, 1988, p.
77). This research analysis relied largely on direct comments from participants. In order
to show that findings are derived from critical investigation of the breadth of data, care
has been taken to exclude repetitive examples and themes as well as views that were less
familiar to the researcher and less common in the literature. The application of some
quantification of comments and themes has been suggested as a way to combat
anecdotalism, yet the use of terms such as “many”, “few”, and “numerous” are
considered to be “imprecise expressions of frequency” (Bryman, 2010, pp. 598–599). As
I used a mix of group and individual interviews, it was difficult at times to attribute
comments to specific individuals. Despite the shortcomings of terms such as “many” and
“numerous”, I found these to be helpful in identifying comments and themes that were
commonly raised.
(4) **The refutability principle.**

This refers to researchers seeking to refute their initial assumptions about their data in order to achieve objectivity (Silverman, 2013, p. 289). This principle was applied in a relatively informal manner. I routinely asked questions of myself and participants, such as “Is this my own feminist bias or do you feel similarly?” and “Is this a problem [i.e., gender segregation], or is too much being made of this issue?” Each time that questions such as these were asked, a small number of participants responded. Those who responded affirmed that gender segregation of the trades is a problem that needs to be better understood and acted upon.

### 4.8 Good Practice Principles for Research with Young People

To maximise the benefit of the study to young people and minimise any ethical issues and limitations, I was guided by principles for research with youth in designing and implementing this study (Delgado, 2005; Heath, Brooks, Cleaver & Ireland, 2009; Kellett, 2011; Kirby, 2004; Shaw, Brady & Davey, 2011). To work respectfully and appropriately with young people, it is recommended that they become active participants in the research process rather than solely as objects of inquiry; that fully informed consent is achieved; that age-appropriate language is used by the researcher; and that young people benefit from participation in the research and benefit from the findings (Shaw, Brady & Davey, 2011). I acknowledge the importance of these. However, their application required a significant commitment of time from staff and students at the participating schools. I did not have pre-existing relationships with the school staff and I experienced some difficulty obtaining acceptances from schools to participate in the research. In order to maximise the likelihood of obtaining research approval from the schools, I decided to adopt a research design that imposed a minimal time burden on the school staff and students. As a result, I accept that
while this research features student views as participants, the process may be limited by the lack of inclusion of youth at all stages of the process (Heath et al., 2009; Shaw et al., 2011).

It is also recognised that risks can emerge in research with secondary students due to their young age and the unequal relationships that exist between them and teachers, parents and other adults (National Health and Medical Research Council [NHMRC], 2007; Shaw, Brady & Davey, 2011). In the National Statement on Ethical Conduct in Research Involving Humans (The National Statement), the NHMRC (2007) warns that coercive pressure or peer pressure may be applied to youth to participate. Consent of both the student and their parent/s or carer/s was required, with both signing the consent form. Several strategies were implemented in order for students to gain some immediate benefit from their participation in the research. I provided trade career information and website addresses to students and staff; a coveted pink hard hat, a safety vest, and $100 student VET award at each of the four schools. Students were asked for their ideas for action, which indicated that I valued their contribution. A summary report on the research findings will be provided to the schools.

4.9 Research Ethics and Approvals to Visit Schools

Ethics approval was granted on 21 November 2013 through the Griffith University Human Ethics Committee (GURef. No/35/13HREC) to interview 120 secondary students from the Catholic Education sector in Queensland as well as 30 adult personnel from this sector and beyond. This was subject to approval from the education authorities, schools and associations nominated in my research application. Approval was sought through a formal written request to Catholic Education in both the Brisbane and Rockhampton Dioceses to visit schools in their regions. Approval was granted in November 2013 in both Dioceses on condition that agreement to participate was at the discretion of individual schools and a written report on the research findings had to be provided to Catholic Education in both
Dioceses. An additional ethics request was sent to Griffith University Human Research Ethics Committee to contact career advisers in NSW listed on an online contact list. The written request was sent on 13 March 2014 and was promptly approved. My research application was also cognisant of the unique position, and possible vulnerability of youth, in the research process.

4.10 Conclusion

This chapter has described how the two-phase research design, with the interconnection of quantitative and qualitative data, will provide a considered analysis to explain why so few female students pursue male-dominated trades and provide impetus for future change. Other main elements of the research reported in this chapter include:

- The critical social science methodology and feminist analysis underpinning the research and my motivation to pursue gender equity outcomes through, and from the research process.

- The co-operation I received from the catholic education systems in south-east and central Queensland and how this access to schools and students was fundamental to the success of the research.

- The process I adopted for the thematic analysis to identify commonly expressed and divergent themes, as well as themes of particular theoretical significance.

- The manner in which research ethics and quality research principles are applied in this study.

- The importance of good practice principles in research with young people. This includes ensuring that there is mutual benefit and youth development from the research.
The next chapter reports the findings from the quantitative data analysis of the gender composition of the trades and the thematic analysis from the interviews.
5.1 Introduction

The findings reveal that over the past two decades, gender segregation of the trades has remained entrenched and resistant to change in Australia. There has been minimal change to female composition of the male-dominated trades, despite increasing efforts to attract females to these trades. All study participants indicated that persistently low female composition of the male-dominated trades is a problem that requires investigation and action. The findings are reported in three parts to align with the three research questions:

**Research question 1:** What is the extent of gender segregation in VET and the male-dominated trades? To respond to this question, quantitative data from ABS and NCVER are presented, by occupation and gender, since 2004 to show the entrenched nature of gender segregation of the trades. The qualitative findings affirm the quantitative data in that the four participating colleges reported very low female enrolments in male-dominated trade courses. This was despite efforts at each college to promote what they referred to as a gender-neutral approach to career and subject pathways for students.

**Research question 2:** Why do very few female students choose the male-dominated trades as their job pathway? The interviews with participants provided the opportunity for me to hear directly from participants, particularly students themselves, to identify the individual, cultural and structural factors that contribute to gender segregation of the trades. The participant views were general consistent with the factors elicited from the literature review.

**Research question 3:** What can be done, particularly in the education and training sectors, to increase female interest in, and take-up of the male-dominated trades? Through the interview process, participants were forthcoming with ideas for action. This qualitative data was
analysed through a thematic analysis, with a report of this analysis presented in detail in this chapter.

5.2 Research Question 1: What Is the Extent of Gender Segregation in VET and Male-Dominated Trades?

5.2.1 Quantitative findings. The pattern of extremely low numbers of females employed in male-dominated trades has been persistent over the past 20 years. To illustrate this, figures from the three male-dominated trade occupations of automotive, construction and electro-technology are shown in Table 8.

Table 8

<table>
<thead>
<tr>
<th>Occupation</th>
<th>1994</th>
<th>2004</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of Females</td>
<td>% of total employed persons</td>
<td>No. of Females</td>
</tr>
<tr>
<td>Automotive and Engineering Trade Workers</td>
<td>3,455</td>
<td>(1.1)</td>
<td>4,055</td>
</tr>
<tr>
<td>Construction Trade Workers</td>
<td>2,380</td>
<td>(1.7)</td>
<td>1,665</td>
</tr>
<tr>
<td>Electro-technology, Telecommunications Trade Workers</td>
<td>2,200</td>
<td>(1.6)</td>
<td>2,673</td>
</tr>
</tbody>
</table>


Note: Percentages are not included in the source table. They were calculated from the total employed persons. I take responsibility that the information obtained from ABS SuperTABLES is appropriate for its intended use.
PAVING THE WAY FOR GIRLS INTO MALE-DOMINATED TRADES

The actual number of female trade workers in 1994 in automotive and engineering (3,455) and construction (2,380) was higher than those in 2014 (2,069 and 1,529 respectively). There is no particular change in workforce demands, industry policy and economic activity within this period to account for this. Table 9 expands on the same data collection, with the addition of health and community services and with percentages included.

Table 9

*Employed Persons by Selected Occupation and Gender: Australia, 1994–2014*

<table>
<thead>
<tr>
<th>Occupation</th>
<th>1994</th>
<th>2004</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total employed (`000)</td>
<td>Total employed (`000)</td>
<td>Total employed (`000)</td>
</tr>
<tr>
<td></td>
<td>% M</td>
<td>% F</td>
<td>% M</td>
</tr>
<tr>
<td>Automotive and Engineering Trade Workers</td>
<td>(314.1)</td>
<td>(311.9)</td>
<td>(344.9)</td>
</tr>
<tr>
<td></td>
<td>98.9</td>
<td>1.1</td>
<td>98.7</td>
</tr>
<tr>
<td>Construction Trade Workers</td>
<td>(140)</td>
<td>(185)</td>
<td>(218.4)</td>
</tr>
<tr>
<td></td>
<td>98.3</td>
<td>1.7</td>
<td>99.1</td>
</tr>
<tr>
<td>Electro-technology and Telecommunications Trade Workers</td>
<td>(137.5)</td>
<td>(148.5)</td>
<td>(209.2)</td>
</tr>
<tr>
<td></td>
<td>98.4</td>
<td>1.6</td>
<td>98.2</td>
</tr>
<tr>
<td>Health and Welfare Support Workers*</td>
<td>(66.7)</td>
<td>(82.2)</td>
<td>(113.9)</td>
</tr>
<tr>
<td></td>
<td>26.8</td>
<td>73.2</td>
<td>31.6</td>
</tr>
</tbody>
</table>


Note: Percentages are not included in the source table. They were calculated from the total employed persons. I take responsibility that the information obtained from ABS SuperTABLES is appropriate for its intended use.
PAVING THE WAY FOR GIRLS INTO MALE- DOMINATED TRADES

There is no increase in the female composition of the male-dominated trade sectors over the 20 years, consistently remaining at under 2%. While there has been around a 5% increase in the male composition of non-professional health and community services workers since 1994, this is still a predominantly female (68%) workforce. This continuing gender segregation is a sign that gender stereotyping of occupations remains a powerful influence on the career paths for males and females.

The NCVER data of the past decade reveal a pattern of gender composition of the trades that is consistent with the ABS labour-force data. While female numbers have grown, the percentage of females relative to males is only increasing slightly. The separate NCVER data collections have been analysed to determine whether the VET in school enrolments of females in male-dominated trade courses differed from the Apprentice and Trainees collection, which comprise those who are post-school enrolments. The school-based manufacturing and automotive courses (Table 10) showed higher enrolments of females (13% and 6.8% respectively) than other courses, and some growth since 2006. In the Apprentice and Trainee collection, manufacturing also showed the greatest numbers of females in the male-dominated industries. These workers include those in female-dominated sectors of textiles and footwear and include trainees as well as trade workers. From 2004 to 2014, the construction category experienced a decline in female representation, from 14.3% to 6.2%.

Industry-specific data collections show similar or higher levels of female composition in their workforces. For example, Auto Skills Australia (2015) reported that females “on the tools” comprise 4% of the auto workforce in Australia. The MCA (2013) reported that women make up 15% of the minerals workforce in Australia, and Master Builders Australia (2015) reported that women in construction comprise 12% of the workforce. The related
industry bodies acknowledge that these figures for mining and construction include females in non-trade roles, such as project management and health and safety.

Table 10

**VET in Schools Students in Courses within Selected Major Industry Skills Councils: Australia, 2006–2012**

<table>
<thead>
<tr>
<th>Major Industry Skills Council</th>
<th>2006</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>No. of</td>
</tr>
<tr>
<td></td>
<td>students</td>
<td>females</td>
</tr>
<tr>
<td>Construction and Property Services</td>
<td>6,510</td>
<td>365</td>
</tr>
<tr>
<td>E-Oz Energy</td>
<td>726</td>
<td>12</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>9,177</td>
<td>793</td>
</tr>
<tr>
<td>Auto Skills Australia</td>
<td>3,475</td>
<td>191</td>
</tr>
<tr>
<td>Community Services and Health</td>
<td>6,440</td>
<td>5,805</td>
</tr>
</tbody>
</table>


Notes: Administrative collection of courses undertaken by students in recognised VET qualifications, including certificate I, II and III, and senior secondary certificate and achievement. Sourced by NCVER from student enrolment records through the relevant state/territory boards of studies. I take responsibility that the information obtained from VOCSTATS is appropriate for its intended use. Percentages were calculated manually from the NCVER database totals.
## Table 11

*Apprentices and Trainees within Selected Major Industry Skills Councils: Australia, 2004–2014*

<table>
<thead>
<tr>
<th>Major Skills Council</th>
<th>2004</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of males</td>
<td>No. of females</td>
</tr>
<tr>
<td>Construction and Property Services</td>
<td>45,368</td>
<td>7,607</td>
</tr>
<tr>
<td>E-Oz Energy</td>
<td>22,417</td>
<td>264</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>41,128</td>
<td>3,909</td>
</tr>
<tr>
<td>Auto Skills Australia</td>
<td>39,787</td>
<td>1,699</td>
</tr>
<tr>
<td>Community Services and Health</td>
<td>3,213</td>
<td>21,233</td>
</tr>
</tbody>
</table>


Note: Administrative collection on apprentices and trainees. Sourced by NCVER from state training authorities via Australian Apprenticeship Centres. I take responsibility that the information obtained from VOCSTATS is appropriate for its intended use.

Localised data from schools and regions where specific female try-a-trade day and related initiatives have been active for some time may show localised increases in female composition of male-dominated trades and trade courses. Due to the confidentiality and privacy provisions of the NCVER data collections, the task of obtaining and analysing localised information requires specific permissions and significant commitment of funds, time and resources. This is a task worthy of future research.
5.2.2 Qualitative findings. In each of the participating colleges, students and staff could only provide a few examples of female students who were pursuing a male-dominated trade subject or course. I did not request enrolment records. Comments from students confirmed the low participation of females in manual trades evident in the quantitative data. For example, “Last year, I was the only one [i.e., girl] in my graphics class . . . I felt a little bit on my own” (College 2); “I’m the only girl in my class . . . the boys say ‘can you manage this?’” (College 3); “Three girls are doing TAFE CERT 1 in engineering, and [name withheld] does automotive” (College 4); and “Only a few girls use the automotive workshop. One girl is doing automotive this term . . . One girl [is] seeking to do an electrical apprenticeship” (College 4).

The following comments from adults in the participating schools also indicate the low female enrolment in male-dominated trade courses: “Thirty-eight students at SkillsTech one day a week. One girl doing construction. One girl doing aircraft mechanics. One girl doing automotive” (College 1); “two girls were in construction last year . . . in Year 11, two girls are doing manufacturing, none in Year 12 . . . one in graphics” (College 2); “the girls do the industrial subjects and graphics . . . but not many ask to do the trade placements” (College 2); “Five female students are currently doing a male-dominated VET option at TAFE” (College 3); “Lots of girls go to the try-a-trade day . . . only one in the auto workshop” (College 4).

One college had a well-equipped, industry-sponsored auto-workshop on site, but only one girl was enrolled in the auto skills course it runs. The regional college surveyed had the most female students enrolled in male-dominated courses, including apprenticeships. Staff largely attributed this to the mining industry presence in the region, and the interest some employers have in increasing the female composition of their workforce. The low enrolment of female students in traditionally male-dominated trade courses at each of the four colleges
existed even though, as the VET co-ordinators and other staff stated, all courses were open to all students.

Adult participants from the colleges did not know of any school in Queensland or interstate where the participation of female students in manual trade courses was anything other than very low. The comments from adults external to the participating colleges revealed that in the contexts familiar to them, female enrolment in male-dominated trades is also very low: “Not many of our girls go into trades, but last year some of them participated in a SALT program that resulted in half of them gaining apprenticeships in their chosen trades” (adult participant, NSW), and “girls in auto skills . . . were really good at it but didn’t want to go on and look for apprenticeships” (adult participant, WA). I gleaned from the interviews and visits that there was little sign that the supply pipeline of skilled female trade workers is increasing significantly. There was some anecdotal evidence from adult participants that individual educators who were championing the cause of attracting more girls into the typically male-dominated trades were having some success in their immediate context. However, based on current female enrolment patterns in trade courses, the number of qualified females in male-dominated trades is not likely to change significantly in the short term.

5.3 Research Question 2: Why Do Very Few Female Students Choose Male-Dominated Trades as Their Job Pathway?

To explore this question, participants were asked a range of questions, primarily about the barriers that limit female participation in the traditionally male-dominated trades. When conducting a thematic analysis of the data, I selected four key themes from these student responses. Similarly, I selected four themes from the contributions made by adult participants. Themes were selected on the basis of the following: (1) their recurring nature
and strength of the views they captured; and (2) the novel or significant way in which they could advance the research aims, including new approaches to theory.

5.3.1 Barriers that limit female participation in male-dominated trades: Student views. There were more similarities than differences among the comments made by students across each of the colleges. As a result, colleges are not identified in the following quotes, unless a distinctive point is being made about a college. The four identified themes were as follows: 1) “More girls would do it if they knew more about it”; 2) “Girls don’t think about the manual trades—they are jobs for boys”; 3) “Only one or two girls do it, and you feel intimidated”; and 4) “Students feel free to choose their careers, but . . . ”. I selected the first three themes because they are student quotes that represented recurring responses, and I selected the fourth because it represented the manner in which many students offered qualified or conditional thoughts on their freedom to choose careers. This is a statement I used in some interviews to represent this conditional choice that appeared to primarily be due to the influence of gender stereotypes.

A number of students raised the roles played by media, popular culture and people around them in determining what professions are mostly women’s or men’s work. I assessed that the students generally understood gender stereotypes even though they may not have used the terminology “gender stereotype”. Their comments were consistent with the theoretical analysis from previous research identified in the literature review that gender stereotypes significantly impact male and female students’ career decision-making and limit choices. Only four male students participated in the research, all from College 2. There was insufficient input from the male students to distinguish gender differences or single out their comments. These four male students were supportive of all students choosing any career,
including female students pursuing male-dominated trades. The four student themes are discussed below.

<table>
<thead>
<tr>
<th>“More girls would do it if they knew more about it.”</th>
<th>“Girls don’t think about the male-dominated trades—they are jobs for boys.”</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Limited knowledge of the male-dominated trades</td>
<td>- Low value on trades</td>
</tr>
<tr>
<td>- Girls with trade parent/s are more interested</td>
<td>- Jobs for boys who aren’t academic</td>
</tr>
<tr>
<td></td>
<td>- “We don’t think about it.”</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>“Students feel free to choose their careers, but . . .”</th>
<th>“Only one or two girls do it, and you feel intimidated.”</th>
</tr>
</thead>
<tbody>
<tr>
<td>- “You hear things like girls don’t do the trades.”</td>
<td>- Few girls doing manual trade courses</td>
</tr>
<tr>
<td>- “Gender stereotypes are really powerful.”</td>
<td>- “I would enjoy it if there were more girls.”</td>
</tr>
</tbody>
</table>

Figure 3. Themes on barriers that limit female participation in male-dominated trades: Student views.

“More girls would do it if they knew more about it.” Overall, it appeared that female students are not dismissing trades as a career option altogether; rather, they are not factoring them into their career options due to a lack of knowledge. This is expressed by one student as: “More girls would do it [male-dominated trades] if we knew more about it—if we had a lot more exposure to it to find out what it’s really like.” As a researcher motivated to increase career options for female students, I am encouraged by the finding that girls are not completely dismissing the option of pursuing traditionally male-dominated trades. I was discouraged, but not surprised, to hear that the female students have little knowledge of the trades. However, the interviewed students showed an encouraging level of interest in, and
willingness to know more about the male-dominated trades. The finding that girls are not dismissing the trades because they do not like them or think that they cannot do them is significant; it creates an opportunity. It seems simple, yet instructive: if girls know more, they will do more. A key issue canvassed in the literature, and that applies in this research, is the need to find ways to engage young people effectively in problem identification and change processes. Currently, the concern and action related to the issue sit predominantly with adult activists, educators, unionists and industry, rather than with young people.

A number of female students clearly articulated their preference for an academic pathway or career in a female-dominated area. Some of these students expressed interest in knowing more about the trades. One student expressed this as: “Maybe if there were more workers coming to schools talking about what it’s like in industry we would wake up to ourselves. It might be dirty . . . it might be hot, but it’s worth it”. Female students commonly made statements indicating that they did not know much about the nature of the work in the typically male trades, the skills required or wages. The lack of correct answers to the focus group warm-up quiz questions and the post-quiz discussion provides some evidence that this group of female students knew little about the male-dominated trades. During the brief quiz, students commonly responded with surprise and/or concern at the low numbers of females in the male-dominated trades and the 20% gender wage gap. Most participants indicated that they thought the composition of females would be low, “but not that low”. Others said they had “no idea” that it would be so low, even though very few females are enrolled in male-dominated trade courses at their schools.

The female students who pursued male-dominated trade work and training pathways mostly applied their own initiative to seek out work experience and traineeships or apprenticeships in these areas. According to the students, the staff support of females who
PAVING THE WAY FOR GIRLS INTO MALE-DOMINATED TRADES

take such initiative is encouraging; students reported that this motivates their interest and helps sustain their enrolment in these areas. When questioned whether girls like the male-dominated trades and if they can do the trades, responses from students included: “There are girls who do . . . but the general female population feel there is a stigma”; “Trades are seen as male jobs” or “We’d lose our femininity.” In each group, the few female students pursuing manual trade subjects or work spoke about their capabilities and reasons for favouring a manual trade. In most cases, a family member had prompted their thinking and interest in pursuing a male-dominated trade. No students specifically stated that girls are not capable of doing the trades; the discussions were more about the lack of information and experience of the trades. One student said: “I think the biggest problem is advertising . . . like Mr [X] puts these uni brochures around the school. They have these bright brochures and you think that looks good. No girls see things about the trades.” This focus on the provision of university information, rather than vocational or trades-specific information, to students has been identified as a concern in Australian research, with recommendations for action to make career information in schools more balanced (Clark, 2014; eSecurity4Women, 2014).

In each group discussion, students were specifically asked whether they thought the low number of females in the male-dominated trades is a problem and whether action is needed to increase female participation. Even though most students who responded said that they had not thought about it before the group discussion, the question generated lively discussion. No student voiced their support of the status quo; there was consensus that the low female participation is a problem that needs change. The accepted view in each group seemed to be that males and females should have choices and be able to do any job. The students made suggestions on what could be done to encourage girls to take more interest in the male-dominated trades. It was clear that facilitated discussions with students, such as the
PAVING THE WAY FOR GIRLS INTO MALE-DOMINATED TRADES

ones provided through this research, can initiate new thinking for students about their available career options, as well as encourage their interest in learning more about male-dominated trades. Some female students, for instance, spoke up in the group to say that girls do not have to accept what is “all over the media . . . as girls’ jobs and boys’ jobs”. These exchanges promoted thoughtful discussion among the students.

“Girls don’t think about the male-dominated trades—they are jobs for boys.”

Students largely attributed the low female trade course enrolments at their school to the common view that they are boys’ jobs. Female students indicated that because these trade courses are seen as “jobs for the boys”, they had not really contemplated the trades as a career choice for themselves. This was summed up in a comment by a female student as: “We don’t really talk about it . . . Most people think it’s a guy’s job.” The male dominance of the courses was evident in student comments across the schools: “I’m doing TAFE CERT 1 in engineering and [name withheld] does automotive. I’m the only girl in my class . . . the boys say ‘can you manage this’?”; “Only a few girls use the automotive workshop. One girl is doing automotive this term. One girl is wanting to do an electrical apprenticeship”; and “In industry . . . it’s pretty much the same . . . in the architectural firm I did my placement in . . . it’s very male dominated”.

An additional factor that students identified as discouraging girls (and boys) from pursuing the trades is the low value placed on VET, including manual trade pathways, within their colleges and the wider community. In one focus group, the following lively discussion occurred about the low status of VET, including male-dominated trades, and the perception that they are for “boys who can’t do academic”. Because of the lively and parallel discussion, comments in this group were unable to be attributed to specific individuals. They include:
They say you’re not smart. That’s for stupid people. Your work’s easy [in VET] . . . We have assignments constantly. When I did TAFE, it was the biggest step of my life . . . OP students think VET students don’t have to do anything . . . we can keep going so we still get uni opportunity if we want it . . . OP, that’s the only way [to get ahead]. You will get better jobs. I find non-OP better because you get things. You can have more.

Another student said that they were told: “When you are choosing a pathway in Year 10, do OP, you’ll get heaps of money [later] . . . [and entry to] all these awesome jobs”.

Female students at the regional college appeared to be the most knowledgeable on the manual trades. This group was more aware of local trade industries than other groups, and some of them initiated trade apprenticeships with local employers. This was no surprise given the extent of mining-based activity in that region.

The literature review showed that the study of Maths is a pre-requisite for most male-dominated occupations. To assess whether students know the significance of Maths to male-dominated occupations and to gauge whether Maths is considered to be “for the boys”, I included a question about Maths in the interviews. However, this topic was not discussed in depth in any of the four student focus groups. In hindsight, this was a weakness in the interview strategy with the students. From the few statements made by students, it was apparent that Maths was compulsory for all students. No student commented on the significance of Maths to the trades.

“Only one or two girls do it, and you feel intimidated.” Students generally agreed that a wide range of opportunities are available to them, yet many female students said that they “cop flak” or they would feel intimidated for pursuing a male-dominated pathway. This was expressed in a student comment as: “Only one or two girls do it, and you feel
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intimidated.” Other comments were made on this issue at each college. They included: “Girls underestimate themselves . . . It is stereotyped as a female thing to be in an office, or hairdressing . . . girls don’t think they can do it [the male-dominated trades]. If they walk into class full of males, they will feel intimidated”; and “If you go into those trades, you lose some of your femininity . . . that’s important to girls . . . you get called a tomboy”. These comments reflected the girls’ views of themselves and how others would see them. For these girls, the male trades were incongruent with their own feminine identity or sense of their capabilities. Another female student expressed a more confident view of herself and the capabilities of girls, saying: “They [boys] are more scared we are going to show them up. They are already competing against each other, let alone a girl in the room.”

The feminine identity issues were raised in other comments by staff and students. A staff member cited an example of a formerly employed female industrial trade teacher “getting a hard time” from students and later leaving the school. Other staff contributed to the discussion, saying that this seemed to be attributed to her “butch” appearance. Students also raised examples of female trade-workers external to the schools being subject to harassment or intimidation. These included “I know a female mechanic . . . she left . . . she was copping not very nice things”, and “I know a girl electrician, and because she wears a lot of make-up, she cops a lot of flak.” These experiences and observations indicated that a feminine identity can have contradictory impacts for female students in relation to the trades. On the one hand, some girls wish to maintain a feminine identity and not be harassed for being “butch”, yet, on the other hand, the young woman maintaining her femininity with make-up still “copped it”. These examples seemed to create a perception in the minds of the students that females would be harassed regardless of whether they were deemed feminine or not. UK research reported that contrary to the view that lesbians may find it easier to be “one of the lads” in a
male-dominated industry due to the stereotype of them being “butch”, some have experienced their “difference and indifference” based on gender and sexuality (Wright, 2011, p. 182).

The issue of males in female-dominated areas being more accepted and less likely to “cop flak” was also raised in a comment from a student: “It’s funny, if a guy becomes a hairdresser—oh, he must be gay. We are more accepting of males coming into female areas.” The students in the study who referred to male students who do hairdressing as gay were not disparaging in their remarks, but they said some students use it as a “put-down”. Several students acknowledged that more boys are doing hospitality subjects at school than girls; it is well accepted that they enjoy it.

Overall, I gained the impression from each group interview that male and female students who pursue non-traditional areas are generally supported by staff and peers, but they perceive or experience intimidation from some students. A number of female students made comments indicating that they would feel better and less intimidated in a male-dominated trade course if more girls were enrolled in it. The contemporary research identifies harassment and intimidation as a concern for students pursuing non-traditional paths (Fuller et al., 2005), affirming the concerns that a number of the female students expressed. It will be important for school staff to be alert to, and remain vigilant in, alleviating the intimidation felt by students. This will both strengthen their inclusive approach to education and expand career opportunities for all students.

“Students feel free to choose their careers, but . . .” Students within each group conveyed that they felt they were choosing their path rather than being influenced by others. With further probing and discussion, this seemed to be a qualified position. The influence of gender stereotypes on their decision-making was profound. The influence of parents was also apparent. When questioned whether they could do whichever career they wanted, students in
each group responded positively, with comments like “Yeah, yeah”, and “Sure.” In one group, a student said: “Most girls [not seeking a tertiary entry score] are doing hairdressing. Most of them are doing it because most of the girls like doing their own hair and looking good. They are doing hairdressing or nursing . . . they are doing what they like”. In another group, a student said: “It’s more socially acceptable for girls to be in a trade now.” However, as this discussion continued, contrary views emerged in each group. In acknowledging the impact of gender stereotypes, a female student said: “I don’t think they [girls] are doing what they want. They are more doing what society needs them to do . . . or suggests to them . . . society is telling them . . . boys do this girls do that”. Other students in this and other groups commonly expressed the view that manual trades are seen as men’s work.

I specifically used and explained the term “gender stereotypes” in student focus groups to explore their views in some depth. It seemed that some girls may not consciously use the term, but they appeared to know and feel the impact of gender stereotypes in a way that makes sense to them. Participants were asked to respond to questions regarding the impact of gender stereotyping on the subject and career pathways of students; if boys are encouraged into different paths than girls; and whether manual trades are seen as men’s work. These questions prompted students to think about both the influences on and barriers to their career choices. Student comments predominantly reflected the men’s/women’s work binary. Comments included: “Yeah, they [gender stereotypes] are really powerful. When women do a trade, it’s like that person’s a really tough person. That person’s butch”; “I applied for an apprenticeship in carpentry but I didn’t get it . . . actually, I think I know the boy who got it . . . probably also I didn’t get it because I’m a girl and I can’t do as much”; “They see a girl done up in her make-up, her hair . . . [and] they think girls can’t do it [the male-dominated trades], you can’t be worried about your nails or your hair”; and “My dad, he’s a truck driver
. . . you rarely see any women in workshops. Men sort of believe we belong in the office
doing cleaning sort of stuff . . . They really don’t understand [that we can do the male-
dominated trades]

The role of media featured in each of the groups’ responses. In particular, a number of
students spoke about the ways in which the media influence the masculine image of the
trades. One student prompted laughter in her group when she referred to the need for media
images of the trades that are positive for females, not like “in the movies [where] you see a
male plumber, fat, with their bum crack showing”. Another student in that group said “if you
watch the V8s, there’s pretty much no women drivers or in the pits”. Students stated that
images of men and women looking “cool” doing “cool” things in the Australian Defence
Force (ADF) advertisements appealed to girls and women. It was clear that the female
students could see themselves in the defence jobs. They responded positively to these gender-
balanced images.

The student views in this study affirmed the need for continuing scholarly attention
and action to understand and alleviate the negative influence of gender stereotypes on
occupational choice. Wright Edelman’s message raised in Chapter 3, “you can’t be what you
can’t see”, seemed as applicable in the contemporary school career development context as it
did decades ago when she raised it. Few students in this study were marginalised by race,
class and gender in the systemic and impoverished manner that Wright Edelman spoke of,
and each college was making an effort, through their mission and programs, to be inclusive of
all students. Despite this, the findings suggest that girls and boys need to see that they can be
free to choose from the full range of careers—not just the gendered range that has been
cultivated in books, media screens, toys and magazines.
Variable and contradictory views were raised by students on the influence of parents on their career choices. The “we are free to choose a career” sentiment was strong, yet, within each group, specific comments from students exposed examples of parents having a significant influence on them. Two students in College 4 shared the following exchange: “Our parents kept pushing. They said [of a trade] it’s a terrible job.” “Yeah, same as me . . . my parents say it’s a job where all the dropouts go”. Another student in that group said: “I actually think there’d be a different outcome or response depending on cultural background. For me, my parents would think the trades are not feminine . . . not a glamorous job . . . but [that] it’s up to me”. Where students had parents or family members working in a trade position, they knew more about trades, and support for the student pursuing a trade career appeared more likely. This was expressed in comments like: “It was always my dad that inspired me to do that . . . we were around trucks . . . dad would always help fix things . . . I haven’t been around the girly girly stuff . . . that’s what inspired me”. The adult participants attributed more influence to parents than the students seemed to express.

Ambivalent feelings and misconceptions of male-dominated trades were commonly expressed by the female students in each group. The discussion in College 3 illustrated this well. A female student whose father was encouraging her into the family plumbing business spoke of ambivalence towards a future trade business career, in saying that: “I’ve got a white card. He’s telling me to take on the business. I’ve been to work and I’ve seen what he does, but I’m not sure. I’ve already experienced some gross stuff . . . but it wasn’t that bad”. This sparked laughter and questions about what she meant. While not explicitly stated, there seemed to be a view that some manual trades are less “dirty” or more technical than others and therefore more acceptable to young women. Nevertheless, overall, the students seemed to hold misconceptions about the nature of trade work. Another student described her
ambivalence as her parents each held different views, with her mother discouraging her from hairdressing and trades generally: “My mum is a hairdresser. She’s allergic to chemicals. It’s really dangerous for her. She takes lots of pills. My dad is a carpenter. He thinks it would be good for me to do carpentry or a trade, but mum doesn’t.” This student prompted discussion about hazards that can exist in female-dominated trade areas, which, in turn, challenged some of the misconceptions that the students expressed.

To encourage girls into male-dominated trades, it will be important to continue challenging these misconceptions. In assessing the student perspectives overall, parents did not appear to be as influential on students as the adult participants and literature review indicated. Among the variety of views expressed, two consistent messages arose: 1) having trade-employed parents can be a significant, positive influence on girls pursuing male-dominated trade careers; and 2) involving and targeting parents and students with current career information is a useful strategy.

A number of female students acknowledged in the interviews that they would feel better in their male-dominated trade courses if more girls participated. Staff from the participating schools made comments like: “Interest comes and goes depending on if their friends are doing it—girls are group oriented. They need teacher support to influence them”; and “Year 10 students are swayed by peer pressure and a lot of female students are doing hairdressing and beautician courses.” In recognising the importance of peer support for girls who choose male-dominated courses, a student said: “…if you’re a good friend, you should support her pathway”.

Students were asked specifically about the kind of career information and advice they have access to and utilise. The students did not discuss career advice and information at length. Career approaches that promote non-traditional careers and subject choices to girls are
considered valuable in challenging gender stereotypes and have featured in research (Bimrose & Brown, 2011; eSecurity4Women, 2014). On reflection, I could have probed respondents more on approaches to career guidance. The students’ responses were brief, but those who commented reported that staff at their school are helpful in providing career information and opportunities. Students did not appear to receive or access career information on income differences among careers. Furthermore, income did not appear to be a major influence on the female students’ career choices, as indicated in comments such as: “Girls do more of what they want to do rather than [for] the money.” Career information is readily available to students through online resources, such as the MyFuture website, and each college provides career information and advice in various mediums. College 2, for example, hosts an annual careers expo that incorporates trade career stalls, information and trade industry representatives. It is apparent from the limited knowledge that students had of the male-dominated trades that few students in the groups were seeking out external sources of information on these trades (including online resources).

5.3.2 Barriers for females into male-dominated trades: Adult views. The four themes elicited from the comments of adult participants about barriers to girls pursuing the male-dominated trades are shown in Figure 4. Themes were selected from the many that arose in the research on the basis of their repetitive nature or significant way in which they could advance the research aims. The theme “Trades are not as good as uni” was selected as it was a participant comment that captured a community sentiment that concerned many adult participants. Adults also discussed the impact of gender stereotypes at length. Due to the strength of this issue and its theoretical significance, “Gender stereotypes influence career choice at a young age” was selected for exploration. “Students are encouraged, not influenced, in career choices” was also common, yet a new concept to me. It also raised
issues of significance to career development theory. The role of employers and industry was also considered significant to the research aims—particularly the aim to impact on industry policy, and thus “Employers’ perceptions need to change too” is the final theme.

Figure 4. Themes on barriers that limit female participation in male-dominated trades: Adult views.

As the comments from school-based participants and those external to the schools were similar, they are reported together. There were a number of key differences between the views of staff in the participating schools (coded as PS) and those adults external to the schools (coded as ES). These and differences between adult and student participants are reported within each theme. It is also important to note a qualification to these interpretations from the interviews. Not all staff at participating schools would have considered that they provided full and comprehensive answers to each of these specific matters in the limited time available. The four themes from the interviews with adults are discussed below.
“Trades are not as good as uni.” Adult participants said that this negative view about the trades is one that they hear in the wider community and is of concern. It was widely acknowledged that an inferior view of the manual trades exists that discourages males and females from pursuing the male-dominated trades. Similar concerns were raised by others in the participating schools: “A common view is that trades are for boys who don’t do well at school—who are not OP students”; “it concerns me that trades are seen as a lower level”; and “If a child has ability then they [parents] want them to aspire to uni.” Adults external to the schools expressed similar concerns, with comments such as: “Trades are seen as an under-qualification” and “The exception is parents who have trade experience.” A former educator similarly commented that: “Most parents don’t know about the TAFE sector. I’m amazed at the prejudice and ignorance amongst parents.” In describing the understanding and influence over students’ careers and VET choices, an adult participant (ES) stated: “The parents fit a 30-30-30-10 pattern: 30% are leaders, 30% are followers, 30% don’t know, and 10% don’t get it.” From this, the participant explained that around 30% of parents seek to lead or direct their sons or daughters into a career path.

The adult participants external to the schools placed more value on the trades than the school-based adult participants, with comments such as: “Trades, that’s seen as being for kids who aren’t academic . . . but in fact you have got to be smart to do a trade” and “It’s a hands-on job, doesn’t mean you don’t use your head” (ES). These concerns from adult participants were consistent with the student views, particularly the acknowledgement that negative attitudes and misconceptions do little to interest students in the male-dominated trades. The staff in the participating schools showed that they were keen to challenge the inferior view of trades: “I don’t think people understand that there aren’t many trades that are hugely heavy,
physically demanding, dirty (in the way they used to be) . . . technology has changed lifting and other things”. These adults all placed a high value on the male-dominated trades, which is necessary in setting a standard for students. However, several school-based staff and others external to the schools acknowledged that some of their peers viewed trades and VET as inferior pathways. The following comment captured this sentiment: “It’s a different world now, but prejudices of [the] ’50s and ’60s are still carried through. VET was always a poor relation to an academic path . . . secondary education is stuck, hasn’t got its head out of the fact that VET doesn’t get a go” (ES).

Most adult participants, in acknowledging the value of VET, also acknowledged the importance of Maths for male-dominated trade careers. While Maths is a compulsory subject for all students at each of the four colleges, students choose the level of Maths to enrol in. Staff at each of the four schools reported that a higher proportion of males are enrolled in the higher level Maths than females. In one of the colleges, a positive trend was identified by a staff member, who said that “Physics and Maths C are more evenly distributed [across gender] than before . . . and we have female teachers in Maths and Physics” (College 3). At another school, a staff member reported “At our school, a large percentage of girls do pursue senior Maths” and “Yes I am aware of the Maths requirement. I also think that more girls are becoming interested in careers requiring Maths due to the way it’s taught.”

The need for competence in Maths and Science as a prerequisite for male-dominated trades was acknowledged by adult participants external to the schools. Their comments showed that the value of Maths may not be not widely recognised: “Schools send low-achieving students to TAFE for trades. That’s not right. Their literacy is poor and we have to help them get through. Trade students need high level Maths and technology skills”,
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“People who struggle with literacy are directed to auto skills, but it is now high tech. Students need Maths.”

Adult participants were unified in the view that girls can and should do male-dominated trades. Some gave examples of female students who have excelled in these trades. No one could identify a large group of females doing a male-dominated trade course in any school or TAFE. Some adults (mostly those from the regional city school) said that they had heard that women are preferred in trades, particularly in the mines. I heard this regularly in my former ministerial role, but it appears to be an anecdote only, as few companies are taking steps to actively recruit and retain women. As stated by an industry participant in reference to the auto-industry: “Women are employed by accident” (ES)
“Gender stereotypes influence career choice at a young age.” Adult participants in the schools and beyond commonly recognised that although equal opportunities are promoted for female students, the influence of gender stereotypes is pervasive. Consistent with evidence in the literature, it was widely acknowledged by adult participants that career preferences and identities form very early and are influenced by gender stereotypes in the media, and within families and communities. Comments from staff in participating schools about the impact of gender stereotypes were abundant, and did not require probing by me as interviewer. Staff in Colleges 2 and 3 had particularly animated discussions, as these were the two group interviews where staff “fed off” the ideas of each other. Their views affirmed the research findings (Sikora & Pokropek, 2012) that gender stereotypes of work are set by Year 10, with comments such as: “Gender stereotypes are still there . . . you constantly have to open their eyes, alert them to possibilities . . . stereotypes are set by Year 10, and mostly girls wouldn’t even consider a trade” and “Year 8 boys and girls are segregated straight up—boys primarily into [industrial learning technologies] and girls into [home learning technologies].”

Adult participants also engaged in lively discussions on the role of media, toys, literature and popular culture in fostering gender stereotypes. School-based participants expressed the limited capacity they have, despite daily contact with students, to overcome the influence of media and popular culture in determining what are acceptable male and female behaviours, identities and career aspirations.

“Students are encouraged, not influenced, in career choices.” The approaches to career advice and guidance were explored in detail in the interviews with adults. Key messages from the interviews with adults were as follows: the career guidance tradition was commonly described as one in which students are encouraged, not influenced; the time and resources available for career advice/guidance in schools are limited; and the focus on the
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manual trades for girls was variable across the schools and regions. The manner in which responses from participating school-based staff compared with other adult participants varied, and is also discussed in this section.

A senior educator (PS) described the approach to subject and career choice at their school as follows:

We make no suggestion either way. We don’t guide them by our influence. We guide by opportunity . . . It’s a dilemma because we have those options . . . We don’t say you must do. We don’t force students into a manual field or boys to home economics. Same with girls; we could say, you have to do manual arts, something non-traditional. If we did, it might open more doors and give exposure that they never got as a kid of the trades to girls. We don’t want groups of kids doing subjects they don’t want to do.

Similarly, other adult participants in current or former school roles used language, such as, “we encourage the students”, with examples being: “We have never discouraged girls from construction or other areas. We offer Doorway to Construction, but no girls do it. We could encourage them” (PS); “It’s a matter of encouraging them, that’s why teachers and career counsellors have to be truly professional, and open the students eyes to possibilities and not rule anything out” (PS); and “The test-and-tell approach is part of the history of guidance counselling . . . now it’s to work with young people to help them come up with a plan. We don’t encourage them into any particular pathway, but we don’t discourage them” (ES).

The different language used to describe career advice with students raised the question of whether it mattered. The answer seems to be that the language used does matter, to school-based staff in particular. The adults external to the schools were using more active language like “we need to excite girls about possibilities”. They were aware of and/or contributing to strategies involving industry and government collaboration aimed directly at
the goal of increasing female composition of the manual trades. The school-based staff appeared cautious yet clear in their approach to encourage, not influence, female students. Because of the limited time and resources they had to implement new career initiatives, only a few girls appeared to be encouraged and inspired from within the school. For these students, it seemed to be family influences that were most encouraging. It was evident from the consistency in their views that school-based adult participants favoured the “encourage, not influence” approach. They favoured the provision of information and activities to students, without making judgment.

On further reflection, I still did not understand the distinction between “encourage” and “influence” that the school-based staff were making. I therefore consulted the Macquarie Dictionary, which provides the following definitions: (1) encourage—to inspire with courage, spirit, or confidence; to stimulate by assistance; and (2) influence—invisible or insensible action exerted by one thing or person on another, especially by people in power. I was curious as to why influence would carry such a sinister connotation. In common daily use, it does not seem to conjure a sense of control over others. In the discussion chapter, the concepts of encourage and influence will be explored more in relation to career-development theory, particularly so as to compare this with the claim-makers who are calling for high level influence from government to increase female participation in the male-dominated trades.

Many of these school-based staff wished to elevate the actions needed to encourage and inform girls about the trades, such as the introduction of scholarships, yet they took care to not use the concept of influencing students. Staff involved in the NSW Macarthur network described their access to more highly developed support programs in their region. They acknowledged that they are encouraging students and parents to consider a wide range of
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options. They too expressed concern about the limited time and staff resources available to them and their schools to maximise the use of these resources.

The under-resourcing and under-valuing of career guidance work in schools was reported in some way by all stakeholders, including the non-school participants. The sentiment was captured in the following statement by one participant (ES):

Career staff are definitely giving girls the information [on male-dominated trades]—there’s no question about that. Career guidance needs to be given more importance. Parents need more input—they only want to give up 10 minutes. Career guidance is not a well-resourced sector. Government can’t see the economic benefit of career guidance. The majority of schools don’t have time for career guidance. Students are not prepared to give up time to career guidance.

Another participant acknowledged that a barrier to getting information to girls and women is that: “Career guidance is not funded well. Auto skills have specific resources for career advisers, but they are poorly equipped to do that” (ES).

The funding formulas used to allocate resources for career guidance in schools were raised in the study. An educator stated that in the school in which she had recently worked, “Career guidance support was limited to 1.2 FTE [full-time equivalent] for 2,000 students. It was mainly personal counselling with some career support because the staff member employed favoured counselling” (ES). This staff funding formula was later confirmed, with an executive staff member at Brisbane Catholic Education, R. Ashford (personal communication, May 2014) stating that the ratio of guidance counsellors to students in Brisbane Catholic Education primary schools is about 1:1,000 and 1:400 in secondary schools, compared to about 1:1,600 across primary and secondary schools in Education Queensland. Resourcing concerns were raised by the majority of adult participants.
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Comments from staff in participating schools included: “Career guidance officers do an excellent job of counselling. They are poorly resourced and lack time for career work”; “Schools don’t have much funding for careers counselling”; “Resources are needed to give staff time. There is no dedicated VET/career advisor staff. They are not doing the job as well because there isn’t the time”, and “Career guidance is under-resourced. There is no time to point them [i.e., students] in the right direction.” Similar concerns were raised by those not in the participating schools, as they saw the post-school impact this has on young people and industry: “Career advice is not well supported in schools. There are government-endorsed career industry standards, but no regulation on schools or industry to put that in to their business model”, and “Career people in schools lack corporate knowledge—their funding isn’t career specific . . . they are diversifying”.

Careers advisers in NSW appear to have a stronger focus on the trades in career support activities. Interviews with staff in the Macarthur partnership showed that they have access to more well-developed information and resources than in most states and territories, enabling them to be innovative in tackling gender stereotypes and implementing networks and programs. This is evident in the Women and Trades policy and program support available through NSW state government agencies, and it was affirmed in the comments and resources referred to me from career advisers in NSW. This included the SALT mobile trade trailer program and the NSW government-sponsored trade career lesson plans and other resources through the Women in Trades initiative. Staff in the Macarthur network acknowledged limits on their own time and resources, but, according to one participant: “There is a lot going on in careers at the moment” (ES). This career adviser explained further: “We teach careers classes to Year 7 through to Year 10. We teach a Year 9 kids@work [course title] class aimed at students who are least likely to stay until Year 12. Its focus then
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is on getting them work ready.” Another career adviser in that region said: “Yes there is [information available], state training services, and the DEC promotes this through videos and posters sent to the careers adviser”, and “Macarthur Workplace learning is very helpful in our local area. They are currently running a workshop called PACTS [Parents as Career and Transition Support].” Schools in that region have developed a careers network and website, but one participant acknowledged: “We are still trying to work out the best ways of filtering our information” (ES).

When presented with information that male earnings post-school and 10 years on are 20% higher than for females, the adult participants in school (as with the students) appeared surprised. By contrast, the adult participants who were not from participating schools knew more about trade incomes and the gender pay gap. There is debate in the literature about the utility (or influence) of industry knowledge—skills shortages, incomes and more—in career advice with students. To keep well informed about up-to-date industry “intelligence”, online resources are available to assist students (for example, Job Outlook). There was no mention of these sites by participants in the study.

Adults from participating schools also described the variable influence of income on students in the following terms: (1) “I don’t think students think much about the wages before deciding on a career, especially those students deciding to pursue trades. Their major consideration is often their capacity to pass subjects leading to a career”; (2) “I think there has been media coverage of trade earnings; however, the type of jobs in trades do not seem to appeal to females in general”; (3) “Students seem to want high paying jobs but are more directed to professional jobs”; and (4) “I don’t think students know of the earnings gender gap between trades.”
“Employers’ perceptions need to change too.” A number of adult participants raised concern that poor employer attitudes and harassment of females in the male-dominated trades exist: “It’s employers’ perceptions that need to change too” (ES). Adults in participating schools and others indicated that perceived employer attitudes and behaviour were “putting girls and parents off” the male-dominated trades. The participants external to the four schools were more familiar with the employer issues than the school-based participants. For example, an auto-industry participant provided evidence of these barriers:

Auto Skills conducted employer research. Would you employ females? [From] six hundred responses, 64% hadn’t given it a thought. They hadn’t thought about it or looked to accommodate it. There’s not much advancement in the auto industry. A structure needs to be in place for women to participate. Women are employed by accident. (ES)

Other non-school-based participants made comments such as: “The girls who did auto skills, they were really good at it, but they didn’t want to go on and look for apprenticeships. Unless there is a really good workplace without teasing and bullying, girls didn’t want to do it” and “They need to create an environment that is welcoming to females . . . Industry won’t change until 10 people line up for a job and 10 are female.” Concerns raised by staff from participating schools about employers and industry were as follows: “There is a need to deal with hostility [to females] at workplaces” and “A big downside for employers is the big push for paid maternity leave. I know my uncle and other employers are saying they would not employ younger girls anymore. You lose them [through maternity leave].” These concerns were consistent with existing research (Bimrose, 2004; Fuller, Beck & Unwin, 2005; Shewring, 2009; WIMDOI, 2010). The need for school staff to have the time to identify and
build relationships with local employers whom they trust is an important step necessary to help overcome these negative experiences and perceptions of employers.

5.4 Research Question 3: Actions to Increase Female Participation in the Male-Dominated Trades

It was very encouraging for me to hear so many constructive views about actions to increase female participation in the trades. However, it was noteworthy that the female students were making useful suggestions, but they were not taking responsibility for suggested actions. The students commonly referred to actions that others could take, not themselves, to increase female participation in the male-dominated trades. For instance, they were suggesting that staff organise trade days and that staff invite industry representatives to the school. This lack of responsibility for future action in itself represented a barrier to change that was worthy of further exploration in the research. Adult participants were generally enthusiastic and forthcoming with suggestions for actions. Their wide-ranging suggestions affirmed the need for a systemic approach to improve female participation in the male-dominated trades. The interest shown by adult participants was to be expected given that they had accepted an invitation to participate in this research. In this sense, they made a choice to commit time to this project, and were likely to be supportive of the research aims. None of the participants expressed hostility towards this topic.
5.4.1 Suggestions for action: Student views. There were no major differences in the ideas of students across the schools or in approaches and programs offered at each school. Common suggestions from students included the following: (1) more role models and positive media advertising; (2) more mentors to speak with female students and more information on the male-dominated trades to be provided to girls; (3) more try-a-trade activities on offer to girls; (4) and increased support for each other to try different trades. These are captured and explained further within four selected themes itemised in Figure 5.

**Figure 5.** Actions to increase female participation in male-dominated trades: Student suggestions.

*We could be men.* The student who said “we could be men” raised laughter from her group, but the more serious message that flowed on from her comment was the need for more positive role models for girls. Several students (and staff) suggested that more female industry role models and females in media advertising were needed to show that manual trades can be for girls too. Comments included: “More can be shown on TV and stuff on
billboards, on social media . . . because a lot of people listen to celebrities—they are role models for them”; “make a Facebook page about girls and trades”; “When I was growing up, my parents exposed me to cars and dolls . . . women can do that job”.

Interestingly, no female students mentioned or named any current female industry role model. This seemed indicative of the lack of high-profile role models for females in male-dominated industries. Several students (and staff) referred directly to the ADF’s positive role models of women in recruitment advertisements, with two students saying: “Information about the trades . . . I haven’t seen it . . . but military advertising actively has women in their advertising” and “Some ads are really cool and you think I wouldn’t mind doing that.” Theories on social change will be explored in this research to help explain how this kind of positive advertising using “cool”, high-profile role models can be a positive influence on young people. The benefit of role models in non-traditional occupations is well documented in the literature. To gain population-wide attention of young women, not just a few, it will be important to see how creatively and effectively social media and mainstream media can be harnessed for this task. The findings seemed to indicate that few girls are aware of role models and that piecemeal initiatives are not effective.

**Increased visibility and information.** A number of female students indicated the benefits that could be achieved if girls had more information on the male-dominated trades. One student suggested female students may be more interested in the trades if there were “more workers coming to schools talking about what it’s like in industry”. Others said: “The school could just promote it more in class time . . . even on assembly . . . get people interested, like sport . . . getting more girls into men’s sports”; “I think if someone came to the school and explained what it [the trade] is about and help others know . . . the Careers Expo helps because there was lots of variety. I saw a lot of girls go to the Construction Skills
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Queensland stall.” Several students in the focus group in the regional city (College 3) indicated that being in a mining area was influencing their interest in going into male-dominated industries. At least four of the female students in the group had sought out employers and initiated their own apprenticeship applications. They were able to see opportunities within their reach.

**Increased work experience.** Students commonly spoke of the benefits of more hands-on experience. Comments included: “Give females more of an opportunity to show they can do more . . . like try-a-trade days. There were heaps of girls there last term.” There was little evidence in the colleges that female students were undertaking work experience in male-dominated trade areas, but the try-a-trade days at TAFE were well attended by female students, with one college reporting over 90 female students attending on one day. This college had a unique industry-sponsored auto-trade centre, yet only a handful of female students were enrolled in courses at the centre. The lack of follow-up by female students from trade experience days, to enrolment in trade subjects and courses, may be attributed to barriers canvassed in this research. For some students, work experience will deter them from trade careers. For those whose interest is piqued by try-a-trade days, it seems clear that trade experience needs to be followed up with other actions to sustain the interest that these experiences generate.

**Increased peer support.** Only a few female students described how they used their initiative to seek out trade opportunities. One student said that she preferred to get a job in the trades, saying: “I applied for an apprenticeship in carpentry but I didn’t get it . . . I found it in the paper.” Another described a chance meeting on a plane: “the bloke that sat next to me was from [name of company withheld]. He asked me what I was interested in after school. They are looking for girls at [name of company withheld].” This prompted her to apply.
Several students said they were using the internet and online career sites. Of those who were seeking information, only a few spoke of seeking trade information. One female acknowledged her responsibility for not accessing available information, saying: “We need to go out to places. The school directs more of those trades towards the guys. Like the Trades thing on today . . . When I get emails about the trades, I ignore it.” She indicated that she would look out for information in future. Overall in the groups, students showed little initiative or responsibility for increasing their exposure to the manual trades. They mostly put the onus on school staff and industry to take action. It would be useful in this and future research to explore whether momentum for change builds and whether students then take more interest in and/or responsibility on themselves.

Several students encouraged girls to support each other more and join in the male-dominated courses to help each other: “If they see a girl going into a trade showing they are capable, others will get into it. I know girls in Year 10 are doing fitter and turner jobs . . . things are changing”. The suggestions for action from students, while not as expansive and detailed, were consistent with those raised by adult participants. This alignment of views provides a helpful foundation upon which future action can be developed and implemented. The theory on youth behaviour change suggests that change will be most effective if young people are engaged or lead the change ideas and processes. The first step is finding ways for young people to know more about the male-dominated trades—the skills, contemporary work environments, wages and benefits involved. The second step is young people identifying that a problem exists that warrants their attention and action.

5.4.2 Suggestions for action: Adult participants. Adult participants were enthusiastic in offering community-wide action to increase take up of male-dominated trades by females. They described individual actions that they could take as well as those that are
the responsibility of others, including industry and government. This differed significantly from the students, who primarily suggested actions that others could take, rather than themselves. Suggested actions are reported within the four themes selected in Figure 6. The actions ranged from cultural change in the early years of children’s development to discourage gender stereotyping to education and industry programs to encourage female interest in the manual trades. The adult responses showed greater strategic and systemic thinking than the students, yet the core comments and concerns between students and adults were very similar. The ideas from staff in the schools showed their experience of working with young people; in particular, their in-depth knowledge of education policies and programs and their awareness of time and resource constraints that may limit their ability to implement actions.

**Figure 6.** Main themes on action required to increase female participation in the male-dominated trades: Adult participant views.
The main difference between the responses from the externally based adult participants and the school-based adult participants was the former’s knowledge of industry-specific ideas and strategies. The participants in this category also had much more of a national or state focus in their ideas for action.

**Instigate community-wide action.** Adult participants spoke of the need for co-operation and action from many people and organisations. In this manner, they were describing the need for system-wide responses that were consistent with those raised in the research literature. These are depicted in (Figure 7) and include education, industry, media as well as government responsibility for actions. The interviews added value to the literature by providing the detail of the educational context; for example, the role of Student Education and Training (SET) plans and how career development is applied in practice. Adult participants were forthcoming, and most showed enthusiasm and responsibility in suggesting actions within the school and training systems that might be effective in increasing the participation of female students in manual trades. Recommended actions within schools and TAFE included the following:

- **Introduce role models, scholarships and more information about manual trades to female students.** “More mentoring. Bringing women into the school—and men who want women in the trades.” Staff in two of the schools (Colleges 2 and 3) suggested that manual trade scholarships could encourage female interest in the male-dominated trades. This idea was supported by other adult participants. Scholarships can increase the profile and status of male-dominated trade careers to female students, staff and parents/carers, and serve as an incentive. My aim in donating to each participating school a VET student award of $100 and a pink hard hat and safety vest was based on similar principles; that is, to elevate the profile of manual trades and provide an incentive to female students. This
was well received by students and staff in each of the schools. It therefore seems likely that scholarships would be similarly welcomed and meet their intended goals.

- **Raise male-dominated trade options with all students in their individual SET plans.**

In Queensland, SET plans are required by law as a method of individualising the learning goals and activities for students. In supporting the use of the SET plans to raise male-dominated trade careers for male and female students, staff in the schools made comments like: “We interview all Year 8s for their SET plan. The leadership of our principal is excellent. [Name withheld] is helping to support the choice of VET pathways” and “We need to influence staff doing Year 10 SET plans. Maybe that’s an avenue if you have a girl come through. If you don’t want an OP path, try a trade” (PS).

The use of the SET plan process as early as Year 8, but specifically in Year 10, was raised in three of the participating schools. This idea will be useful to raise with education authorities so that the implementation of the SET proposal can be considered at a state level.
Source more work-experience employers in the male-dominated trades. A school-based participant raised a concern that was shared by other staff and students, saying: “I can’t think of a time when a female tradie has come in and spoken to the girls.” This comment indicated that female students do not appear to be exposed to industry role models and the information and support they provide. Access to female mentors was something the female students expressed interest in, and therefore it could be a task they take responsibility for, with support from staff. There was no sign that this is currently occurring. Another staff member noted the importance of men in industry welcoming female participation. He
suggested that it would be helpful “if males come out to the school to say we want you . . . because that’s what girls get worried about—getting put down”. Attracting and maintaining industry partnerships was considered important by VET staff at the schools and other adult participants. It was evident from the interviews that partnerships required a significant investment of time by school staff in all locations. VET staff at each school reported that they had little time available for this.

All schools reported having difficulty in finding local trade industries willing and able to offer apprenticeships and work experience to students. The regional city school was located in proximity to extensive mining industry activity, which was generating more manual trade opportunities and industry partnerships of benefit to female students when compared to other regions. These, however, were said by several staff to be experiencing “peaks and troughs”. A staff member (PS) expressed concern that, with the current down turn in the mining industry, “We can’t encourage girls into trades without anything being there.” This is a valid issue, particularly for students in regional communities and Indigenous students in remote areas where little economic activity is generated.

- **Lift the status of VET and TAFE trade pathways through public promotion and social media and increased funding for VET and career advice in schools.** A school staff participant saw benefit in a range of programs being offered to students, saying that: “We need girls into hard hats programs, awareness programs with girls only in attendance, and a greater focus on training female manual arts teachers.” A number of school-based staff stated that our interview and/or school visit had prompted their own interest in pursuing more action. A staff member in College 2 explained that her interest in providing female students with more information about the male-dominated trades, including scholarships to encourage their interest, was prompted by this research and by the high youth unemployment in her
area. She noted that higher-paying male-dominated trades could benefit girls in her region where, she said, “kids are disadvantaged already”. Given that each participating school was located in an area of moderate to low, rather than a high, socio-demographic status, this point could be applicable to the other schools.

Participants who were not from the four schools also had many suggestions for schools to elevate the status of the career advice and VET roles in schools. TAFE/VET sector participants were critical of school staff who viewed trades as inferior and encouraged low achieving students into manual trades without requisite standards of Maths and English. One TAFE participant described how numeracy and literacy support is provided by TAFE staff to low-achieving students, but additional support is not a guarantee of the students’ success in electro-technology, automotive and other male-dominated courses that require high level Maths competency. The staff I interviewed in schools appeared to know the value of Maths and Science as pre-requisites for male-dominated occupations, but, as indicated by the TAFE/VET participants, this value may not be consistent across staff at all schools.

The view expressed by one participant external to the schools, that “Cross sector co-operation is needed to promote trades to girls”, was shared in similar terms by others. These participants also knew about and/or had developed industry and government websites that promoted mentors, such as the National Association for Women in Construction and Auto Skills Australia. There was little specific evidence in the school-based interviews and visits that students and staff were actively accessing these sites. I provided a list of useful career and industry websites and contacts to each school to add to their resources.

Participants external to the schools were more aware of industry needs and skills shortages than school staff. They acknowledged that male-dominated trade industries could benefit from recruiting women to fill these shortages: “There are skills shortages in
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automotive—not enough males, we have to open it up to females. We need to increase the inflow of apprentices in auto and mentor them. Fifty-two percent of first years don’t complete their apprenticeship.” Others suggested that industry needed to make much more information available about the nature of trade work. Several participants, both school- and non-school-based, made the point that working conditions need to be made more appealing to girls: “It [trade work] is mechanised and automated, cleaner with better protection from harmful effects of materials and procedures. It is less ‘blokey’” (PS).

In each of the categories for action, adult participants implied or directly stated the need for government funding, policy and support for activities. For example, a number of staff spoke in favour of more mainstream advertising of male-dominated trades targeted to girls. Industry advertising to attract women, such as those used by the ADF, requires government funding. A participant seeking funding for auto-industry social media campaigns targeting women said this funding initiative “was difficult to obtain” (ES). Similarly, it was commonly reported that career guidance and VET in schools need increased government funding and program support.

Several of the non-school-based participants who were well aware of the entrenched nature of gender segregation in the male-dominated trades were calling for, or actively pursuing, national government and industry policy, funding and action. These participants described the benefits of, and need for, co-ordinated action where each relevant sector or stakeholder takes responsibility for reducing gender segregation in the manual trades. Adult participants who were familiar with initiatives such as Women in Trades, NSW, the Auto Skills Australia’s Women in Autotrades activities, and increased funding for national career information initiatives cited these as positive examples. The non-recurrent, time-limited
funding for community and school programs and lack of national consistency in these programs were raised as concerns.

A participant from the auto industry described the ways in which Auto Skills Australia and supporters within the auto industry have made a strategic decision to recruit more female auto industry trade-workers. In contrast to school-based staff language of “encourage, not influence”, this participant used assertive language, stating that Auto Skills Australia wants to “ignite interest” and passion for the auto trades in girls and women through innovative advertising and programs. This industry body has successfully initiated government, industry and union strategic partnerships and research to advance their goals. Nevertheless, funding for these activities is limited. This participant is an example of a “champion for change”, a community leader who is promoting awareness and seeking to mobilise support to increase female participation in the male-dominated trades. The lack of engagement of young women was a concern expressed by the participant. The youth participation models affirm the need for active participation by young people and this analysis features in the following chapter.

Adult and student participants supported the innovative use of media, particularly social media, to promote positive images of the manual trades. A number of staff spoke in favour of more mainstream advertising of manual trades targeted to girls. The ADF recruiting advertisements that had been raised by several students were also raised as a positive initiative by staff in two schools, as they had gender-balanced images aimed at attracting women to the ADF. Two adult educators (PS) noted that the Australian Army provides a residential recruitment program at Enoggera (Brisbane) for females.

One adult participant noted that there is a need to change public perceptions to show what the auto industry is about, suggesting: “If we ran a directed campaign, we could raise
awareness of the auto industry . . . get a viral message out quickly using social media. For cultural change three to five years of program action is needed.” This approach is consistent with the youth social change models that feature social media, which have received positive outcomes from young people (Maddaleno & Breinbauer, 2005; UNICEF, 2015).

*Look for examples from hospitality and sport where gender barriers are being broken.* One male teacher relayed how the female-dominated hospitality course at his school had increasing male enrolments, stating: “A lot more boys do hospitality. It’s popular . . . it breaks the mould. They don’t do Home Ec. but they’ll do hospitality in senior. The TV chefs have broken the mould for male role models—boys like to cook.” This staff member was suggesting that the phenomenon of popular male TV chefs appears to be breaking down gender stereotypes. Another participant in this group also described how their school has “a lot of girls doing male-dominated sports, but not subjects”.

A positive trend in the reduction of gender stereotypes in hospitality courses and sport at the participating schools was identified in the field work. These trends were not explored in detail in the interviews as their significance was recognised later through the thematic analysis. This prompted me to seek further information on sports development programs in Queensland, and literature on social change and youth. Notably, through national junior development programs, gender inclusion in sport is being actively encouraged. This included some mixed-gender teams in the early-years age groups. In sporting associations such as the National Rugby League (NRL) and others, female participation is supported. A female rugby league team from one of the participating schools (College 4) had participated in a female-only regional rugby league carnival sponsored by the NRL. While the teams are gender segregated, there are worthwhile learnings that could apply to manual trades as a career
choice. Other schools also had female teams in male-dominated sports, with examples being rugby league, touch football, AFL, rugby union and soccer.

These “break-throughs” prompted me to explore literature on social change and youth more extensively to explain: (1) how the positive media promotion of male celebrity chefs is making hospitality “cool” for male students; (2) how the growing gender-inclusive approach to junior sports development programs in Australia is having a positive impact on making male sports “OK” or “cool” for females; and (3) whether the positive media images of male chefs and the gender-inclusive approach in junior sport could usefully apply to career development. I found minimal literature, but, given the significance of these issues, I have identified them as an opportunity for future action that I canvass in the following chapter.

**Change culture at an early age.** This statement is not a participant quote but it sums up the importance of action in the early years of school that many participants expressed. Adult participants stated that career options that are not limited by gender stereotypes need to be promoted in schools and the media: “Girls don’t get exposure early enough. We need to target kids in Year 3 or 4. The language needs to be ‘building industry’ in gender non-specific ways to expose kids in non-prejudicial way” (PS); and “We need to get knowledge out to them early. For example, in Year 7, that trades are a valued pathway . . . we need to identify the skills of girls early . . . The girls don’t use their trade skills. There needs to be more encouragement from schools” (PS). These views were consistent with issues raised in the literature review. This affirmation from staff of the significance of early-years intervention signalled to me that this was another important area for exploration and action in this research.

**Provide gender-aware career advice and intervention.** In tackling a view in the literature that career guidance staff do not adequately challenge gender stereotypes, one
participant stated: “It is a myth that career-guidance officers discourage girls from non-traditional pathways. This debate helped to raise the issue. That helped girls. They [career professionals] would talk about the hurdles for girls” (ES). The interviews did not confirm or affirm this position. Several staff, however, supported the need for early-years career intervention with young people, to overcome the differentiation of boys’ jobs and girls’ jobs that they believed form in very young children. Adult participants placed significant emphasis on the influence of gender stereotypes on children and young people (as discussed in earlier sections of this study). It was clear that staff saw a role for themselves as teachers, VET co-ordinators or career-guidance officers, to challenge gender stereotypes. The extent to which this was occurring was not able to be gauged in this study. I was also not aware of the NSW Department of Education and Communities (2014) paper “The Case for Career-Related Learning in Primary Schools” (McMahon and Carroll, 2001) or advocacy for this until after my field work was complete. It was noteworthy to hear support for early-years career work in this research.

In response to the interview questions about approaches to career guidance, only one participant described the theory that underpins career advice approaches. On reflection, I feel that it would have been helpful to this study for career development theory to have been explored further with participants. In commenting on theory, the adult participant made the point that: “There’s been criticism that theory isn’t helpful to [career] practitioners . . . but there has been real evolution. Systems theory is helpful. I like a systems framework to look at all things influencing students’ decisions” (ES). This interview piqued my interest in systems theory in career guidance. I am familiar with systems theory as it applies to my professional discipline of social work but its application to careers extended my understanding. As discussed in the literature review, Systems Theory Framework (STF) promotes understanding
of structural, institutional, family and individual influences on career decision-making, including gender, culture and socio-economic status (McMahon, 2014; McMahon, Patton & Watson, 2005). As the research participant suggested, I found that STF and related career-development theories that incorporate a gender analysis are helpful, and they gained prominence in this research as it progressed.

Some different perspectives emerged between school and non-school staff on the nature of career advice to students. One adult participant expressed a critical view of career advice in schools, saying that:

Career information needs to be early. VET age is too late for many students. Career advisers are often older and not up to date. They need labour market research and more corporate engagement . . . VET staff are connected to industry but career guidance is not linked to the corporate sector. (ES)

Very little discussion ensued on frameworks and approaches to career guidance, although one staff member suggested that “It has to start in primary school . . . and Year 7s and Year 8s” (PS). Adult participants spoke more consistently about the need to increase the resourcing and priority given to career advice particularly in schools. One comment summed up commonly expressed views:

We need more time and resources for career work. It’s very hard to link with employers, TAFE students and parents in the VET role and take on teaching responsibilities . . . career guidance and VET staff are not well resourced in school.

The hours will be cut back for career work in 2015. (PS)

5.5 Summary of Findings

5.5.1 Overview. There was no evidence of upward growth in female composition of the male-dominated trades in the data. In addition, there was no evidence showing that
female composition of courses leading to the male-dominated trades was increasing significantly. The entrenched nature of gender segregation of the trades depicted in the literature review was affirmed in this research. Based on the current situation in Australia, it appears that a significant increase in the participation of women in the male-dominated trades is unlikely to flow from young school-leavers. Very few girls at the schools involved in this research were enrolled in courses and subjects that lead to these trade careers, and the enrolments through post-school VET courses were similarly low. This early training is a pipeline for supplying the trade-based workforce. The future female workforce in these trades may in fact be sourced more through the entry of more mature-aged women. However, this age cohort issue was not under examination in the qualitative phase of this research. The major findings of this research are summarised according to each research question below.

5.5.2 Research Question 1. A finding of the qualitative data analysis is that the current composition of females in the male-dominated trades, such as automotive, electro-technology, construction and manufacturing, is below 2% (see Table 8). In male-dominated VET trade courses, the female composition is highest in manufacturing, at 6.8% (see Table 10). These figures are higher than the trade qualified numbers (ABS, 2014) as they include trainees and apprentices. There is no sign of a significant increase in females in the supply pipeline to the male-dominated trades. The number of females training for the male-dominated trades, who are enrolled in school-based and post-school male-dominated trade courses, has remained consistently low since 2006 (as per Table 10).

5.5.3 Research Question 2. This research has affirmed that many structural and historical barriers continue to entrench the low participation of females in the male-dominated trades. The barriers limiting female entry to the male-dominated trades are compounded as few people have identified the lack of female representation in the trades as a
problem that warrants action and change. This includes the young women in this study. While the students and school staff who participated in this research showed enthusiasm for the topic, they generally had limited awareness of gender segregation of the trades. In contrast, the adults from career and industry associations clearly responded to the invitation to participate in this research due to their interest in advancing the issue. This research showed it is possible to activate public interest in the issue of gender segregation of the trades. When student and adult participants were informed about this issue, particularly the low female composition in the male-dominated trades and the higher rates of pay they attract relative to female-dominated trades, participants accepted it as a problem. In fact, discussion of and exposure to information about the trades prompted participant concern about the low female composition and caused them to raise many ideas for action within their own schools and beyond.

5.5.4 Research Question 3. The ease with which adult participants and students raised actions on multiple fronts in response to this research question affirmed the relevance to this research of change models and theories that target the interdependence of interpersonal, community and policy level factors (Bartholomew, Parcel, Kok, Gottlieb, 2001; End Violence Against Women Now, 2014; Maddaleno & Beinhauer, 2005; UNICEF, 2015). Adult participants were informed and confident in using concepts such as “the system has to change” and “change has to be in the early years”. Their suggested actions showed that they were generally approaching the issues from a system-wide framework of action. Students raised actions that targeted the media, schools, parents and more, but it was no surprise that the adult responses displayed a much more sophisticated conceptual analysis of the interaction of the education system with industry and government in particular.
As indicated in the theory and research, there are many structural and individual barriers that limit female entry to the male-dominated trades. The following was evident in the findings.

- **Girls are not dismissing the male-dominated trades.** It is significant that girls are not dismissing the male-dominated trades because they do not like them or think they cannot do them. It is primarily gender stereotypes and gender-essentialist views that distinguish male and female careers. These act as a major barrier to girls even thinking about the male-dominated trades, let alone doing them. For more girls to consider male-dominated trade careers, they require greater exposure to them and more positive role models and media images of girls in male-dominated trade roles.

- **The need to better understand youth participation and change processes.** Action to overcome gender stereotyped attitudes and behaviour about careers will require creative input and engagement of young people in the change process. The current actions are led by adults who recognise gender segregation in the trades as a problem. It was evident that mostly young people in the interviews did not see the issue as a problem until prompted by the group discussion.

- **The significance of a feminist or gendered approach to career development theory and practice.** This research showed that applying career systems theory through a feminist lens to the field of career intervention could reduce some of the barriers that limit female representation in the male-dominated trades, particularly if career development begins in the early years of education.

- **The need to influence decision-makers.** It is essential to explore ways to harness and sustain the attention and interest of many more people and decision-makers on the issue
of gender segregation of the trades. As gender segregation is entrenched, change also needs to be sustained and enduring.

5.6 Conclusion

The combined quantitative and qualitative data show a pattern of low female participation in the male-dominated trades over the past two decades. Many factors interact at an individual, cultural and structural level to entrench this gender segregation of the trades, particularly gender stereotypes that continue to distinguish careers as typically male or female. From the thematic analysis, there was little variation in the experiences of students across the four colleges. Furthermore, no one college is achieving a significantly higher enrolment of female students in male-dominated trade subjects and courses than any other.

The organisation of participants’ views around 16 themes: eight as barriers to female participation in the trades and another eight that identify actions to increase female participation, show both the complexity of the problem, but also provide impetus for future action.

The experiences of the participants in this study reflected much of the evidence-based research that informs the career-development theories explored in this thesis. In particular, the gender differences in aspirations, impact of self-efficacy and decisions of young people were generally affirmed. The next chapter analyses in depth the systemic influences on gender segregation of the trades and the career decisions of young people, and opportunities for action. Finally, very few people share an interest in or have thought much about the gender segregation of the trades. While some high level organisations have attempted to attract public attention and action, very little interest is sustained. To pursue the “claims-making” objective of this research, specific recommendations for consideration by industry,
government and education sector decision-makers are made in a separate conclusions chapter.
Chapter 6: Discussion

6.1 Introduction

This chapter critically analyses the findings of this research study in light of the theoretical knowledge and previous research and practice canvassed in this thesis. The minimal change in the female composition of the male-dominated trades over the past two decades and the pervasive impact of gender stereotypes in limiting career exploration and choice for young people are two significant issues which have been affirmed in this research. The gender-essentialist views that arise from gender stereotypes are powerful influences on career aspirations and decisions on young people. While the historical trend of girls’ aspirations being lower lower than boys may no longer be typical (Howard et al., 2011), the views young people have on what are typically male and female occupations remain influential (Charles & Grusky, 2004; Sikora & Pokropek, 2012). As shown in this research, young women and girls do not give much thought to male-dominated trades as potential careers, nor to whether low female participation may be problematic for themselves, other girls or women, or the wider community. Moreover, very few young women actively seek out information or action to better understand male-dominated trades as a career option for themselves or other girls and women.

This chapter discusses how systems theory is a useful organising framework, particularly to inform and guide the multi-level analysis required to understand the gendered segregation of the trades. STF of career development complements this as an analytical tool to focus on the personal and contextual influences on career aspirations and decisions of young people. As an intervention tool, the Social Ecological Model of Change (SEM) (UNICEF, 2014; see Figure 8) is applied to provide a framework for targeting action from the
individual through to the macro, system-wide levels to increase female participation in the male-dominated trades.

Overall the issues, barriers and actions raised in this research have a central connection to gender differences and gender inequality. Analysing this research process from a feminist perspective is highly useful in explaining gender differences and inequalities that are associated with the gender segregation of the trades, and to challenge and take action to alleviate these inequities. As others point out, adopting an analytical framework for this issue that is not gender aware will most likely fail to focus attention on the political, cultural, and social relations that continue to perpetuate the superiority of men over women in the labour market (Blau et al., 2006; Evans, 1995).

6.2 Structure of Discussion Chapter

This chapter draws on the research findings to make a case for change by focussing on the following three areas:

- **Determining whether female participation in the male-dominated trades is increasing.** The analysis of the quantitative data shows that the low female participation in male-dominated trades is stubbornly entrenched at 2%.

- **A focus on barriers and opportunities.** In exploring why gender segregation of the trades is so entrenched and determining the required action, this chapter analyses five main barriers that limit female participation in the trades and eight opportunities to overcome these barriers. Barriers that are identified in the review of theory in the literature review – especially the contextual influences on career aspirations of young people and how this impacts on their self-efficacy and career outcomes – are incorporated into the selected barriers. The discussion of these barriers is structured within one or more of the five levels identified in the SEM (see Figure 8). From the breadth of findings, I
have also purposefully selected eight opportunities for system-wide action to overcome existing barriers.

- **Applying a systems framework and STF for analysis and the SEM for action.** The barriers identified and selected in this research are interconnected within a dynamic system that involves economic structures, such as the labour market, education systems, culture and media, and gender relations and identity formation. The systems analysis derived from applying a systems theory and STF for career development in this research shows the complex factors that underpin the gender segregation of the trades. As the intervention tool, the SEM helps to manage this complexity in determining where and how action to reduce gender segregation of the trades can be effective. The discussion on Research Question 3 will show how the key barriers can be targeted for action at the five levels of SEM (the individual, inter-personal, community, organisational and policy enabling environment) to create opportunities to increase the female composition of the male-dominated trades.
Figure 8. The Social Ecological Model applied to the gender segregation of the trades. Adapted from UNICEF (n.d.) Social Ecological Model. Retrieved from www.unicef.org/cbsc/files/Module_1_SEM-C4D.docx

Detailed discussion on these areas is set out in a format that responds to each of the following three aims of this research:

- To determine whether female participation in the male-dominated trades is increasing.
- To explore, primarily from the perspective of young women, why so few of them pursue male-dominated trades.
6.3 Determining Whether Female Participation in the Male-Dominated Trades Is Increasing

For those who share an interest in increased female participation in the trades, there is little to celebrate in the trade composition data in Australia. The pattern of entrenched, low representation of females in the male-dominated trades in Australia, with little change in the past two decades, is consistent with many other nations. The female participation in male-dominated trades, such as automotive, construction, electro-technology and manufacturing, over the past two decades has been around 2% (Australian Bureau of Statistics, 2014). Industry associations reported increasing rates of female participation, with 13% or higher in mining (Minerals Council of Australia, 2013), 12% in construction (Master Builders Australia, 2015), and 20% in manufacturing (Manufacturing Skills Australia, 2012, p. 4). However, this data included non-trade female workers as well as trade workers. For example, female trade workers ranged between 1 to 6% in various sectors of the manufacturing industry (Manufacturing Skills Australia, 2012, p. 4).

A gender analysis of labour force and vocational education data was a primary task in the qualitative phase of this research to explore Research Question 1. The task included an analysis of the supply pipeline from schools into the trades through VET in schools data and observations and feedback from the school-based participants on female enrolments in their courses. Each source of data and information showed low female participation and little sign of any increase to these participation trends in the male-dominated trades. The enrolment of
female students in male-dominated trade courses at the four participating schools could literally be counted on one hand. The enrolment pattern was one or two female students in any given male-dominated trade course or subject, and one or two, maybe three, female students enrolled in a male-dominated apprenticeship. This low female participation was common and consistent with past years at the schools, despite the stated “non-gendered approach” adopted by the schools to encourage all activities for all students.

This pattern is also consistent with the research by Watts (2003) and Blau et al. (2006) that found the female composition of the blue-collar occupations, including male-dominated trades, was very low and relatively fixed over the past two decades. These researchers separately reported, and forecast, little sign of change to this pattern of segregation. All data sources examined in this research showed a low number of women in the supply pipeline. The pipeline refers the women and girls who are currently in training to prepare for an apprenticeship in the male-dominated trades. The low enrolment of female trainees and apprentices in male-dominated trade courses was evident in the ABS data, the NCVER school-based VET data and Apprentices and Trainees collection as well as through my observations of the schools.

More intensive research and evaluation of initiatives in geographical areas or specific companies in Australia, where targeted actions are occurring specific to that location or company, may identify above-average female enrolments (mature-aged women and/or school leavers) in male-dominated trade courses. For instance, a more detailed analysis of NCVER data to localise VET course or occupation information by geographic location, institution or sector could be conducted. It would require a significant allocation of time and resources; moreover, in the case of the NCVER database, it would require formal approval from
NCVER to access data at the level of training provider or institution. This task was not undertaken within the scope of this research.

No trade was identified in the course of this research as attracting higher numbers of female trade workers than any other. While there are noteworthy national efforts and initiatives within various industries—for example, the automotive industry through Auto Skills Australia’s Women in Auto campaign; the mining sector through Women in Mining Network; construction through the National Association of Women In Construction; and electro-technology through the E-Oz Energy Skills Australia annual women’s conferences—no noticeable change to the trade workforce was identified through the literature review, data analysis, or comments from industry leaders participating in the study. Nevertheless, it is a positive sign that increasing numbers of women are joining the male-dominated workforces more broadly in these industries, since this will provide a more supportive environment for women employees.

To monitor future trends in the gender composition of the trades, it is important that industry, government and the education and training sectors all support routine gender disaggregation of trade composition data and routine public reporting (Butler & Ferrerie, 2006; eSecurity4Women, 2014). Some industry peak bodies have, in recent years, collected and reported on gender composition of trades within their industry. For example, Auto Skills Australia (2014) has used their industry scan data as evidence of the need for continuing action to increase female representation in the auto industry. The Workplace Gender Equality Agency (WGEA) collects and reports on gender composition of organisations with 100 or more employees annually as per the requirements of the Workplace Gender Equality Act (2012). This annual reporting exercise has been criticised for being an impost on business, and WGEA’s own future is considered vulnerable. However, gender-equality advocates have
rallied behind WGEA and the legislation, arguing that to hold individual organisations accountable to workplace gender equality, through legislation and reporting of their progress on workforce diversity, is an essential step in achieving this goal (National Foundation of Australian Women, 2015).

During the course of this research, I was not aware of any industry peak body establishing targets for female representation in the trade workforce. Some industries have set targets for female composition overall, but this includes ‘white-collar’ and non-trade roles. E-Oz Energy Skills, an electro-energy peak association, hosts an annual women’s conference with industry representation from around Australia at which quotas for women are discussed (e-Oz Energy, 2014). At the 2015 E-Oz Energy Women’s Conference at which I presented preliminary results from this current research, participants suggested numerous actions, one of which was that targets for higher female composition of the male-dominated electro-technology trades be established. This was simply a conference recommendation, rather than a binding policy. The 2015 conference recommendations are not yet published by E-Oz Energy, but may be posted on their website as per the 2014 conference outcomes. It is commendable that E-Oz Energy Skills Australia facilitates these annual conferences where issues and action can be discussed. Individual organisations, such as Origin Energy, have set targets to increase the female composition of their workforce. These are primarily in management roles, rather than applying to trade occupations specifically.

6.4 Major Barriers Limiting Female Participation and Opportunities for Change

This section provides an outline of the five major barriers and eight opportunities for change selected for discussion. These are set out in Tables 12 and 13, and identify the level of influence or required action, as per the levels of the SEM.
Table 12

*Barriers Limiting Female Participation in the Male-Dominated Trades*

<table>
<thead>
<tr>
<th>Barriers</th>
<th>Level of Influence</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Limited public recognition of gender segregation of the trades as a problem that requires change.</td>
<td>Mainly structural factors in media and culture that reinforce gender stereotypes of careers. Requires action at all SEM levels.</td>
</tr>
<tr>
<td>2. The entrenched nature of gender stereotypes and their impact on career decision-making and the labour market.</td>
<td>As above.</td>
</tr>
<tr>
<td>3. The intimidation and harassment experienced or perceived by girls who pursue male-dominated subjects, courses and trades.</td>
<td>This results mostly from organisational level factors that perpetuate male-dominated organisational cultures.</td>
</tr>
<tr>
<td>4. The lack of knowledge female students have of the trades and of Maths as a pre-requisite to male-dominated trades.</td>
<td>Primarily individual and inter-personal level behaviours and attitudes of individuals, yet influenced by factors at other levels.</td>
</tr>
<tr>
<td>5. The lack of time and resources for career interventions, and limited gender aware career interventions, in schools.</td>
<td>Mostly priorities at the organisational level.</td>
</tr>
</tbody>
</table>
Table 13

Opportunities Identified in the Research to Overcome Barriers That Lead to the Gender Segregation of the Trades

<table>
<thead>
<tr>
<th>Opportunities</th>
<th>Level of Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Extend gender disaggregation and public reporting of data.</td>
<td>Macro (national) and (organisational or regional) level of data collection required.</td>
</tr>
<tr>
<td>2. Promote gender-disaggregated school-based VET data to schools.</td>
<td>As above.</td>
</tr>
<tr>
<td>3. More widespread use of STF for career development to foster systemic career development practice and policy.</td>
<td>Macro (national action by industry, government, media and more) and organisational level of action in schools and organisations.</td>
</tr>
<tr>
<td>4. Apply learnings from the break-throughs in gender stereotypes in sport and hospitality at the participating schools to the trades.</td>
<td>Macro (national planning and policy) and organisational levels of action required.</td>
</tr>
<tr>
<td>5. Elevate the importance of STEM subjects for female students, encouraging more to pursue a male-dominated occupation, including a trade.</td>
<td>As above.</td>
</tr>
<tr>
<td>6. Elevate action and awareness to engage young people, rather than relying on adult-led action.</td>
<td>All levels, with a focus on engagement of individuals through networks and communication.</td>
</tr>
<tr>
<td>7. Develop more gender aware education and training policies and career interventions.</td>
<td>Macro (national planning and policy) and organisational level.</td>
</tr>
<tr>
<td>8. Implement more systemic action across industry, unions, education and training sectors and government that is sustained and resourced through a national strategy.</td>
<td>System-wide action at all levels of SEM.</td>
</tr>
</tbody>
</table>

6.4.1 Barrier 1: Limited public recognition of gender segregation of the trades as a problem that requires change. A major barrier to reducing the gender segregation of the trades is its limited public recognition as a problem that requires change. It was evident in the
research interviews that school-based participants had limited awareness that female composition of male-dominated trades was around 2% (Australian Bureau of Statistics, 2014) and that it was not rising. While the students and school staff who participated in this research showed enthusiasm for the topic, they generally had limited awareness of the gender segregation of the trades. In contrast, the adults from career and industry associations clearly responded to the invitation to participate in this research due to their interest in advancing the issue. All adult participants were much better informed than the students about the trades and wage differentials between male and female-dominated trades. Without prompting, most adult participants were highly motivated to take action to encourage more female students into STEM courses and male-dominated occupations, including trades. Students were forthcoming with ideas for action when some of their peers spoke in favour of action being taken in the group discussion.

This research showed that it is possible to elevate public interest in the issue of gender segregation of the trades from the low level at which it currently exists. The agenda-building theory (Cobb & Elder cited in Maddaleno & Beinhauer, 2005) and policy analysis provided by (Wanna et al., 2010) described how public interest in, and action on issues is a political process. Social issues are not necessarily deemed problematic until public and media concerns are generated to prompt decision-makers into action. Advocates of reduced gender segregation of the trades have at times gathered evidence of the problem; raised concern through public reports and media, and sought action (eSecurity4Women, 2014, WGEA, 2015). This has not been sustained in a manner that has gained widespread interest, including from young people. However, it seemed evident in the interviews that when student and adult participants were informed about this issue, particularly the low female composition in the male-dominated trades, and the higher rates of pay that they attract relative to female-
dominated trades, participants expressed concern and felt it was a problem. In fact, discussion of and exposure to information about the trades prompted participants to raise many ideas for action within their own schools and beyond.

For “claims-makers” to be successful in obtaining public support and action on a given issue, evidence of the benefits of change must be argued and be made more widely available (Wanna, Butcher & Freyens, 2010). In my parliamentary career and in my non-government advocacy roles, I have experienced how this process can build momentum and generate widespread public support on issues such as domestic violence, homelessness and more. To date, there has not been a high level of recognition of gender segregation of the trades as a social problem that requires action.

**6.4.2 Opportunity 1: Extend gender disaggregation and public reporting of data.**

This research has shown the importance of maintaining a gendered analysis of the vocational education system and labour force, and to report on these gender differences publicly and routinely into the future. Feminist researchers and scholars continue to argue that gender-based reporting is essential in efforts to reduce inequality for women. The more the gender inequities in occupations and earnings are known and exposed, the more public evidence there is of the gender inequity to argue the case for change (Butler & Ferrier, 2006; eSecurity4Women, 2014; National Foundation for Australian Women, 2015; Workplace Gender Equality Agency, 2014). The role of the WGEA in collecting and reporting the gender composition of workplaces and gender pay gap information needs to be strengthened, not diminished. Gender differences are significant and ought to be exposed, not buried, in non-gendered data collections. This is the rationale behind the work of the WGEA and explains its requirement that large employers report the gender composition of their workforces to it annually. The WGEA also regularly analyses and reports on the gender pay
gap and wage differences between female- and male-dominated occupations. This has generated public interest and drawn attention to these areas of gender inequity. Routine reporting of gender-disaggregated data is needed to expose gender inequities. The main data collection agencies, such as the ABS and NCVER do not routinely report their labour force and trade course data disaggregated by gender. This means that gender-based information is not readily accessible to the public. Researchers with an interest in gender need to apply analytical tools to data collections to report on gender differences in trade courses and occupations. As this serves as a barrier to exposing the differential gender impacts and inequalities, there are continued calls for gender reporting of data to be routine and public (Butler & Ferrier, 2006; eSecurity4Women, 2014; National Foundation for Australian Women, 2015; Workplace Gender Equality Agency, 2014).

6.4.3 Opportunity 2: Promote gender-disaggregated school-based VET data to schools. It will be useful for schools to be readily able to compare their enrolment data for female students in male-dominated trade courses with the progress of other schools and state/territory or national averages. By having benchmarks and possible targets in place for the female composition of male-dominated VET courses, schools and education authorities may be more informed of the gender disparities and be better positioned to take action to address them. In this way, the gender differences will not be hidden (Butler & Ferrier, 2006).

6.5 Why So Few Young Women Pursue Male-Dominated Trades

Many factors that contribute to the low female representation in the male-dominated trades were raised in this research. This was anticipated, as the division of labour on the basis of gender has been attributed to a wide range of individual and structural factors. Economic or structural theories on occupational segregation, feminist theories, and theories on gender
formation, career development and social change have all contributed to the understanding of the phenomenon of the gender segregation of the trades.

Economic and human capital theorists specifically explain occupational choice and differential wages as products of rational decisions, within a labour market and culture that create different gender roles in social reproduction (Becker, 1993; Polacheck, 2004). This research did not explicitly seek to test or apply these theories. The qualitative interviews did provide some support, however, for the view that economic theories are limited if they do not also explain the impact of sex stereotyping and why gender segregation persists despite the ability of women and men to do similar work (Anker, 1997). It was apparent that gender roles are ascribed to occupations, and that these are very influential on the views of the female students. In particular, research that incorporates a feminist analysis captured the gendered nature of the barriers evident in this study more so than the neo-classical economic theories on occupational segregation (Anker, 1997; eSecurity4Women, 2014; Game & Pringle, 1983; Human Rights Commission, 2013; Watts, 2003). These main barriers were as follows: (1) the limiting impact of gender stereotypes; (2) the intimidation felt (or perceived) by the female students from male students and employers if they pursued a male-dominated trade or course; (3) lack of knowledge of the trades and knowing the importance of doing Maths; and (4) the lack of time and resources for more gender aware career interventions. The lack of public awareness and policy attention to gender segregation of the trades and the lack of breakthrough action makes it very difficult to shift these barriers.

In each of the four groups, female students made comments to the effect that the option of a male-dominated trade as a career was something that “we had not thought much about, because ‘they are jobs for boys’”. These responses were unprocessed; that is, they were discussion starters with the groups, lacking the depth of understanding that emerged
from the interaction in the group discussions. The group discussions prompted the students to think about their own individual experiences and views as well as wider societal factors that result in them not thinking or knowing much about the male-dominated trades. Adult participants had more awareness of this complex range of factors than students, but they too were prompted to think more broadly through their interviews.

The systems frameworks (Ford and Lerner, 1992; Meyer, 1993, cited in Healy, 2005) and STF of career development (Patton, McMahon & Watson, 2006; Patton & McMahon, 2014;) proved helpful in guiding the group discussions and in the research analysis, to expose the range of factors that operate at many levels to deter, rather than attract young women to the male-dominated trade careers. Beneath the student response— “we had not thought much about, because ‘they are jobs for boys’” —lay, deeply embedded in our culture and community life, many barriers inhibiting female awareness of, and interest in, the male-dominated trade careers. Like other research, this research found variable results with respect to gender differences in career aspirations, but through the student narratives the early years influence of gender differences and stereotypes in embedding a sense of typically male and female jobs was clear, leaving little doubt that this contributes to a segregated trade workforce.

6.5.1 Barrier 3: The entrenched nature of gender stereotypes and their impact on career decision-making and the labour market. The pervasive influence of gender stereotypes and gender inequality identified in this research indicated that theories explaining gender segregation of occupations will be most relevant with a gender or feminist analysis applied to them. The argument that neo-classical economic theories do not take sufficient account of gender inequality gained some currency in this research. According to neo-classical economic and human capital theorists, gender divisions are primarily due to the
following: (1) the needs of a market-based system for a primary, high-skilled workforce and a secondary labour force (predominantly women who take on the greatest share of home-based caring responsibilities); and (2) the differing levels of investment men and women make in their training and education, based on their anticipated returns (Becker, 1993; Polacheck, 2004). These perspectives retain wide support. In the absence of a gender or feminist analysis, these theories are criticised as being unlikely to fully expose or challenge the inequalities for women and the limited choices of women in the labour market (Anker, 1997; Game & Pringle, 1983; Ryan & Conlon 1989; Watts, 2003). The relevance of this critique to this study was apparent, as rational investment choices about the future income and prestige of occupations appeared less influential on the female student participants than gender stereotypes (the macro-level influence).

It is widely recognised that at the macro level, the capitalist market systems have generated significant labour market divisions and inequity. This may be deemed rational or expected. From a feminist analysis, these gender differences and inequities that result from occupational segregation are not accepted as fair or efficient (Blau, Ferber & Winkler, 2006; Cockburn, 1991; Walby, 1986). Many of the female students interviewed seemed to accept these gender differences with a kind of “this is the way things are” attitude. Interestingly, when some female students spoke up in the group to say that girls do not have to accept what are considered as “girls’ jobs and boys’ jobs”, and when they were presented information on the gender pay gap, the discussions seemed to prompt some students to think further on these issues.

While student participants in this research commonly expressed the attitudes that they feel free to choose their careers, their behaviour was gender-stereotyped in their subject choices and career aspirations. This is consistent with the youth attitudes survey conducted
by Tinklin et al. (2005) in which students indicated that they are free to choose their careers, and that males and females should have the same opportunities in careers, yet their career decisions were highly gendered. From a feminist standpoint, it is likely that the concept of choice would be challenged with the argument that girls are not choosing careers or subjects as freely as they ought to. In many ways, this research has shown how the impact of gender stereotypes and associated inequality for females are significant barriers that limit their career and subject choices. This issue of “free to choose, but” was identified in the findings. I observed female participants expressing confidence in their capacity to choose any career, yet, as the discussions progressed, it was evident that many barriers were limiting their choice. The early influence of gender stereotypes on career decisions was exposed by Sikora and Saha (2011) in reporting that by Year 10 the career expectations of students are gender segregated. The career expectations of girls commonly include child care, psychology, tourism, journalism and nursing, with boys commonly expecting careers as computer technicians, engineers or motor mechanics (Sikora & Saha, 2011). The observations from staff were consistent with these research findings.

A major issue discussed in response to Research Question 2 was the powerful influence of media and cultural norms, operating at the macro level, in determining what the expected subjects and jobs for girls and boys are. In our discussions, female students stated that gender stereotypes perpetuated through media and popular culture influence what are “girls’ jobs” and those “more for the boys”. This study has reported on research indicating that career aspirations and decisions of children are determined largely by the gender role ascribed to occupations and the prestige of occupations, with male-dominated occupations carrying more prestige (Gadassi & Gati, 2009; Teig & Susskind, 2008). Expected income and prestige of occupations was not discussed in any detail in any of the four school groups.
However, the female students most commonly referred to pursuing a job that they are interested in or one in which they can help others, rather than for reasons of money or prestige. They described their interest in service professions and vocations, more than occupations in science, technology, engineering or maths. This is consistent with research showing that the majority of students have a preference for academic aspirations and pathways, and that female students prefer female-dominated occupations (Clarke, 2013; Sikora & Pokropek, 2012; Patton & Creed, 2007). As identified in the career development literature, it may no longer be the case that girls’ aspirations are typically lower than boys (Howard et al., 2010) but their aspirations and outcomes are influenced by gender norms.

The school-based adult participants stated that subject choices are set along gender lines by Years 8 to 10. The adult participants who raised this as a problem considered it to be limiting student opportunities. This experience is consistent with academic research showing the pervasive impact gender stereotypes, fostered in the media and popular culture, have on limiting careers decisions of young people at a very early age (Gadassi & Gati, 2009; Sikora & Pokropek, 2012; Smith, Choueiti, Prescott & Pieper, 2012; Teig & Susskind, 2008). Initially, participating students did not identify gender stereotyping of subject choices or careers as a problem. However, when these issues were discussed and processed further within the group discussions, students seemed to better understand the implications for career choices if Maths and Science were not pursued successfully through to Year 12.

The staff at the participating colleges who were aware of, and keen to challenge, gender stereotypes were taking action to encourage girls into male-dominated pathways and subjects. Those who expressed a more gender-neutral position (that is, boys and girls are free to choose, no specific action is needed) appeared to be offering little that was different to existing norms and stereotypes for female students. The positive strategies at each of the four
PAVING THE WAY FOR GIRLS INTO MALE-DOMINATED TRADES

schools included try-a-trade days for female students offered by VET co-ordinators, and the policy to make Maths through to senior years compulsory for all students.

The research showed the important role that positive media images of women in non-traditional occupations can have. Participants spoke of the predominance of male characters as trade workers, with female “tradies” rarely depicted. Students and adults spoke of how this contributed to the common view that trades are mostly pursued by boys who are not academic achievers. A number of staff in participating schools attributed lower female Maths enrolment, the gender segregation of subject choices by Year 10, and lack of female enrolment in male-dominated trades to the lack of positive non-traditional media images for girls and the gender stereotypes held by parents and the wider community. Several students and staff mentioned the media recruitment campaigns by the Australian Defence Force (ADF) that contained images of women and men and praised it for appealing to women because of its positive images of women. I viewed these campaigns after the interviews. The fact that they were recalled by participants and that some staff and students contacted ADF recruitment staff for more information is a sign that positive media images of women in male-dominated careers can influence the thinking of young women. The positive impact of role models and mentors on young people, is reported in research (Grossman, Chan, Schwartz, & Rhodes, 2011, cited in DuBois et al., 2011; Payne, Reynolds, Brown & Fleming, 2002), with advocates of change calling for more positive, non-traditional role models for young women (eSecurity4Women, 2014; WGEA; 2015).

At the inter-personal level of influence, supportive parents—particularly fathers with a trade background—were reported as being a major influence on girls who chose a male-dominated career and were succeeding in it. A number of female students at each college spoke of the positive role that their fathers had played in their choice of a male-dominated
Paving the Way for Girls into Male-Dominated Trades

Trade career. The significance of supportive parents, and especially fathers, has been reported in previous research (Archer et al., 2013; Fuller et al., Delaney & Ralston, 2010; Shewring, 2009).

All adult participants recognised that girls have the capability to do all trades. They cited the success of girls in male-dominated courses and try-a-trade days as evidence of this. A barrier operating at the micro or individual level for some female students in this research was their own expressed lack of experience and ability to do the trades. The self-efficacy of these students— their judgement of their capabilities to organise and execute courses of action (Lent & Brown, 1996; Rogers & Creed, 2011)—was discouraging them from considering a male-dominated trade career. These female students were weighing up how well they may achieve in a given role, whether they would like it, and how it would affect their self-identity (in some cases, whether they would be considered as gay or “butch”). As proposed by proponents of Social Cognitive Career Theory (SCCT), early exposure to tasks (in this case, the tasks and tools of the male-dominated trades) and the positive reinforcement that may result from this could help young women to gain confidence in their abilities (Betz & Hackett, 1997; Creed, Patton, & Prideaux, 2007).

These identity and confidence considerations seemed more of a concern to the participating students than the income that the future job would attract or what their parents thought. Only a small number of female students openly expressed their desire to pursue a male-dominated career and do what they wanted, not was expected of them as girls. Some of these students were choosing male-dominated trade pathways. Others were choosing an academic path with a view to a STEM-based career. It was clear from participants that exposure to capable women in male-dominated trade roles in the media and at school can help to build self-efficacy and more favourable perceptions that trades can be for girls too.
6.5.2 **Barrier 3: Intimidation and harassment experienced by girls.** In this study, the adult participants and, to a lesser extent, the students spoke about how girls can be discouraged from pursuing the male-dominated trades due to perceived or real experiences of harassment and intimidation from male employers. Participants noted how parents of girls, and girls themselves, are put off the male-dominated trades due to the risk of girls being taunted as “butch”. These experiences operate at an inter-personal and organisational level, yet they arise from macro or wider cultural beliefs about the inferiority of women and the cultural expectations on women to be feminine, rather than masculine or butch. In stating that they would be seen as “butch” or not feminine if they worked the male-dominated trades, several girls were showing that these trades were in conflict with a female or feminine identity. This was causing them to exclude the male-dominated trades from their list of potential careers. As identified by Gottfredson (1981, 2002), this is a longstanding practice, with the socialisation of young people into gender roles causing some to eliminate career choices that conflict with that gender identity. There was a view among female students at each college that they would feel intimidated if they enrolled in subjects and courses with mostly male students. Several supported this sentiment, using examples of their own experience of being the only female in particular classes.

While perceptions of harassment may exceed reality, there is no reason to suggest that young women in this current study who follow a male-dominated career will not experience discriminatory employment practices of employers, put-downs, or direct emotional or sexual harassment, as reported in existing research (Bimrose, 2004; Fuller, Beck & Unwin, 2005; Women in Male Dominated Industries 2010; Shewring, 2009). It was encouraging, however, to find that lesbian employees in male-dominated jobs in the UK reported that, while experiencing their own feelings of indifference, the more direct negativity came from a small
number of men. The majority of men were reported as generally supportive of female colleagues (Wright, 2011). Given the historical subordination of women in workplaces, negative treatment of female colleagues by employers may not be easily overcome until a critical mass of women assume roles in these workplaces.

6.5.3 Barrier 4: Lack of knowledge of the trades and knowing the importance of doing Maths. Very few female students in this research knew much about the male-dominated trades or the prerequisite nature of Maths for entry into these trades. The limited knowledge of and lack of exposure to male-dominated trades operating at the individual level for the female students are primarily due to the macro-level influence of gender stereotypes. Industry participants in this study stated that negative perceptions of the male-dominated trades conflict with the contemporary skills required for these trades, especially the reliance on computer-based technologies and high-level Maths knowledge in auto and many other trades. Industry skills analyses demonstrate the need for industry recruits to have high levels of competence in STEM as their industries are highly skilled and technologically advanced (Auto Skills Australia, 2014; Minerals Council of Australia; 2013). It was clear that few student or school-based participants were well informed of the realities of the improved workplace health-and-safety practices, academic requirements, and technological tasks that exist across many of the male-dominated industries.

The significance of increasing female enrolment and competence in STEM courses/subjects to reduce occupational segregation is gathering momentum in research and education policy. Contemporary research findings that have exposed the way in which, at an individual level, girls under-score their Maths competence and self-select away from Maths (Correll, 2001; Schmader et al., 2004; Sikora & Pokropek, 2012) applied to this study. The four participating colleges reported a lower (yet increasing) number of female students
enrolled in higher level Maths relative to males. Both the staff at the colleges and other participating adults primarily attributed this to the following reasons: (1) incorrect assumptions (and parental views) that males are more capable at Maths; and (2) the lower self-concept and confidence that female students have for Maths and Science due to these cultural beliefs. Staff cited examples of mothers promoting Maths as unnecessary for their daughters, stating that they were doing a disservice to their daughters.

It was not possible to make firm assessments on the significance of Maths from the perspective of the students in this study. Many of the participating female students were themselves enrolled in Maths and they had little to say on this topic. Adult participants had much more to say about STEM subjects, raising the need for strategies to encourage higher levels of female participation in STEM subjects to generate pathways into STEM-based careers for more female students. Several staff indicated that career interventions needed to be more effective in overcoming the prevalence of the “Maths/Science is for boys” view, identified as the “girl-nerd” factor by Sikora (2013).

There was limited knowledge among the students of the higher earnings in the male-dominated trades relative to female-dominated trades, such as hairdressing. From a human capital perspective, anticipated income and return on investment in training and education are factors that are considered as influences on career choice (Becker, 1993; Polacheck, 2004). While students did not raise anticipated income as a major influence, it seems important for their future economic security that income is given a higher priority in their considerations. Knowledge on the gendered nature of income differences is also an important step in overcoming future gender inequalities at work and the gender pay gap. I am aware that I am looking at this through the wisdom of adult eyes and my feminist lens. Few students in this
research appeared to use or be aware of the availability of this information through
government websites, such as *MyFuture*.

6.5.4 Barrier 5: The lack of time and resources for career interventions. Through
the interviews in this research, individual and external influences on the career exploration of
students became apparent. Participants raised elements of the individual system of influence
(such as self-confidence, self-efficacy and gender); the social system of family and peers; and
cultural influences, including media portrayal of girls. In addition, several students spoke of
random occurrences (McMahon, 2014) where they had a chance meeting with a future
employer or support person, who encouraged them to try out something new. Career
interventions need to be able to assess this range and encourage students to think systemically
(McMahon et al., 2015). Career counsellors can then “…consider clients in the context of
their complex dynamic relationships with their systems of influence which are accounted for
by the stories the clients tell” (McMahon et al., 2015, p.150). This all takes time. Within the
school contexts observed in this study, career advisers and guidance officers were time poor.

It is proposed that these influences, identified in the student narratives, are recursive
(Patton & McMahon, 2006, cited in McMahon, 2014). That is, they are interconnected
“within and between all elements of the system and also between systems” (McMahon, 2014,
p. 22). For example, this recursiveness could be seen in students identifying ambivalence
about male-dominated trade careers because of negative stereotypes (primarily external
factors), causing fear of being intimidated and low self-confidence. Yet, they also showed a
willingness to participate in a try-a-trade experience (primarily individual factors). It is this
interaction among influences that can usefully be explored and exposed through career
learning and interventions in a manner that helps students to overcome any limiting
influences, such as gender stereotypes.
While STF identifies multi-level influences on students, school staff participants in this research were emphatic in expressing their own approach to careers with students as one in which they are encouraging, not influencing students. The term influencing students was expressed as a negative concept by school staff participants. In contrast, adult participants external to the schools used active language in our interviews, such as their efforts to engage, excite and influence students. They explained their use of this active language and action as necessary to overcome the misconceptions and negative attitudes that both adults and young people generally have about the trades. It seems essential that adults who have a significant role in assisting young people with subject and career choices are equipped with well-developed knowledge of all careers, including the skills and pre-requisite subjects required and general industry data on job vacancy rates and earnings across sectors. Online resources provide ready access to this information for students, educators, industry and the public. Encouraging students to this factual information would not appear to “cross the line” into influencing students. Overall, school-based staff considered their school cultures to be non-gendered. They accepted, however, that inequities exist and that their intervention is needed to facilitate access to information and opportunities for female students about the male-dominated trades. They expressed a duty of care, however, to do this in a manner that did not unduly influence or favour one student or group of students over another.

Interestingly, the term “influence” was deliberately chosen by McMahon, Patton & Watson (2005) in developing STF:

as it does not carry positive or negative connotations, but rather affords individuals the opportunity to ascribe their own meaning to each influence. In addition, influence is a dynamic term capable of reflecting both content and process components of career theory. (p. 8)
In this, McMahon et al. (2004) refer to influence as a noun, rather than a verb (to influence) as expressed by the school staff participants. The interesting point to note is that McMahon et al. (2004) assert that influence does not have a positive or negative connotation. I remain puzzled as to why school staff across the schools were adamant about not being seen to influence students. It seems apparent that encouragement alone is not likely to be sufficient to overturn the powerful influence of gender stereotypes and other barriers. Influence through active language and targeted action, that is evidence-based, is needed.

6.5.5 Opportunity 3: More widespread use of STF for career development to foster systemic career development practice and policy. This research indicates that approaches to career interventions are likely to be most effective in supporting career exploration for students if they:

1) Identify the systemic influences on students’ career decisions, such as culture, socio-economic status, family, and self-confidence. The STF as a meta-framework is a helpful tool in career guidance practice and could usefully be applied more widely (McMahon, 2014; McMahon, Patton & Watson, 2005).

2) Promote gender awareness and challenge any limiting factors, such as gender-stereotypes.

3) Introduce career learning in the early years of schooling within a life span learning approach (McMahon, Patton & Tatham, nd)

4) Are resourced and prioritised at a high level by governments and education authorities within a national framework (CCDA, 2015; McMahon, Patton & Tatham, nd).

This research provided some support for the view that education and training systems will be limited in identifying and addressing the many barriers to female participation in male-
dominated trades if they do not adequately incorporate an analysis of the many individual and external influences on their career aspirations and decisions. Understanding and responding to gender differences and their impacts in career interventions and subject choices, is an important element to career interventions. The *My System of Career Influences* developed by McMahon, Patton & Watson, (2005) as a guide for career practitioners is the kind of tool that can be helpful in aiding systemic career interventions with individuals.

Adult participants in this study stated that innovation in career interventions in schools will require a significant expansion of current resources allocated to this area of education. In the Australian context, school-based career interventions are far from the aspiration set by Hooley (2013) that places career “at the heart of education rather than tacked on as an after-thought” (p. 2). The *Australian Blueprint for Career Development* signalled a new era in national attention and funding to boost standards and accessibility to life-long career supports in Australia. Following a change to a conservative federal Government, this new era may be short-lived. In Australia concern has been raised about recent funding cuts to major new initiatives - the *Job Guide* and *MyFuture* (CDAA, 2015). It was evident that career staff in schools were enduring significant workloads, including classroom teaching responsibilities – few were full time career staff. Concerning trends have also occurred in the UK under conservative governments with less reliance on career interventions provided by schools, with more focus on adult career services run through a company structure (Hooley, 2015b).

An effective national career strategy will require higher levels of recurrent funding. And bi-partisan commitment to an enduring strategy. It will also require gender disaggregation of available data and the evaluation of gender differences in educational outcomes in subject and career choice for students (Association of Women Educators, 2014;
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Clarke, 2014, 2012; eSecurity4Women 2014). There are national and international policy and data collection initiatives aimed at identifying and reporting on the participation and success of female students in STEM subjects and careers. These need to be strengthened and monitored, as competency in Maths is a pre-requisite to male-dominated trade careers (Correll, 2001; Sikora & Pokropek, 2012). Feminist activism and research have forged some of the notable breakthrough actions that have led to increased female participation in higher education, professional and management roles. Rather than thinking that the job has been done—that girls are succeeding in education—and there is no longer a need for gender-specific or gender equity policies, this research provides some impetus to persist with these gender-aware actions in career learning from the early years of schooling.

Early-years career learning has been reported as helpful in overcoming gender stereotypes of careers in primary-school-aged children (Department of Education, 2010; eSecurity4Women, 2014; National Union of Teachers, 2012). The review of early-years career development in the UK (Hooley, 2015) and the NSW Department of Education and Communities (2014) indicated that early career exploration helped to engage children more in their learning. Several school-based participants in this research made comments showing their support for the introduction of more early-years career learning. Strategies to enable more gender-aware career interventions in Australian schools are detailed by eSecurity4Women (2014).

An opportunity exists as girls are not dismissing the male-dominated trades—they want more trade information, experience, mentors and role models. A significant finding of this thesis is that girls are not ruling out the trades because they do not like them or think they cannot do them; rather it is because they do not have enough information or exposure to make an informed decision. Student and adult participants spoke of the benefits that female
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students were likely to gain from improved career supports, role models and mentors from industry. Other research has found that more girls will consider male-dominated trades careers if they have greater exposure to them, and if individual and structural barriers can be overcome (Shewring, 2009; Wright, 2011). Young people can be encouraged and supported to adopt new behaviours or participate in activities, when guided by positive role models and mentors—particularly when the mentoring has been longer term (Grossman, Chan, Schwartz, & Rhodes, 2011, cited in DuBois et al., 2011; Payne, Reynolds, Brown & Fleming, 2002).

An industry participant in the research described the positive benefits of a social media campaign run by Auto Skills Australia that offers industry mentors and scholarships to women and girls. Participating colleges were running career expos, work experience and try-a-trade days, but only occasionally were industry mentors visiting the schools. A number of staff at the colleges initiated the idea of introducing trade scholarship programs for girls to spark their interest in male-dominated trades.

Several staff and students also spoke of the positive media influence of the ADF television and cinema recruitment advertising running in 2014. They described how the advertisements portrayed male and female officers in exciting roles and leadership positions. Several students reported this positive media as influential in them thinking that these were jobs for girls too. Similarly, staff spoke of how important this gender-balanced recruitment advertising was in attracting women and girls. Researchers have called for more positive media role models to break down gender stereotypes, and for these to be accessible to children from their early years (eSecurity4Women, 2014; Ford, 2011). In 2015, economic Security4Women received federal government funding specifically to establish a national website showcasing role models in non-traditional trades for secondary students.
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It was clear that while the female students knew little about the male-dominated trades at the commencement of the interviews, they participated in a lively manner and were forthcoming with ideas on why they felt so few young women were pursuing careers in male-dominated trades. The challenges will be to overcome the apparent lack of impetus shown by students in taking action on the issue themselves and the powerful way in which gender stereotypes of work seem to hinder career advisers, parents and others from informing girls about, or encouraging them into, the male-dominated trades. It is apparent from the student narratives that the professions carrying more prestige, and that are viewed as more acceptable by parents and teachers are those that young women to aspire to. Career services can play a greater role in promoting understanding of the high level academic requirements and skills required for male-dominated trades.

6.5.6 Opportunity 4: The breakthrough in gender stereotypes in sport and hospitality. Several staff and students spoke positively about the breakthrough in gender stereotypes seen in hospitality (boys enrolling in greater numbers in hospitality and cooking) and sport (where more girls were playing male-dominated sports) at their schools. Female students across the colleges were participating in rugby league, rugby union and AFL, and staff at three of the four colleges acknowledged the increasing numbers of male students enrolled in hospitality at their colleges. Participants indicated that there are significant learnings from sport and hospitality to create breakthroughs in gender-stereotypes in the male-dominated trades. The participants who spoke on these breakthroughs attributed them to the following: (1) media role models of “cool” male celebrity chefs influencing boys in a manner that promotes cooking and being a chef as a desirable pursuit; (2) junior sports development and the role models who have gained public acceptance for girls to play male-dominated sports; and (3) the non-gendered approaches fostered at their colleges. The
availability of literature was limited on these areas. More detailed searching than I undertook for this research may uncover links between male celebrity chefs and male interest in hospitality, and the influence of female role models in male-dominated sport on increased participation of girls in male-dominated sports. Positive change appears to require creative campaigning (such as the use of social media and advertising) and early-years intervention, as is the case with gender-inclusive junior sports development. The early-years sports development has encouraged and enabled boys and girls to play traditionally male sports through junior game design changes and practices that have been inclusive of girls.

6.5.7 Opportunity 5: More female students to complete advanced Maths at school. Unless female students gain high level competence in Maths, they are unlikely to pursue a male-dominated STEM-based career, including a trade (Blau et al., 2012; Correll, 2001; Sikora & Pokropek, 2012). This present study was not designed to examine cultural beliefs about Maths in any detail, but it identified that the participating colleges put a high value on the subject. Maths study is compulsory in the four schools and female students are encouraged to pursue advanced Maths through to Year 12. By placing a high value on Maths for all students, at all year levels, the participating colleges were taking steps to overcome the cultural beliefs that males are more competent at Maths and that it is more useful to males than females. A number of adult research participants suggested that this high value on Maths and the goal to achieve higher female enrolment in it are not necessarily accepted by all parents, staff and students. To change these stereotypical cultural beliefs about Maths, continuing action by education authorities and career advisers to promote STEM subjects to female students, as well as initiatives within individual schools, will be required.
6.6 New Action to Increase Female Participation in the Male-Dominated Trades

This section categorises suggested actions from the research using the five levels described in SEM (see Figure 8). Given the significance of career development to this research, the discussion also draws on the analysis derived from the use of STF for career development to set out ideas for future approaches to career interventions for students. Finally, in recognising the importance of youth engagement in future actions, the discussion also features principles and actions to work effectively with young people on change.

This research was consistent with developments in the broader field of occupational segregation that demonstrate that action to reduce segregation needs to be informed by theory and evidence from multiple disciplines and theoretical perspectives. Both adult and student participants offered an abundance of ideas for action, including the following: (1) to overcome the limitations of gender stereotypes on the self-image of students, subject choices and careers; (2) to improve attitudes of industry and employers to female apprentices; and (3) to improve resources available for career advice and vocational education within schools.

Adult and student participants identified barriers that limit female participation in the male-dominated trades from within many areas of our social, cultural and economic life. Students provided insights into the influence of the media and gender roles on their career plans. As expected, adults showed their understanding of how organisations such as educational institutions can perpetuate the problem and contribute to its resolution, particularly with better resourced career intervention and VET in schools.

**Actions at the individual and interpersonal level.** The individual and interpersonal levels of action in the SEM include characteristics of an individual that influence behaviour change—knowledge, attitudes, behaviour, self-efficacy, gender, racial/ethnic identity, economic status—and the role played by those in their social networks, such as parents, peers.
and teachers (UNICEF, 2014). Participants suggested many actions at both the individual and interpersonal level to prompt behaviour change. Female students suggested the following: (1) that they could try a trade or do trade work placement; (2) that male and female students could be supportive, not judgemental, of girls who pursue male-dominated trades; (3) that role models and mentors could be introduced more into schools; and (4) that students could access more information on trades via the MyFuture website and other online resources. It was also suggested that school staff could advise students about the opportunities available in male-dominated trades in the annual meetings that shape the student’s individual Senior Education and Training (SET) Plan. Parents who hold misconceptions about the trades only being for boys were also encouraged to get a better understanding of contemporary attitudes, workplaces and skills required in these jobs. In this research, the Social Networks and Social Support Theories pioneered by Bauman and Ennett (1996) are helpful in explaining the influences of peers and significant adults on career decisions of young people. The use of networks, including social media networking, was raised in the research. This will be an important area for promoting trade careers information in an accessible manner for young people. Auto Skills Australia (2015) is an example of an industry association making good use of social media in promoting the auto trades and auto trade scholarships.

The youth social change literature indicates that interventions and change outcomes will be most successful when “young people are part of the solution to the difficulties they face, not merely a problem to be resolved by others” (United Nations, 2003, p. 271) or similarly when young people “become agents of change instead of targets to be changed” (Centre for the Study of Social Policy, 2007, p. 5). The significance of these principles was evident in this present study. The qualitative method employed in this research facilitated the participation of young people so that their views could be central. They were not actively
engaged in research design, decision-making or dissemination of findings, yet they actively contributed to group interviews when presented with that opportunity. It became evident as the research progressed that actions to reduce gender segregation of the trades would be more effective if young people were initiating and/or sharing decision-making and responsibility with adults (Treseder, 1997, cited in Kellett, 2011, p. 4; United Nations, 2005). This active level of participation in research and action can lead to young people taking greater ownership of research outcomes and the change process.

Behaviour and social change literature provide extensive information and practice examples that show how difficult it can be for young people to be actively engaged in change processes, yet how rewarding it can be when the youth engagement is given priority (Maddaleno & Beinhauer, 2005; United Nations, 2003, 2005). Overall, the message is rather than being apathetic, many young people are “cause-oriented”, directing their efforts towards specific issues that are of relevance to them (Beadle, 2011 cited Youth Affairs Council, Victoria, 2011; Harris, Wyn & Younes, 2007; World Youth Report, 2005). Young people are participating in and having their say differently through creative mediums—popular culture, music, online petitions and social media (Baer, 2012; United Nations, 2005; Youth Affairs Council, Victoria, 2011, p. 5). International campaigns promoting youth safety and sexual health using creative and social media are reporting positive results in engaging young people (Maddaleno & Beinhauer, 2005; United Nations, 2003, 2005). For example, the United Nations (2005) reported positively on the involvement of youth “in media-driven transnational activism through new forms of creative, open and non-hierarchical channels of cyber-participation” (p. 74). The Communication for Development (C4D) approach that uses advocacy and social mobilisation with large populations of young people and communication strategies, including social media (UNICEF, 2015), provides ideas for action with young
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people on breaking down gender barriers and opening access to the male-dominated trades for young women.

It is a number community, government and industry leaders who have sought change on gender segregation of the trades, rather than their being a ground-swell of community action. Yet when the participants in this study were exposed to issues relevant to gender segregation of the trades, they expressed concern and were forthcoming with ideas for change. The secondary students, educators and industry participants considered the increased participation of female students in the male-dominated subjects, courses and trades to be worthy because of the benefits it will bring—particularly for girls and women. Most of the adult participants in the research showed that they were ready and willing to do more to interest and inform female students about the male-dominated trades. However, they lacked the ability to implement consistent substantive change due to lack of time and resources. Female students themselves were forthcoming with ideas for encouraging more girls into male-dominated trades, but there was little sign that they would follow through on these actions unless supported by a teacher or unless they had initiative and a keen interest.

The most challenging task appears to be the engagement of young people. Students canvassed in this research did not indicate that they would take much action themselves. Mostly, their suggestions for action were directed at other adults and organisations. The research process was limited in not providing any structured follow-up; I only provided informal follow-up to VET staff by providing them with scholarship information and summaries of my research findings during the course of the research.

• Community and Organisational Levels. These levels focus attention on the relationships among organisations, institutions, and networks and the rules and regulations of organisations. There were abundant ideas for action on how the education, VET and industry
sectors could take action to better inform, and engage young women in career opportunities in the male-dominated trades. School-based staff wanted to develop better industry links to attract mentors and role models into schools, yet expressed concern about the lack of time and resources they had available for this. Adult participants external to the participating schools spoke of the benefits of industry associations in actively welcoming, recruiting and retaining female trade workers by fostering work cultures and work practices that did not lead to harassment or intimidation for women. The need for collaborative, cross-industry action was raised by many adult participants. This is consistent with previous research in Australia and internationally (Equal Opportunity Commission, 2004; eSecurity4Women, 2014; Human Rights Commission, 2013; Trade Union Congress, 2013).

The valuable role that professional networks and social networking among young people could play in raising the profile of career opportunities in the male-dominated trades was identified in this study. The Auto Skills Australia social media Women in Trades campaign is a useful example, yet based on input from a study participant, the strategy is not receiving high volume take-up from employers and young women. The significance of interpersonal communication in spreading innovation, the importance of peer–peer conversations and peer networks, and opinion leaders and understanding the needs of different stakeholder groups have been raised in communication theories, such as Diffusion of Innovations Theory (Robinson, 2009; Rogers, 2003). These have been applied to youth public-health campaigns with some success (Maddaleno & Beinhauer, 2005). The promotion of new ideas is likely to be most successful where there are high profile, trusted innovators of the idea and, while “advertising and media stories may spread information about new innovations . . . it’s conversations that spread adoption (Robinson, 2009, p. 2). This suggests that young people need to be engaged and active in the development of campaigns for
conversations to develop among themselves. In the UK, the #notjustforboys social media campaign launched by the Employment Minister has the potential to attract attention and support of young people. Yet, to date, the main adopters of the campaign appear to be industry representatives.

- **Policy/Enabling Environment.** This level of action relates to local, state, national laws and policies, including policies regarding the allocation of resources for education, VET, industry and labour. Adult participants in this study external to participating schools suggested tripartite action was needed, with industry, government and the education and training sectors working together to reduce the gender segregation of the trades. Participants external to the schools spoke of their work in lobbying government and industry bodies to attract enduring, not simply one-off support and funding for social media campaigns that promote male-dominated trades to women and girls. A common message was that one-off funding and support is insecure and insufficient to sustain positive change. The NSW Women in Trades industry pledge, career resources and funding to community activities were cited by some participants as examples of government setting a policy agenda then facilitating collaborative action.

  My review of the literature also revealed that the UK experience of targets to employ women in non-traditional occupations, which are aligned to procurement policies, are increasing the employment of women in these occupations (Olympic Delivery Authority, 2010; Wright, 2014). In her research on the construction and transport industries in the UK, Wright (2011) noted that “change in these sectors has not come about without political will, supported by targeted and funded activity” (p. 27).

  It was noteworthy that the preferred, and commonly raised, approach to gender issues in the participating schools was the concept of the “non-gendered” school. This contrasts to
the former, predominance in education policy of gender equity in Australia. Gender equity is
grounded in feminist theory and identifies girls and women as a group experiencing
significant inequality and disadvantage relative to men that requires specific attention
(Delaney, 2009). The non-gendered approach spoken of in each of the participating schools is
intended to place an equal value on both males and females. The risk is that it can mask
gender differences in education and training. It can act as a barrier to identifying gender
segregation of the trades as a problem that is worthy of attention. Gender-equity units and
policies in education gained support over two decades ago. They actively promoted the need
for schools to monitor gender differences in subject and course enrolments and educational
achievement for female and male students. Calls for the re-emergence of gender-equity
policies and programs in education to better understand and respond to gender differences
and inequity have been maintained (Butler & Ferrier, 2006; Delaney, 2009;
eSecurity4Women, 2014; Keddie, 2004). The concept “engendering education” has been
raised by the Association of Women Educators to reclaim the focus on gender-equity policy
(Delaney, 2009). Yet, non-gendered approaches have prevailed in Australian schools. The
decline of gender equity in education and the emergence of gender mainstreaming appear to
be trends common to developed nations. This is not consistent with international action with
developing nations where gender-equity strategies have been prioritised to improve access to
education and educational success for girls specifically (International Labour Organization,
2014; International Monetary Fund, World Bank & OECD, 2014; UNESCO & UNEVOC,
2011).

Some adult participants spoke of the positive way in which affirmative action policies
in Australia had raised the number of women in male-dominated areas of work. Regulating
industry behaviour rather than relying on voluntary action through affirmative action and
related legislation generates robust debate. Governments in Australia can regulate change through legislation, such as the Workplace Gender Equality Act (2012), when they are seeking uniform, national behaviour or data collection and when voluntary participation is not likely. To counter industry efforts to dilute the powers in the Act, equality advocates are lobbying to retain the workforce gender composition and earnings national reporting requirements on industry required under the Act (Department of Employment, 2014a; Equal Rights Alliance, 2015). Advocacy groups are also lobbying to strengthen quotas for women on boards, in industry, and in politics. For instance, affirmative action quotas adopted in the Australian Labor Party in 1994 have contributed to a 110% increase in female participation in Australian parliaments to 38.2% in 2015. In contrast, female parliamentary representation in the Liberal Party—a party that has not supported affirmative action for women—is at 23.2% (Emily’s List Australia, 2015). Significantly, the Australian Labor Party has increased their female representation quota to 50% by 2015 (Emily’s List Australia, 2015).

Government regulation, policy, planning and resourcing of new initiatives are important elements of a change process. Effective claims on decision-makers require a groundswell of support to be developed, economic and other benefits to be demonstrated, and for action to be cost effective (Wanna et al., 2010). In addition, a social condition needs to achieve the status, as "troublesome and in need of repair" (Loeske 2003, p.14 cited in Wanna et al., 2010) to compete for government attention and resources. I also support the case for gender-responsive budgeting that embeds gender in economic policies by: (1) integrating the needs of women across the budget cycle, not relegating them to women's units only, and (2) measuring how budget allocations impact on women’s economic and social position (Sharpe & Broomhill 2013,7; Stotsky, 2007). Gender-responsive budgeting, can be a mechanism to hold governments accountable and to assign responsibility to specific agencies for the
implementation of strategies and targets that increase the participation of women in male-dominated trades. As Minister for Women, I observed how an issue deemed as primarily a women's issue, suffered an inferior status, inadequate funding, and rarely did other portfolio areas take responsibility for their implementation. Women's issues need to be integrated across government, not isolated (Sharpe & Broomhill, 2013).

Much can be learned from agenda-building theory on how more public attention to female participation in the trades could be generated through the mobilisation of young people and stakeholders in all sectors, through media to mount pressure and elicit action from decision-makers (Cobb & Elder, 1983, cited in Maddaleno & Beinhauer, 2005). There has been little mobilisation of the public (particularly young people) on the gender inequities in the trades. The exceptions are the NSW Government Women in Trades policy, which incorporates a planned, modestly resourced implementation and marketing strategy, and the former Queensland Government Advancing Women strategy, Women in Hard Hats, discontinued by the LNP Government in 2012. The work of WGEA, the Human Rights Commission, the Women and Trades program, and support from trade unions, industry leaders and women’s organisations provide a firm foundation on which to build more collaborative change efforts in Australia. Participants in the research showed enthusiasm for further action, yet the students shifted responsibility to teachers for this.

6.7 Opportunities for Future Action in the Education and Training Sectors

The following three main opportunities for change are selected in this section of the discussion: youth engagement rather than a reliance on adult-led action; more gender-aware education and training policies and career intervention; and the need for systemic, sustained action across industry, unions, education and training, and government sectors.
6.7.1 Opportunity 6: Elevate action and awareness to engage young people, rather than relying on adult-led action. As stated in the previous section, this study indicates that new opportunities for change are most likely to emerge if young people are more informed about the skills, earnings and industry demands of all trades, and if they are actively engaged in efforts to encourage more females into male-dominated trades. Action to overcome gender-stereotyped attitudes and behaviour about careers will require creative input and engagement of young people in the change process. Mostly, young people in the interviews did not see male dominance of the trades as a problem until prompted in the group discussion.

There is a growing body of evidence of what works best in engaging youth, some of which has been canvassed in this research. The future application of social media strategies with young people offers some encouraging opportunities. The importance of youth conversations and action, rather than adult-led dialogue and action, has been gaining traction in the youth development sector (Harris, Wyn & Younes, 2007; Maddaleno & Beinhauer, 2005; Youth Affairs Council, Victoria, 2011; United Nations, 2005, 2003). Informed by STF, the importance of responding to the narratives of young people is also gaining traction in career development practice (Patton & McMahon, 2014).

6.7.2 Opportunity 7: More gender-aware education and training policies and early career interventions. Career interventions that challenge gender stereotypes can reduce the elimination of careers based on gender, particularly if introduced in the early years of education (Bimrose, 2004, 2014; Department of Education, 2010; eSecurity4women, 2014; Sikora & Pokropek, 2012). Support for early-years career intervention and gender aware career intervention emerged in this research. Overwhelmingly, however, adult participants expressed concern that career interventions were not well resourced within
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schools. This limited the capacity of school staff to pursue in-depth career counselling and support with students in primary and secondary school years. These issues act as a barrier, limiting career choices for students, and are therefore discussed in some detail in response to Research Question 2.

6.7.3 Opportunity 8: There is a need for systemic action across industry, unions, education and training sectors and government that is sustained and resourced through a targeted national strategy. The entrenched nature of the barriers contributing to gender segregation of the trades, evidenced in past research and this study, will remain resistant to change unless the action to overcome them is itself entrenched—that is, sustained, well-resourced and enduring. The economic benefits of increasing the participation of women in male-dominated trades will not be realised if business as usual prevails. The momentum that has been building within government, industry and the education sector to promote gender equality in all areas of the workforce, including the male-dominated trades, needs to be harnessed within high-level policy and resource commitments. The ad-hoc approaches based on leadership and advocacy from a relatively small group of determined people and organisations are not adequate to cut through the entrenched barriers. A national framework for action to increase female participation in the male-dominated trades is most likely to succeed if it has the active engagement of, and allocates specific responsibilities to education and training sectors, trade unions, industry, women’s organisations and government. This research shows that a national plan that uses mechanisms such as gender-responsive budgeting to allocate clear responsibility for outcomes and targets to be achieved (Sharpe & Broomhill 2013) and one that engages young people, could be both innovative and effective.

An effective national framework for action to reduce male domination of the trades could expand existing industry initiatives, such as the WGEA reporting regime, the industry
pleads operating in NSW, the Human Rights Commission tool-kit for employers, and the social media and scholarship programs targeting women and girls that are emerging in industry sectors. It could also introduce procurement policies, with equity targets and support to new employees recruited through these policies, as per the UK construction industry example (Parliament United Kingdom, 2014; Wright, 2014). Voluntary industry action has not been sufficient. The incentives and directions to industry that operate within a government-regulated procurement policy could be helpful. Within the education and training sectors, a national strategy could include the following: (1) early-years career interventions within all states and territories in Australia; (2) specific strategies to promote awareness of the male-dominated trades to female students; and (3) more support for trade work experience and industry mentors for female students. The significant difference from the current position in Australia would be the elevation of actions to a national, planned and resourced regime, rather than one that is piecemeal and poorly resourced.

6.8 Conclusion

It is apparent from this research that the social, cultural and economic forces that create and maintain gender segregation in the trades will not be readily overcome. Fundamentally, it is not a problem that is front of mind for many people. This study showed that once students, educators, career practitioners and industry representatives are exposed to the gender inequality and gender pay gap associated with low female participation in the female-dominated trades, they are likely to be concerned. A challenge is to sustain this concern and to motivate people to take action to reduce gender segregation in the trades. This includes system-wide action from industry stakeholders, career practitioners and researchers, educators and government decision-makers.
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Efforts to break through the so-called “glass ceiling”—a common reference to the unacknowledged barriers restricting women’s entry to the male-dominated professions and leadership positions—have gained a higher level of public recognition and attention than those to break through the barriers restricting women’s entry to the male-dominated trade occupations. The low female participation in the male-dominated trades is not a priority in public policy, career strategies or industry agendas. The findings of this research will provide additional impetus for industry, education and training, and government representatives to give a higher level of attention to gender segregation of the trades.

From this research I have identified three main areas for consideration by decision-makers and advocates: (1) the importance of engaging young people actively – both in career development activities and broader social change to interest young women in careers in male-dominated trades; (2) the systemic and sustained high level public attention and action that is needed to increase female participation in the trades, including government planning and use of mechanisms, such as gender-responsive budgeting; and (3) the benefits of applying a feminist analysis to understand and respond to this issue. Eight opportunities have been highlighted in this discussion chapter. While they do not represent new discoveries, they provide direction for future action. The opportunities are derived from an examination of existing practice and theory and from the ideas of the research participants. The conclusions chapter focusses attention on ways in which these research findings can impact on the field of research, policy and action as it relates to gender segregation of the trades.
Chapter 7: Conclusions

7.1 New Opportunities and Impetus for Change

From the many ideas and actions raised in this research, three empirical and theoretical insights helped to crystallise my thoughts and explain why the current actions are having little impact in attracting more girls and women to careers in these trades. These insights are as follows:

- The importance of youth participation, whereby young people act as agents of the change, rather than solely targets to be changed.

- The status of gender segregation of the trades as a social issue, not yet a social problem of national significance, means that very few people, let alone young people, think about or act on this issue.

- The significance of systems theory, and STF of career development as analytical frameworks and the SEM model to guide intervention.

The quantitative data, the narratives from the students and adult participants and the theoretical insights combine to highlight the complex influences that entrench gender segregation of the trades.

This research provides further impetus to support the case for a national plan for action that tackles individual as well as structural contributing factors. A national plan that allocates responsibilities and targets action system-wide to many areas of government and industry, is worthy of consideration. It could complement a national careers framework with a broader focus on industry, education and training strategies.

This research affirms existing knowledge and evidence, while offering new insights and impetus for action. In response to Research Question 1, the results of the quantitative
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analysis show the pattern of low female participation in the male-dominated trades has been consistent over the past two decades, with little sign that increasing numbers of women are in the supply pipeline to these trades. In response to Research Question 2, many barriers limiting female participation in the trades that operate within the minds of young people and which are influenced by external factors in their schools, homes and communities, were informed through the qualitative narrative and theoretical insights. Finally, in response to Research Question 3, actions have been proposed that are system-wide to overcome attitudinal, behavioural and structural barriers that steer girls away from occupations that continue to be seen as “jobs for the boys”.

It is clear from this research that female students are not dismissing the male-dominated trades as a career for themselves. Rather than girls not liking the male-dominated they know very little about them and/or do not have confidence to pursue them. This leads to lack of interest, lower self-efficacy and can contribute to the lack of female participation in the male-dominated trades. Gender-essentialist views that distinguish careers as primarily male or female continue to act as barriers to girls having interest in careers in electro-technology, automotive, construction and other trades that are deemed typically male. Encouragingly, it seems that more girls would pursue male-dominated trade careers if they had more experience of them, and more positive role models and media images of girls in male-dominated trade roles. This is an area where career practitioners and researchers could continue to make progress.

Advocates of change have been increasing their efforts to reduce gender segregation of the trades. Yet this research indicates that action will be more effective if the low participation of women in male-dominated trades is elevated from a social issue to a social and economic problem of national significance. Reduced gender segregation of the trades
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will benefit the economy, industry, and women’s livelihoods. Paving the way for girls into male-dominated trades is worthy of national attention and action in the manner that breakthroughs in the “glass ceiling”—that is, management and leadership positions for women—are receiving. Improving the economic security of girls and women at the mid-to-lower levels of the labour market warrants heightened attention from industry, government and the public.

The co-ordination and implementation of national, state, and territory skills plans aimed at increasing female participation in male-dominated trades, including setting targets to facilitate the recruitment of female trade workers, could provide the much-needed momentum on this issue. A national industry / skills plan to address gender segregation of the trades could be complemented by:

(1) Strengthening and resourcing for a national careers strategy, such as the Australian Blueprint for Career Development.

(2) A reinvigorated nation STEM strategy.

(3) National strategies that promote positive media images of women and role models.

This plan could be facilitated by a mechanism, such as gender-responsive budgeting, to allocate funding and responsibility across all relevant government portfolios – particularly career development, STEM initiatives and industry mentoring and training.

In the current mix of worthy yet ad hoc actions, the missing element is responsibility. No specific agency or organisation is assuming responsibility to implement action to raise awareness of, and reduce gender segregation of the male-dominated trades. To convince
more people of the problematic nature of gender segregation of the trades, on-going research to generate evidence will be invaluable.

7.2 Limitations of this Research: Ideas for Future Research

Ongoing research and evidence gathering will play an important role in maintaining momentum on the issue of gender segregation of the trades. To build the case for change on this issue it will be helpful for future research to continue to gather evidence and report on: (1) the economic benefits of increasing the numbers of skilled women in the male-dominated trades and (2) the economic and social benefits of trade careers to women and girls. Ready access to gender disaggregated data will assist this research. To interest, and engage young people on the career opportunities available in male-dominated trades, it will also be helpful for future research to include young people as active participants. Some limitations in this research and ideas for future research include:

- **Larger samples of young people.** I recognised in this research that in using a qualitative interview method with a relatively small sample, the results cannot be generalised to a wider population of young people (Bryman, 2010; Denzin & Lincoln, 2003). Larger youth surveys or interviews with a much larger population may be beneficial in gaining a wider, more representative, sample and in engaging more young people on the issue of low female representation in the trades. In addition, very few male students participated in the research. The invitation for this research was for male and female students, but few males accepted the invitation. This may have been a function of the staff responsible for approaching students. Future research could benefit from the perspectives of male students.

- **Engage with more employers and industry leaders.** A small number of employers and industry leaders with trade experience were interviewed in this research as it was primarily focussed on the views and experiences of young people making career decisions.
PAVING THE WAY FOR GIRLS INTO MALE-DOMINATED TRADES

Future research that further explored employer attitudes to gender segregation of the trades and women in trades – both positive employer initiatives aimed at increasing the participation of female trade workers and experiences of intimidation and sexual harassment that act to deter girls and women, are worthy of exploration.

- **Determine the most effective ways to engage young people in future research and action.** This study canvassed youth-participation models and change theories. While the views of young people featured in the study, it did not engage young people in decision-making and implementation of the research process and findings. Future research that is effective in engaging young people on the issue of gender segregation in the trades, will be help to shift research and action from adult-led to youth-engaged and youth-inspired action.

- **Localised data analysis.** This research analysed national data. Future research that localised data analysis to particular states, regions, industry sectors or training and educational settings will be better placed to identify where particular initiatives may be having success in increasing enrolment of women and girls to trades in a specific locality or sector.

- **Examine other education systems.** This research was able to progress as colleges from the Catholic Education system in Queensland agreed to participate in this study. This system has a lower number of students overall enrolled in schools, including enrolments in VET in schools, than government schools (NCVER, 2012, Table 18, p. 17). There was no evidence uncovered in this study to suggest the proportion of female enrolments in male-dominated trades is significantly higher in government schools than Catholic schools. Comparisons with schools in the government sector are worthy of exploration in future research to identify whether any different strategies or trends are present.
7.3 A National Plan of Action: Recommendations from this Research

Reducing the gender segregation of the trades matters to women and men who are determined to eradicate the gender pay gap and improve economic opportunities for women. It matters to industry. It matters to the economy. The economic benefits derived from filling skills shortages, and increasing productivity through increased female participation in the male-dominated trades is being recognised. To achieve these benefits, I recommend the opportunities identified in this research to industry, union, government, education and training representatives—and to young people—for consideration in a national plan of action.

The application of any one or some of these actions will be unlikely to achieve enduring change. To move beyond the status quo—to elevate gender segregation of the trades from a social issue to a social problem that captures the attention of decision-makers—all of the eight recommended areas for action must be undertaken together in a planned manner.

This is not an exhaustive list of areas for action and the details underpinning these areas are canvassed in the Findings and Discussion chapters. In summary, the eight opportunities recommended in this thesis are:

Opportunity 1: Extend gender disaggregation and public reporting of occupation and VET data.

Opportunity 2: Promote gender-disaggregated school-based VET data to schools.

Opportunity 3: More widespread use of STF for career development to foster systemic career development practice and policy.

Opportunity 4: Apply learnings from the breakthroughs in gender stereotypes in sport and hospitality at the participating schools to the trades.
Opportunity 5: Elevate the importance of STEM subjects for female students, encouraging more to pursue a male-dominated occupation, including a trade.

Opportunity 6: Elevate action and awareness to engage young people, rather than rely on adult-led action.

Opportunity 7: Develop more gender aware education and training policies and career interventions.

Opportunity 8: Implement more systemic action across industry, unions, education and training sectors and government that is sustained and resourced through a targeted national strategy.

It is difficult to overcome the individual and structural barriers that block female entry to these trades unless the issue can capture the hearts and minds of many more people in industry, government and the public—and particularly young people. My aim is for media interest, public awareness activities, and publications to be generated from this research to provide further impetus for ongoing change. The challenge is for young people to see that gender segregation of the trades can impact negatively on them and their peers. The goal is for young people to be free to choose from the full range of careers, and not the gendered range that has been cultivated in books, media screens, toys, and magazines.
References


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PAVING THE WAY FOR GIRLS INTO MALE-DOMINATED TRADES

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*Building, Conference Series, 1*(1), 73–83. doi: http://dx.doi.org/10.5130/ajceb-cs.v1i1.3157


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PAVING THE WAY FOR GIRLS INTO MALE-DOMINATED TRADES


PAVING THE WAY FOR GIRLS INTO MALE-DOMINATED TRADES


PAVING THE WAY FOR GIRLS INTO MALE-DOMINATED TRADES


Parmenter, J. (2011). Considering the experiences of Indigenous women in the Australian mining industry. In K. Fahiri-Dutt (Ed.), *Gendering the field towards sustainable livelihoods for mining communities* (pp.67–86). Canberra, Australia: Australian National University:


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Paving the Way for Girls into Male-Dominated Trades


PAVING THE WAY FOR GIRLS INTO MALE-DOMINATED TRADES


PAVING THE WAY FOR GIRLS INTO MALE-DOMINATED TRADES


Appendices

Note to Appendices:
As described in the Methodology Chapter, the terms “skilled manual trade” and “manual trade” appeared in the interview schedules and other materials provided to participating schools and research participants. During the early stage of the research process, the terms “skilled manual trades” and “male-dominated trades” were used interchangeably. It became clear that the terms are not synonymous. For example, the female-dominated trade of hairdressing is considered a skilled manual trade. Thus, the term “skilled manual trade” is not used in this thesis or future publications arising from the research. The preferred term is “male-dominated trades”.

Appendix A:
The Youth: Choices and Change model

<table>
<thead>
<tr>
<th>Theory Level</th>
<th>Pre-Intervention</th>
<th>Post-Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual level</td>
<td>Clusters of individual health promoting developmental capacities and health-compromising determinants of behaviour</td>
<td>Individual level intervention</td>
</tr>
<tr>
<td>Individual needs and wants of adolescents of different ages, gender and culture</td>
<td></td>
<td>Clusters of more developmentally recommended health promoting capacities, determinants and behaviour</td>
</tr>
</tbody>
</table>

Change

| Interpersonal needs and wants of adolescents, parents, teachers and peers | Clusters of interpersonal health promoting and health-compromising determinants of behaviour | Interpersonal level intervention |
| | | Clusters of more interpersonal health promoting capacities, determinants and behaviour |

Youth and young adults adopting health promoting lifestyles

Change

| Community needs and wants of adolescents, parents and other community actors | Clusters of community health promoting and health-compromising determinants of behaviour | Community level intervention |
| | | Clusters of more community health promoting determinants and behaviour |

Change

| Policy- needs and wants of adolescents, parents and policy makers | Clusters of health promoting and health-compromising regulations and policies | Policy level intervention |
| | | Clusters of more health promoting regulations and policies |

Change

Appendix B:
On-line Information and Response Sheet to Attract Research Participants

Pathways for Girls into Trades Research Project

Invitation

Have Your Say

**Invitation:** You are invited to have your say and share your experience on the topic: *Why do so few girls pursue careers in the manual trades?*

**Did you know?:**


- The earnings post-school and ten years on of young men are 20% higher on average than young women (Marks, 2008). Female dominated trades such as hair dressing are lower paid than male dominated trades.

- Skills shortages exist in construction management, automotive, electrical and other manual trades (Australian Government Job Outlook, 2013).

- By the time students reach year 10 their career expectations are gender segregated and that performance in mathematics is an important factor for females in facilitating a choice of a more gender-neutral occupation (Sikora&Saha, 2011).

The aim of the project is to impact on education and industry policy to foster more economic opportunities for young women - specifically by broadening the career options for those who may chose a vocational education and training pathway.

**Background:** I am seeking the views of staff and students on the barriers inhibiting female students from pursuing male-dominated trade careers and ways in which these barriers can be overcome. This research project has ethics approval through Griffith University, Queensland. Participants remain anonymous. I will provide a report on findings to CAANSW & ACT.

**How can you help?:** I am seeking interest from career advisers to participate in a 15 minute telephone interview or to complete an on-line response (pgs.2-3). Please contact me by email or phone if you would like to ‘have your say’ or simply complete and return the on-line response sheet.
PAVING THE WAY FOR GIRLS INTO MALE-DOMINATED TRADES

Please complete and return this response sheet to me by **Wednesday May 21, 2014** karen.struthers@griffithuni.edu.au

Ph. 0437503207

Thank you for your consideration of this invitation.

Karen Struthers, PhD candidate, Griffith University.

![Griffith University Logo](image)

Pathways for Girls into Trades Research Project

<table>
<thead>
<tr>
<th>Name and contact details(optional)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Please describe your role</td>
</tr>
</tbody>
</table>

Are there many opportunities for students to pursue manual trade careers in your school/region and do many female students pursue these?

Do you think students and staff know that male dominated trades have higher earnings on average, than female dominated trades? To what extent do wages influence student career decisions?
Why do you think so few females pursue manual trades, such as construction, electrical, automotive and others?

What do you think about the views: "girls don't want to do these trades" and "girls can't do these trades"

Please describe career information and support available to female students that promotes their interest in manual trades.

How do you think parents feel about the manual trades as a career option for their child?

Are you aware that Maths completion to a senior level is a requirement for many of the male dominated careers? Are you aware of any activities aimed at encouraging female students to pursue Maths?

What strategies are needed to increase female
participation in the manual trades?

I consent to participating in this research. My views can be incorporated into a report on findings from the research. I understand my identity will remain anonymous.

Agreed
Yes

No

Thank you.
PAVING THE WAY FOR GIRLS INTO MALE-DOMINATED TRADES

Appendix C:

Information Sheet for Students

Hard Hat Girls Research Project
INFORMATION SHEET FOR STUDENTS

Who is conducting the research?

Professor Clare Tilbury. School of Human Services and Social Work (Project Supervisor)
Griffith University
Meadowbrook Drive, Meadowbrook
Logan, Queensland. 4131
Ph. 33821406
Email c.tilbury@griffith.edu.au

Professor Glenda Strachan. Griffith Business School
Griffith University
Nathan
Ph. 0737355495
Email g.strachan@griffith.edu.au

Karen Struthers. PhD student, Griffith University, School of Human Services and Social Work.
Email: karen.struthers@griffithuni.edu.au

Why is the research being conducted?

The researchers are interested in your views on why so few girls do vocational training courses and careers in manual trades, like building, electrical and automotive trades. This research aims to increase students and educators knowledge of the skilled manual trades and the job opportunities available in the trades. It also aims to find ways to overcome barriers that may limit girls in undertaking a manual trade vocational education and training (VET) course or career. This is a PhD student research project conducted by Karen Struthers from Griffith University.

Who will we be talking to?

Female and male secondary students aged 14-18 years of age will be invited to be part of the study - particularly students who are interested in, or are doing vocational education and training at school (VET). Staff who have a role in career guidance, VET or related area at the approved schools or in an external role will be invited to participate (approximately 30 in total).
What will participants be asked to do?

Students will be invited to take part in a group discussion with 15 or so other students with a staff member present. In the discussion participants will be asked questions about: what they know about the manual trades; why they think so few girls undertake training or careers in manual trades, and what information do students receive from school staff, parents and friends about manual trades.

Participation is voluntary.

The decision to accept the invitation to be part of the research project is voluntary. Participating staff will also be required to sign a consent form. Students and their parents/carers will be asked to co-sign a consent form. Participants can withdraw at any time.

What are the expected benefits of the research?

By participating in the research, staff and students will be likely to increase their understanding of the trades and the opportunities that exist in trade careers for students. As researchers we expect to gain ideas from the students and staff that will help industry and the education and training sectors increase the take-up of female students into manual trade careers. In these ways, it is expected that participating staff and students and others will benefit from this research.

Are there risks to staff or students in being part of this research?

It is not expected that staff or students will be exposed to any risk other than potential discomfort in speaking within a group. The Hard Hat Girls project is not dealing with a sensitive issue. Participation is voluntary and staff and students can withdraw at any time.

Your confidentiality and privacy is important.

At no stage of this research will individuals or schools be identified in the reporting of this research. Notes will be taken from the discussions and the discussions may be recorded (for ease of transcribing) if all participants consent to this. In the report on the research some comments from the interviews may be used as an example of an interesting idea or comment but the source of the comment will not be identifiable. Also an interesting or innovative school activity may be reported as an example, but the school will not be identified in the reporting of the research. A clear distinction between this research and school activities will be made. For example, if the School Principal wants to publicly acknowledge an innovative school activity, that will be done in the usual way as a distinct school decision, separate from this research.

Information gathered from the interviews will be transcribed and stored in a password secure computer. Only the research team will have access to this information.
The Commonwealth Privacy Commissioner has classified opinions as personal information in accordance with the Griffith University Research Ethics Manual. The conduct of this research involves the collection and use of student and staff opinions. They will be regarded as opinions and not policy of participating schools. The information collected is confidential. Participants will not be identified and their anonymity will at all times be safeguarded. For further information consult the Griffith University Privacy Plan at http://www.griffith.edu.au/privacy-plan or telephone (07) 3735 4375.

What do you do if you have any questions?
Please contact a member of the research team.

The ethical conduct of this research

Griffith University conducts research in accordance with the National Statement on Ethical Conduct in Human Research. If potential participants have any concerns or complaints about the ethical conduct of the research project they should contact the Manager, Research Ethics on 3735 54375 or research-ethics@griffith.edu.au.

Feedback to you

A user-friendly report of the overall findings and results of this research will be provided to the school and made available to all staff and students who participated.

Thank you for your interest.
Appendix D:

Consent Form for Research Participants

Hard Hat Girls Research Project

CONSENT FORM STUDENTS AND PARENT/S OR CARER/S

Research Team
Professor Clare Tilbury. School of Human Services and Social Work (Project Supervisor)
Griffith University
Meadowbrook Drive, Meadowbrook
Logan, Queensland
Ph. 07 33821406
Email c.tilbury@griffith.edu.au

Nathan
Ph. 0737355495
Email: g.strachan@griffith.edu.au

Karen Struthers (PhD student, Griffith University, School of Human Services and Social Work).
Email karen.struthers@griffithuni.edu.au

The researchers require the consent of the participating students and their parent/s or guardian/s. Where students are 18 years of age and live independently only their written consent is required. By co-signing below, I/we confirm that I/we have read and understood the information package and in particular have noted that:

- I/we understand that involvement in this research will include participation in two group interviews with approximately 15 students and a staff member.

- I/we have had any questions answered to my/our satisfaction;

- I/we understand that if I/we have any additional questions I/we can contact the research team;

- I/we understand the risks involved;
I/we understand that participation in this research is voluntary;

I/we understand that students are free to withdraw at any time, without explanation or penalty;

I/we understand that I/we can contact the Manager, Research Ethics, at Griffith University Human Research Ethics Committee on 3735 4375 (or research-ethics@griffith.edu.au) if I/we have any concerns about the ethical conduct of the project.

Please fill in and sign the agreement.

☐ I agree to participate in the project.

or

☐ I agree to participate in the project, and am 18 years of age and I can make this agreement independently of parent/s or guardian/s

<table>
<thead>
<tr>
<th>Student Name</th>
<th></th>
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<tbody>
<tr>
<td>Signature</td>
<td></td>
</tr>
<tr>
<td>Date</td>
<td></td>
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</table>

☐ I agree to Name of Student ………………… participating in the project.

<table>
<thead>
<tr>
<th>Parent/Guardian Name</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Signature</td>
<td></td>
</tr>
<tr>
<td>Date</td>
<td></td>
</tr>
</tbody>
</table>

Thank you for your interest in this research project.
Hard Hat Girls Research Project

CONSENT FORM – ADULTS/ STAFF

Research Team

Professor Clare Tilbury, School of Human Services and Social Work (Project Supervisor)
Griffith University
Meadowbrook Drive, Meadowbrook
Logan, Queensland
Ph. 07 33821406
Email c.tilbury@griffith.edu.au

Nathan
Ph.0737355495
Email: g.strachan@griffith.edu.au

Karen Struthers. PhD student, Griffith University, School of Human Services and Social Work.
Email karen.struthers@griffithuni.edu.au

The research team require the consent of the participants in this research project. By signing below, you confirm that you have read and understood the information package and in particular have noted that:

- I understand that involvement in this research will include participation in individual or group interviews with several other staff involved in career guidance or vocational education and training (VET).

- I have had questions answered to my satisfaction and I understand that if I have any additional questions I can contact the research team;

- I understand the risks involved;

- I understand that participation in this research is voluntary and I am free to withdraw at any time, without explanation or penalty;

- I understand that I can contact the Manager, Research Ethics, at Griffith University Human Research Ethics Committee on 3735 4375 (or research- ethics@griffith.edu.au) if I have any concerns about the ethical conduct of the project.

☐ I agree to participate in the project.
Thank you for your interest in this research project.
Appendix E.

Interview Schedule for Student Interviews

**Interview Schedule – Students**

**Group Information:**

Number of students......Number of females?...................... Number of males?......................

Age range?......................... .Cultural background?...................................................

How many are enrolled in VETiS?...................................................

Are any of the girls enrolled in male dominated trade VetiS courses?

**Category 1. Knowledge of/ interest in the manual trades**

1. What VETiS courses are you doing?
2. Are many girls doing construction, electrical, plumbing, or manufacturing courses?
3. What things influenced your choice of VETiS course?
4. What do you know about the type of work in manual trades and the wages?
5. Have you ever had any experience of these trades?

**Category 2. Influence of gender stereotypes**

6. Why do you think girls do not commonly pursue careers as carpenters, electricians and jobs like that?
7. Do you think girls can do these courses?
8. Do girls want to do these courses?

**Category 3. Role of other adults, educators, career advisers**

9. What do your parents think about VETiS and the course you have chosen?
10. What career guidance have you experienced?
11. Who or what is the major influence or source of information for your career choices?
12. Has a career option in the manual trades been raised with you?

**Category 4. Subject choices**

13. Is anyone doing Maths? (explore the female students interest in Maths)

*Researcher Notes: The questions are in 4 categories to respond to the theories and barriers raised in the literature review.*
Appendix F:

Interview Schedule – School Staff and other Adults

**Information:** Role of staff member/adult participant

Gender.................... Organisation…………………………….

**Category 1. Knowledge of/interest in the manual trades**

1. What is your role in relation to Vocational Education and Training in Schools (VETiS)?
2. What VETiS courses are your students doing?
3. What do you know about the type of work in manual trades and the wages?
4. Have you ever had any experience of these trades?

**Category 2. Influence of gender stereotypes**

5. What things influence the students in their choice of VETiS courses?
6. Are courses or work placements available in construction, electrical, plumbing, automotive or manufacturing courses, and are any girls doing these?
7. Why do you think girls do not commonly pursue careers as carpenters, electricians and jobs like that?
8. Do you think girls can do these courses?
9. Do you think girls want to do these courses?

**Category 3. Role of other adults, educators, career advisers**

10. How do you think parents/carers feel about VETiS, and specifically the manual trade courses?
11. Do you know of any parents/carers who have encouraged female student/s to undertake a manual trade course?
12. What career guidance do your students experience?
13. Has a career option in the manual trades been raised with students?

**Category 4. Subject Choices**

14. Are many female students doing Maths? (Explore link between maths and non-traditional jobs).
Appendix G:

Students Transcript - Stage One Identification of Themes. Extract from Researcher Notes.

Method: Focus group interviews at 4 schools (groups from 13 - 23 participants). One group had 4 males, others all females.

23 themes identified in total from adult and student interview transcripts. This extract shows themes 4-6 from student participants.

<table>
<thead>
<tr>
<th>Theme</th>
<th>Participant/ Comment</th>
<th>Frequency -Low, Medium, High and Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theme 4. Are females interested?/ Can they do trades?</td>
<td>St.C I: Do you think females can do the trades? Yes - overwhelming response. STM:&quot; If we knew more about it&quot; &quot;If we had a lot more exposure to it to find out what its really like.&quot; &quot;I'm the only girl the boys definitely under estimated me...until we started building...the teacher came up to me and said that's better than my third year apprentice...one of the guys was really dirty on me&quot; STM: I thinks a lot of girls just don't want to do it&quot; &quot;If they had more information about it they would&quot; If you had brothers...depends what your parents do as well...It's great for non-OP people cause we have to actually go out to companies and .. CC: re: Can you do anything that you want? &quot;Yeah yeah&quot; &quot;I don't think they (girls) are doing what they want...they are more doing what society needs them...or suggests to them...what society is telling them ....boys do this, girls do that...&quot; CC: I prefer to get a job in the trades...I applied for a apprenticeship in carpentry but I didn't get it...I found it in the paper then I had to send in my resume report cards...um...actually I think I know the boy who got it...probably also because I'm a girl and I can't do as much</td>
<td>High Frequency. TC Summary: Girls don't really think about these as career options for themselves. Those who do trades/ training prefer beauty therapy, hairdressing because that's what they like. Students agreed girls are capable and can do the trades. They thought girls might get intimidated by there being more males in the trades. They didn't think they would be very good work environments. Although when we discussed hazards of hairdressing, they were agreeing that female workplaces can be harsh (they hadn't thought of it like that).</td>
</tr>
</tbody>
</table>
### Theme 5
Are girls encouraged into different areas compared to boys?

**S:** "When I came back from Brisbane the bloke that sat next to me was from Hastings Deering...he asked me what I was interested in after school...they are looking for girls at Hastings Deering"

**CC:** "Yes mainly at TAFE and school oh you’re a girl you can’t do it...but at work and some at school are really helpful"

Others: "People at schools are really helpful"...Girls don’t do the trades ...Males say.." the females haven’t got the same strength or sort of skills as they do so we get paid out about it".

They don’t tell us when the group training companies visit. The boys go.

| Medium frequency |

### Theme 6
Knowledge of and interest in male-dominated trades

**High frequency.**

**Summary:**
Students knew generally of the trades and some had tradespersons in the family - fathers, brothers. There was little detailed knowledge of the trades.

Eg,TC: Students who have parents in the trades spoke of their influence and support, including offers to ‘run the business’. They all said if there was more information and mentors they would give more thought to the trades. Even though Trinity has a keen VET co-ordinator and range of programs, few girls were interested in manual trade careers.