

The role of technical and vocational education and training in women's empowerment: a capabilities perspective

By Sophia Matenda

Supervisors: Prof. Merridy Wilson-Strydom

Prof. Melanie Walker

Dr. Faith Wadzanai Mkwanzani

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Declaration

I Sophia Matenda declare the following:

(i) The Doctoral Degree research thesis that I herewith submit for the Doctoral Degree qualification in Development Studies at the University of the Free State, is my independent work, and that I have not, in part or its entirety, submitted it for a qualification at another institution of higher education or another faculty at this university.

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Abstract

The Department of Higher Education and Training in South Africa has conceptualised Technical and Vocational Education and Training (TVET) as being transformative and developmental in addressing unemployment, inequality and poverty (DHET, 2012). Priority has been placed on increasing access to this form of post-school education, and more women have been enrolled in predominantly male fields, such as engineering studies, than before. It is, therefore, vital from a social justice perspective to analyse whether engineering education is able to enhance the opportunities and freedoms that women students have reason to value. The study uses the capability approach for analysis in understanding the experiences of women students in and through TVET education. The study acknowledges the importance of the economic and monetary benefits of education but argues that this is not sufficient. Such an analysis will lead to an understanding of the constraints and facilitators for the women students as they experience TVET education. As this study is a qualitative study, information was gathered through in-depth interviews with 14 women students studying engineering at a particular TVET college, four lecturers at the same institution and the Principal.

Findings from this study show that, while the South African government has been supporting the TVET sector through increased funding, improved infrastructure and staff training, TVET still needs to be embraced as a viable post-school system by many South Africans. None of the women participants in this study wanted to enrol at a TVET college yet ended up opting for this owing to constraints, such as poor passes, an inability to afford university education, and having dropped out of university for various reasons. An examination of the experiences of women students revealed various challenges, such as sexist comments from lecturers, feelings of alienation, sexual harassment, too much workload and the inability to actively participate in the learning

environment. All these are conversion factors that end up affecting the conversion of resources into valued functionings. Evidence from this study, therefore, mostly points to the constraints that characterise the experiences of women studying engineering at a TVET college. Informed by the capabilities approach, I came up with a list of nine capabilities valued by the women studying engineering at a TVET college. From the conversion factors, which affect the well-being of students, the study recommends TVET education that fosters various capabilities for women engineering students. This way, both students' well-being and women's empowerment may be promoted through TVET education. Findings from this study will help in the understanding of women students' experiences at a TVET college and may assist in the promotion of multidimensional education to foster the lives that women have reason to value. By so doing, women's empowerment through TVET education may be promoted.

Key Words: *South Africa, technical and vocational education and training, human development, capability approach, capability list, women's empowerment.*

Acronyms and Abbreviations

AU	African Union
CCF	Colleges Collaboration Fund
CEDEFOP	European Centre for the Development of Vocational Training
COSATU	Congress of South Africa Trade Union
DBE	Department of Basic Education
DHET	Department of Higher Education and Training
ETF	European Training Foundation
FET	Further Education and Training
HRDC	Human Resources Council of South Africa
HSRC	Human Sciences Research Council
ILO	International Labour Organisation
NATED	National Accredited Technical Education Diploma
NEET	Not in education, employment and training
NQF	National Qualifications Framework
STEM	Science, Technology, Engineering and Mathematics
TVET	Technical and Vocational Education and Training
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
VET	Vocational Education and Training

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CHAPTER 1: SETTING THE SCENE

Introduction

Engineering education as part of the broader national science and technology landscape is important to human development, as it generates the skills needed for technological transfers and economic development (Baatjes, 2014). Women's access and participation in science and engineering studies has traditionally been limited. In the South African context, there has been an increase in the uptake of post-school engineering studies at Technical and Vocational Education and Training (TVET) institutions. However, the number of women students still remains low, as women are concentrated in business related studies (DHET, 2015). Nevertheless, considering the contribution of TVET education to employment, poverty alleviation and the general well-being of the people, it is important to examine its role in the lives of women students, which should go beyond mere employment and economic benefits. The question to ask is whether engineering education is contributing to the creation of opportunities for students to live the lives they have reason to value (Sen, 1999). This analysis will identify issues to do with women's access to and participation in TVET, their experiences in and through the education system, and the contribution of TVET to women's empowerment. The capabilities approach will be adopted as a framework of analysis to understand these experiences. The intention is not to replace human capital theory, which frames TVET education, but to go beyond and adopt a broader purpose of human development (McGrath and Powell, 2016). In Sen's (1999) words, acknowledging the social, political, economic and the leadership contributions of women is an important element of human development. 'Nothing, arguably, is as important today in the political economy of development

as an adequate recognition of political, economic and social participation and leadership of women. This is indeed a crucial aspect of "development as freedom."”(Sen 1999:203).

1.1 What is TVET?

The definition of TVET has eluded authors and, so far, there is no clear cut definition for the concept (Powell, 2014; Maclean and Lai, 2011). This is mainly because TVET applies to a range of delivery methods, targets different age groups, can be formal or informal and can be provided by public, private or non-governmental organisations (Powell, 2014). Technical and vocational education has been evolving over the years worldwide. Various terms, such as apprenticeship training, vocational education and training (VET), career and technical education (CTE), and workforce education have been used for this type of education (UNESCO, 2012). Other countries have preferred terms, such as industrial arts, technical education and occupational education (Maclean and Lai, 2011:2). A UNESCO conference (*Second International Conference on Technical and Vocational Education*) held in 1999, in Seoul, led to the adoption of the term Technical and Vocational Education and Training (TVET) (UNESCO, 1999). This term has now become internationally accepted and is the term currently used in South Africa as well. UNESCO and ILO (2002) define technical and vocational education and training (TVET) as:

A comprehensive term referring to those aspects of the educational process involving, in addition to general education, the study of technologies and related sciences, and the acquisition of practical skills, attitudes, understanding, and knowledge relating to occupants in various sectors of economic and social life.

Technical and vocational education is further understood to be as follows:

- a) An integral part of general education;

- b) A means of preparation for occupational fields and for effective participation in the world of work;
- c) An aspect of lifelong learning and a preparation for responsible citizenship;
- d) An instrument for promoting environmentally-sound sustainable development; and
- e) A method of facilitating poverty alleviation.” (UNESCO & ILO, 2002: 7).

Psacharopoulos (1997) believes that TVET can be a solution to youth unemployment and can drive economic development. The belief is that, as in the cases of Germany and Japan’s industrial revolution, TVET can contribute to economic development through skills provision. The other assumptions are that TVET also offers alternative training and skills provision for less academically able students. Since not everyone is able to go to university, TVET would, thus, fill the gap for middle-level skills, such as those needed by artisans. Moreover, it is believed that TVET could reduce poverty and improve the general well-being of the poor by offering economic opportunities.

1.2 TVET in South Africa

In South Africa, institutions providing technical and vocational training have been known as Further Education Training (FET) colleges since the early 1990s. The Department of Higher Education and Training (DHET), however, recommended that all public and private FET colleges change their names to TVET colleges (DHET, 2012; DHET, 2013). The change was necessitated by the need to align with international standards. Kraak and Hall (1999:19) acknowledge the complexity of the TVET education band in the country since it has become too ‘broad and inclusive.’ Included in the [TVET] band are the institutions that provide vocational education, such

as senior secondary schools and technical colleges, including both public and private providers like the non-governmental organisations.

In the National Qualifications Framework (NQF), TVET programmes provisions fall between levels 2-4. Thus, a TVET certificate is awarded when one completes NQF level 4. The Department of Higher Education and Training (DHET) subsidises educational costs for students at public TVET colleges. Students only pay 20% of the costs, while 80% is paid by the DHET. Full bursaries are also available, and students who apply may qualify for them. TVET colleges in South Africa offer various courses that cater for the needs of the industry, such as construction and building, engineering, education, agriculture, business, commerce and management courses.

My case study is the NATED (National Accredited Technical Education Diploma) or Report 191 engineering course. This programme is quality assured by Umalusi under the Department of Higher Education and Training. The structure ranges from N1 to N6. A total of 36 months for the whole programme is required. Eighteen months are for theoretical studies and eighteen months for workplace training in the relevant field. A student, however, may decide to end at N4 and start looking for an internship and subsequently employment. With a Grade 9 pass, one can be admitted from N1; and, with a Grade 12 pass, one may start from N4. TVET courses are vocational or occupational (DHET, 2016). This means that a person will acquire education and training for specific employment or for entrepreneurial endeavours (DHET TVET Colleges Website, 2016). There is a chance for further education at a university of technology if one wants to acquire a degree in the same field, such as engineering. TVET is a post school education band, but a student can enrol for it at an institution after completing Grade 9, provided they are 16 years or older (DHET, 2016).

Generally, in South Africa, the assumption has been that TVET will contribute to human capital and economic development (Vally and Motala, 2014). Powell (2014) adds that the TVET sector will be key to the process of attaining social justice, as it is mainly targeted at increasing employability. In other words, South Africa has been influenced by the assumption that skills development is key to socio-economic development. Fisher, et al. (2003) argue that TVET colleges' main mandate is to provide intermediate level skills, therefore contributing to economic development. TVET colleges are also expected to solve the social inequalities created by the apartheid regime through the provision of skills and training to disadvantaged people and societies (DHET, 2012). The other mandate of TVET education is to provide training for entrepreneurship for the informal sector; and, it is also considered a second chance to access higher education (McGrath and Badroodien, 2006). The Department of Higher Education and Training intends to expand student enrolments to 2.5 million by 2030 (DHET, 2013). This is an increase from about 737 880 students enrolled in TVET colleges, both private and public in 2015 (DHET, 2017). DHET (2011) adds that targeting students from poor backgrounds, who often face poor quality schooling and unemployment, may realise the ultimate aim of addressing both poverty and social inequalities. The South African Constitution (1996:1257) states that everyone has 'the right to further education, which the state through reasonable measures, must make progressively available and accessible.' Thus, the constitution guarantees accessibility and availability of further education including TVET to citizens.

TVET colleges in South Africa cater for different types of students and their individual educational training needs. These range from those who are preparing for employment and self-employment to those who want to acquire a university qualification later. The colleges also aim to meet the needs of students who require vocational qualifications, reskilling and up skilling training (DHET,

2016). DHET (2013) describes TVET colleges as flexible institutions that offer a varied range of courses from short to long, ranging from a week's training through to qualifications that take several years to complete. There are National Technical Education Diploma (NATED) programmes and the National Certificates (Vocational) NC (V), after which a graduate with National Certificate Level 4 may be eligible to study at a university or university of technology (DHET, 2016). Thus, TVET colleges 'exist at the cross roads between compulsory education, higher education and the world of work' (Powell, 2012: 643). Most of the TVET colleges in South Africa have multiple campuses. There are 50 registered public TVET colleges currently in both urban and rural areas (DHET, 2016). The DHET TVET College Website (2016) further states that the Department of Higher Education and Training oversees the running of the TVET colleges, offers financial and professional support, conducts examinations, does assessments and provides certification for most of the programmes. Other programmes have independent quality assurers which are industry based.

1.2.1 TVET during apartheid in South Africa

The historical development of TVET in South Africa backdates to the apartheid era when the colleges were formed to respond to the needs of the mining sector, which required technical skills (Badroodien, 2004). In the mid-1970s, this training was opened to black people, as it had been predominantly for whites (Chisholm, 1983). The training was divided into two components, with theory being offered at the TVET institutions and the practical component within large companies (Chisholm, 1983). Badroodien (2004:21) analysed the evolution of TVET and noted that 'TVET has always been characterised by apartheid education, located within a salvation paradigm for the poor whites, Africans and coloured urban workers.' In addition, colleges in rural areas were meant to provide skills to rural people to prevent them from migrating to urban centres (Badroodien,

2004). It is also important to note that, not only was education racially segregating, it was divided on gender lines as well. Until after the end of apartheid, there was limited skills training for women (McGrath, 2004). McGrath (2004) further reiterates that TVET has always been regarded as degrading and unacceptable under apartheid, as it encompassed poor quality education for blacks, coloureds, Indians and poor whites. A milestone in skills development analysis was forwarded by the Congress of South African Trade Union (COSATU), which became critical of this form of education and training. COSATU argued for education that contributes to emancipation, creativity and liberation, and should not be used as an apparatus for manipulation of workers (Cooper et al. 2002: 122-123). However, despite such calls by black workers and the HSRC Commission of Inquiry of 1980, which sought to address these challenges, nothing of significance was implemented (Baatjes, Baduza and Sibiyi, 2014). This led to a ‘seriously dysfunctional skills development system’ that lasted until the end of apartheid in 1994 (Baatjes et al. 2014:87).

1.2.2 Post- apartheid era

In the post-apartheid era that began in 1994, TVET consisted of institutions that were producing fewer numbers of graduates. Moreover, these colleges were virtually unknown except for producing ‘hairstylists and artisans’ (Wedekind, 2014:61). The sector comprised of a mixture of historically white institutions, with some self-sufficiency, and the predominantly black institutions, which were mostly in rural areas, or low income parts of towns and cities (McGrath, 2004). Akoojee, McGrath and Visser (2008:254) add: ‘In 1994, the incoming democratic government was faced with a college sector that was not fit for its purpose.’ McGrath (2000) further asserts that TVET education was believed to be able to play a role in reducing the crime and violence perpetrated by unemployed youth. The government has viewed this type of post school education as a solution to social ills of poverty, unemployment and inequality. After

independence, research work that was done was mainly concerned about the need to gain an understanding of the sector. The main organisations involved during this period were the National Business Initiative (NBI); a non-profit organisation and the Human Sciences Research Council (HSRC), a parastatal. Due to the need for these organisations to assist the government in the implementation of policies in the TVET sector, they favoured applied research approaches over theoretical studies (McGrath 2008).

Among the policy changes of the Further Education Act was the need to change the name of the institutions to Further Education and Training (FET) colleges. The change was necessitated by the need to remove the negative image that surrounded the sector during apartheid. TVET institutions had been seen as being of low quality and low status (McGrath and Akoojee, 2009). The colleges around the time of independence in 1994 were 150, which were later merged under the FET Act 98 of 1998. This led to the conversion of the colleges from racialised institutions to 50 institutions, which became diversified in terms of race (Wedekind, 2014). Thus, at the time of the mergers technical colleges were a provincial competence and so provincial buildings and staff in some cases from teacher training colleges were incorporated into technical colleges. The function of teacher education though, was given to the Department of Education (now the DHET) (Human Resources Development Council Report, 2014). From 1998, the government policy on education and training in the country renewed its focus on TVET. DHET (2010) envisaged that these colleges could play a major role in alleviating skills shortages and serve a large part of the country, since they are found in every province and require cheaper investments as compared to universities (Sheppard and Sheppard, 2012). The changes implemented had a significant impression on the student body. In the end, the racial profile of students changed significantly after independence, reflecting the overall racial composition of the country (McGrath and Akoojee, 2009). However,

the sector continued to be haunted by a number of challenges, as will be examined in a later section (Section 2.3.5).

1.3 TVET and the challenge of NEETs

The Centre for Higher Education Transformation (CHET) Report; *Responding to the educational needs of Post- School Youth* (Cloete, 2009) coined the term ‘not in employment, education and training’ (NEET). This report highlighted that, by 2009, about one million pupils who had matric needed further education and training because they were not in education, employment and training. By 2015, there were about 3.1 million youth aged from 15-24 who were NEETs. The report also noted that, of these, 53.8 % were female and that more than half of them had not completed secondary schooling (HRDC, 2015). There are increasing numbers of young people who complete the National Senior Certificate (Matric) and pass, although they still do not manage to gain entry to university for different reasons. Added to this, there are those who fail each year, as well as those who left school in Grade 9, 10 or 11, whose options are even more constrained. Cloete and Butler-Adam (2012) add that about 45% of young people end up being NEETs. The Report on NEETs led to a renewed focus on TVET and, since then youth, unemployment was acknowledged as a national problem. Perold, Cloete and Papier (2012) also add that the problem of NEETs can best be solved through the provision of better educational opportunities, especially through post-school education. Thus, there has been a growing emphasis on the expansion and strengthening of the TVET sector, since not everyone qualifies for or wants to enter into higher education.

Another realisation was that access to post-school education was critical in order to deal with the challenge of poverty. It was important to provide a way out of poverty for young people (Cloete

and Butler-Adam, 2012). The expansion of TVET, therefore, became a strategy for reducing poverty as well (DHET, 2012). The World Bank (2007) also underscores the importance of post-school education, as part of alleviation efforts, by arguing that the better the education someone holds, the better the chances of finding a job. An international survey (World Bank, 2007) revealed that the mean return per year of schooling was 7.3% for males and 9.8% for females. This all goes to support the importance of post school education and the role that it can play in development. Thus, TVET has been expanded, not only for access to a better job but also for employment creation and poverty alleviation. Zuze (2012) argues that, although the expansion of post-school education is a commendable move to overcome the problem of NEETs, job creation is also important, since graduates need to look for jobs and find them.

1.4 The Decade of the Artisan

The ‘Decade of the Artisan’ is a Ministerial Advocacy programme for the period 2014-2024. The plan operates under the theme ‘It is cool to be a 21st Century Artisan’ and the target is to produce 30 000 artisans per year by 2024 through TVET colleges (DHET, 2014). The ‘Decade of the Artisan’ followed the end of the ‘Year of the Artisan’, which had been launched in 2013. This was due to the realisation that artisans have a major role to play in the economy and need to be provided with skills especially relevant to strategic infrastructure projects, including building infrastructure, in the face of the shortages of skills in the country. The launch of these programmes was also driven by the need to enhance the status of TVET colleges so that they do not continue to be seen as a ‘second choice’ (DHET, 2013). Therefore, TVET colleges were placed at the centre of artisan development in the country; and, they are expected to play a role in supporting industry and

economic growth through this long term plan. According to DHET (2014:3) this campaign would serve three main purposes:

- Promote artisanry as a career of choice among the youth.
- Professionalise artisanry by skilling the already trained artisans.
- Implement 'Recognition of Prior Learning' (RPL) for artisans.

An analysis of data regarding South African artisans who complete their training revealed a gender imbalance, as an average of 80% men, as opposed to 20% women, graduate as artisans (DHET TVET College Times, 2016). Through the Decade of the Artisan Advocacy Programme, it is hoped that enrolments for artisans will improve and also that the gender imbalance will be addressed. In an effort to support skills development, the National Artisan Development Support Centre, which is responsible for the overall artisan development in the country, was formed to spearhead support for the artisan sector.

Thus, one can argue that the South African government is making progress in promoting TVET. Efforts are being made in terms of policy changes as well as financial injection into the sector to address gender, racial and class disparities in access to skills development. However, what is important to understand is the role that TVET is playing in the lives of women who were previously sidelined. Research needs to extend to consider how women are experiencing TVET, possible challenges in the system, and issues of pedagogy and curriculum. This kind of research will bring to light any challenges or issues that need to be addressed in order for women students to achieve their well-being and live the lives they have reason to value.

1.5 Rationale of the study

Technical and vocational education and training has often been perceived as a second class form of education (Butler and Ferrier, 2000; Leathwood, 2006; Lopez-Fogues, 2014). This is due to the fact that mainly those who have not attained adequate passes for universities end up enrolling in these institutions. However, this form of education is important, since it incorporates the fields of both education and work and, thus, provides a link between education and the economy (Lopez-Fogues, 2014). The government's perception of TVET education as a solution to the three challenges of unemployment, inequality and poverty (DHET, 2012) has driven this research study as well, in an effort to suggest that education should equip learners for life in its broadest sense (Nash et al. in Lopez-Fogues, 2014). Thus, apart from the fact that this form of education should address the above three social problems, it is important to explore its role other than that of offering economic benefits in the lives of women students. My interest was not only sparked by the status of TVET in the educational system but also by the increasing amount of research on the experiences of women students in institutions of higher learning (universities) in South Africa (Jawitz et al 2000; Shackleton et al. 2006; and Chisholm et al. 2007) as compared to TVET. Although TVET represents a significant percentage of the population of post-school education, not much is known about the experiences of women students who enrol in predominantly male areas, such as engineering. According to DHET (2017) the number of women students enrolled in the N1 to N6 programmes across all TVET institutions in the country in 2015 was 274 836. Moreover, the question needs to be asked whether the increased uptake of science courses by women in TVET has been matched by the benefits to be accrued through education. I was, therefore, prompted to examine the role of TVET in the lives of women and ask, 'Can TVET be used as a form of women's

empowerment?’ Thus, this research study will lead to an analysis of TVET in terms of its contribution to women’s empowerment.

My interest in women and education was also sparked by my professional and academic experiences. My first degree is a Bachelor of Science in Sociology. I went on to acquire some qualifications in counselling and worked for several years as a counsellor in a reproductive health research organisation. It was through this research experience that I decided to broaden my knowledge on the experiences of women in different circumstances. I went on to study part time for a Master of Science in Development Studies and looked at poverty alleviation strategies adopted by female-headed households in an urban low-income area. My job description, when I was working, entailed providing counselling services mainly to women between the ages of 18-35 years. During that time as a counsellor, I was greatly vexed by issues of women’s empowerment. Some of these women were educated women, who had professional qualifications, but they had difficulty in making personal decisions regarding, for example, financial management, reproductive health, and household matters. I did not understand their situation, which led to my thinking about the type of high school and post-school education that these women receive and the role of education in their lives. When I was given the chance to study for a PhD, I grabbed the opportunity and decided to pursue my area of interest, which is women’s empowerment through education. Since my funding required me to study the post-school system, I decided to look at the area of TVET, as I realised that there was limited research in this field. To date, very few empirical studies have investigated TVET education in South Africa with regard to the experiences of women students and its role in the empowerment of women. This study attempts to fill this gap in literature by designing a case study of TVET in one province in South Africa, guided by the research questions below.

1.6 Research questions, contribution and the aim of the study

1. Why do women students choose TVET and why engineering?
2. What are the experiences of women students studying engineering at Acacia¹ Technical and Vocational Education and Training College?
3. How do these experiences shape the construction of aspirations, agency and well-being for the students?
4. What are the valued capabilities for women engineering students in TVET? To what extent are these capabilities being developed?
5. What needs to change in TVET education in order to foster women's empowerment in and through TVET education?

The contribution of this research can be viewed in three different dimensions:

- It aims to gather the views of the underrepresented in the engineering field, women students at a TVET College.
- The research presents a human-centred approach to technical and vocational education in South Africa, viewing TVET education not only for economic benefits but also its contribution to the well-being, freedoms, agency and aspirations of women.
- It also helps in bringing to light the role of TVET education in the lives of women students; this can help in proposing recommendations towards women's empowerment through TVET education.

It is the aim of this research study to acknowledge the economic importance of technical and vocational education in women students' lives. Moreover, it aims to show the importance of a

¹ Acacia is the pseudonym for the TVET College under study.

multidimensional approach to this form of education that could contribute to the enhancement of women students' capabilities.

1.7 Analytical framework for the study

The capability approach (CA) is adopted in this research study as an evaluative framework mainly because it brings to the forefront the voices and the perspectives of the women students in TVET. Powell (2012) acknowledges the limited literature on TVET and says that the little research carried out has been by academics, donors and policy makers, although the students themselves have been side-lined. In South Africa, when research has been done to gather the voices of the students, it has largely been through quantitative studies (Cosser, McGrath, Badroodien and Maja, 2003; Powell and Hall, 2000, 2002, 2004).

The CA has been applied to higher education by scholars, such as Robeyns (2005), Walker (2005, 2006, 2006a), Walker and Unterhalter (2007). Limited application of the CA to TVET, however, has been done (Powell, 2012, 2014; Tikly, 2013; McGrath, 2012; Lopez-Fogues (2014). In applying this approach to TVET education, this research scrutinises the 'productivist' approaches that inform TVET policy and research (Powell, 2012). The productivist approaches emphasise economic growth and income as development objectives. The human capital theory is the main informant of educational policies, whereas the capabilities approach emphasises human flourishing (Wilson-Strydom and Walker, 2015). Thus, according to the capabilities approach, economic growth is essential for development, but it is not enough (Powell, 2014). The main aim of development, as viewed from capabilities lenses, is to expand the individual's freedoms to live the life that they have reason to value (Sen, 1999). Applying the CA, McGrath and Powell (2013)

conducted a study in South Africa to gather the views of students and the reasons for their enrolment into TVET colleges. The results from this study indicated that learners:

Seek not simply to prepare themselves for the world of work, but to prepare themselves for work that fulfils, improves their ability to contribute to their communities and their families, raises their self-esteem and expands their future life possibilities. (McGrath and Powell, 2013:2).

These findings showed that, although employment is one of the reasons for enrolling in TVET education, it is not the only reason as students also want to benefit holistically from education. In support of the above view, Anderson (2009:44) states:

TVET students are not only already aiming to become workers. They are also human beings and citizens with a wide range of needs, relationships, duties, aspirations and interests beyond work, in the family, the local community, in civil society and the global environment.

Thus, McGrath (2012) adds that significant work needs to be done on vocational education and capabilities. In considering justice, agency and well-being, the capabilities approach allows a wider, person-centred analysis. This emphasises the analysis of the empowering role of TVET alongside the technical aspect (McGrath, 2012). This research, therefore, seeks to understand TVET students' experiences and will use the CA lens to understand the positive outcomes beyond the economic benefits of TVET education.

1.8 Methodology

As this study is a qualitative research study, I conducted in-depth interviews with fourteen women students in their final trimester of their studies. All the students were studying the NATED (National Accredited Technical Education Diploma) in engineering. Follow-up interviews were also done with some of the students after they had completed their studies, which was about four months after the first interview. The aim of the second interview was to know more about their

transition from college to practical work and the labour market. All the women who took part in the study were black students. They came from different provinces in the country and were mostly from very low socio-economic backgrounds. In-depth interviews were also conducted with four lecturers in the engineering department. These consisted of two women and two male lecturers. This provided an in-depth understanding of the experiences of women students, as I had two sources of information: the students themselves and the professional views of lecturers. At the end of the data collection process, I interviewed the principal of the college. The objective was to record the principal's views on the role of TVET in empowering women, after giving feedback from the preliminary findings, as well to seek clarification on some of the issues raised by the students.

1.9 Thesis outline

This thesis is divided into nine chapters. Chapter 1 starts by defining what TVET is and outlines the South African context, background and rationale of the study. I situate the study within the post-apartheid era and examine various policy changes that were implemented to support and manage the TVET sector in the country. Chapter 2 is the review of literature, which begins with an overview of the current situation in the TVET sector. This includes various research outputs from different stakeholders, and challenges generally faced by TVET colleges are explored. In addition, the international literature on TVET from selected countries in Asia, Africa, Europe and the United States is examined. The aim is to understand knowledge production trends not only in South Africa but internationally. Chapter 3 introduces the theoretical framework adopted for the study. In this chapter, the human capital theory is looked at in detail since it generally informs educational policies in the country. The capabilities approach is then introduced as an alternative way of thinking about the role of TVET in women's lives. The central tenets of the capabilities

approach are also discussed. I conclude the chapter by giving examples of how the CA has been applied not only in education generally but also specifically to TVET. Chapter 4 is about how the term ‘women’s empowerment’ is conceptualised. Different definitions of the concept are explored, including the capabilities conceptualisation of the term ‘empowerment’. In the end, I propose the capabilities definition, as I consider it to be all-encompassing and relevant to all aspects of the lives of women. Chapter 5 presents the methodology that was used in this study. I discuss the qualitative methodology and why it is the most suitable for my study. Chapter 6 introduces the participants who took part in the study. This gives a summary of the socio-economic status of the students as well as the professional qualifications of the lecturers who took part in the study. Chapter 7 is the first chapter on the findings from the study. In this chapter, I look at the reasons why women students chose TVET education. I also seek to understand why, as women, they had opted for engineering as a course of study. I also explore the experiences of the women students in the TVET system with regard to teaching and learning, the curriculum, and interaction with lecturers and male students. This analysis is aimed at understanding the enablers and constraints in the lives of women students in achieving their well-being. Various conversion factors, such as sexual harassment, feelings of alienation, lack of practical experience and male dominance emerge from the findings. Chapter 8 is about capabilities formation through TVET. Informed by the CA, I come up with a list of nine capabilities that women students value. I also go further to explore the extent to which each capability was being developed or enhanced through TVET in the case of the research participants. This investigation includes the various conversion factors that hinder or enhance the development of capabilities in the case study. Chapter 9 is the conclusion chapter. This chapter suggests possible areas of future research and the contribution of the study. Having been informed by the CA, I recommend the use of the nine capabilities as a starting point for

debates about the role of TVET in women's lives and how, as a tool for women's empowerment, it could be used to foster the lives that women students have reason to value.

CHAPTER 2: LITERATURE REVIEW

Introduction

A lot of literature has been generated about TVET colleges in South Africa and worldwide. Focus has been on these colleges as being critical to the production of human capital and economic growth, often at the expense of student voice (Powell, 2014). This reveals a research gap, as there are almost one million students in TVET colleges in South Africa, which comprises 36% of the enrolments in post school education (DHET, 2017). In addition, considering that the majority of the students in TVET colleges are now female (DHET, 2015), it is also important to understand their experiences with regard to TVET, which has typically been a predominantly male environment. It, therefore, becomes imperative to extend research to this group, which has not been explored intensively so far. The paucity of research on women in TVET can be attributed to the very low enrolments of women during apartheid in relevant institutions, which were mainly aimed at training young men for industry (Chisholm, 1983), and to the neglect of the sector by the apartheid government. Focus has been intensified, since the end of apartheid, when the new government realised the role that TVET could play in economic development and in addressing social inequalities. Thus, in the South African context, the main research focus has been on the participation of girls in science and mathematics at school, as opposed to the experiences of TVET women students.

The methodological gaps of research on the TVET sector have been exacerbated by the adoption of quantitative methodologies in much of the existing research. Powell (2013:74) argues that prevailing research studies do not tell us what we need to know about the experiences of students:

They also tell us little about the qualitative aspects of these institutions, such as the way in which learners experience [TVET], the institutional culture and the culture of teaching and learning, vocational cultures, the

skills, aptitudes and attitudes related to FET, the quality of teaching and the way in which FET contributes to the lives of FET students.

However, the above assertion does not imply that research studies premised on the quantitative aspects have not been helpful. In fact, Powell (2013) and Wedekind (2008) acknowledge the role played by these studies in understanding the sector and show how they have created a space for explaining the challenges that affect TVET institutions. In fact, these studies have influenced decisions regarding the following: management; governance; college infrastructure; and student and staff profiles. Powell and Hall (2000; 2004) conducted two of the major quantitative studies in South Africa that led to significant changes in the TVET sector.

Powell (2013:60) argues that for research to be more effective, there needs to be a reconsideration of the assumptions that inspire the ‘paradigmatic and epistemological’ approaches applied. This is important in understanding the sector and for policy making. This study, therefore, seeks to contribute to the developing literature on the value of education and training in women’s lives. With a sample of 14 TVET women students, I intend to redress the marginalisation of women’s voices in the TVET literature and, thus, challenge an economic understanding of education that is expected to focus on producing TVET graduates only for employment purposes. I will argue that TVET should make contributions to well-being, aspirations, agency and, above all, women’s empowerment. Although, the literature on TVET in South Africa is increasing, individual values and well-being have virtually been overlooked, in favour of an instrumental vision. Reliance on quantitative studies is an indication of this, as this chapter will explain.

This research will embrace an important component by taking a qualitative stance and employing in-depth interviews for data gathering. This presents a significant shift from quantitative research, which draws conclusions from numbers and quantifications. The main advantage of a qualitative

methodology is that it captures the accounts and the experiences of the women students (Olesen, 2005). Olesen (2005) argues that qualitative research is more appropriate for research with women, as it presents the opportunity for research to generate new knowledge, which can help in answering the call for changes and adjustments with regard to the oppression of women. Thus, Cook-Sather (2002:3) argues that there is ‘something fundamentally amiss about building and rebuilding an entire system without consulting at any point those it is ostensibly designed to serve.’ This research will try to bridge the gap by capturing the experiences and views of TVET women students. By adopting a qualitative methodology, and being able to understand the issues of culture and attitudes, this study presents a new focus in research on TVET. My aim is to provide an empirical basis from which to influence the debates around the experiences of women students. My hope is that this will contribute to the development of an effective and valued education system with the needs of young women at heart.

2.1 TVET education and development

2.2.1 The role of TVET in the context of human development

According to the human development approach, as operationalised in the human development index, education is one of the key indicators of human development. Human development is an approach that has shifted development measurements from gross domestic product or income to a focus on well-being or the ability to increase the chance of individuals to realise their potential as human beings. This can be achieved through giving them opportunities, such as education, and health care that will enhance their ability to live the lives they have reason to value (Cremin and Nakabugo, 2012). The Human Development Report (1996:49) states:

‘Human development went far beyond income and growth to cover the full flourishing of all human capabilities. It emphasised the importance of putting people – their needs, their aspirations, their choices at the centre of the development effort.’

From a human development perspective, TVET education should not only result in being employed and earning an income, it should also be about adding to the quality of human life (McGrath and Powell, 2016). TVET should also help one to become a ‘flourishing person’ (Bonvin and Farvaque in McGrath and Powell, 2016:279). Thus, work should be seen in the line of its contribution to human development. In this view, TVET education should be seen to develop the person more than only the worker. Tikly (2013) is of the same view and argues that the aims of skills development should not only be economic but contribute to social, cultural and political development as well. Human development would view TVET as a means of enabling the development of capabilities, conceived as opportunities to develop what the CA terms ‘functionings’ that individuals, their communities and society at large have reason to value (Tikly, 2013). Nussbaum (2000: 78-79) adds that education develops capabilities such as literacy and numeracy and the ability to apply acquired scientific knowledge. Thus, this research intends to contribute to human development knowledge by means of the research findings with the aim of expanding relevant concepts and, thus, developing a conceptual framework through which the role of TVET in women’s empowerment can be viewed. This contribution may change current perceptions of TVET, the meaning of which been minimised to that of an ‘exclusive acquisition of relatively narrow band of employment-related job specific skills and competencies’ (Anderson, Brown and Rushbrook, 2008:234). This narrow perception of TVET, which is held by most countries, organisations and theorists, calls for an engagement with learning outcomes that are broader than a purely economic one (Baatjes, Baduza and Sibiya, 2014).

The relative silence on TVET internationally has been attributed, among other reasons, to the promotion of Education for All (EFA) and the Millennium Development Goals (MDGs), which prioritised the role of primary education in the reduction of poverty (McGrath, 2011). These movements viewed primary education as being far more effective as a development strategy than secondary, vocational and higher education (Unterhalter, 2007; McGrath, 2011). Thus, TVET lost support until a few years ago when it began to be incorporated into the World Bank and UNESCO policies. According to McGrath (2011), governments had to look for solutions to growing youth unemployment and the problem of where young people will go after basic education, which led to a renewed focus on the TVET sector, particularly in 2010, when UNESCO announced that the 10th Edition of the Global Monitoring Report would be on skills development. McGrath (2011:35) posits that the TVET sector is an issue that ‘is currently neglected by academics notwithstanding its significance to millions of people and its fruitfulness for broader theoretical work on the links between education and development in Africa.’

Historically, TVET has been founded on the process of industrialisation and economic development; and, therefore, its policies have often been informed by economic and equity perspectives (UNESCO, 2012). However, McGrath (2012) argues that this approach to TVET is grounded in an outdated model of development. In fact, Pavlova (2013) and Psacharopoulos (1997) postulate that conceptualising TVET in terms of human capital theory means that colleges have to focus on skills development for employability, which may be confusing. This is because acquisition of some form of training may not necessarily guarantee a job, although it increases the chances. The belief in investing in human capital has been widespread in South Africa and, therefore, the TVET sector has been expected to fill this gap through skills development. However, Vally and Motala (2014:40) postulate that, if human capital theory continues to frame the TVET

sector, it will lead to seeing the sector as pivotal in solving ‘a problem that is not primarily an educational problem’. What needs to be emphasised instead is the role of TVET in ‘deepening knowledge, developing capabilities (including hard and soft skills required to work) and strengthening (occupational and wider social) identities that enable learners to become both workers and citizens’ (Wedekind, 2014:77).

Vally and Motala (2014:16) argue that education and training should be able to:

... instill in society the importance of knowledge essential to the development of a citizenry, for the fullest expression of civil rights and responsibilities, for such elementary rights as numeracy and literacy, accessing public goods, making informed choices, and most importantly, for ensuring greater levels of democratic accountability of public representatives and organisations.

In this study, my objective is to establish a comprehensive conceptual framework for an analysis of the relationship between education and skills development. The challenge is that, upholding conventional approaches, such as human capital theory, predisposes us to embrace entrenched societal inequalities, perpetuate the powerlessness and the marginalisation of certain groups of people in society, instead of overpowering the challenges reminiscent of apartheid (Vally and Motala, 2014). Sears (2003) argues that human capital theory, as a framework for skills formation has failed, and therefore there is a need to come up with alternative theory. Baatjes et al. (2014) conclude that the widespread belief that increased education and skills acquisition will translate to overall development for poor countries is a dream that is yet to manifest.

Another critique comes from Kilminster (1997) who notes that vocational education rooted in economic notions deprive students of a socially useful education, which relates directly to their lives and encourages them to be active citizens. Thus, the Human Resources Development Council of South Africa (HRDC) (2014:16) argues that the human development approach acknowledges the new challenges that the global economy and TVET face: skills shortage; differences between

the rich and the poor; and marginalisation based on social class, rurality, gender and ethnicity. In this light, the CA, an approach to human development, will be adopted in this study as a framework for analysis. The study intends to further the assertion that the role of TVET should be multi-dimensional in the lives of women.

2.2 TVET education for empowerment

Scholars like Drèze and Sen (2002) identify the significant roles of education in people's lives. These include the development of knowledge and skills, for human fulfilment and for transformative purposes. This understanding of the roles of education plays a key role in this study that aims to examine the part played by TVET education in the lives of women students. (This is looked at in more detail in Chapter 3 of this thesis). Wedekind (2014) asserts that, especially in South Africa, the mandate of TVET colleges should include social responsiveness and address the legacies of the apartheid system by providing post-school education to previously disadvantaged groups, such as black South Africans and women. However, there has not been much research about the gendered experiences of students as they engage in TVET education, which is the focus of this research project, in determining the extent to which this type of training might empower women, who are part of the previously disadvantaged groups in South Africa. Since previous research has been mostly focused on the education system and its curriculum, studies that focus specifically on the experience of women students is needed.

Looking at the history of TVET in the United States and the United Kingdom, it can be noted that this training was mainly for black working class men and women (Hyland and Musson, 2001). The South African system is faced with the same challenge; TVET is accused of training students to 'work with their hands, not their heads' and not to think critically and conceptually (Baatjes et

al. 2014:84). In addition, the programs have been targeting poor black youths who fail to go to the universities, and also provide skills that are ‘outdated in the globalising environment’ (Baatjes et al. 2014:84). Considering these assertions by scholars, it is important to examine whether historical race, gender and class inequalities are not being reproduced in TVET. Scholars like Chisholm (1983), Kraak (2002) and Badroodien (2004) strongly feel that the development of TVET in South Africa gives rise to a subordinated working class. This study, therefore, seeks to understand the role played by TVET in relation to women’s empowerment by asking the following questions: Are women being empowered as citizens? Are gender inequalities being reproduced in TVET? This is an area that has not been explored much as women students engage in this form of education, and it is this gap that this study seeks to address.

Shor (1988) and Baatjes et al. (2014) refer to what they term ‘democratic education’, defined as ‘education that embraces social justice, economic equality and sustainable development’ (Baatjes et al. 2014: 94). This implies that, through TVET, citizens need to experience ‘intellectual growth, vocational enrichment and social improvement, as well as being able to participate effectively’ in society and think critically (Hyslop-Marginson and Sears, 2010:57). In addition, Baatjes et al. (2014:97) claim that TVET principles should be ‘intended to enhance citizenship, technical, work oriented and vocational education that supports the development of informed, reflective and politically empowered citizens.’ If women students are able to accrue the above attributes during their education, then we can say that women students have been empowered through TVET. However, whether this is the case in real life is what this study seeks to find out. It is also important to find out if the expansion of TVET in its current form will not continue to fortify the stratification left by apartheid that leads to under-privileged youth being marginalised as a result of gender, racial and social inequalities.

2.3 International perspectives on TVET

To understand the TVET system in South Africa, it is important to examine the sector in other countries as well. This section, therefore, looks at the available literature on TVET generated in other countries and, in particular, gives a brief overview of the TVET sector in a few African, European and Asian countries. These international examples, which may shed some light on the South African situation, were selected because they highlight key issues surrounding TVET.

2.3.1 TVET in Europe

Kirchberger (2008) maintains that by 2008, TVET in European countries such as France, the United Kingdom, Italy and Germany was in crisis and in the process of major restructuring. Even a country like Germany, which has always been considered as the best example of TVET that is closely aligned to the needs of the industry, has been called into question (Kirchberger, 2008). Spain has also had challenges such as an increase in the number of TVET graduates working under unfavorable conditions and having only interim contracts or part time work (Lopez- Fogues, 2014; Kirchberger, 2008). Lopez-Fogues (2014) observe that another challenge in Spain involves women being restricted to healthcare, beauty and management courses, which often leads to decreased labour market participation. Women end up in low-skilled and poorly paid jobs. In Spain, women comprise more than 85 percent of students studying community services, textiles and health, while auto-maintenance, information and technology, and electronics have an average of 2.1 percent of women students (Lopez-Fogues, 2014). This is also the case in England, where Atkins, Flint and Oldfield (2011)'s findings revealed a concentration of female learners in care work and male dominance in science and engineering courses. In addition, Kirchberger (2008) notes how conditions are even more difficult for women graduates, who tend to receive lower salaries than

men in industry in countries like United Kingdom and Italy. In European countries as well, TVET education has been driven by the need to fight youth unemployment and provide the chance for women to acquire skills for work (CEDEFOP, 2009). The reform process in the EU is aimed at creating a better quality TVET system that is responsive not only to the needs of the economy but also to the society and individual aspirations (CEDEFOP, 2009). However, whether this has had a positive impact on the lives of women is an area that requires further investigation.

Atkins et al. (2011) did an analysis on the views of young people enrolled in TVET institutions in England and acknowledged the inadequacy of research in the area of students' experiences and views. From Atkins et al.'s (2011) findings, it is clear that TVET is viewed as a possible channel for employment, as well as the creation of a chance to make valued contributions to communities (Atkins et al. 2011). As supported by Powell (2012)'s findings in South Africa, Atkins et al.'s analysis also reveals the value that is placed on TVET by learners, as they see it as an opportunity for building self-esteem and developing new skills on top of the economic benefits that could be accrued. Moreover, TVET 'provides the opportunity for significant measures of achievement for young people, who in some cases have enjoyed only limited previous experience of success in the system' (Atkins et al. 2011:6).

The European Centre for the Development of Vocational Training (CEDEFOP) has made significant strides in the development of literature on European TVET. However, the rationale behind improving TVET in the European Union (EU) remains attached to skills provision and economic growth (Lopez- Fogues, 2014). Policy documents from the CEDEFOP continue to foster the instrumental vision of TVET. Another influential agency in TVET is the European Training

Foundation (ETF²) whose mandate is to oversee TVET policies outside the European Union. Lopez-Fogues (2014) argues that this organisation follows the same pursuit of productivity and economic growth principles and helps developing countries to harness the potential of human capital through educational, training and labour market reforms. This has led to the agency's influence on national strategies and shaping even academic work in TVET in the countries where the ETF is involved (Lopez- Fogues, 2014).

From 2010, the Torino Process was implemented through the European Training Foundation (ETF). This is an assessment tool for monitoring progress of TVET. The main aim of this was to 'analyse TVET reforms by identifying similar policy trends, challenges, constraints, good practices and opportunities for improvement' (ETF, 2012:1). Reforms in the TVET sector in EU have mainly been aimed at governance issues as well as the structure of education (USAID, 2014). Thus, projects, such as the purchase of new equipment and technical assistance, have become the main mandate of the Torino process. Other areas of reform were in terms of policy, such as aligning TVET with market needs. Such changes led to curriculum reforms, fostering partnerships with industries and emphasising both improved education and teacher training (USAID, 2014). Consequently, the broader aims of these reforms were to improve the quality of TVET and enhance labour market participation of graduates. USAID Forward is another international reform agency that has an agenda to prioritise fostering women's empowerment through skills development and economic participation by means of its Gender Equality and Female Empowerment Policy. This aims to reduce gender imbalances and gender based violence by 'increasing the capability of women and girls to realise their rights, determine their life outcomes and influence decision

² The ETF has the mandate to assist and assess TVET systems in non-European Union countries and is a sister organisation to CEDEFOP which oversees TVET in European Union member states.

making in households, communities and societies' USAID (2014:43). This agenda was implemented in 2010 and its effectiveness is still to be evaluated. However, the USAID Report³, (2014:40) argues that Germany, France and Britain are still dogged by the challenges of 'relevance and effectiveness' of the TVET sector, since they are still to overcome the problems overshadowing TVET education.

Parity of esteem between vocational and academic education has remained a challenge in Europe. TVET is still considered as being of lower significance and this has been exacerbated by the economic returns associated with a TVET qualification. Operational weaknesses continue to be rampant in the sector (Colley, 2006). In England, as acknowledged by Colley et al. (2003), social class issues were apparent, as TVET was mainly being accessed by young people from poor backgrounds, and the learning material tended to be class specific. Colley et al. (2003:491) also argue that young people with lower passes who come from poor backgrounds were directed to TVET. This, in the end, would play a role in the replication of class and gender inequalities, as vocational education results in poor pay, low-level skills and little chance of progression. In addition, Colley (2006) posits that all these influence societal attitudes on TVET colleges and eventually transition from college to work becomes difficult for young people who go through these institutions. Bathmaker's (2001) study of TVET colleges in England found that students with vocational qualifications end up being channeled into low-status, low-paying jobs leading to increased social inequalities. Atkins (2009) articulated how class and gender inequalities influence the lives of young people studying at TVET colleges in England. Atkins (2009) further explores how class and gender influence the career paths and choice of educational institutions.

³ This Report is about a USAID funded project that was carried out on TVET systems in selected European and Eurasian countries.

Programmes, such as health and social care, are dominated by women students, whilst information technology and engineering are almost exclusively male. In another study, Atkins (2009:112) found that ‘all participants were undertaking class specific courses and had parents who had low levels of education and were either economically inactive or employed within class and gender stereotypical occupations.’ This implies that choice of career paths among the students interviewed was greatly influenced by their social backgrounds. Atkins (2009:151) further suggests that such scenarios have a tendency of limiting students’ chances of a better life and their agency ‘rather than providing an educational system which facilitates each individual to achieve their potential and aspirations.’

Watts and Bridges (2006) applied the CA to an analysis of the aspirations of young people who had gone into vocational education. The conclusion was that higher education may not be necessary for some people to live lives that they have reason to value and that their choice of vocational education cannot necessarily be attributed to low aspirations. Assuming that low aspirations can be attributed to those who do not choose higher education can be problematic, since this does not appreciate other people’s choices of alternative forms of post-school education (Watts and Bridges, 2006). There is a need, therefore, to respect individual choices, as not all aspirations can be fulfilled by the pursuit of a degree. The work of Watts and Bridges (2006) further highlights how young people’s choices of alternatives to higher education may be influenced by costs, media reports on students’ debts and high university fees. In my study, therefore, I will explore issues around the choice of TVET education to understand why the women students chose to study engineering at a TVET college. This study will, thus, contribute to an understanding of the career choices of women students, on the one hand, and to literature on TVET and gender, on the other.

What is emerging from the literature reviewed above is that in the selected European countries, TVET is marked by a concentration of male students in the science courses such as technology and engineering and women students dominating in the health, education and social care courses. In addition, TVET often attracts young people who obtain lower passes in school leaving examinations. Furthermore, the expansion of TVET is directly linked to skills development and economic growth.

2.3.2 TVET in Africa

McGrath (2011) and Powell (2012) both recognise the paucity of research on TVET in Africa and add that this could be due to the low social status associated with these institutions and the neglect of the sector by the funders of research. An 2011 analysis of 14 TVET journals revealed that there were only two papers written on TVET in Southern Africa (South Africa excluded) (McGrath, 2011). In Africa, research on TVET has to put up with the difficult economic, social and political situations that most of the countries are experiencing. This has resulted in prioritising agricultural and health research at the expense of education and social science (Azoh, Weyer and Carton, 2012).

There is no uniformity in the TVET sector in Africa, with regard to delivery, which could be provided by both private and public institutions, including colleges, schools or through apprentice training. (Kirchberger, 2008:8). In sub-Saharan Africa, this form of education has a reputation of being associated with low-achieving learners and women, who constitute the majority of TVET students in countries, such as Ghana, Zimbabwe, Tanzania and Senegal (UNESCO-UNEVOC, 2014). Kirchberger (2008:7) summarised the TVET situation in Africa as uncoordinated, unregulated, very fragmented, and characterised by low-quality training, obsolete teaching material and equipment, as well as gender, geographical and economic inequalities. The UNESCO

Report (2016) argues that TVET in Africa is haunted by a lack of training of the workforce, a poor link between training and the labour market demands, insufficient funding, the inability of training to foster self-employment, and a general unavailability of career guidance. UNESCO (1999:11) puts forward possible ways of addressing the low social status of TVET, which has always been a challenge in Africa, by enhancing career guidance and counselling, as well as providing better employment prospects. As TVET in Africa has always been viewed as inferior to tertiary education, progression to higher education through this route is unavailable in most cases, which results in failed aspirations on the part of those who want to go in this direction (UNESCO, 1999).

Across Africa, TVET is seen as being key in addressing unemployment and skills development, especially for women and youth. It is against this background that the African Union in 2015 formed the TVET Expert Working Group for the African continent with the sub-title 'To foster youth employment.' There have been significant shifts and reforms in the sector in an effort to overcome the challenge of unemployment that is faced by many countries in Africa. TVET is being reformed for the development of skills needed for economic growth, and the sector has been recognised for the potential role that it can play in poverty alleviation (AU, 2007). However, an African Union Report (2014) argues that TVET has failed to achieve the main objective, which is to reduce unemployment. According to the report, proposed policies have not been implemented adequately to address the challenges faced by TVET in most African countries. Lolwana (2016) also analysed TVET in most Sub-Saharan African countries and noted that responsiveness to the needs of the labour market, poor infrastructure, and low throughputs are the main challenges faced by TVET institutions.

After an examination of the research approaches adopted in three West African countries, Burkina Faso, Ghana and Ivory Coast, it was apparent that 'economics (macro and micro-economics)' is

the most preferred approach in researching the TVET sector (Azoh et al. 2012:19). This is, however, at the expense of other approaches, such as qualitative analysis, especially in gathering the views of those who are directly involved in TVET. This goes against McGrath's (2011) view that learners' perspectives should be privileged in TVET research, since they are the heart of the system. Just like in most African countries, research in West Africa has mainly been done by research agencies and consultants with little contribution from local academics and an absence of examination of students' experiences (Azoh et al. 2012). Findings from studies conducted in selected African countries have shown that many countries are making efforts to revamp the TVET sector to make it better managed and coordinated (Afeti and Adubra, 2012).

Studies in Africa have mainly been quantitative and conducted for the purpose of making policy recommendations. An example is the AU (2007) survey, conducted in a number of countries to gather comprehensive information about the provision of TVET in Africa. The findings also revealed a lower representation of women in science and mathematics studies but a higher representation in business and commercial courses. Findings from surveys like the one conducted by UNESCO (2005) in Africa with regard to policy changes, led to recommendations for the development of a competitive workforce in light of the incompatibility between skills and the world of work in the African countries (Afeti and Adubra, 2012). The desire to promote TVET as a vehicle for poverty reduction, employment, general economic development and regional integration has been the underlying driver for the generation of studies and literature (Oketch, 2007; Afeti and Adubra, 2012). Furthermore, findings from the studies conducted by institutions, such as UNESCO and the African Union identified several challenges that affect the TVET sector in Africa, including the poor perception of the sector, inadequate funding and poor management.

In Nigeria, TVET is also associated with under-achievers, which has contributed to a negative perception of the sector (Kehinde and Adewuyi, 2015). Furthermore, the authors argue that it is strongly believed that TVET is not academically oriented and so should best be taken by those with a mental or physical disability. As in many African countries, the Nigerian sector does not have enough funding to purchase teaching/learning materials and equipment for courses. Moreover, capital investment is required for machinery, laboratories and workshops, which are currently absent or out-dated (Ogbuanya and Izuoba, 2015). Ogbuanya and Izuoba (2015) argue that, in Nigeria, the present state of the TVET sector is an indication that the country is not recognising its significance and neglecting to give it the support that it deserves. Okoye (2013) adds that the major challenge with TVET is that the institutions are not imparting employability skills. This has resulted in the country importing labour, such as engineers, although there are unemployed TVET graduates. There is a mismatch between skills development and the needs of the market (Pamdoff, 2013; Okoye, 2013).

In Ghana, TVET offers the chance for skills training for a large percentage of the population (Kirchberger, 2008). However, the TVET sector in Ghana faces challenges, including poor infrastructure, inadequate training institutions, outdated syllabus and inadequate funding (Boateng, 2012). Boateng (2012) observes that the Ministry of Education spends one percent of the national budget on the sector, which is far from the needed financial injection. Negative perceptions also continue to haunt the sector, as TVET is also believed to be for less academically talented people. Anamuah-Mensah (2004) conducted a small-scale study in Ghana and noted that from 87 respondents, none of them wanted to send their children to a TVET college mainly because of societal perceptions of the sector. Though TVET is thought of as a vehicle for improved

craftsmanship and enhancing useful citizenship (Boateng, 2012), there is a need to foster positive perceptions and improve its image in Ghana.

For TVET to be effective in contributing to improved learning outcomes, there needs to be adequate funding for the sector. Countries, such as China, Singapore, Britain and the United States have managed to spend a substantial amount from their national budgets in an effort to maintain and upgrade the system, which has paid off (World Bank 2011). However, this is not the case in most African countries. According to Afeti and Adubra (2012) the priority in Africa has been to increase access and participation to the whole population, regardless of gender, physical ability or geographical location. This, however, needs to be followed up by studies that examine how those who have accessed TVET are experiencing this form of education. This study, therefore, intends to contribute to knowledge by exploring the experiences of the women students in a particular TVET college. In addition, the fact that there has generally been a lower uptake of science and mathematics courses by women in some African countries, South Africa included, calls for more literature and studies to be developed in order to understand the circumstances of women students. None of the above mentioned research set out to understand the experiences of women in engineering in TVET. However, my study intends to gain this understanding through honouring the voices of women students, and thus prioritising the advancement of TVET through research.

2.3.3 TVET in Asia – The cases of India and Singapore

The TVET system in India is characterised by a formal and non-formal education system. The formal system comprises secondary schools, polytechnics and colleges. The non-formal sector consists of pre-employment, on the job training and apprenticeships (Government of India, 2010). TVET in India is also associated with low-paying jobs and, as Agrawal (2012: 458) argues, ‘TVET is considered as an education system for the poor and educationally backward sections of the

society who are not eligible to get admission in higher education.’ Failure to secure a job after completing a TVET course is a significant challenge among graduates. According to Agrawal (2012), employers prefer high school graduates and those from higher education institutions to TVET graduates. A World Bank Report (2008) revealed that, in India, up to 60% of graduates from TVET institutions remained unemployed up to three years after graduation. In addition, Agrawal (2012) and Government of India (2010) point to the fact that, generally, unemployment rates are much higher among women TVET graduates as compared to the overall unemployment rates. Such gender disparities point to important issues that continue to trouble the skills development sector in India.

Singapore has been upheld as an example of a success story in terms of TVET provision in Asia. Law (2010) analyses the TVET system in Singapore and concludes that it has been a success owing to the ability of TVET to align with the stages of economic development of the country. Different stages of development were followed by different policy shifts, including meeting the needs of the multi-national companies, employee reskilling, transforming the TVET system into regional colleges, and changing the perception of the sector (Law, 2010). However, TVET in Singapore has been criticised for being too rigid and not fostering creative thinking (Tickly, 2013). Tikly (2013) appreciates the extent to which Singapore has been able to link TVET to its development phases but argues that this has been informed by human capital theory, which involves a narrow instrumental view of TVET. Policy reforms based on human capital theory have a tendency to perpetuate marginalisation and inequality, as other groups, such as women, may not be able to access skills training (Tikly, 2013). While many theoretical approaches can be adopted in an effort to enhance our understanding of the TVET sector, Powell (2013:71) asks important questions: ‘What difference do the [TVET] colleges make to the lives of students?’ ‘What kind of education

is needed for education and training to make a difference in the lives of students?’ In an effort to try and answer the above questions, the empowering role of TVET will be examined in this study. Thus, to understand the experiences of women students, it is imperative to interrogate the kind of education that they acquire and also to find out if it will make a difference in their lives. McGrath (2011) also emphasises the need to move away from productivist approaches and to begin to interrogate the TVET sector by asking new questions; which is what this study will try to do. In addition, by examining the voices of women in TVET, I will contribute to knowledge about TVET in the country in an effort to foster education that is flexible and encourages creative thinking, unlike the Singapore scenario. The next section now looks at the South African case.

2.3.4 The South African case

The 1997 National Committee of Further Education was one of the first committees to conduct a study on TVET colleges after 1994. The Committee made the following findings that led to substantial changes in the system: a lack of plant and infrastructure in the colleges; poor governance and management structures; inadequate administrative and organisational systems; poor support functions; a lack of quality training of lecturers; and insufficient linkages to industry (DoE, 1997). From that point, the Collaboration Fund (CCF) projects then began to focus on the colleges to identify challenges and make policy changes (Powell and Hall, 2000; 2004). They analysed TVET colleges in terms of numbers, looking at student profiles, programmes offered, colleges’ staff profiles and pass rates. This became a handy resource for policy makers and educationists. Akoojee, McGrath and Visser (2008), who were involved in a Human Sciences Research Council (HSRC) project, did an extensive overview of human resources development in the country, which resulted in crucial findings leading to the realisation that the critical skills shortage was a major challenge. Such findings led to an emphasis on the need to expand middle-

level skills, such as those required by artisans and technologists. Research activity during this stage, which helped in policy directions, was extended to other research projects including the situational analysis of colleges in nine provinces and the labour market reviews conducted by the HSRC and the Colleges Collaboration Fund (CCF). The CCF also conducted three national surveys of the TVET sector in 1998, 2000 and 2002. The findings from this research were mainly negative and, according to Powell and Lolwana (2012), there were challenges, which included poor quality service in the sector, poor management, unskilled staff and inequalities in terms of race and gender.

A significant contribution during this period was a study by the Colleges Collaboration Fund, which included both focus group discussions and a quantitative component (Fisher et al. 1998); Jaff, 2000; 2000a; 2000b; 2000c and 2000d). Powell (2013) argues that these focus group discussions, however, limited the nature of the responses, as the students and the lecturers who took part did not have enough space to express their views. Thus, research around this time was predominantly quantitative and, when qualitative approaches were adopted, they tended to present descriptive data on which policy could be built (Powell, 2013).

There was a marked increase in academic research on the TVET sector after 2003, and Masters and Doctoral students also began to examine the skills development debate in the country. Gamble (2006) interrogated issues of curriculum development in the South African system. Allais's (2007) thesis is an analysis of skills development in South Africa, which includes study of the role of TVET colleges. Allais (2007) also noted the National Qualifications Framework (NQF) challenges and the problems in aligning education and training with the needs of the economy. Thus, this research was a critique of the NQF as a regulatory structure based on economic ideas. Matea (2013) investigated a selected number of TVET colleges in Gauteng to evaluate their responsiveness to

skills shortage in the country and noted that some colleges were performing well below standards in terms of outputs and governance. Barnes (2004) focused on the success and failures of the TVET policies in the Northern Cape and concluded that the DHET needs to aim for realistic improvements in the sector, and not assume that education and training will resolve problems of unemployment and poverty.

2.3.5 Challenges in TVET colleges in South Africa

There are many problems facing the TVET sector in South Africa, but one of the main challenges is that lecturers at these colleges are part of ‘marginalised educators’ (Baatjes 2014). About 60 percent of the lecturers in the TVET colleges are not holders of professional qualifications and a large number lack pedagogical training and experience in vocational fields (Baatjes, 2014; HRDC, 2014; Gewer, 2013). This is due to the fact that, until recently, there have been no institutions of higher learning which offer training for the lecturers. Moreover, when they start working they are faced with ‘predetermined instructional procedures and standardised content’ (Baatjes, 2014:92). These practices have been criticised by scholars, such as Collins (1991), as being the products of human capital theory that discourages an ‘emancipatory critical practice’ of vocational education. Thus, according to Collins (1991), lecturers are regarded as mere facilitators and this results in deskilling. Considering learning experiences in TVET colleges in South Africa, critical teaching and learning practices are still to be adopted (Baatjes, 2014). In addition, policy and governance issues in the sector have led to increased enrolments of students, which has not been followed by an increase in the number of lecturers (HRDC, 2014). According to the HRDC (2014) the student-lecturer ratio in the sector has increased from 1:20 in 2002 to a national average of 1:55. McGrath and Akoojee (2009) allege that the legacy of the past, the problems of understaffing and a lack of

adequate support continue to seriously hamper positive change and negatively affect the performance of TVET colleges.

Wedekind, during interviews with TVET college lecturers, principals and council chairpersons discovered that the governance reforms adopted in the TVET sector were regarded as stressful, and resulted in ‘alienation, disillusionment and disempowerment’ among staff members (Wedekind, 2010:302). Wedekind (2010: 306) further observes how these mergers resulted in the disruption of the work identities of educators. Against the backdrop of such findings, one may conclude that staff at the colleges are unlikely to be effective in delivering services, considering the challenges that they are faced with. This assumption will be researched in this study that will examine the experiences of women students in a TVET college and how they are affected by the pedagogical practices, the curriculum changes and learning experiences, an area that has not been explored much in the South African context.

Esplen (2009) explores the implications of gender stereotypes in the educational curriculum and points out that generally discriminatory gender norms and roles in the curriculum have the potential of lowering students’ self-esteem and affecting aspirations and students’ engagement. Thus, for gender equality to be promoted through education, curriculum and textbook reform is mandatory, since it is still evident that gender bias continues to be prevalent in textbooks around the world (UNESCO, 2015). There has been an increase in literature on the prevalence of gender-based violence in educational settings (UNESCO, 2012). Arnot (2006) maintains that, since sexual violence is entrenched in authoritarian and highly gendered educational situations, male and female relationships tend to influence behaviour between the students and educators and among the students themselves. Thus, the study will explicitly explore the women students’ gendered experiences, as this cannot be overlooked in the context of women students studying engineering,

a currently male-dominated discipline. However, despite the lack of South African literature on gender and TVET, we can learn from the international literature examined.

Another important challenge in the South African TVET sector is the low status of TVET institutions, which, according to Baatjes (2014), often leads to graduates facing challenges in securing employment. This was brought to light by Cosser's (2003) tracer study of TVET graduates, who stated that they had faced challenges in getting a job because 'the employers are doubtful of the quality of education offered at these institutions.' Some graduates ended up being under-employed, especially in the case of those from township colleges, which were under-resourced during apartheid and whose quality of education might not have been comparable with former whites-only institutions (Cosser, 2003). This study may have been done some years ago, but it points to ongoing challenges in TVET, as well as the importance of research on the experiences of graduates accessing the labour market. My study aims to report on such issues, and thus contribute to updated knowledge about TVET. With regard to the low status of TVT colleges, the HRDC (2014: v) adds that they have always been viewed as the 'weakest' in the South African education system, which has exacerbated the negative perception of them. The stigma associated with the TVET sector also stems from the fact that white collar jobs are valued more than blue collar jobs in the country (Wedekind, 2014). According to Wedekind (2008) training in artisan and vocational education in South Africa has a negative history due to the policies of the apartheid regime, which offered training to a few blacks, Indians and poor whites and has led to the stigmatisation of manual labour. This means that, for the TVET sector to be effective, it needs to overcome these socio-cultural legacies left by apartheid.

Some of the TVET colleges in South Africa are under resourced (HRDC, 2014). From the study conducted by Cosser et al. (2003a) it was clear that some colleges operated without adequate

machinery and computers, especially for engineering students. Cosser (2003) concluded that the South African TVET sector had created victims through an inability to ‘channel graduates into appropriate career paths.’ The Green Paper (DHET, 2012b) and The White Paper (DHET, 2013) also highlight the poor quality of education that is characteristic of many of the institutions. The White Paper adds that most of the colleges were underperforming both in student and institutional outputs. The HRDC (2014) sums up the challenges in the sector into three broad categories: The first is termed ‘Partnerships’, which refers to the fact that there is no effective partnership between the colleges, communities and industry. The second category is labeled ‘Pathways’, which is the term used to indicate that there is no direct or easy passage for graduates who seek jobs, further education, or self-employment, as they often face challenges in transitioning from college to employment. The third category is named ‘Positive learning experience’, which determines the eventual perception of TVET colleges as a last resort. The South African government invested R2, 5 billion into the recapitalisation of TVET institutions (UNESCO-UNEVOC, 2015). However, recent studies of Gauteng TVET colleges (Matea, 2013; HRDC (2014), revealed that the financial injection had not been able to transform some of these institutions, although a few were capacitated to expected standards. Kraak, Paterson and Boka (2016: viii) bemoan the situation that some TVET colleges find themselves in by saying that ‘despite multiple changes intended to improve quality and efficiency, some of the colleges are still viewed as underperforming, perhaps even impervious to change efforts.’

Another interesting comment is from one of these students in the survey (Cosser, 2003) who expressed their wish to see improvements in the TVET colleges on the following issues, specific to engineering students: how to get the job one wants; business-orientation skills; negotiation skills; motivation; and confidence restoration (Cosser, 2003:87). The comment about confidence

restoration is interesting considering the damage that had been inflicted on black people through apartheid. This invokes the need for education to help in boosting the morale of learners (Cosser, 2003). From the study, it is clear that engineering students also need assistance on other issues, such as preparation in entering the job market, interview, and negotiation skills. Papier et al. (2016) found out that communication skills were an important capability that needed to be fostered for TVET students to be able to communicate effectively in the workplace. Other important attributes that are of importance are logical thinking, problem solving, and fluency in English as a language of communication (Papier et al. 2016). In general, the studies of Cosser (2003), Papier (2017) and Papier et al. (2017) highlight the challenges that are faced by students and what potential employees require as attributes from TVET colleges students. The problems identified in Cosser's (2003; 2003a) studies include unemployment, underemployment, lack of funding for further education, and insufficient equipment for practical work, especially in the case of engineering students. The negative perception of TVET on the part of prospective employers, learning experiences and students' views on the curriculum also emerge from the findings. This study was one of the few that gathered data on students' experiences of TVET and, moreover, a milestone in that it involved a qualitative approach. It has been a while since Cosser's (2003) studies, so it is important to understand the challenges that students are currently facing, since there have been many policy and governance changes in the sector. Therefore, this study focuses on the present-day experiences of women students in order to contribute to knowledge about the TVET sector.

TVET education is mainly accessed by students from lower socio-economic backgrounds of which most of them are black (DHET, 2013). DHET (2017) shows that about 90% (650 419) of students enrolled in TVET colleges were Africans. Yet, access and participation in post-secondary education should not be influenced by factors such as parental income, ethnicity or gender (Salmi

and Bassett, 2014). Due to the huge economic burden of sending a child to post-secondary institutions, such as a university, for example, families often opt to send their children to institutions, such as TVET colleges, since the courses are shorter and the fees lower. In the United States, Cahalan and Perna (2015) point out that sending a child to a university can account for up to 84% of the annual income of a family. In African countries, such as Malawi, Tanzania and Rwanda, 90% of students attending institutions of higher education came from the richest households (Mountford-Zimdars and Harrison, 2017). Moreover, as Cahalan and Perna (2015) found out, in most cases, children from lower socio-economic backgrounds tend to enroll at two-year colleges, for shorter courses or as part-time students, which has led to mainly students from lower socio-economic backgrounds opting for TVET education. Thus, reasons for choices of post-school education, as discussed above, deserve further study, which this research project aims to do by seeking to understand why students particularly choose TVET, and thus contributing to the body of knowledge on the topic.

Another challenge faced by TVET institutions in South Africa is that of outdated syllabi. Papier (2017) in a study in South Africa found out that employers and lecturers were concerned about the type of education offered by some TVET colleges. Lecturers and employers, therefore, were advocating a syllabus that aligns with the needs of industry. Papier's (2017) study revealed the need for TVET colleges to improve the employability of TVET graduates by offering both theory and practical components of skills training. Papier et al. (2016) also emphasise the need for partnerships between TVET colleges, workplaces, government and other social partners in curriculum development in order to improve the quality of training in the country. Thus, there are several challenges faced by TVET institutions in South Africa. My study therefore, by examining the experiences of women students, the aim is to understand and to bring to light different

challenges faced by women students. It is evident that South African TVET has several issues in common with other countries. The main driver to the expansion of TVET is to address skills shortage in the country which trains most middle level workers for the industry. The South African government has made a tremendous effort in improving the TVET sector through restructuring, financial injection, staff and infrastructure development. However, the sector is still faced by various challenges which are not unique to South Africa. The next section will examine the participation of women in TVET, in other countries and then in South Africa.

2.4 Women's access and participation in TVET

2.4.1. International Perspectives

It is important to extend and promote TVET so that women and girls will be able to participate equally. However, this has not been the case, as women are generally underrepresented in engineering training in TVET (UNESCO, 1999, Leathwood, 2006). There is a need to provide training to women that will open up opportunities and will have an impact on women's empowerment. Foster (2011) argues that access and participation of women in TVET has been hindered by social, cultural, political and economic factors. Although in recent years there has been an improvement in the inclusion of women in TVET, a preference for male participants still exists in the African context (Foster, 2011). For example, in some developing countries, it is not acceptable for men and women to work alongside each other. In addition, patriarchy dictates who should be sent to school, and preference of a boy child is often made (Lifanda, 2005). Issues, such as household income, lack of knowledge on the available post school education and the value of education in society will continue to determine who studies what and at which level. This results

in women being excluded from science and engineering training. UNESCO- UNEVOC (2011) observes that this has led to inconsistencies between the desire to foster equal participation and the situation on the ground. UNESCO- UNEVOC (2011) concludes that ‘violence, scathing language from fellow students and even trainers, lack of separate toilet and leisure facilities, absent or costly transportation, inflexible timetables and above all, lack of female teachers, trainers and management’ will continue to affect the participation of women in TVET (UNESCO- UNEVOC, 2011:10).

A study that was done in the United Kingdom by Thurtle, Hammond and Jennings (1998) has contributed significantly to the understanding of the gendered experiences of students in a TVET institution. This study examined what women go through as they study engineering and also the experiences of men students in a predominantly women’s training course. From the findings, it was clear that both groups of respondents reported satisfactory experiences during learning. However, women students faced some challenges in the process of acquiring practical experience, for example, in workshops where the men thought that they could not handle heavy machinery. In addition, female respondents reported gender based intimidation in classrooms from male counterparts, which ended up limiting their participation. In the United States, Morgan (1992) made a significant contribution to knowledge about TVET institutions. The study revealed how parental influence hindered the uptake of engineering and science training by women students, as parents would reportedly discourage their daughters from taking science courses, which they viewed as masculine. Morgan (1992) maintains that such perceptions have persisted and continue to affect women’s participation in engineering studies in TVET.

A more recent analysis by Makarova, Aeschlimann and Herzog (2016) also analysed the experiences of women studying engineering and other science subjects at vocational level in

Switzerland. The findings from the study indicated that both fellow students and tutors sometimes gave an indication that women were in the 'wrong' field. This also highlights some of the challenges that women students face during their education and point to the need for further research as far as the experiences of women students are concerned.

2.4.2 The South African scenario

Education is important as it affords women the chance to enter the highly skilled labour market that is traditionally male dominated, such as engineering. UNESCO (2014) alludes to the fact that women's access to post-school education globally has been increasing. However, despite the fact that women account for the highest percentage of students in post-school education in South Africa (Department of Women, 2015; DHET, 2013), the challenge is that very few of them are accessing and participating in mathematics and science studies and are clustered in non-STEM (Science, Technology, Engineering and Mathematics) subjects. There is generally an overrepresentation of women in arts, humanities, education and business fields (UNESCO, 2014; DHET, 2015). There are many barriers to women's participation in STEM subjects, and some of these can be attributed to unequal access to skills training under apartheid. Women have also faced challenges that stem from discriminatory policies and societal norms in the country (Department of Women, 2015). The National Senior Certificate results (2009-2013), reveal that male matriculants outperform their female counterparts in mathematics and physical sciences (Department of Basic Education, 2013). These subjects are prerequisites for enrolment in engineering and technological courses, for example, and they have a bearing on the gender ratios in post-school education, which will eventually determine who enters the science and engineering fields.

Research literature has been developed in South Africa in the field of engineering, as technical skills are believed to be able to play a pivotal role in development, as alluded to earlier. However, research about women and their experiences with regard to the field of engineering field has been lagging behind, especially in the TVET sector. Studies in South Africa present an understanding of the experiences of women in and through higher education, but not specifically in TVET. For example, Martineau's (1997) study analysed the participation of women in science and engineering courses and the findings showed a severe gender imbalance in these fields. Martineau (1997) also observed that black women were particularly excluded from attending higher education science courses and argued that, if this persists, it will perpetuate the marginalisation of women. Jawitz, Case and Tshabalala (2000) also conducted a study at a particular university, which was an effort to understand career choices among women. The study findings pointed to the fact that engineering was not a preferred career for most women, even if they qualified for enrolment in the relevant courses. Most of the respondents had initially been attracted to medicine not engineering. Jawitz et al. (2000) then recommended the promotion of engineering as a career since it entails working with people and offers good career prospects. Another important finding from this study was that career choice was influenced by gender, race and socio-economic background. For example, the few black women who chose engineering hoped to make a contribution to society and 'prove themselves in a career dominated by white males' Jawitz et al. (2000:471) and Lubben et al. (2010)'s studies explore the reasons behind science students' decisions to persist with a science course. The study noted a link between career orientation and study persistence. However, issues of gender were marginal in this study.

Jawitz and Case (1998) also conducted a study with women engineering students at a university to find out the reasons behind selecting engineering as a career path. From the findings, it was evident

that they had chosen engineering since it gave them the chance to contribute to social development. In another study, Jawitz and Case (2002) suggested that engineering needs to be marketed amongst women as a career option; as 'women friendly'. In another case, Shackleton et al. (2006) conducted interviews with university women students (engineering) and noted that the academic environment had been very supportive and welcoming. The only challenge cited was the heavy amount of work to the extent that some had considered dropping out at first. Shackleton et al. (2006:276) further assert that engineering is perceived as being a tough, academically challenging, sink or swim, male environment, in many ways a somehow frightening, if exciting, place for a young woman to be.'

Another milestone in research in higher education focusing on women in engineering is an HSRC research project (Chisholm et al. 2007) that studied three universities in South Africa. This study sought to understand the experiences of women students in higher education, most of whom were studying engineering and science courses. What drove the research in this area was the fact that accessing higher education for women was not the problem, but the challenge was that a higher concentration of them were in the humanities, health and social sciences. Chisholm et al.'s (2007) study revealed that gender inequality both at institutional and departmental level was not apparent. In fact, the participants denied that there was gender inequity and stated that 'young women are not estranged, alienated, or indifferent to the institution; that indeed they demonstrate a fair degree of social and academic integration and strong identification with the institution' Chisholm et al (2007:9). One key finding in the Chisholm et al. (2007) study is that the women students interviewed showed a 'strong sense of agency and independence.' This contributed immensely to the understanding of women students' experiences in higher education. The study also identified

gaps in the literature in South Africa and stated that future research should examine the following areas:

social relationships, between young men and women, curricular content, classroom dynamics, labelling practices, lecturer expectations, peer dynamics, organisational arrangements, sexual harassment, lecturer and student support and other academic experiences (Chisholm et al. 2007:4).

This is part of the gap that my study seeks to fill. In this case, however, the experiences of women students in TVET will be the focus.

Although the above studies have contributed to the understanding of the experiences of women in engineering studies, there is still a gap that needs to be filled. Most of the studies have been quantitative in nature and have focused on women students in the higher education sector. It is important, therefore, to conduct studies to understand the experiences of the women students in the TVET sector as well, which is the focus of this research study.

Conclusion

This chapter has presented some insights on the gaps that have emerged in literature on TVET in South Africa particularly, and other countries as well. The underlying insight is that the literature has mainly focused on quantitative analyses of the sector. In addition, the approaches have been informed by the human capital theory, which is a narrow view of TVET. Therefore, experiences of students, especially women, have not been captured. This is the identified void in literature that this study strives to fill. By gathering the views of the minority in the TVET engineering sector, my study aims to arrive at an understanding of the enablers and constraints in the process of empowering women through TVET. The available literature needs to be built upon in order to understand this sector of post-school education in South Africa. This study will build on the

available literature by investigating the experiences of women students in TVET, in particular those in the final trimester of the N6 programme. In addition, through the application of the capability approach, the study will add to existing literature by forwarding the valued capabilities by women students in TVET.

CHAPTER 3: CONCEPTUALISING WOMEN'S EMPOWERMENT

Introduction

This study investigates the role of technical and vocational education and training in women's empowerment and, therefore, explores the experiences of women students studying engineering to understand the impact of this form of education on their lives. Informed by the capabilities perspective, the aim is to comprehend whether TVET in its present state in South Africa is able to foster the lives that the women students have reason to value. In this chapter, therefore, I examine various definitions and conceptualisations of empowerment. Different views are scrutinised as far as the link between education and women's empowerment is concerned. After the realisation that access to education alone is not enough, attention has been shifted to the assessment of the quality and relevance of education offered to women and how this education can contribute to women's empowerment (Murphy-Graham and Lloyd, 2016; Murphy-Graham, 2012; DeJaeghere and Lee, 2011). A number of studies have been conducted on the concept of women's empowerment through education (Kabeer, 1999; Rowlands, 1997; Stromquist, 1995; Malhotra et al. 2002). Murphy-Graham (2012:3) looks at how education can be used a tool for women's empowerment and notes that education has the potential to empower women. This study, therefore, seeks to complement the available literature on women's empowerment through education. Before looking in detail at empowerment, I am going to discuss the construct of gender, since I am focusing on a specific aspect of empowerment, women's empowerment.

3.1 Defining gender as a social construct

Gender is defined in terms of the social positions that men and women occupy (Haslanger, 2000 in Robeyns, 2007: 56) According to Haslanger (2000), one's gender is mainly conceived in terms of bodily features that determine their reproductive capacities. For a person to be defined as either a 'man' or a 'woman' their bodily features mark them as such (Robeyns, 2007). The social category 'gender', thus, becomes projected on the biological category 'sex'. Thus, gender as a concept is socially constructed and, in the end, gender norms determine socially acceptable behaviour and may end up creating or reinforcing gender inequalities (Robeyns, 2010). Robeyns (2007:60) argues that gender is a complex and a multi-layered phenomenon; moreover, institutions can be gendered. For example, educational institutions like classrooms can reinforce gender stereotypes in the way the teachers treat women and men, girls and boys. Families are also gendered institutions as parents tend to teach their children appropriate behaviour based on whether a child is a girl or a boy, and gender norms underlie most family's living arrangements (Gheaus, 2012). Robeyns (2007) shows how gender stereotypes are formed as part of socialisation and may also affect an individual's achievements and aspirations. Therefore, it is important for research on the experiences of women students to understand gender more broadly so as to be able to examine these experiences as they are affected by institutions, such as family, institutions of learning and society. Sen (2001) explains how women's empowerment through education, employment and property rights can play a pivotal role in addressing gender injustices.

This research tries to explore the notion of distribution and equitable access to TVET by investigating the gendered experiences of women students and how these experiences shape the creation of agency, aspirations, freedoms and wellbeing. It is not enough to have more women studying engineering, it is also important to consider their experiences in education, and the

outcome of TVET education in their lives. The capability approach is helpful here, as it emphasises the expansion of individual freedoms and opportunities for one to lead the life one has reason to value. Using this approach, the research will understand women's empowerment in education and examine students' personal and social conditions that nurture or restrain the creation of educational outcomes that are of value to them. Aikman and Unterhalter (2005:4) argue for a form of education that facilitates the process of overcoming constraints on capabilities through the development of knowledge, understanding and skills needed to achieve valued functionings. Unterhalter (2015) argue for the need for reflexive education that invokes questions about one's context. This can be achieved if an education system allows all individuals, irrespective of their gender, to develop the capabilities and freedoms that they have reason to value. According to Chopra and Muller (2016) women continue to experience inequalities in their economic, social and political spheres, continue to face poverty, lower rates of education, unequal access to health services, unequal pay for the same work as men and lower political participation. In addition, Nussbaum (2000:1) asserts the following:

Women in much of the world lack support for fundamental functions of a human life. They are less well-nourished than men, less healthy, more vulnerable to physical violence and sexual abuse. They are less likely than men to be literate and still less likely to have a professional or technical education.

While the term empowerment can be used for both men and women, it is more pertinent to women since disempowerment of women is a challenge that is faced by women in much the world (Nussbaum, 2000). Women's relative powerlessness emanates from households and families (Malhotra and Schuler, 2005); and, therefore, these gendered inequalities compel development practitioners and researchers to learn more about the role of education in the lives of women. It is,

thus, important for this study to examine whether TVET education can contribute to women's empowerment.

3.2 What is women's empowerment?

Empowerment is a term that has been widely adopted in development discourse but does not have an agreed definition. Datta and Kornberg (2002) argue that the concept is multifaceted and the definition, therefore, eludes simplification. Even within the human development approach, the meaning of empowerment, when the concept is used in diverse contexts, has different meanings (Drydyk, 2013). However, the term 'empowerment of women' was validated at the Fourth Conference on Women in Beijing in 1995. From there, the term has evolved over the years and is adapted in different circumstances (Drydyk, 2013). In the 1990s, the term women's empowerment was used in the development field by the critics of the Women in Development (WID) and the Women and Development (WAD) approaches. These models were criticised for being too economic, and it was argued that the concept of women's empowerment should be all-encompassing and bring to light issues of inequalities, race and ethnicity (Batliwala, 2007). Since then, the concept has been applied to different fields, such as health care, education and rural development. Thus, it is important to examine how different scholars have conceptualised the notion of empowerment in the fields of gender and education.

Kabeer (1999; 2005) offers a choice-based definition of empowerment, which illuminates the reality that disempowered people have limited choices and cannot be blamed for failing to act, since they do not have many choices to flourish, and flourishing is out of their control. Kabeer (1999:437) defines women's empowerment as 'the process by which those who have been denied the ability to make strategic life choices acquire such an ability.' These strategic life choices, as conceptualised by Kabeer (1999, 2005), are the first order choices that are important for individuals

to live a life they have reason to value. Thus, according to Kabeer, choices should be related to power and should be of significance in a person's life. This definition of empowerment in terms of choice emanates from the fact that women do not have the freedom to make choices as a social group as compared to men. Such choices are 'strategic' and range from the realm of households to that of communities (Kabeer, 1999; 2005). Kabeer also refers to resources as being key to the empowerment process. Resources could be both human and social, and they are important, since they facilitate the exercising of choice. For example, a woman, who has a subordinate position in society and her household, has limited resources at her disposal to facilitate making strategic choices (Kabeer, 1999). Examples of resources that may contribute to women's empowerment are access to education and paid work, as well as women's involvement in governance and leadership structures.

Khader (2011), however, critiques this definition and argues that empowerment aims at improving people's opportunities for well-being or flourishing, not simply multiplying their choices. The choice definition is problematic in the sense that some people may not have the desire to flourish, even when faced with choices. It becomes difficult to distinguish between disempowerment resulting from lack of choice and that which is due to a lack of desire to flourish. The choice definition also assumes that it is possible to achieve women's empowerment without structural changes (Khader, 2011). This, however, may be difficult when looking at TVET students, for example. Structural changes may be necessary in the TVET system in order to afford women students the opportunities to flourish and move towards women's empowerment. Women's subordination, which may lead to non-participation in class, for example, needs to be overcome, as it is a structural impediment to their flourishing.

The other challenge of defining empowerment in terms of choice is that those who are disempowered also make choices ‘even if these choices do not challenge the social order that oppresses and deprives them’ (Khader, 2011:180). This definition brings to light the question on the types of choice that development interventions could avail for the disempowered. I would argue, therefore, that while the choice definition offers essential insights on the conceptualisation of empowerment, it is not sufficiently far reaching. Drydyk (2013:250) argues as follows: ‘The new idea of empowerment as choice expansion is neither relational nor transformative; it has no connotations referring to gender relations or other power relations, nor does it imply any transformation of social relations.’ This statement implies that one should look at alternative conceptions of empowerment.

As argued earlier, the term empowerment lacks conceptual clarity. Khader (2011), therefore, cautions that a poorly conceived definition may lead to difficulties in distinguishing or separating development interventions that are empowering and those that are not. Khader (2011), therefore, proposes a definition of empowerment that draws from the concept of adaptive preferences. Empowerment is a ‘process of overcoming one or many IAPs through processes that enhance some element of a person’s concept of self-entitlement and increase her capacity to pursue her own flourishing’ (Khader, 2011:176). IAPs are inappropriately adapted preferences, which are defined as ‘inconsistent with a person’s basic flourishing that is causally related to conditions of deprivation’ (Khader, 2011:176). However, Khader posits that not all changes in IAPs are empowering and that not all IAPs need to be overcome in order to be empowered; only those IAPs that inhibit the achievement of well-being. Empowerment from this perspective denotes that one has to overcome IAPs and move towards seeing oneself as worthy and capable (Khader, 2011). In the case of TVET as an intervention, it should help women with their self-conception and

encourage them to take action that is conducive to their flourishing. Thus, empowerment needs to be conceptualised in terms of all domains of well-being in order to understand issues of well-being trade-offs (Khader, 2011). Access to one type of resource, such as income, cannot be taken as empowerment, as women may trade their well-being; in other words, an improvement in only one domain does not constitute women's empowerment.

With regard to the women students in this study, the fact that they have access to TVET, engineering education in itself cannot be synonymous with being empowered, as focus has shifted from issues of access to the examination of the type of education that can promote empowerment. There is now a need to address the marginalised status of women and change the norms and values that leave women at a disadvantage. Education is expected to play a significant role in this (Murphy-Graham and Lloyd, 2016). Thus, for us to know if a woman is making progress towards being empowered, it is necessary to explore how the development intervention is positively affecting all the dimensions of her life (Khader, 2011; Ibrahim and Alkire, 2007). This definition, therefore, offers a better understanding of empowerment, by drawing our attention to issues of adaptive preferences in the lives of women. For example, having been brought up in a patriarchal society may affect the participation of women students in the education system. Overcoming this adaptive preference by actively taking part in the college activities may be a step towards women's empowerment. The challenge with this definition is that it only focuses on one concept which is adaptive preference. For women's empowerment to be achieved, however, there is a need to look beyond adaptive preferences into issues of resources and agency. Overcoming inappropriately adapted preferences alone may not be enough for women students in TVET to achieve empowerment. DeJaeghere and Lee (2011) argue that, in most cases, gender inequality is rooted in the family and social life, so education cannot effectively contribute to women's improved well-

being unless issues of content, curriculum and lesson delivery are addressed, which calls for a comprehensive definition of empowerment. Murphy-Graham (2012) and Murphy-Graham and Lloyd (2016) also offer a definition of empowerment that is linked to education. Murphy-Graham (2012: 15) proposes the following definition of empowerment:

A process of recognition, capacity building, and action. Empowered individuals come to recognise their inherent worth, the fundamental equality of all human beings, and their ability to contribute to personal and social betterment. They develop the capacity to critically examine their lives and broader society and to take action towards personal and social transformation.

The work of Murphy-Graham (2012) and Murphy-Graham and Lloyd (2016) deepens our understanding of empowerment by helping us to engage with issues of equality, inequality and agency. This, therefore, compels us to look at the different forms of inequality in the TVET system. Issues such as hierarchies between the lecturers and women students, on the one hand, and women students and men students, on the other, as well as pedagogical and institutional structures that may perpetuate inequalities, need to be investigated. The formulation of a definition also requires us to examine the type of education that is being offered by TVET colleges. It becomes essential to investigate whether engineering education is capable of enhancing critical thinking and action towards positive change. In this study, therefore, by examining what students feel about the curriculum and what they want to change, I would be moving towards recommendations for education that fosters women's empowerment, a conceptualisation that may provide an understanding of the important role that TVET should play in the lives of women students.

Unterhalter (2015) suggests that empowerment as a social justice project needs to incorporate all the aspects of capabilities, which means that an individual should have a wide capability set, high quality choices, and the freedom to act as well as the relationships that facilitate and sustain these freedoms. Unterhalter, (2015) and Sen, (1999) conceptualise empowerment within the capabilities

space and contend that women's empowerment is important for development and is influenced by their education, ownership of resources, and access to employment and the labour market. For all these to be achieved, a 'reflexive form of education' should be offered (Unterhalter, 2015). This resonates with the opinion of Murphy-Graham (2012) who emphasises the need for education to be able to foster critical analysis and contribute to social and personal transformation. I now turn to different scholars who have defined empowerment in the context of capabilities, drawing on the link between empowerment and agency.

3.3 Empowerment and agency

As noted above, various attempts have been made to develop the conceptualisation of empowerment, which differs according to particular agendas. In this section, however, I am going to focus on definitions that consider agency, which is a specific component of empowerment. Malhotra et al. (2002) identify agency as the core of empowerment but emphasise that this conceptualisation does not imply that all improvements in women's lives are brought about solely through individual efforts by women.

Crocker and Robeyns (2010:61) argue that, according to Sen's conceptualisation, empowerment is used interchangeably with the terms agency and well-being when assessing how individuals and groups are doing. Thus, Sen (1999: 19) uses the term agent to refer to 'someone who acts and bring about change.' The conceptualisation of empowerment as agency is beneficial in the sense that access to resources do not necessarily lead to empowerment if there are still factors that constrain agency (Malhotra et al. 2002). Thus, resources are not always sufficient to bring about improvement. Malhotra, (2002:9), therefore, considers agency as the essence of empowerment and resources, on the one hand, and achievements as enabling conditions and outcomes, on the other.

Ibrahim and Alkire (2007) and Alsop et al. (2009) offer an understanding of the link between agency and empowerment. Although they do not engage with the possible relationship between education and empowerment, they draw from the capability approach and from its key concept, agency. Ibrahim and Alkire's (2007) contend that empowerment entails the expansion of agency and emphasise that changes in the institutional structures are necessary in order to enable the expansion of agency.

Alsop et al. (2006) argue that empowerment has two components: 'agency' and 'opportunity structure'. An expansion of agency is considered an important constituent of empowerment. In addition, the institutional structure facilitates, and is necessary for, an individual's exercising of agency. 'A process of empowerment is incomplete unless it attends to people's abilities to act, the institutional structure, and the various non-institutional changes that are instrumental to increased agency' (Ibrahim and Alkire, 2007:9). Thus, Ibrahim and Alkire (2007) consider empowerment to be an expansion of agency⁴ and emphasise the need for structural changes that facilitate agency. According to this definition, for empowerment to be achieved, individuals should have the freedom to act and be active agents of change to achieve their well-being. Thus, in any development intervention, people should participate effectively not only to influence decisions but also to control and hold institutions and states accountable (Sen, 1999; Narayan, 2005). Expanding people's capabilities to be able to act and bring about change in their lives is an important step towards empowerment. This aspect is useful for understanding women's empowerment through TVET. In this study, therefore, exploring the experiences of women students in the education system brings to light their ability to exercise agency and the constraints that hinder this process,

⁴ Agency is defined by Sen 1985:206 as 'what a person is free to do and achieve in pursuit of whatever goals or values he or she regards as important.'

which could require structural and institutional changes. Opportunity structure denotes the 'broader institutional, social and political context of formal and informal rules and norms within which actors pursue their interests' (Samman and Santos, 2009: 3). This context, therefore, may create either an enabling or constraining environment for effective agency. Alsop et al.'s (2006) definition of empowerment's strength lies in being able to highlight the fact that the opportunity structure can constrain one's ability to convert available resources into valuable functionings. For my study, therefore, an understanding of structural arrangements is important, as it enables us to recognise their effects on the lives of the women students. Comprehending their experiences in the educational system would, therefore, bring to light what structural changes need to take place in the institution, for example, in order to facilitate active agency and choice. Thus, the relationship between empowerment and agency is undoubtedly close.

Empowerment is, thus, seen as the expansion of agency (Ibrahim and Alkire, 2007; Alkire, 2008); empowering women means that they become active agents. Moreover, Alkire (2003: 131) uses the term empowerment to convey the concept of 'agency achievement'; and, women's empowerment, in particular, can be seen from two viewpoints. The first is that, a developmental project, such as goat rearing in Pakistan, gave women the opportunity to discuss choices, make better choices and improve self-confidence. The second is that development projects gave the women decision making power and 'built confidence in the women's individual and collective capacities and cognitive abilities' (Alkire, 2003:252. For Alkire (2005:4) empowerment is 'an increase in certain kinds of agency that are deemed particularly instrumental to the situation at hand. Thus empowerment is a subset of agency, and increases in empowerment would be reflected in increases in agency.'

This understanding of empowerment can also be applied to TVET education. For us to say that women have been empowered through education, it is important to examine if they are able to make better choices, acquire enhanced self-confidence and develop cognitive abilities that lead to effective agency. This can be revealed through the examination of the valued capabilities developed by the women students. This study, therefore, expands the conception of women's empowerment by Alkire (2003) by using this conception as a starting point. Alkire (2003)'s argument is that a development intervention's success should not only be measured in economic terms, but in the development of valued capabilities. In the same manner, the effectiveness of TVET as a possible tool for women's empowerment should not only be assessed through its potential to create economic benefits. By coming up with a list of capabilities, I will be bringing to light the potential benefits of TVET, which go beyond monetary benefits and are what women students have reason to value.

In this sense, agency is important in that the acquisition of a TVET qualification, for example, may not be automatically empowering, but it creates the conditions necessary for one to be able to exercise one's agency and work towards empowerment. Resources and opportunities need to be translated into functionings and achievements to offer possibilities of change in the lives of women (Kabeer, 1999). Walker (2008: 124) sees education as a potential source of empowerment and says that, at the same time, education can be a source of inequalities and symbolic violence. This means that, although education can be used as a potential tool for empowerment, there is a need for agency to be considered as well, since education can also be disempowering. Empowerment is influenced greatly by one's agency (Kabeer, 1999).

Narayan (2005) postulates that empowerment can be distinguished from other concepts by two features: process and agency. Narayan (2005) conceives empowerment as a process of change

towards greater equality or better freedom of choice and action. With regard to agency, the author argues that women themselves must be significant actors in the process of change. Even though change is effected in the lives of women, unless they are seen as agents of that change rather than passive recipients, this will not be considered empowerment. The importance of agency in the development discourse comes as a rejection of top-down approaches which assumed that development was led by experts. Agency encourages popular participation and social inclusion; therefore, it is crucial to acknowledge that women can be agents of change in their own lives (Nayaran, 2005). Thus, Narayan (2005) defines empowerment in terms of human development and agency, emphasising the importance of women as active agents in the development process.

Drydyk (2008: 243) argues that, if changes in power relations fail to enhance agency, well-being and freedom, such changes cannot be taken as 'empowering' because the main goal of empowerment will not have been met. For women's empowerment to take place, they must become empowered relative to the men in their lives. This does not mean that women will have more power than men, or power over men. Rather, women's empowerment will lead to the improvement of women's relationships with the men in their lives (Murphy-Graham 2012:20).

Thus, Drydyk argues as follows:

The concept of empowerment contextualizes agency in two ways: in relation to well-being freedom and in the relational context of power. Or, put this another way, empowerment has three distinct but related dimensions: agency, well-being freedom, and power. Development that is defective in any one of these dimensions is less empowering than it might have been, or, arguably, than it ought to be (Drydyk, 2013:260).

Drydyk (2008; 2013) conceives empowerment in the space of capabilities. According to Drydyk (2008: 2), women's empowerment implies being able to make one's own decisions, which involves active decision making instead of having family members or others making decisions on one's behalf. For Drydyk, agency, well-being, freedom and power constitute empowerment. Drydyk

(2013), however, brings in issues of power in conceptualising empowerment and argues that gaining power in itself is not enough if one is not able to shape one's own life. Drydyk therefore, acknowledges the importance of gaining power in empowerment but contends that one can be empowered through expansion of agency, even without gaining power. This means that power gains can be taken as one dimension of empowerment that may not be necessary to reach the empowered stage (Drydyk, 2013).

An important issue is that empowerment entails changes in the different domains of an individual, and this is greatly influenced by structure. Empowerment can also be within the family or in the public domain, (Kabeer, 1999:13). Literature on empowerment, therefore, offers three insights of particular importance for this study. The first insight from the different definitions is that empowerment is about changing power relations (Batliwala, 1993; Rowlands, 1997; Kabeer, 1999). For Batliwala (1993), power manifests itself in the ability to control available resources, such as the following: physical, human, intellectual, and financial resources; the self; beliefs; values; and attitudes. The second insight is that empowerment is relational. This perspective sees empowerment as transformative, and implies the transformation of relations, be they gender relations or power relations. Drydyk (2013:256) explores the different definitions and concludes that 'empowerment does have relational aspects, and these can be neglected by the choice conception of empowerment and by the idea of being better able to shape one's own life.' Thirdly, it is also clear from the concepts of empowerment that it is a process, 'not a fixed state nor an end-point, let alone an easily measurable outcome to which targets can be attached' (Cornwall, 2016:344). In addition, there is no uniform recipe for empowerment, as its presence in one area of a woman's life might not lead to the transformation of power relations or agency in all aspects of her life (Cornwall, 2016). Thus, Cornwall (2016:345) argues that 'this encourages an approach

that looks at different dimensions and sites of empowerment in a more holistic way, one that aims to understand the relational dynamics of power and positive change at a variety of levels, in different spaces over time.’ This is the reason why I adopted the capabilities view of empowerment for this study. The significance of the definitions grounded in the capabilities framework is that they ‘help refine discussions of empowerment suggesting a practice regarding how it may be used in the direction of equality and social justice, rather than simply agency for any purpose.’ (Unterhalter, 2015:16). This is important to understand, as some forms of education may empower one group of people and not the other (Greany, 2012). In this study, although it is not comparative, there is a need to examine if engineering education has the potential to expand the capabilities of women students. This is done by coming up with a list of valued capabilities, which was based on the responses of the women students in the study. This list of capabilities will help in providing direction towards social justice in the TVET system. The definition of empowerment in terms of capabilities might adequately capture all the domains of empowerment. Understanding all these domains may lead to an evaluation of TVET as a potential tool for women’s empowerment. I consider the conception of empowerment in the space of capabilities to be more encompassing than that of other conceptual frameworks, as the following diagram will show.

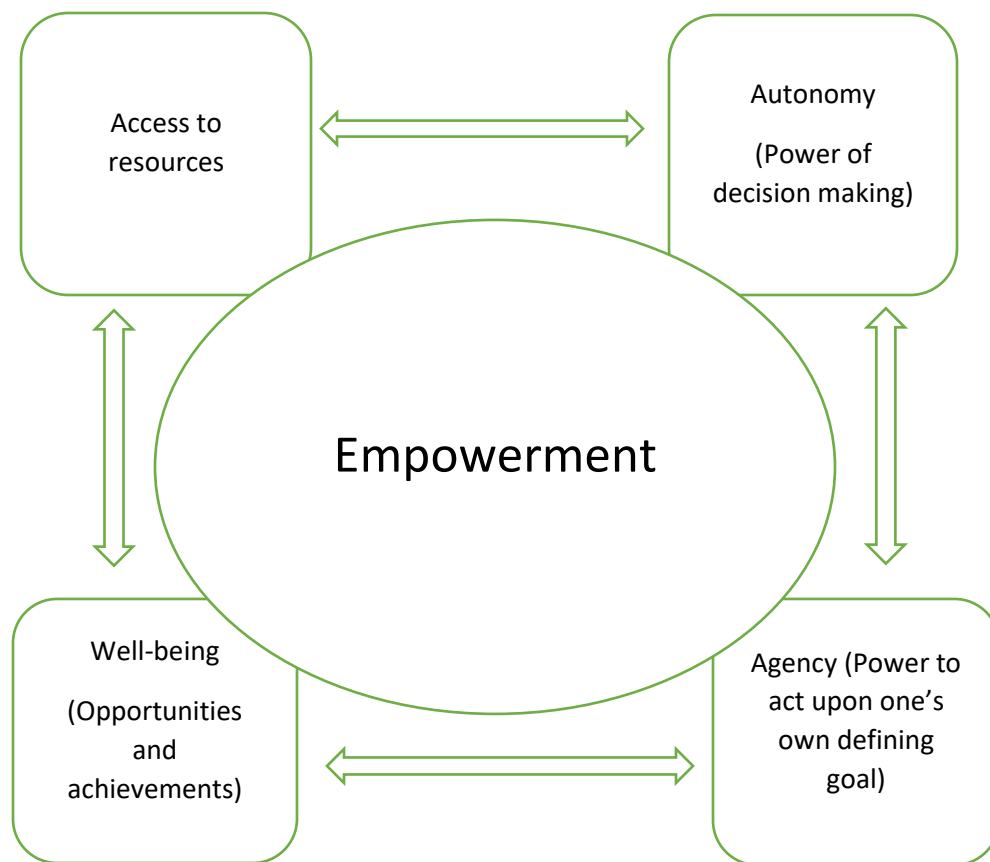


Figure 3.1. Conceptualisation of empowerment (Adapted from Tripathi, 2011:7)

Tripathi (2011) draws from the capabilities perspective in her conceptualisation of empowerment. The path diagram above tells us that the route from accessing education to women's empowerment is not straightforward but is determined by processes, such as access to resources, the power of decision making, and agency. According to this conceptualisation, resources form circumstances under which choices are made. The processes 'denote expansion in capabilities in a way which brings changes in the lives of individuals; people who were previously denied power and are now being empowered' (Tripathi, 2011:5). From the diagram, it is clear that agency, access to resources and autonomy are key concepts of empowerment. Tripathi (2011:8) considers agency as the

‘essence of empowerment, resources and achievements as enabling conditions and outcomes respectively.’ Therefore, empowerment without the agency of women cannot be termed women’s empowerment. Women should play an active role in the process of change (Tripathi, 2011). Drawing from Tripathi (2011), empowerment could be defined as the process of gaining increased life options, as well as choices, being able to take control of one’s life, and generally being able to live the life one has reason to value.

Tripathi’s conceptualisation of empowerment (Figure 1) helps to explore inequalities that may be masked by numerical data (the number of women in TVET). Through asking questions about women’s material and social conditions, such as access to college, (transportation), funding, accommodation and safety issues, this study uncovers what the women students really want and what can be improved in order for TVET to be used as a tool for empowerment. It is important to examine such factors, as inequalities may be entrenched in social arrangements. Therefore, conceptualising empowerment in the capabilities framework is far-reaching and goes beyond numerical analysis. A superficial conceptualisation of empowerment would ‘undermine its ability to expose social processes that relate to gender equity and the processes of becoming empowered’ (Monkman, 2011:5).

An expansive definition of empowerment would go further than the analysis of the material well-being of women, since it is only but one outcome of empowerment (Tripathi, 2011). Tripathi (2011:5) argues that, for empowerment to take place, there should be ‘expansion in capabilities in a way which brings changes in the lives of individuals, people who were previously denied power and are now being empowered.’ Thus, Sen (1999) emphasises the removal of ‘unfreedoms’ to facilitate women’s agency and empowerment. From a capabilities perspective, therefore, empowerment is multi-dimensional and is not reducible to any one of the three components of

agency, well-being freedom and power (Drydyk, 2013). Thus, Tripathi (2011) like Drydyk (2013), recognises all three dimensions of empowerment and posits that any development intervention that lacks these may not be as empowering as it ought to be. The next section looks at the different dimensions of empowerment.

3.4. Dimensions of empowerment

Women's empowerment is multidimensional and has four distinct areas: personal; economic; social; and political (Mujahid et al. 2015). These dimensions relate to Tripathi's four blocks in that, for a woman to be considered empowered, they should all be positively affected, come into effect. Thus, empowerment should not be conceptualised according to only one given outcome, but should be multi-dimensional.

3.4.1 Economic empowerment

Economic empowerment is more concerned with women's participation in the labour market. This entails the need to create opportunities for women and the removal of barriers hampering their meaningful participation in the labour markets. Chopra and Muller (2016) argue that, under this dimension, it is important to take into account the contribution of women through non-market fields, such as care work which is unpaid, and how it eventually influences their full participation in the labour force. According to Carr (2000:2), women's economic empowerment is 'having access to and control over the means to make a living on a sustainable and long term basis, and receiving the material benefits of this access and control.'

The dimension of economic empowerment raises a series of questions that need to be considered in this study. Can TVET in its present state translate into economic gains for the women students of this study? Will they be equipped to get jobs that they have reason to value? This is especially

important for TVET students because it is poor black women students who are overrepresented in the TVET colleges in South Africa (DHET, 2015). If TVET education can contribute to women's economic empowerment, we could at least expect to see a move towards equality of employment chances to an extent. Is society or the economy rewarding these women's educational achievements? If, through TVET, women are given the opportunity to participate effectively in economic activities and generate an independent income, then we can say that education is fostering women's empowerment. This would contribute to women's empowerment, as it gives them the opportunity to contribute economically and also to make economic decisions. To understand if a woman is moving towards empowerment, therefore, one would need to explore if a development initiative (in this case TVET) has made a positive impact in her life, especially in the different domains of life. Khader (2011) however warns against an emphasis on increasing access to income as the main domain of women's empowerment. What is important is to aim towards improving the overall conditions of the lives of women, focusing mainly on what the women have reason to value. Thus, women's empowerment conceptualised only in economic terms is inadequate. The overall aim of empowerment should be focused on 'the complexities of real women's struggles for flourishing and real women's needs.' (Khader: 2011:205). In addition to education providing a source of income, women should contribute to society as responsible citizens.

3.4.2 Social dimension of empowerment

Another dimension of women's empowerment is the social dimension. This relates to the changing power relations at family, community and society levels, generally, through being aware of women's rights and needs. Social empowerment embraces a realisation and an expansion of the areas of family and social relationships. This will also help women in changing the way they see

themselves. According to Duflo (2012), legal rights, especially property rights, continue to favour men compared to women. It is important to understand whether TVET can be used to improve women's unequal status in society. Does education lead to a shift in the power structures? In other words, one needs to know if there is 'a process of transition from a state of powerlessness to a state of relative control over one's life, destiny and environment' (Sadan 1997:144). This means that a curriculum and teaching practices that encourage students to question inequalities in the college system and the society is essential. This is what Shor (1992) terms 'critical thinking curriculum' and 'critical dialogue'. Women students should be able to question their subordinate positions and disempowerment. Shor (1992) adds that the experiences of students in the education system may generate alienation and reciprocate existing societal inequalities. For social empowerment to take place, students need to be encouraged to develop 'the power to think critically and act constructively; the power to study in-depth, to understand school, society, work, politics...' (Shor 1992:111).

3.4.3 Political dimension of empowerment

Political empowerment is defined by Hennink et al. (2012:210) who state that 'empowerment in the political domain, refers to the ability of individuals, communities and organisations to have legal rights, hold governments accountable to protecting those rights, and have the freedom to advocate for political and legal change.' Thus, for a woman to be said to be empowered, politically, they need to be able to advocate for policy change and demand better service provision, for example. This form of empowerment is enhanced by women's rights to vote, quotas for women in parliaments and representation in the local government. It would also include the exercise of choice in whether to take part in decision making matters and structures and, eventually, being able to influence outcomes in the political sector (Hennink et al. 2012).

This dimension of empowerment, therefore, entails having the freedom to make decisions on voting, and the opportunity to contest in politics, campaign or be involved in political decision making. Women will then be able to raise their grievances on problems, such as holding the state accountable (Mujahid et al., 2015). Mujahid et al. (2015:42), therefore, argues: ‘Political freedom is necessary for human development and is an integral part of empowerment. Political empowerment increases the participation of women in decision-making that affects their lives.’ Mujahid et al. (2015) further postulate that, considering that men monopolise politics worldwide, it is necessary to increase women’s participation in political activities. This form of empowerment requires change at all three levels of family, community and society, and a challenge of power structures (Chopra and Muller, 2016). Through TVET education, therefore, women should be able to come to an awareness that they have rights to vote, contest, make decisions, and not to leave the power of decision-making to others. This would also include women’s participation in the governance structures at TVET institutions through voting or contesting in students’ representative councils.

3.4.4 Personal dimension of empowerment

Personal empowerment denotes the development of a sense of self, whilst personal competencies are those that relate to an individual’s thoughts, habits and dispositions. Personal empowerment also involves issues to do with self-awareness, personal development and spirituality (Murphy-Graham and Lloyd, 2016). All these will ultimately contribute to individual well-being. This means that attaining skills and abilities through education is important; but, unless this is accompanied by the capacity of critical thought, education will not be useful in an individual’s personal life (Murphy-Graham, 2012). In addition, education that empowers should be able to nurture personal traits, such as resilience and discipline. For personal empowerment to be fostered,

therefore, education should encourage students to be reflective about the reason for their existence and how they can contribute to social well-being. For women, the development of personal competency will entail an understanding of one's sexuality as well (Murphy-Graham and Lloyd, 2015). Personal empowerment, which is closely related to agency, is essential for a woman to be able to take action concerning issues in her life. Murphy-Graham and Lloyd (2016: 563) state the following:

Education must provide opportunities for individuals to critically think about their strength and weaknesses, their talents, their habits, and their likes and dislikes and to ultimately support students in cultivating their innate strengths and dispositions so as to maximize their potential contributions to social well-being.

Personality traits, such as resilience, emotional awareness and discipline need to be fostered through education (Murphy-Graham and Lloyd, 2016). This study will seek to examine the development of these traits when looking at valued capabilities in the lives of women students.

Despite the fact that the concept of empowerment lacks a precise definition, its importance cannot be overlooked. The interconnections between economic, social, political and personal dimensions cannot be overlooked, since they depend on each other (Hennink et al. 2012). They all contribute to women's empowerment and may facilitate empowerment in another domain of women's lives. In the same vein, lack of empowerment in one domain may also lead to disempowerment in another one. Thus, it becomes imperative to understand these components of empowerment, especially for the development interventions and the educational institutions that strive to foster change and poverty reduction in the lives of women.

3.5 Women's empowerment through TVET education

It is often assumed that the more the years of education, the more empowered a woman becomes (Murphy-Graham, 2012). However, Unterhalter (2015) and Monkman (2011) postulate that the link between education and empowerment is neither clear nor simple. It is then my aim to understand how, and if, TVET education works to empower women students. Thus, it becomes important to examine the learning experiences of these women students. By so doing, this research contributes to the literature on education and women's empowerment. The ultimate aim is to call for 'real' education that fosters social transformation in women's lives (Nussbaum, 2003:34). Murphy-Graham (2012) concludes that, since education varies, it is important to ask the question 'What kind of education?' in an effort to establish the link between education and women's empowerment.

Shor (1992:12) argues as follows:

Education can either develop or stifle [their] inclination to learn. A curriculum that avoids questioning school and society is not, as is supposed, politically neutral. It cuts off the students' development as critical thinkers about their world. If the students' task is to memorise rules and existing knowledge, without questioning the subject matter or the learning process, their potential for critical thought and action will be restricted.

Thus, for education to be empowering, it needs to encourage students to question knowledge and challenge the status-quo. This is particularly important for women students, who often find themselves in submissive positions as dictated by gendered inequalities and patriarchy. 'Empowering education should lead to actions that challenge inequitable social structures and improve individual and collective prosperity' (Murphy-Graham 2012: 20). Samman and Santos (2009) argue that education is one major determinant of empowerment, among other determinants, such as land ownership, participation in the market economy.

Shor (1992) observes that classroom interactions play a significant role in both empowering and disempowering the students. An empowering education would be in a classroom where dialogue between the teacher and the students is encouraged. However, one needs to ask the following questions in this regard: Is everyone, including women students, given the chance to contribute to the learning process? Do the classroom dynamics favor the most assertive, who are most likely to be men? (Leathwood, 2006) Moreover, the curriculum also plays a vital part for education to be empowering. Women students who have been empowered through education would acquire skills and knowledge, as well as develop aspirations about their futures. In the end, they also aim to earn a decent income and do the type of work that they have reason to value (Sen, 1999; Nussbaum, 2000; Murphy-Graham, 2012). These are the factors that this study will seek to explore in order to consider TVET as education that contributes to women's empowerment.

Khader (2014:3) makes the following important point: '... interventions that do nothing to affect the subordination of women, or women's awareness of their own subordination, do not empower women.' This is the reason why a number of scholars of women's empowerment define the concept in terms of challenging gender hierarchy and sexist oppression (Khader, 2014). In this case, what could be termed 'feminist agency' becomes a prerequisite to women's empowerment. According to Khader (2014:5), a woman who has not been empowered has two different attitudes. One is directed towards herself and is characterised by low self-worth and self-devaluation. The other is directed towards the world as 'one of acceptance of the power status quo - a sense that gender inequality is part of the natural order of things'. Thus, an empowered woman tends to develop a new sense of worth and begins to question the status quo, especially patriarchal values. Thus, for education to be said to have contributed to women's empowerment, it could be argued that there are two essential conditions that need to be met: the development of critical thinking capacities;

and the providing of encouragement so that women act and make meaningful decisions about their lives (Murphy-Graham, 2012:3).

Murphy-Graham and Lloyd (2016) came up with four necessities for education for empowerment. The first requisite is that ‘the environment where learning takes place must be physically, materially, and socio-culturally conducive to learning’ (Murphy-Graham 2012:560). This means that for young women to experience empowering education, there should be adequate ablution facilities, enough learning space, and learning resources; moreover, the environment also needs to be devoid of sexual harassment or bullying. It is important, therefore, to explore the experiences of women students in TVET from this perspective; and, one needs to ask: Is the learning environment safe for the young women? This study, therefore, explores the experiences of women engineering students, such as the following: the availability of learning resources; and the relationships and interactions between the women students, their male colleagues and their lecturers.

The second condition that Murphy-Graham and Lloyd (2016:561) note is that ‘education for girls should foster recognition and dignity’. Coming from patriarchal conditions, women may believe that they are inferior to men. This means that for education to contribute to empowerment, it needs to foster a sense of self- esteem and self -worth in the young women. Thus, Murphy-Graham and Lloyd (2016: 561) comment that: ‘Having a clear understanding of one’s own dignity and equal worth with others will provide a stronger impetus for girls to imagine alternative futures and provide motivation for them to make different choices’. This study, therefore, examines the learning experiences of women students to understand if their education has contributed to their aspirations and enhanced their choice. In addition, education also needs to foster ‘global

citizenship’ (Murphy-Graham and Lloyd, 2016). Students, through education, should come to a stage where they are also concerned about the well-being of others.

The third condition for empowering education is that it should help students to exercise their agency. ‘In other words, an empowering education will expand the actions girls are able to take and push the boundaries of the cultural constraints that limit them from achieving their full potential’ (Murphy-Graham and Lloyd 2016:561). One key component of empowerment is action. If women students learn to take action (agency), this a step towards women’s empowerment through education. The action could be small, such as learning communication skills, which may lead to improved communication between women and significant others in their lives. Thus, the authors conclude that ‘[w]hile education alone cannot change the social structures that constrain opportunities available to women, (and men), it can foster habits and dispositions that result in social action rather than apathy and social withdrawal’ (Murphy-Graham and Lloyd, 2016:562). To understand the role of education, this research will examine the experiences of the students to learn if TVET education is fostering agency in the lives of women students. In fact, engineering education should strive to meet the above requirements in order for it to contribute to women’s empowerment.

Conclusion

I began this chapter by examining how empowerment is defined by various scholars in gender and education contexts. What emerged is that the term is defined differently depending on one’s field. While they may be relevant to my own research study, the different definitions and conceptualisations are limited in their reach. I also presented a brief overview of the link between agency and empowerment, how the terms are used in the development contexts, and how TVET

can be used as a tool in women's empowerment. In conclusion, I argue that a definition of empowerment grounded in the capabilities space would extend to all dimensions of empowerment, and therefore offer a more comprehensive account of women's empowerment. This conceptualisation has the potential to foster women's empowerment in and through TVET, N6 engineering course. My core argument in this chapter is that women's empowerment is multi-dimensional. For a woman to be considered empowered, the three domains of access to resources, autonomy, and agency need to be affected positively in order to contribute to their well-being. Thus, the gains from TVET need to translate not only to economic benefits but also to other areas of their lives. In addition to opening economic opportunities for women, engineering education should also provide education that encourages them to live a reflective life, think critically and improve their unequal status in society.

CHAPTER 4: TVET AND WOMEN’S EMPOWERMENT; TOWARDS A HUMAN DEVELOPMENT PERSPECTIVE

Introduction

The arguments presented in the previous chapters show that it is believed that TVET plays a key role in the economic development of countries, through skills development. However, it is important to look for alternative ways of thinking about this role in the context of human development. In examining the role of education in the lives of women, I considered the capabilities framework as a potential evaluative tool. I begin this chapter by examining the human capital theory, which generally frames educational policies in TVET. I also look at the human rights perspective as an informant of educational policies. After exploring what these two approaches offer to education, and their limitations, I argue for an approach that I consider to be more useful and applicable to the context of TVET, which is the capabilities approach.

4.1 The human development approach

The human development approach was pioneered by Mahbub ul Haq who recommended the move from income based measurements, such as the Gross National Product (GDP), to consideration of human lives aspects (Alkire, 2010a). The UNDP Report (1990:10) defines human development as: ‘The process of enlarging people’s choices. The most critical ones are to lead a healthy life, to be educated and to enjoy a decent standard of living.’ In addition, the UNDP Report (1990:13) reiterates that development ‘has to be development of the people, by the people, for the people.’ This means that people should be at the centre of development as agents of development. What

human development does is to critique income-based approaches to development and, therefore, emphasises capabilities formation as a basis for human development (Alkire, 2010).

From the human development perspective, it is the objective of development to flourish in varied and creative ways; thus, the human development approach advocates for the measurement of development in terms of improvements in people's well-being not the growth of the economy (Alkire, 2010:37). This is mainly because of the weaknesses of economic measurements, which do not reflect equity, distribution or other valued achievements, such as relationships, culture or political freedoms (Alkire, 2010). The UNDP Report (2010) elaborates on the concept of human development by proposing three essential components: well-being; empowerment and agency; and justice. This conceptualisation sums up the essential link between human development and women's empowerment, as there cannot be human development without empowerment as an element of social justice. The following section looks at other informants of educational policies, the human capital theory and the human rights approach.

4.2 Human capital theory as a basis for women's education policies

The origins of the human capital theory can be traced back to Adam Smith who postulated that investing in machines might have parallels in human capital through expenditures on education and training (Little, 2002). Later on, Schultz and Becker, among other scholars, developed the view in the early 1960s. Proponents of the human capital theory argue that formal education is greatly instrumental in the enhancement of the production capacity of the population. In general, the proposition is that an educated population is a productive population (Robeyns, 2006; Olaniyan and Okemakinde, 2008). The provision of formal education is seen as an investment in human capital, which has been considered as equal to, or more worthwhile than, that of physical capital (Olaniyan and Okemakinde, 2008). Initial human capital theory formulations pointed to the need

to invest in human beings either through formal education or on the job training (Unterhalter, 2007). The upholders of this theory, therefore, would justify huge public expenditures on education with anticipated returns in rapid economic growth. Robeyns (2006:72) sums this up:

Human capital theory considers education relevant in so far as education creates skills and helps to acquire knowledge that serves as an investment in the productivity of the human being as an economic production factor, that is, as a worker.

The human capital theory, however, despite its weaknesses, is credited for bringing in the human element and for seeing people as central to economic development (Robeyns, 2006). Thus, from this perspective, human beings are seen as a form of capital and, like other forms of capital, based on rates of return (Unterhalter, 2007).

The Women in Development (WID) perspective which grew in the 1970s came to the realisation that women need not be seen as passive recipients of developmental efforts but also need to be active and be part of the developmental agenda. Therefore, promoting women's education, employment, availing income generating projects and access to credit became the main components of WID (Reeves and Baden, 2000). The main driver behind this policy formulation was the human capital theory with its emphasis on the strategies that contribute to economic growth (Unterhalter, 2007). The main aim of the WID policy was to facilitate directing resources to women, the assumption being that investing in women has higher economic and social returns and, therefore, should be fostered (Razavi and Miller, 1995).

WID emerged as a development plan and had a great impact on educational policies in developing countries. Hill and King (1993) alluded to the fact that the human capital theory influenced educational policy that emphasised sending women to school especially because of the anticipated economic benefits. This educational policy was explored in relation to the increased GDP per

capita, and marked decreases in both fertility and infant mortality rates. Thus, owing to the link between national development and women's education, this encouraged the adoption and the implementation of WID policies.

As mentioned above, the human capital theory and Women in Development (WID) gave birth to the need to invest in women's education because of its anticipated benefits, which are for development and economic growth, but not for women themselves. Thus, education of women was conceived as being of great benefit to families and societies, which led to the upholders of this view concluding that there were gender differences between the rates of return, and therefore there was a need to emphasise the education of women and girls. There were a number of research studies done by the World Bank, the findings of which pointed to the fact that the higher the education of a woman, the lower fertility rate, and that educated women are likely to be concerned with the education of their children (Unterhalter, 2007). Therefore, from the 1990s, the World Bank adopted policies based on the human capital theory. The justification was that educating women would accrue long-term benefits to families and society, and therefore to development in general. Overall, women's education came to be viewed as a poverty reduction strategy (The World Bank, 1995). Unterhalter (2007: 45) adds that a slogan was adopted around that time: 'If you educate a woman you educate the nation.' This view continued to be held in United Nations structures and, in 2003, the Secretary General of the UN, in a UNICEF (2003) report acknowledged that no other policy is likely to raise economic productivity, lower infant mortality, improve general health more than the education of the girl child. Unterhalter (2007: 44) further argues that 'the education of women ... is the magic key to unlock the door to global good fortune and ensure human security.'

4.2.1 A critique of the human capital theory

From a gender justice perspective, a major flaw of human capital theory is that the rationalisation for educating women and girls lies in the anticipated benefits not to the women themselves but to their children, current and future, as well as for the communities they live in. Unterhalter (2007) argues, therefore, that the World Bank paid insufficient attention to how education might enhance women's and girls' freedoms and the choices they make in their households, in the economic or political arena that they value. Both the human capital theory and the WID policy framework have weaknesses in that they consider women and girls as means not an ends in themselves (Unterhalter, 2007).

According to Drèze and Sen (2002:71) education has several roles in individuals' lives. Education can be intrinsically important, meaning 'a person may place value on knowing something simply for the sake of knowledge.' Robeyns (2006a) adds that there are also non-economic instrumental roles of education, that is, education can open minds of people and motivate them to explore available options in life, widening their opportunities, giving the chance to people to lead the lives they have reason to value. This broader conception of education's intrinsic values, however, is missing in the human capital theory, since it considers the economic value of education and the contribution to economic growth. Thus, it can be seen that considering women's education entirely from a human capital perspective would not acknowledge the intrinsic value of education, such as being able to solve personal problems, being able to read and interpret the holy books, claim legal rights, or escape an abusive relationship (Robeyns, 2006a). From the human capital theory perspective, investing in human capital equates to economic growth. Baatjes (2014:90) expands this arguing that: 'This economic rationale for education regards investment in human beings as no different to investment in land and machines as they all represent part of the technological

enhancement of the economy.’ Therefore, for the human capital theory to be effective it needs to expand its reach and embrace other values of education in human lives.

The human capital theory also treats social inequalities, such as gender inequality, as being the result of competitive markets (Baptiste, 2001). By so doing, such a theory tends to blame the victims; failure to achieve academically would imply that one’s economic achievement is limited. In addition, by failing to consider non-market forces, such as power imbalances within society or structural arrangements, the human capital theory falls short in helping to explain social behaviour. Policies wedded to the human capital theory are unlikely to address social inequalities (Baptiste (2001: 198; Robeyns, 2006(a) and Unterhalter, 2007). This means that an analysis of gender issues using the human capital approach will fall short of explaining gender inequalities and addressing them, since it upholds an economic perspective without taking account of social inequalities.

It is also evident from Baptiste’s (2001:198) analysis that the human capital theory is a ‘lone wolf’ because of its simplistic view of human society, challenges and belief that the solution to ‘poverty, unemployment and under-employment’ is technical education. Thus, human capitalist approaches, or the policies that stem from them, makes them vulnerable to critics, since no individual lives in isolation, and economic growth cannot have a single solution. Moreover, with regard to female students in technical and vocational training, it will be important to look at how their lives are shaped by their surrounding circumstances. A study conducted by Lopez-Fogues (2014), in Spain, revealed that technical education may not necessarily be the solution to economic challenges. The study shows how students still had challenges finding employment and how technical education did not necessarily result in economic growth. This shows that economic challenges often have complex causes and solutions that go beyond the simplistic view of human capital theory. The

following section examines the human rights perspective as a possible alternative approach in informing educational policies.

4.3 The human rights approach

Grounded in international policies and constitutional guarantees, the human rights approach views education as a basic human right. Unlike human capital theory, it emphasises that every person is entitled to education, without focusing on the economic benefits (Robeyns, 2006a). It then becomes the responsibility of individual governments to offer affordable and quality education. The human rights perspective lays all power in the hands of governments and not families and communities; yet, these could play a significant role in providing opportunities for education. Thus, from a human rights viewpoint, human beings are seen as ‘the ultimate ends of moral and political concerns’ (Robeyns, 2006:75). Unterhalter (2003), however, argues that even if policies, such as the Education for All, the Millennium Development Goals and constitutional guarantees of countries are in place, they are hardly upheld. In other words, international bodies and governments are aware of their duty to formulate targets but do not go into detail about who should be responsible for what. For example, the United Nations Sustainable Development Goals (SDGs) 4 and 5 spell out clearly the rights that can be taken to relate to women’s empowerment through TVET. In fact, SDG 4 states the following aim: ‘Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all’. And, according to SDG 5, the aim is to: ‘Achieve gender equality and empower all women and girls’ Thus, from the human rights perspective, education should be accessible to everyone regardless of gender and disability, for example. However, the human rights approach does not extend to the realisation of human rights in the lives of people. The issue is one of rights in policy, or rights on paper, versus rights being actually realised in practice. This is the reason why I consider the capability approach as a potential

way of understanding the issues of education and women's empowerment. Nussbaum (2003: 37) argues for the adoption of the capability approach by saying that it 'provides important precision and supplementation to the language of rights.' Robeyns (2006a) supports this view by arguing in terms of gender:

[I]n rights based approaches, men and women are entitled to equal rights, but once these rights have been granted, no further claims for social change can be made. For example, if citizenship rights grant equal access to schooling for boys and girls, then governments might be satisfied under such a rights based approach, even if the outcomes display significant gender inequalities (Robeyns, 2006: 80–81).

By adopting the capability approach for this study, I will be going further than both the human capital theory and the human rights perspectives, as the following section will show.

4.4 The capability approach

Sen (1980, 1999) and Nussbaum (2000) propose the capability approach (CA) as an alternative conceptual framework to the utilitarian approach and other approaches to social justice. This is a broad normative approach that can be used in the assessment of individual well-being and social arrangements (Robeyns, 2005). Sen (1999:75) postulates that, when making assessments on poverty, inequality, justice and development, a focus needs to be on what an individual is able to do, and be. Sen (1999:75) also advocates for the enhancement of freedoms and opportunities for the achievement of 'valuable beings and doings.' Thus, the capability approach involves the concepts of capabilities and functionings. Capabilities are 'what people are able to do and to be' and functionings are the 'outcomes or achievements' realised from what one values (Robeyns, 2005:94). The CA has become very attractive in the assessment of well-being as it rejects evaluations done exclusively on monetary terms, and; therefore is a critique of welfarist approaches (Walker, 2015). The approach is also a critique of approaches that show an exclusive

reliance on mental states, such as happiness evaluative approaches, as it covers all dimensions of human well-being (Robeyns, 2005). At its core, is an analysis based on what opportunities are available for individuals to lead the lives they have reason to value (Sen, 1999). Walker (2006) adds that CA provides an analysis framework for the evaluation of education policies and institutions, their contribution to wellbeing and quality of life. What makes the CA valuable is its ability to embrace issues of well-being, social justice, freedom, agency and development (Powell, 2012). Thus, at the core of the CA is an emphasis on human flourishing; and, the approach acknowledges the importance of economic growth but only in terms of its contribution to human development (Powell, 2014). Owing to the above considerations about the CA, the approach will be adopted in this research study as a framework of analysis for the contribution of TVET education in women students' empowerment.

In this research study, the main concepts of the capability approach to be considered are as follows: well-being; freedoms; conversion factors; agency; adaptive preference; and aspirations. These are going to help in the understanding of gender issues in TVET education and the experiences of women students as viewed from the CA lenses.

4.4.1 Wellbeing and freedoms

There has been a tendency for the evaluation of well-being to focus on the gross national product (GNP) and the resources that one has at one's disposal. It is Sen's (1984) argument that a person's well-being cannot be adequately measured by how rich they are. Sen (1999) argues that the capability perspective informs us if the person is living the life they have reason to value. According to Sen (1984: 195), the questions that need to be asked about well-being are: 'What kind of life is she leading?' or 'What does she succeed in doing and being?'

The capability approach will be used in the evaluation of TVET education and the ‘freedoms’ it creates for women students in their social, economic and political lives. Development is seen from a capability’s perspective as ‘a process of expanding the real freedoms that people enjoy.’ (Sen, 1999:3). Therefore, development will entail the removal of unfreedoms, such as ‘poverty as well as tyranny, poor economic opportunities as well as systematic social deprivation, neglect of public facilities as well as intolerance or over activity of repressive states’ (Sen, 1999:3). Unlike the initial conceptions of development in economic terms, for example, gross national product, development conceived from a capabilities stance will be all encompassing and not limited to economic achievements only.

The fact that the evaluation of well-being in the capability approach focuses on what an individual is able to do, and to be, allows assessment to focus on individual freedoms. Thus, well-being will be measured on whether the ‘freedoms, which one has, are enhanced’ (Sen, 1999:4). TVET education, in this study, will be examined to see how it can enhance female students’ freedoms and well-being. As in the case of agency, women’s education, their employment, and ownership rights are important, as they improve the general well-being of women (Sen, 1999). The freedom to look for and maintain jobs outside the home, as created by TVET education, will help women to enhance their freedoms from lack, poverty, hunger and dependence on male counterparts (Nussbaum, 2000).

Alkire (2003), in an effort to test the capability approach developed by Sen and Nussbaum, did an evaluation of an educational programme in Pakistan that targeted women. She argued that, if an evaluation of projects had been done using the human capital theory, it would have revealed how no economic benefits were realised, since none of the women could find work despite learning a

skill. However, an evaluation using the capability approach revealed that, although the rate of return in human capital terms was low, the women reported improved perceptions about themselves and from others (Alkire, 2003). Another project, which she evaluated using the capability framework in the same country, was a goat rearing project. This had better economic returns and, therefore, could have attracted more funding in terms of human capital approaches. Despite these differences, however, the author noted that the educational project brought intangible benefits to the women, which they valued. Women learnt about societal arrangements and solving personal problems, as well as having greater satisfaction (Alkire, 2003). Robeyns (2006:360) adds that this development project ‘had a fundamental transformative impact on women.’ In fact, the educational project had a significant effect on the empowerment and the general knowledge of the Pakistani women in this case.

The capabilities approach could encourage education that broadens a student’s choice in all aspects of her life in addition to enhancing her chances in the labour market. Thus, it is clear, that the adoption of the human capital approach might limit an analysis of TVET to economic benefits, whereas the capabilities perspective incorporates other aspects of well-being and freedoms emphasising its relative usefulness in the application. Thus, the effectiveness of TVET should be measured in terms of the opportunities and freedoms that it creates for the women students to live a life they have reason to value. Moreover, from a capabilities point of view, this kind of freedom should be positive and consider both the opportunity and the process aspects of freedom (Wilson-Strydom, 2017). In other words, ‘opportunity freedom refers to the ability of a person to achieve what they have reason to value (the real opportunities available to a person) and process freedom refers to the extent to which the person is able to exercise their agency and freedom of choice, the extent to which a person has autonomy to act in the manner that they value’ (Wilson-Strydom,

2017:115). Thus, the effectiveness of TVET as a potential tool for women's empowerment will be measured according to the freedoms that it makes available to women students to live the lives they have reason to value. Apart from well-being and freedoms, conversion factors are also important in the capabilities perspective, as the following section will show.

4.4.2 Conversion factors

Sen (1999) and Nussbaum (2000) distinguish between capabilities and functionings. This is important in the evaluation of well-being. Sen's (2005:153) definition of capabilities as 'the opportunity to achieve valuable combinations of human functionings' means that, if only the evaluation of functionings, such as a women's attainment of a skill through technical education, is considered, there may be many issues missed, including the conversion factors of two female students who have the same functioning, for example, of attaining a TVET qualification. This can comprise the challenges that one student is able to overcome at home and at school, such as poverty in the family, the divisions of labour at her home where she had to do most of the domestic work before or after school (Unterhalter, 2007). This is clearly an omission of the capability sets of individual students, a major component of the capability approach.

There are three major categories of conversion factors: personal; social; and environmental (Crocker and Robeyns, 2010; Robeyns, 2005). Personal conversion factors are 'internal to the person, such as metabolism, physical condition, sex, reading skills, or intelligence.' (Robeyns 2017:46). Social conversion factors stem from the society in which a person lives. These may include cultural and social practices, public policies, as well as gender and power relations. Environmental factors are determined by the physical or built environment, for example, rural versus urban areas and availability of roads. Robeyns (2017:46) argues;

'The three types of conversion factors all push us to acknowledge that it is not sufficient to know the resources a person owns or can use in order to be able to assess the well-being that he or she has achieved or could achieve; rather, we need to know much more about the person and the circumstances in which he or she is living.

The provision of resources, such as funding, alone will not be enough, as conversion of these resources into functionings, such as a TVET qualification, may be determined by various factors as outlined above. Thus, the use of the capabilities approach compels one to understand the process and not only the outcomes (Walker and Unterhalter, 2007).

Unterhalter (2007) argues that, when making evaluation in relation to capabilities, one would need to be aware of how a student's opportunity to achieve the education she values is constrained by social arrangements as well. Two different students may have capability sets that are totally different; one's capability set may be severely constrained as reiterated above. Therefore, using the capability approach will entail the evaluation of well-being looking at a combination of capabilities and functionings will be helpful since it brings to light the different circumstances of each individual and will help in directing policy making, further analysis and suggestions for improvement. Other theories, such as human capital theory, will only be interested in evaluating the economic outcome of an educational policy.

Sen (1999), therefore, sees gender inequality as a key aspect in how individuals convert resources into capabilities. The idea of capability inclines us to acknowledge that the availability of resources is not enough for a person to achieve their functionings. Two people with access to the same resources may not be able to achieve the same valued functionings because of a variation in their capabilities as determined by gender, a personal conversion factor (Sen, 1999). Evaluations that are made using the capability approach, therefore, will bring to light the differences between the circumstances of a female and a male student. Thus, when assessing capabilities, one needs to be

aware that conditions may be similar, for example, there may appear to be the same teachers, study materials and opportunities that should achieve valuable functionings; but, in fact, there could be other factors affecting female students more than they affect male students. In other words, a female student may attend school but lack the conditions to convert the capabilities into achieved functionings because women's voices are not respected in the classroom, for example. If the evaluation is done, simply based on whether the female student attends school as suggested by the human capital theory and the human rights approach, it means that the ways in which gender inequalities play a role in her conversion of resources into capabilities is not considered; and, what happens during the education process itself is not explored. Looking at gender inequalities and the conversion of resources into capabilities brings to light issues that need to be addressed in the education sector or in the lives of women students. The circumstances may dictate that some students require more resources to achieve the same functioning; for example, if a female student has to do domestic work, which a male student might not have to do (Unterhalter, 2007).

Conversion factors play a significant role in that they determine whether someone will be able to achieve their valued functionings. Female engineering students in a technical and vocational college, for example, may have to overcome structural barriers, such as stereotyping and prejudice, which may not apply to the male students studying in the same field. Robeyns (2008) points out that women tend to have lower conversion rates when converting resources into capabilities that he attributes to injustices. In addition, Robeyns (2008) adds that a feminist capability account would argue that women's and men's capability sets would not have been equal in the first place because gendered norms and expectations work together to restrain the capability sets of men and women in different ways. Walker (2005:109) asks the following question: 'Do some people get more opportunities to convert their resources into capabilities more than others?' Asking this kind

of question is particularly important in this study, as I look at issues that affect the ability of women to convert available resources into functionings. Gender can, therefore, be a key conversion factor. In the end, the contribution of this study would be identifying conversion factors, which have a constraining effect and need to be addressed for TVET to be used as a tool for women's empowerment. Another key tenet of the capabilities approach relevant in this study is agency.

4.4.3 Women and agency

Situating the evaluative space of quality of life in the capability space requires that the women themselves be the subjects of development (Robeyns, 2001) and that development should be achieved through the 'free agency of individuals' (Sen, 1999:4) (see Chapter 3 for more on agency). Agency is an important outcome for women, since they have all too often been viewed as passive recipients of many developmental interventions, and unjust backgrounds have limited their agency (Kabeer, 1999). Sen, (1992:57) in his book, *Inequality Re-examined* defines *agency freedom* as 'one's freedom to bring about achievements one values' and *agency achievement* as 'the realisation of goals one has reason to pursue.' Thus, one's agency freedom can be critical to achieve goals (agency achievement) that influence their well-being (Hart, 2013). Sen (1999) and Klasen and Wink (2003) went on to show how improving female education and employment chances and, therefore, enhancing women's agency has helped in overcoming their challenges and improve their wellbeing.

Sen (1999: xii) observes that development entails the removal of unfreedoms that hinder people from exercising their agency. 'No longer the passive recipients of welfare-enhancing help, women are increasingly seen, by men as well as women, as active agents of change: the dynamic promoters of social transformations that can alter the lives of both women and men.' (Sen, 1999:189). Sen, (1999) also goes into detail to explore how women's education can lower fertility rates, when

women exercise their agency by adopting family planning methods and also having a say in the number of children to have. The author also shows how an educated woman ends up raising healthier children and will also encourage her children to be educated. Thus, according to Sen (1999), the conception of agency arises from acknowledging that women are responsible persons, who have the ultimate choice to act or not to act. Education, therefore, has a central role in that it makes women's agency more informed and skilled (Sen, 1999). Women end up having the confidence to speak up, to influence decision making in the home, to leave an abusive relationship or to claim legal rights (Nussbaum, 2000).

Jayaweera (1997) concludes that not all educated women will be able to exercise their agency. This is mainly because there are so many factors that are at play. The form of education that women receive plays a key role as do broader social structures. If education policies are conceived under circumstances that do not allow for the enhancement of capabilities, it is unlikely that the education will be effective in fostering agency. Under the capabilities perspective, however, it is important to offer education that broadens a person's capabilities; and, it is the aim of this study to examine the role of TVET in the cultivation of agency in the female students' lives. The study will, therefore, explore how engineering education creates the knowledge, skills and power for the students to act in their social, economic and political lives.

4.4.4 Adaptive preferences

As mentioned in Section 3.2 of this thesis, Sen (1999) and Nussbaum (2000) acknowledge the weaknesses of the utilitarian based approaches, such as preference satisfaction, and argue that they are inadequate as means of comparison. According to Teschl and Comim (2005:229) it is important to examine adaptive preferences because 'people might adapt to certain unfavorable circumstances and any self-evaluation in terms of satisfaction or happiness will in this case necessarily be

distorted.’ Thus, the CA was developed in part to address the problem of adaptive preferences. Applying the utilitarian perspective to female education means that families educate their female child in anticipation of the rates of return and for economic benefits, (Unterhalter, 2007). However, the use of this as a measure of well-being presents problems in that the daughter exercising adaptive preference may decide not to go to school, as she will be married and move from home, and so the parents would not benefit economically from her education (Unterhalter, 2007). Thus, the proponents of the capabilities approach reject the economic perspective, since it does not provide a scrutiny of preferences ‘that are shaped by fear, habit, low expectation or the unjust background that deform one’s choices’ (Nussbaum, 2000:114). John Stuart Mill in his essay *The Subjection of Women* further explains the concept of the subordination of women using the notion of adaptive preference. Mill argues that these ideals shape not only moral sentiments but also sexuality itself: ‘for men came to eroticise submissiveness and women to believe submissiveness erotically essential.’ (Nussbaum, 2000:141) This critique from Mill, who was a utilitarian, exposes how women can surrender to a position of submissiveness. Khader (2011) and Sen (1990) also argue that women may internalise limited views about themselves and what they are capable of doing. For Khader (2011:6), the question to ask is ‘whether deprived people’s preferences are consistent with human flourishing.’ Under such circumstances, a development intervention should encourage change so that women would be encouraged to choose preferences that are consistent with their flourishing. However, women need to play a role in determining possible action to overcome these adaptive preferences.

Nussbaum (2000) goes on to elaborate how it is possible to drop habituated preferences and adjust aspirations in line with a sense of dignity and equality. Education plays a pivotal role in this adjustment. This means that an educated woman has the chance to go through the two stages of

awareness: being able to realise that they are in a bad situation; and coming to the realisation that they are individuals who have rights to a better situation (Nussbaum, 2000:140). Thus, the role of TVET education in the lives of the women students will be analysed using the capabilities approach to bring to light the weakness of using only income and/or resources as evaluative tools in interpersonal comparisons. It is important to rather explore what women really want and what will make them live a life that they have reason to value.

4.4.5 Aspirations

Ray (2003:1) defines aspirations as the ‘social grounding of individual desires.’ Hart (2013: 79) argues that it is important to understand aspirations, as they inform us of the freedom that one has ‘to develop capabilities and to choose to pursue a future they have reason to value.’ The author goes on to explain that aspirations are ‘dynamic and multidimensional’ and may relate to ‘career, educational, financial, environmental, religious, community, social status and community goals’ (Hart, 2013:81).

Social, economic or political circumstances surrounding an individual may also play a role in shaping aspirations (Hart, 2013). The aspirations of students from poor backgrounds are affected by inadequate information, poverty, and a lack of career information, (Shumba and Matsidiso, 2012). Dalton et al. (2014:66) state that: ‘Poverty imposes additional external constraints on the poor that exacerbate the adverse effects of the behavioural bias in setting aspirations.’ These authors argue that poverty plays a significant role in shaping the aspirations of individuals. The poor become susceptible to aspiration failure. Appadurai (2004) supports this view by saying that poverty restrains the poor individual’s capacity to aspire, which Dalton et al. (2014:167) term ‘a behavioural poverty trap’. Ray (2003) concurs, arguing that poverty can be both an effect of and a cause of aspiration failure. To elaborate on the impact of economic context on aspirations, Mani

et al. (2013) in Dalton et al. (2014) explain how an individual's preoccupation with financial concerns can decrease their capacity to aspire for other valuable beings and doings, although the reverse is also true. For example, a student who has access to adequate food, shelter, study space, time and clothes is likely to aspire beyond the basics and, therefore, has a higher capability to aspire than the student who aspires only to be able to meet basic needs (Robeyns, 2005).

It is important to explore how aspirations can be fostered by TVET education, especially in the case of women students. Aspirations are situated within gendered relations and norms (DeJaeghere, 2015) that, in this study, are conceptualised within the capabilities framework. This is because of their future orientation towards well-being, which is affected by social economic and cultural factors (DeJaeghere, 2015). The author notes the need for educational practices to 'foster imaginations of alternative futures through discussions, mentoring and developing knowledge and skills' (DeJaeghere, 2015:11). Thus, in the conception of women's empowerment, it is important to understand how TVET education has fostered or constrained aspirations in women students' lives.

Gender also has a great influence on career outcomes and aspirations. Cech (2015:57) posits that there are questions that women in the engineering field tend to ask themselves such as: Is engineering the right profession for me? Do I want to continue in the profession for the rest of my life? Do I really 'fit' in the engineering field? The fact that engineering remains strongly male-dominated makes the profession an interesting field of study as far as the aspirations of women students are concerned. According to Cech (2015), there is evidence that women still face hurdles as they navigate the field of engineering and encounter problems in being accepted, despite the changes in stereotypes in other male-dominated areas such as law and medicine. There are still masculine traits that are upheld and feminine ones that are not valued, which can be attributed to

culture and the dominance of patriarchy, especially in the engineering field, which impacts on the overall aspirations of the women students. Owing to these cultural beliefs, women students can end up being viewed as incompetent professionals, which will eventually shape the views of the students about themselves and determine their aspirations (Cech, 2015). Engineering is, therefore, an interesting field in which to explore how the aspirations of women students are shaped and developed using the capability approach. Economic-based approaches, such as the human capital theory, would not be concerned with the aspirations of the students, and therefore the capability approach becomes the best framework for analysis in this research study. In this study, I propose a list of capabilities relevant for women in TVET, (See Chapter 7). The next section, therefore, examines the need for a list of capabilities for women in TVET. The list also shows what participants value and should be taken into account when trying to assess women's empowerment through TVET.

4.5 Why the list? Conceptualising a capabilities list for gender and TVET

When arguing for the need for a capability list, Alkire (2002) says that it can only be through a list that a social initiative's impact can be measured. Its purpose, therefore, becomes a way of determining whether women students' capabilities were expanded or contracted through TVET. The list enables me to practically apply the CA to TVET in order to see how the approach might work in the actual lives and experiences of women students and to enable us to counter the pervasive human capital perspective that views TVET as being only for economic growth and employment creation. This will ensure that TVET is rather seen in terms of what it enables women students to do and to be. Walker (2006) claims that, in making evaluations in education, it is important to note the relationship between the available resources and the ability of each individual to convert those resources into valued capabilities. She argues that it would not be rational to make

evaluations based on men, able bodied people or one racial group only, as this tends to mask differences in terms of gender, race and disability. These factors have an impact on how one converts resources to valued beings and doings. Evaluations need to be made based on the opportunities available to each individual to live a flourishing life (Wilson-Strydom and Walker, 2015). Kamsler (2006:1990) supports the importance of a list of capabilities by saying that they have a role in ‘specifying, and thus making capabilities practically applicable and operational.’ Looking at resources alone is inadequate. This then explains why I have to come up with a list of capabilities that could be used as a starting point in thinking about the circumstances of women students in TVET. A list is particularly relevant for women students in TVET, as they may not have developed desired capabilities owing to adaptive preferences in response to the gendered sector (Nussbaum, 2000). Nussbaum (2000) also defends a list of capabilities for women due the power differences in society. According to Nussbaum, the most powerful (who are most likely men), may select capabilities on behalf of the marginalised groups.

A list of capabilities can then be used as a tool for the promotion of social justice (Wilson-Strydom, 2012) and, in this case, social justice in TVET. Walker (2006) explores the importance of a list of capabilities in higher education and gives three main reasons. The first is that a list of capabilities is an effort to narrow down the concept of capabilities to the specific field of education. The second reason is that a list of capabilities can be used to promote education that fosters capabilities and equality. The third reason is to test the usefulness of the application of the capabilities approach to education. These broad arguments for a list of capabilities may also apply to the need for a list for TVET women students. There has been limited application of the CA in TVET (See Chapter 3 of this thesis). Applying the CA to the specificity of TVET would be moving towards expanding approaches to TVET as a broad area of human development.

To Sen, Nussbaum's list is 'canonical' and this for him is problematic. Since Sen emphasises participation and deliberation, he preferred to leave the CA framework open and not define a list. Walker (2006: 49) argues for a list of capabilities but says that it 'should be for a particular purpose, or evaluation, or critique, it should not be fixed or canonical, it should not be hierarchically ordered, and it should in some way include participation and dialogue.' By coming up with a list for women students in TVET, the idea is to set a precedence of what TVET education should strive to do in the lives of women students. It is also Nussbaum's argument that the pursuit of social justice should be complemented by a list of valued capabilities. Nussbaum (2003a: 33) adds that Sen's approach does 'not take us far enough... as it gives us no sense of what a minimum level of capability for a just society might be.' Having a list of capabilities, according to Walker (2006), is helpful in that without one there will not be a basis for the identification of certain capabilities that are of value, or the practices that may impede the development of capabilities.

In this study, I drew from Powell (2014)'s list to come up with a list of capabilities that are relevant to women students in TVET. Although Powell (2014) focuses on both men and women students, the list she developed is applicable to women students in TVET. While the list that I came up with, however, may not have been developed through public participation, it has been teased out from the experiences of women students in TVET. The list presents what emerged as being valuable and important for the women students. However, this does not constitute a claim that these findings represent the views of all women in TVET. Rather, as suggested by Walker (2006a), the idea is to illustrate how students' voices can be used to identify valued capabilities. In doing so, formulating a capabilities list generally allows teasing out what the women students found valuable and what they gained from TVET education, not only for their present lives but even beyond. Nussbaum (2003a:36) therefore postulates that:

The capabilities approach will supply definite and useful guidance, and prove an ally in the pursuit of sex equality, only if we formulate a definite list of the most central capabilities, even one that is tentative and revisable, using capabilities so defined to elaborate a partial account of social justice, a set of basic entitlements without which no society can lay claim to justice.

Powell and McGrath (2014:142) argue that the evaluation methods applied to TVET in South Africa so far have not been able ‘to identify the capabilities or opportunities that are of value to students; the extent to which [TVET] institutions expand or restrict these valued capabilities; and the future policies and institutional trajectories required to achieve such capability expansion’. Thus, by coming up with a list of capabilities in this study, I will be moving away from the economic views on TVET to a greater emphasis on human well-being and capability expansion. Moreover, one more important motive for the formulation of a list of capabilities is to correct for ‘inattention blindness to human flourishing’ (Powell and McGrath, 2014:141). The list of capabilities will complement other lists that are related to this study.

Various scholars have explored the applicability of the CA to gender and education (Unterhalter, 2003; Walker, 2006a, Vaughan, 2007; Cin, 2014; Ongera, 2016). Others have also used the CA as a theoretical lens for research in engineering education (Boni and Berjano, 2009; Boni et al. 2012; Case and Marshal, 2015, Hoppener, 2016). There is also growing literature on the use of the CA in TVET (Powell, 2014; Lopez-Fogués, 2014, Powell and McGrath, 2014; Tikly, 2013). In proposing a list of capabilities in this study, I draw on all of these sources. The following table summarises existing lists of capabilities related to gender, education and engineering that may be relevant to my study.

Table 4.1 List of capabilities from other scholars

Scholar	List of capabilities
<p>Walker (2006)</p> <p>List of capabilities for gender and schooling in South Africa</p>	<ol style="list-style-type: none"> 1. Autonomy 2. Knowledge 3. Social relations 4. Respect and recognition 5. Aspiration 6. Voice 7. Bodily integrity 8. Emotional integrity and emotions
<p>Cin (2014)</p> <p>List of capabilities for women teachers in Turkey</p>	<ol style="list-style-type: none"> 1. Physical capability- conditions needed to lead a physically, emotionally and mentally healthy life 2. Social capability- emotions and affiliation 3. Intellectual capability- capability of senses, imagination, thought and practical reason 4. Economic capability- ability of an individual to generate an income,

	<p>own property and to control their own earnings.</p> <p>5. Political capability- concerning the political aspect of control over one's environment</p>
<p>Hoppener (2016)</p> <p>List of capabilities for engineering students in higher education</p>	<ol style="list-style-type: none"> 1. Learning how things work- technical functionality 2. Learning how to solve problems 3. Opportunities for personal development 4. Being resilient 5. Being confident and feeling empowered 6. Being perceived as smart 7. Having a sense of affiliation
<p>Ongera (2016)</p> <p>List of capabilities for women legal graduates in Kenya</p>	<ol style="list-style-type: none"> 1. Aspirations 2. Practical reason 3. Social relations and networks 4. Bodily integrity 5. Respect, dignity and recognition 6. Voice 7. Confidence and self esteem

	8. Resilience 9. Financial security 10. Control over one's life
Powell (2014) List of capabilities for TVET college students	1. Economic opportunities that matter 2. Active citizenship 3. Confidence and personal empowerment 4. Bodily integrity 5. Senses and imagination 6. Recognition and respect 7. Upgrade skills and qualifications throughout the life course 8. Occupational knowledge

I chose to draw mostly from Powell's list because the list relates more to the scope of my research. Though Powell looked at both men and women students in TVET, and without a special focus on one discipline, her findings are closely related to the experiences of women students in my study. In addition, the context is the same, as both are South African studies. I could not use Walker (2006a) who operationalised the CA by producing a list of capabilities related to gender equity in South African schools. This list draws specifically from younger women who are still in school, and I focus on TVET, which is post school education. Though Walker (2006a) contributes

immensely to the operationalised of CA in gender and education, in South Africa, I could not adopt the list for the above reasons. For a country like South Africa, there is need to come up with a list of capabilities that relates directly to the experiences of women TVET students, especially in engineering. This is because the country's political and social context is unique and the apartheid system has greatly influenced all aspects of life, TVET included. Therefore, I find it essential to draw up a list which pertains to the circumstances of these women students.

Cin (2014) also drew from Nussbaum and developed a list of capabilities that pertains to the experiences of Turkish women in the education sector. The political and social contexts of Turkey and South Africa are immensely different, and thus the need for a list that draws from TVET in South Africa. Cin (2014) points out that her list can be used 'in other contexts that are socio-culturally and politically similar to the Turkish context.' However, South Africa is not similar to Turkey, as it is still being haunted by the remnants of apartheid, which manifest through gender, race and economic inequalities. The same applies to Ongera's (2016) list of capabilities for gender justice in higher education that focused on law students in Kenya, which is not useful to my study that focuses on TVET engineering students. Hoppener (2016) also came up with a list of capabilities drawing from the experiences of engineering students in higher education. Though this list bears a similarity to the experiences of students in my study, this will not be the ideal list to follow, as it draws from university students. In the South African context, there is a difference in how the two post-school systems are viewed and experienced by students (See Chapter 2). My thesis is strategically located between educational research (TVET) and gender, and the ultimate goal is to contribute to knowledge about the relationship between TVET and human development. A list of capabilities must be contextual, relating to the geographical area as well as the evaluation

that is to be done (Robeyns, 2003:68). This means that lists may be remarkably different depending on the context.

Having explored what a list of capabilities is and the importance of a list in educational evaluation, I now turn to procedures for the formulation of a list of capabilities. Robeyns (2003:71-72) formulated a list of capabilities that she says is for the evaluation of gender inequality in Western countries. She then proposes a five step process in the development of a list: i) explicit formulation; ii) methodological justification; iii) sensitivity to context; iv) different levels of generality; and v) exhaustion and non-reduction.

Walker (2006a) also came up with five steps in capabilities list development;

- Identifying important capabilities from the capabilities approach
- Extracting capabilities from the relevant policy texts
- Interviewing participants
- Engaging with other capabilities
- Debating the list with others.

In extrapolating valued capabilities in this study, I followed Powell's (2014)'s procedures, which draws primarily from Walker (2006a) and Robeyns (2003). The aim was to identify the capabilities that students considered to be important for their lives. From the interviews conducted, the focus was on the life goals, or valued functionings, that the students cited. From these, capabilities could be extrapolated. It can be seen that in the process of formulating the list, the concept of public deliberation is missing. It is my hope that this first step of formulating a list of capabilities for TVET women students will lead to public deliberation, as Walker (2006a) asserts that a list like this calls for public engagement.

Table 4.2 Powell's List of capabilities

List of capabilities for TVET Students	Valued functionings
1. Economic opportunities that matter	<ul style="list-style-type: none"> • Being fairly remunerated • Earning a living wage • Having employment stability and security • Having access to fair and equal opportunities to career progression • Able to make a valuable contribution in the workplace • Able to take pride in their work
2. Active citizenship	<ul style="list-style-type: none"> • Inclusion in political and institutional decision making • Knowledge and understanding of the problems of their community • Able to mobilise resources for change • Strong sense of their own effective agency
3. Confidence and personal empowerment	<ul style="list-style-type: none"> • Being encouraged to live a full life • Being able to encourage others to live a full life. • Having a range of futures as possible aspirations
4. Bodily integrity	<ul style="list-style-type: none"> • Being free from attack and physical harm, including sexual assault, and from the fear thereof

	<ul style="list-style-type: none"> • Being safe from the psychological trauma of attack on your person, or other members of the family or community or anyone else
5. Senses and imagination	<ul style="list-style-type: none"> • Developing an understanding and love of the creative arts • Participating in and enjoy in sport that promotes physical wellbeing
6. Recognition and respect	<ul style="list-style-type: none"> • Being treated as a dignified human being • Having self-respect • Not being discriminated against for any reason including religion, gender, race, physical handicaps and age
7. Upgrade skills and qualifications throughout life course	<ul style="list-style-type: none"> • To have the opportunity to study and learn throughout their lifetime • Having the learning skills required for further study
8. Occupational Knowledge	<ul style="list-style-type: none"> • Having the qualifications needed for entry into the labour market • Having the skills to do a good job • Having the learning skills that allows for experiential learning in the workplace

Conclusion

This chapter has looked at various approaches that have been used as models of educational policies. It was noted that, although these models offer a way to understand educational policies and gender issues, they have some drawbacks. The CA then fills this gap and was forwarded as an alternative to the analysis of the role of TVET education in women students' empowerment. While the contribution of the human capital theory and the human rights approach is acknowledged, they both have a limited view of the realities in the lives of women. Emphasis on measurable indicators, such as the gross national product, the labour market and the number of women enrolled in TVET, were shown to be inadequate measures of development. Due to these limitations, the question about the role of TVET in empowering women cannot be adequately answered. The capability approach was then considered as an alternative framework to the above approaches to human development. This normative framework is applicable to all areas of human development including gender issues. Therefore, the researcher will draw primarily from the capability approach to understand the experiences of women as engineering students in TVET education. I also argued for a list of capabilities for women students in TVET and explained how I drew from Powell to come up with a list of capabilities that are relevant to women students in TVET.

CHAPTER 5: METHODOLOGY

Introduction

This chapter presents the research methods and design of the study. I set out by justifying the adoption of the qualitative methodology and explaining the case study approach. The second section explores the data collection tools in terms of how and why they were used in the data collection process. The last section looks at the ethical considerations and the limitations of the methodology. The study sought to understand the following: how women students perceive their capabilities will be enhanced by their education at a TVET college; and the contribution of TVET to women's empowerment. I examined the process through which the women position themselves in the social, cultural and economic environments. In this research study, the respondents are referred to as participants. This is because according to Seidman (2006), the word participant is capable of capturing both the idea of active involvement of the respondents and that of equity that should prevail between the researcher and the respondent. The study was guided by the following research questions:

1. Why do women students choose TVET and why engineering?
2. What are the experiences of women students studying engineering at Acacia Technical and Vocational Education and Training College?
3. How do these experiences shape the construction of aspirations, agency and well-being for the women students?
4. What are the valued capabilities for women engineering students in TVET? To what extent are the capabilities being developed?

5. What needs to change in TVET education in order to foster women's empowerment in and through TVET education?

5.1 Research design

This section explains the research procedures that were adopted in this study. Choice of the research design was mainly influenced by my research questions and my epistemological stance. In this section, I will explain why I used a qualitative methodology. I also set out my study population, sampling methods and the research tools.

5.1.1 Qualitative research

There is always a choice between quantitative and qualitative methodology in research. In this study I chose qualitative methodology because I felt it would be the most appropriate. Oakley (1998) argues that the experiences of women are less likely to be heard when using quantitative research methods since they are an oppressed social group. This is because qualitative research methodologies are meant to capture women's accounts of their experiences and quantitative methods are mainly about drawing conclusions from numbers and quantifications. Qualitative research entails asking questions about 'the why and how' in order to understand the lived experiences of the studied individuals (Hesse-Biber and Leavy, 2010). The research questions above required descriptive data about an individual's experiences of TVET (N6 course), therefore quantitative research is not suited for this purpose. In addition, although students may be within the same institution and receiving the same type of education, various conversion factors may affect the experiences of each individual student. This calls for qualitative enquiry in order to be able to capture these unique experiences. Oakley (1998:708) talks about 'hearing the silent' as one strength of qualitative research that allows the views of the oppressed to be heard. Letherby (2003)

adds that, unlike quantitative research methods, which rely on numbers to explain social realities, qualitative methods have the ability to place researchers into the world to understand the research participants. Therefore, qualitative research was more appropriate for this study since, as a researcher, I was better placed to explore women students' experiences in TVET. I was also able to examine the education system and how this education is able to enhance the capabilities that these women have reason to value.

Oakley (1998) argues that qualitative research has the upper hand over quantitative methods because the latter positions the researcher as the knower. Such a hierarchical relationship produces 'data that are by definition invalid' and, so by contention, if there are non-hierarchical research relationships the data that comes out is 'intrinsically more valid' (Acker, et al. in Oakley, 1998). Edwards (1990) is also of the same view, as he argues that hierarchical research methods may not work because, if research participants are treated as subjects, they lack trust in the researcher and may end up lying to them, thereby distorting the truth. Oakley (1998) concludes that it is also a contradiction to moral obligations to assume a knower's role, and a researcher should avoid this, especially when doing research with women. Women should 'be treated as one would wish to be treated', and anything contrary to this will be viewed as being at odds with the 'emancipatory ideal' (Oakley, 1998:711). Due to the above reasons, I adopted the qualitative enquiry as I saw that it was best suited to adequately answer the research questions.

5.2 Data collection tools

The study used in-depth interviews as a data collection tool. Atkinson and Silverman (1997) came up with the term 'interview society' to reiterate the ways in which interviews have become a part of our society and become the major way for understanding who we are. Generally, interviews have become pivotal in understanding human lives. Denzin and Lincoln (2005:642) underscore

the importance of interviews in our everyday lives: 'But the interview is a negotiated text - a site where power, gender, race and class intersect. The interview is a conversation - the art of asking questions and listening' (Denzin and Lincoln, 2005:643). Interviews with women are different from other forms of interviews because the process requires openness and emotional engagement between the participant and the interviewer (Denzin and Lincoln, 2005). This proved to be an important conception in this study, as it fostered the tenets of the capability approach by engaging each individual and valuing their contribution.

As a form of data gathering and understanding the experiences of people, semi-structured interviews were chosen because of their flexibility in allowing the respondents to change the flow of the conversation, thereby bringing out information that may not have been 'preconceived' (Axinn and Pearce, 2006: 6). (See Appendices A, B and C for interview guides). Use of semi-structured interviews also requires the researcher to ask open ended questions such as "What do you think?" "Would you tell me about ...?" (Okkolin, 2013:13). Such questions gave women students and lecturers the opportunity to explain in detail their experiences, their voices and their insights. Gathering this information is crucial in the endeavour to answer the research questions. Open ended questions are exploratory in nature. Since the main goal of an interview is to help the participant to reconstruct their experiences within a certain context (Fontana and Frey, 2005), open ended questions gave room for that by encouraging the participants to explain and build upon their assertions. The interviews were 'dialogic' (Henning et al, 2004:67). This means that the participants were able to provide more reliable responses because they were made to feel that they were not being examined or were passive subjects, but contributed willingly to the discussion. This is what the researcher endeavoured to do in this research project by giving participants space and also making the interview a dialogue.

Semi-structured interviews have the potential of giving breadth to the conversation, as they aim to gather the information about participants' lives and lived experiences. Fontana and Frey (2005:706) say that semi-structured interviews seek to understand the behaviour of people without any preconceived biases. Henning et al (2004:65) is of the view that an interview involves complex talk and is 'loaded with unknowns and hidden messages.' It is important for the interviewer to interpret answers in context, and not just code or categorise the responses. Thus, the strength of qualitative interviews lies in searching for meaning beyond the obvious (Henning, 2004). In this study, I used the case study approach to understand the experiences of women students at one TVET college.

5.2.1 Case study approach

Yin (2009) in Creswell (2013:98) defines a case study as 'a case within a real life contemporary context or setting'. The key concept in identifying a case is to choose one 'that can be bounded or described within certain parameters, such as a specific place and time' (Creswell, 2013:98). Creswell adds that it is typical for the case to be one that is a real life case so that information gathered is not lost by time. 'A hallmark of a good qualitative case study is that it presents an 'in-depth understanding of the case' (Creswell, 2013:98). After the completion of the research, conclusions are drawn, which Creswell (2013:99) prefers to call 'general lessons learned from studying the case(s)'. It is important to remember that generalisation for policy making is not the purpose of case study research but to present a case that adds to knowledge about a particular phenomenon (Simons, 2009: 24). Simons (2009: 3) argues that, although there is no one agreed definition among different disciplines, generally, case study research entails the exploration of the 'particularity, the uniqueness' of a single case. This means that using the case study approach was helpful in understanding the experiences of the women students studying the N6 engineering

course at Acacia TVET College and how these experiences shaped their life in and beyond post-school education. However, this knowledge cannot be generalised and applied to the experiences of all women students in TVET colleges in South Africa. What I did was to understand a particular phenomenon by studying a single case (Stake, 2005), to learn more about the role of TVET in women's empowerment. Thus, a case study is 'not a methodological choice but a choice of what is to be studied' (Stake, 2005:443). As mentioned earlier, this case study is in one of the provinces of South Africa and in order to uphold anonymity, the pseudonym 'Acacia' was used.

5.3 Targeted participants

Selection of research participants was done using a purposeful sampling strategy. Lincoln and Denzin (1994) argue that purposive sampling allows the researcher to be able to choose a case that has the feature or the characteristic that one is interested in. The main aim of this sampling method is to find the population where the phenomenon being investigated is likely to occur. In this case, the population comprised women engineering students (N6 course) and their lecturers. Purposeful sampling was chosen because random sampling is more appropriate for bigger samples, and qualitative interviews involve relatively fewer respondents (Seidman, 2006). Thus, after obtaining the required permission (See Section 5.6), I went to one of Acacia's campuses and talked to the Campus Manager. The Campus Manager then requested students who were interested in taking part in the study to come to a room that had been allocated to me. I explained where I was from and what my research was all about. I tried to ensure that the women students understood what was expected of them. Issues of confidentiality were explained to them. It was then up to each individual to agree or not to take part in the study, and those who were interested left their contact details with me so that I could phone them later to set up interview dates and times. For those who had no cell phones, appointments were made soon after the information session. I also made use

of flyers that I had developed (See Appendix D). I left flyers with lecturers in the engineering department to give them to women students studying towards N6 diploma. This was convenient, as they could distribute these to students who attended evening classes, when I could not be there to talk about my study. Though only a few contacted me from these flyers, it proved to be an alternative recruiting method. When the students made contact, I was able to make appointments at their convenience.

Creswell and Clark (2007) claim that the selection of research participants should be based on their familiarity with the subject under investigation. This led me to choose to interview women students who were in their final year, and thus close to graduating with the Diploma in Engineering/N6. This NATED programme that covers levels N1 to N6 is completed after about eighteen months theoretical study (See Chapter 1). Targeting this group meant finding participants who were better placed to talk about their experiences in TVET, as they would have spent the maximum time at the college. Moreover, interviewing N1 to N5 level students would not have yielded the same results. My main objective was to explore the experiences of women students in TVET; so, by talking to the selected participants, I was able to interview students who were the most familiar with TVET engineering education. In addition, I also wanted to track them after their studies.

The sample consisted of 14 women students at N6 level in their final year of TVET engineering education. Initial interviews were conducted in November 2016, when I managed to find only four participants. The main reason for this challenge was that, at that time, students were writing their final examinations, so it was difficult to get hold of some of them. In addition, N6 is a part-time programme, so some of the lectures were conducted in the evening. Follow-up interviews with these four participants were conducted four months later, after the completion of their studies, when some were still looking for positions as interns or for work. In March and April 2017, I

managed to conduct face to face interviews with two participants, but had to hold discussions with the other two telephonically, as they had moved back home to different provinces after their studies. Thereafter, I maintained contact with these first four students by sending text messages asking about their well-being. I also contacted them to find out if they had passed their final examinations. This made it easier for me to set up dates for the follow-up interviews, as we were in constant contact.

From April to May 2017, I managed to conduct the remaining ten interviews with the second group of women students. After the interviews, I requested their contact details, although some of them did not have cell phones at that time. Yet despite the fact that all of them had agreed to be contacted for follow-up interview after their examinations, this proved to be difficult. Those without cell phones had supplied their friends' or relatives' numbers, and when I tried to contact them they were not reachable. In addition, most of the students lived out of the research area, so I needed to go to their homes as soon as they finished their final examinations. This resulted in my only managing to do follow-up interviews with six out of the ten women students.

In-depth interviews were also conducted with the four lecturers in the engineering department, two women and two men lecturers, with whom I made appointments to talk about my study. After explaining my research aim to them, they all agreed to an interview at a later date. After the preliminary analysis, an interview was done with the Principal of the College to brief her about the findings and to hear her views on the topic. For a comprehensive profile of all the participants who took part in this study (See Chapter 6 of this thesis). After data collection, I had to go through the processes of transcription and data analysis.

5.4 Data analysis

Data analysis is ‘a means of making sense of relevant data gathered from sources such as interviews, onsite observations, and documents and then responsibly presenting what the data reveal’ (Caudle, 2004: 417).

For this research project, I used both manual and electronic coding. The first step was the verbatim transcription of audio recordings into word documents. Manual coding was used to familiarise myself with the data and to formulate initial codes. I used NVivo to apply the knowledge practically for storage, retrieval and management of data. The coding process involved assignment of labels to the data, which are short phrases and words that sum up portions of the interview transcripts. I used descriptive coding to categorise portions of the interview scripts. This enabled me to bring together data that have the same characteristics. Some of these codes were decision making, family, future plans and gender (See Appendix G. for the code book). These were used to code some sentences and paragraphs of the scripts. Through this, I was able to take the initial step towards analysis and interpretation of data. As Richards and Morse (2007:137) in Saldana (2009:8) rightly put it about coding: ‘It leads you from the idea to all the data pertaining to that idea.’ Under the code ‘family’, for example, the following details were recorded: general information about parents and siblings; the employment status of parents and their level of education; and domestic responsibilities. In addition to the various codes in the code book, I also coded intriguing quotes that I later accessed during write-up to support my arguments and assertions.

After this process, I moved to a higher level of coding which involved extracting themes. Thus, codes such as family, future plans, and gender were merged to form categories like aspirations, capabilities and conversion factors. For example, under aspirations were codes like future plans, employability and helping others. Codes such as schooling, funding, information and family were

categorised under the theme conversion factors. In the end, I had seven major categories or themes. Each category had related codes under it. Using NVivo for the coding process made it easier, as the software formulates the frequencies (number of times) each code appears, and thus was useful in the identification of patterns and relationships in the data. The NVivo software could also perform analysis, for example, on what two or more participants said on a certain topic. This software also supported the writing of analytic notes, which discussed how each of the categories related to the findings. These emerging themes were used to support the interpretation of data. In summary, the core elements in the data analysis were the process of coding the collected data, the categorising of the data into major themes that emerged, and the making of comparisons, which was later done through tables and graphs. Before data collection however, it was mandatory to get ethical clearance.

5.5 Ethical considerations and access

Despite the fact that the in-depth interviews used in this research study did not pose any threat or harm to the participants, there were ethical considerations that were upheld. This is because this type of qualitative research is not without its risks. There was the possible risk of discomfort by participants, especially when asked to talk about intimate details of their lives (Seidman, 2006). It is also the right of the participants to be protected from harm if the results are going to be shared with others. In this research study, the following tenets were upheld: voluntary participation; protection of research participants; assessment of potential benefits and risks to participants; obtaining informed consent: and doing no harm (Silverman, 2013). I spelt out the purpose of the study and the anticipated length of each interview as well as requesting permission for the interviews to be audio recorded. I explained the following to each participant: the intellectual and the instrumental role of the research; why it was being done; the possible risks as set out above;

how the researcher would minimise the potential risks; and the voluntary nature of the research, which was strongly emphasised.

Ethical clearance from the University of the Free State was granted before conducting of any interviews. Moreover, approval to conduct the study at Acacia TVET College was granted by management (See Appendix F). The approvals were necessary, as they legitimised my research study and helped in gaining the confidence of the research participants who viewed me as a researcher with the backing of legitimate academic institutions. Moreover, these contributed to establishing rapport and encouraging the participants to open up, and therefore contribute effectively to the research. After all the permissions were granted, I went to one of the campuses that offers engineering courses. After explaining my research study and showing the Campus Manager the approvals, verbal permission was granted to start interviewing the women students. According to Cohen et al. (2007), the principle of informed consent arises from the participant's right to freedom and choice. So, consent was needed in this study in order not to infringe on a volunteer's freedom and to respect the participants' rights and self-determination. Before each interview, I explained the following: issues of voluntary participation; all the information about my study; possible risks and benefits; and confidentiality issues. I then asked the participants to sign an informed consent form after reading it and asking questions if they needed to (See Appendix E). This gave the participants room to consider the costs, the benefits and the choice to join or not to join the study. Every one of the participants who took part in the study provided written informed consent willingly. Only the Principal insisted on verbal consent, as she felt she knew what I was doing after explaining my study several times. Information gathered did not reveal the participants' identity, and pseudonyms were used in order to protect the identity of the participants.

5.6 Limitations of the methodology

One major critique of the qualitative case study approach is its non-generalisability (Stake, 2005). This means that the results obtained from a small scale study cannot be applied to all women students at TVET institutions in different contexts. These women students' experiences cannot be taken as representative of the general views of the women who study engineering. Nicholls (2009) observes that no one can represent anyone else in qualitative research, since experiences differ and are unique. However, qualitative research attempts to build theory, and it is this theory that can be generalizable to others (Nicholls, 2009). This means that this research will affect what is known about women students' experiences in TVET institutions and the impact of the education in their lives.

Another possible limitation was the potential for researcher bias. Simons (2009:81) is of the opinion that a researcher's values and judgements may end up affecting the way the participants are portrayed in the research. Olesen (2005) says that one challenge still remains in research with women, which is making women's voices heard without distortion. This research was indeed influenced by my personal experience and values as well as the importance I attach to women's issues. There was a chance for my emotions and feelings as a researcher to influence the research. Therefore, it was important to demonstrate reflexivity during the research process. Being reflexive entailed thinking about how my 'actions, values, beliefs, preferences and biases influence the research process and outcome' (Simons, 2009: 91). In ensuring the validity of the research, reflexivity is critical, more so in a qualitative case study where the researcher represents the experience of others and interprets the observed realities and the stories told (Simons, 2009). I employed reflexivity by being vigilant, staying flexible and open to interpretations that were not the same as mine and avoiding being defensive. I also kept a personal memo to record my thoughts,

feelings and emotions, especially after each interview. This made me aware of how these may affect the research process (Pillow, 2010).

Interviews as data collection tools are not without their limitations. Hatch (2002) notes that the main limitation of an interview is that some participants may not be very forthcoming and end up not wanting to share exactly what is on their minds. I encountered this challenge with one of the participants, who was reluctant to share her views, even after careful probing and assurance of confidentiality. This ended up being one of my shortest interviews, which lasted about thirty minutes and made me mindful of such experiences during the following interviews. Thus, I tried to be sensitive to each participant, creating rapport to encourage the participants to open up as well as creating enough time and space for the participants to trust the researcher and be able to share. This was important, since I interviewed students from diverse backgrounds, in terms of marital status, socio-economic status and age.

Being a PhD student interviewing TVET college students could pose some challenges owing to the differences in educational attainments and power hierarchies. I deconstructed these power differences between the researcher and the participants through reciprocity. Interviews were done at the college, where the women felt comfortable being in their own environment. Each participant was also given the chance to talk about their experiences with minimum interference.

At the beginning, my intention was to follow up all the participants for a second interview during the transition from college to the labour market. However, this was not possible, as I could not contact all the students owing to various challenges. As mentioned earlier, not all students had cell phones or reliable contact telephones. In addition, when I tried to contact some of the students about five months later, they had changed their numbers, and some of them had relocated back home soon after their final examinations.

Conclusion

This chapter has outlined the methodology and design that I adopted to examine the experiences of women students at Acacia TVET College. I explained why I chose to use the qualitative methodology and also justified the use of a case study approach. The data analysis process, ethical issues and access with regard to this study were also explained. The last section examined the limitations of the methodology.

Chapter 6: INTRODUCING PARTICIPANTS

Introduction

In presenting the following student profiles, I begin with a short narrative introduction of each student drawing on the information provided in the initial and follow up interviews. The purpose of these narrative profiles is to provide the reader with insight into the particular situations of each student. This provides an important background to the later analyses of why these women chose to study engineering at a TVET college, as well as their teaching and learning experiences.

6.1 Students' profiles

Dineo

Dineo was a 21 year old student at the time of our first interview. She was studying mechanical engineering. At the time of the interview, she had failed one subject from the previous trimester, which she had to carry over. Dineo comes from the North West Province, is the first of four children and both parents are unemployed, although her father sometimes does occasional work for others in their community. She said her decision to study at a TVET college was influenced by her stepbrother who had studied mechanical engineering at university level. Dineo had tried to apply at a local university but did not qualify for the teaching qualification that she wanted to pursue because of final marks in grade 12/matric, and so she chose TVET. Her studies had been funded by NSFAS since her first year. This funding covers accommodation and other educational expenses. She rented a room in a nearby residential area, about fifteen minutes' walk from college, was still single and had no children.

By the time of the second interview in November 2017, Dineo was still at the college repeating courses that she had failed the previous trimester. She hoped that, this time, she would pass so as to be able to start looking for an internship. Dineo's future plans were to do the Government Certificate of Competency (GCC), a specialized qualification for engineers. To do this, however, she needed to pass all the subjects first and then acquire practical experience in the industry. Moreover, she planned to go back to the same college after attaining practical experience. This means that she would start working as an engineer, not as an artisan, after completing the GCC course.

Karabo

Karabo was 27 years old when I first interviewed her. She hailed from an urban town in the Free State province and grew up in a high density residential area. She was single, had no children of her own, but did have two siblings. Her mother was a single parent and had raised Karabo and her other siblings single handedly. While studying, Karabo ran her own business selling consumer products, mostly stationery, to local schools. Karabo had initially enrolled at a local university of technology for a marketing qualification but could not complete her studies when she failed to qualify for government funding; she had to withdraw, as her family could not afford the fees. After that, Karabo took a break and later enrolled at a TVET college. She said she enrolled for electrical engineering because she had always wanted to be an electrician. She had, in fact, once attended a technical school, so she was able to start from N3 when she came to the college. Even though she was trading in stationery at the time of the interviews, her desire was to venture into supplying electronic goods and services after her studies. Karabo stayed with her mother some distance from the college. She owned a car, which she used for her business and to drive to school.

When contacted for the follow-up interview in November 2017, Karabo reported that she had passed all the subjects from the previous trimester but had not managed to secure an internship yet. She indicated that she was not in a hurry to find practical training, as she was busy running her business, but would nonetheless continue to look for an internship placement.

Lebo

Lebo was studying electrical engineering, hails from the North West Province, was 23 at the time of the interview, had never been married, had no children, and was the youngest of four siblings. An older sister had partially studied for an auditing degree, but withdrew because of lack of funding, and another sister was a social worker. Lebo's decision to enroll at a TVET college was influenced by her brother, who was in the engineering field. Lebo had the desire to go to a university but could not afford to do so. She said her father had lost his job as she was transitioning to post-school education, which led to financial constraints for the family. She did not manage to get NSFAS funding, so her family was responsible for all educational expenses.

Lebo was contacted for a follow-up interview at the end of April 2017, and she reported that she had successfully completed all her theory courses but that she had not managed to secure an internship by that time. She had attended a few interviews at local companies and was hopeful that she would get something. After completing her N6, she had decided to stay in the city so that she would continue to look for an internship. Her family members were still responsible for her upkeep, and thus she could not yet afford to further her education, which she wanted to do.

Lesedi

Lesedi was a 20 year old student when we met, and she hailed from the Free State Province. Like other students, she was in her final trimester of the N6 qualification. Lesedi was the first of three children, stayed with both parents and was the first in the family to study at a TVET college, or any other post-school educational institution. Before coming to the college, she had tried to enroll at the nearest university but had not attained the required points for the medical degree she wished to pursue. She was then advised by her cousin to try a TVET college. The cousin had studied engineering at the same college and had a good job. In her own words, she had enrolled at the college because she was ‘desperate’, although her intention had been to become a medical doctor. She said she had difficulties at first in adjusting to her engineering course because she had not wanted to study this, but later on enjoyed the studies. Lesedi’s father ran his own welding business and she would sometimes help him during holidays. As she did not qualify for NSFAS funding, her father paid for her education. Lesedi was renting a room in the nearest high density residential area, about 20 minutes’ walk from campus. Her future plans were to study for the Government Certificate of Competency (GCC) so that she would be able to work as an engineer. She would have had to gain practical experience after she completed her studies and come back to the same college for this specialized training. Lesedi could not be contacted for the second interview despite several repeated attempts.

Mabatso

Mabatso was 26 at the time of the interview and came from the Free State Province. Mabatso said she had never considered studying engineering because she had always considered mathematics and science to be both difficult and a male domain. The reason she enrolled at the TVET College was that she did not do very well in her matric results. She had attended a technical high school,

so she considered engineering to be the second best option for her, given her results. She said when she enrolled at the college, she found the lecturers supportive and had begun to like her studies. At the time of the interview she was doing an internship/apprenticeship at a local engineering company. She felt lucky to have managed to secure this internship, as would receive a minimum stipend at the end of every month, which was enough for transport costs to the company and to the college. Mabatso's parents were not educated and her father worked as a general hand at a local mining company, whilst her mother worked as a caregiver at a local hospital back home. She had not managed to secure funding, so her parents were responsible for educational costs. She was also renting accommodation in the area around the college and would walk to the college.

By the time of the follow-up interview, Mabatso had managed to complete her studies and had passed all the subjects. She was still working at the same electrical company as an intern, but now full-time. She was looking forward to completing her practical training and, hopefully, be employed by the same company. Mabatso's future plans were to pursue further education and attain at least a B Tech in engineering. She intended to do this part-time while she continued to work.

Mtswaki

Mtswaki was studying electrical engineering. She came from a rural area in the Free State Province, where she did her secondary education at the local school. She was 21 years old, single, had no children, and had two older brothers, one of whom had studied at a university. When at home, she lived with her mother, who was a single parent and worked as a domestic worker. However, when she was at college, she stayed in the local residential area, from where she walked to college. Mtswaki had studied human resources at a private college before enrolling at a TVET college. After completion of the human resources course, she felt she did not have a passion for

the field that she said she had studied only because she had not wanted to just stay at home. The reason why Mtswaki then chose to study engineering at a TVET college was that she enjoyed science subjects at school. She said she would have wanted to go to university for a degree in engineering but could not afford the fees. Mtswaki had applied for NSFAS funding but had not been successful when she came to the college. Her mother and an aunt were paying for her educational expenses, but they began to experience financial challenges and Mtswaki had to withdraw from college in 2015. She then came back in 2016 to complete her studies, after which she aspired to find an internship first and then a job in the electrical field. She said it might be difficult for her to find a practical training position, so she also had the option of going to a university of technology and further her studies in the engineering field. She said she would try to apply for funding for her university education. When contacted for a follow-up interview in October 2017, Mtswaki was still looking for an internship, although she had passed all the subjects. She said she hoped the college administration would help her in acquiring the internship. Since she had been forced to move back home in the rural Free State, it was proving to be a challenge to find practical training, as she could not easily access the internet. However, she remained optimistic and looked forward to getting the training soon. She said she had given up on her plans of going to university, as she did not have the funds.

Hazel

Originally from Lesotho, Hazel was a 29 year old student, studying electrical engineering. Hazel had married when she was young and had two young children and was pregnant with her third child at the time of the first interview, which took place in November 2016. Her mother had died when she was very young, and her father was then responsible for looking after her and her older sister. The reason why she studied at a TVET college was that her father could not afford university

fees and her father had encouraged her to go where the fees were affordable, although her matric results had been good enough for university. Both her older sister and her husband had studied at the same TVET College. She said that she had wanted to go to university to study accounting or management sciences. Her husband was responsible for her educational expenses and had taken over the responsibility when he married her, although, before she was married, her father had paid the fees. Her husband had studied motor mechanics and did vehicle repair jobs for others in their community. Hazel and her husband were also running their own business. They provided cleaning services and products. By the time of the second interview, Hazel had given birth to her third child, and had, thus, postponed the search for an internship because of pregnancy and child birth. She wanted to go to a local university of technology for a teaching qualification so that she could take up teaching at a TVET institution after her studies.

Noni

At our first interview, at the end of November 2016, Noni was a 23 year old student who hailed from the Free State province. She was not married, had a son who was six years old, and stayed with two younger siblings as well as both parents, who looked after her child when she was at college. She had wanted to be a medical doctor or a nurse but her matric results were not good enough for entry to university studies, and thus she had to enroll at a TVET college, being the first in her family to do so. She says she had chosen engineering because she was very good at mathematics. Noni had been a bursary recipient from N5 to N6 only, and her parents had been paying her fees before that. Both parents were not working but her father did odd jobs in their community. After completing her N6, she intended to go to a University of Technology for further studies and graduate with a degree in electrical engineering.

At the time of the follow-up interview, five months later, Noni was still at home. She had been invited to attend entrance exams at the university but could not raise the money for travel expenses and entrance tests. She was hopeful that she would get an internship soon, and planned to continue to look for funds for the entrance tests or an internship, whichever came first.

Puleng

Puleng was 23 years old when I first interviewed her. She came from the Eastern Cape Province, and said she had to come to the Free State Province for studies, as her nearest TVET college at home did not offer electrical engineering. She was single, had a 7-year-old son, and both parents had died. Two of her older siblings were responsible for her educational expenses and were also looking after her son. Puleng said the father of her child had not taken up his responsibilities as a parent, and so she and her family had to provide for him. She had wanted to go to university for a nursing qualification but her matric results were not good enough. Puleng was the first in her family to study at a TVET college, although she had one sibling who had studied at university. After her studies, she intended to look for a job and work as an artisan so that she could start looking after herself and her son.

By the time of the follow-up interview in December 2017, Puleng had passed her final exams and was now looking for an internship. She had returned home to the Eastern Cape soon after her studies and was staying with her sister in a small town, where the hopes of finding an internship were low. She, however, hoped that her college would help her in finding an internship and was keeping in touch with the responsible office. She said that she was continuing to look for placements on the Internet, and had been applying, but had not yet managed to find anything.

Thatho

Thatho was a single 23 year old student who was from the Free State Province, who had enrolled at the college in 2013. Thatho had failed some subjects along the way that she had to repeat several times. She felt engineering was a difficult course that demanded perseverance in order to finish. This was her last trimester, and she hoped she would pass all subjects. She stayed with both parents and was the first in her family to study at a TVET college. One of her siblings was studying law at university, and the younger ones were still in school. Both parents were unemployed, but her father, who paid her fees, would do odd jobs to sustain the family. She had been ineligible for a bursary and was not sure why. After completing her studies, she planned to look for an internship and later pursue further studies when she could afford to. She was contacted for a follow-up interview in October 2017 and reported that she was still in college. She had failed some courses, and so had returned to repeat them. She hoped that this would be her final trimester in school so that she would be able look for an internship afterwards.

Tumelo

Tumelo was originally from the North West province where her parents still lived. She was the eldest of four children, single and had no children. Her father was a policeman and her mother did not work. Tumelo had studied from N1 to N2 back home at a local TVET college in North West Province, then moved to Acacia College for her N3 to be with her best friend who was doing the same course. She opted for TVET education because it was cheaper than university education. Her intention had been to study psychology at university, but her family could not afford this, and she was not sure if she would have qualified for NSFAS funding at university. At the time of the first interview, Tumelo was studying electrical engineering and also doing an internship at a large parastatal. She looked forward to permanent employment in the same company after completing

her apprenticeship. During her studies, she had been unsuccessful in obtaining a bursary, and her parents were paying her fees and educational costs. After her studies, Tumelo aspired to study project management and take up hobbies in cooking and baking. When contacted for the second interview, she was still doing her apprenticeship at the same company and was happy that she had completed her studies and could concentrate on gaining practical experience.

Ntabiseng

Ntabiseng was 22 years old when I first interviewed her. At the time of the interview, she was in her final trimester, studying mechanical engineering. She had three younger siblings and lived with her mother, who was a single parent and also looking after her late aunt's five children. She reported that life was tough at home until they managed to access a government grant, which is now supplementing their household income. She does not know her father, and has never sought to find out about him. Ntabiseng's mother works as a cleaner at a local college in her home town in the North West Province. The reason why Ntabiseng enrolled at a TVET college is that she did not meet the requirements for an engineering degree at university, although she had tried an extended physics degree program at the local university, from which she withdrew after realising it was not what she really wanted to study. Ntabiseng withdrew from the university in the first semester and later on enrolled at a TVET college to study engineering. Her sources of funding were her mother and NSFAS. She was renting a room within walking distance to the college. She said that, although she sometimes experiences financial challenges, she managed to cope. She, said, however, that she would like to study part time, as she wanted to find an internship first and then a job. Ntabiseng could not be contacted for a follow-up interview.

Palesa

At the time of our first interview, Palesa was 24 years old. She was single and studying mechanical engineering. Her mother passed away in 2004, and she never knew her father. However, she had tried to look for him a few years back, only to find out that he had also passed away. She stayed with her maternal grandmother in a township area about an hour out of the city, and used public bus transport to travel to school every day. Palesa was in her final trimester of study and had also managed to secure an internship at a local company, where she had been working since April 2017. Palesa had good passes for her matric, and could have qualified for a degree program, but she had no financial support to study at a university. NSFAS was the main source of funding for her TVET studies, although her uncle would sometimes help with stationery, but not consistently. She took up odd jobs during the weekends and holidays, when she worked as a domestic worker and earned money to supplement her educational expenses. Her grandmother provided accommodation and food. She said that she chose engineering because she wanted to inspire other women, especially in her community; and, in addition, it was cheaper to study at a TVET college.

By the time of the second interview, she reported that she had managed to pass the subjects she had written the previous trimester. She says she was still attending classes and doing the remaining subjects. Palesa explained she could not cope with both being at work and school, and so had decided to take a few subjects at a time. She was still doing her internship and hoped that she would be able to pass the remaining subjects so as to focus on her internship.

Naledi

Naledi was 27 years old and doing her final trimester of the mechanical engineering course. She was engaged to be married and came from the rural Free State. Naledi's parents were responsible

for her upkeep, paid for her accommodation and all other requirements, although her fiancée also assisted financially. Naledi was renting a room close to campus. Although she had three siblings who all attended university, she had enrolled at a TVET college because she did not meet the requirements for the engineering or medical degree that she wanted to study. Soon after matric, she had enrolled at a private college and studied for a certificate in information technology. Yet, she failed to secure a job in the field on completion. She then enrolled at the a university for a bridging course in sciences, but failed mathematics, lost her funding and had to withdraw from the university. After this, she decided to enroll at a TVET college. Naledi felt that it might be difficult for her to get an internship after her studies, so she intended to go to university to study a safety training course. She said that, with this course, it would be easier to get a job in the engineering field. Naledi could not be contacted for the follow-up interview.

Below is a summary of the profiles of the four lecturers and the Principal of Acacia who took part in the study.

6.2 Staff Profiles

Mr. Zulu

Mr. Zulu was a lecturer in the civil engineering department and taught civil subjects. Before joining Acacia College as a lecturer, he had been working as a quantity surveyor for a local engineering company. He held a National Diploma in Building Science, an Honours Degree in Education and a Post Graduate Certificate in Education. He had about two years' experience of teaching at a TVET college.

Ms. Rooyen

Ms. Rooyen was also a lecturer in the engineering department and taught Mathematics only. She had been at Acacia for twenty years teaching mathematics in both the engineering and business studies departments. She was a holder of a degree in Education. Before joining a TVET college, she had worked as a high school teacher and had risen to the position of Principal when she left. She says she came to a TVET college because the work was flexible enough to allow her to look after her children.

Ms. Khotso

Ms. Khotso was a lecturer in the engineering department. She taught mathematics only from N1-N6 levels of the engineering course. She had been teaching the same subject at the same college for the past thirteen years. She had a Diploma in Education, a Degree in Education and a Post Graduate Certificate in Education. At the time of the interview, she was also studying part-time towards a law degree at a local university.

Mr. Molweni

Mr. Molweni was a lecturer in the mechanical engineering department. He had studied up to N6 at the same TVET College (Acacia). After completing his N6 qualification, he went to university to study for a Bachelor of Technology in Mechanical Engineering. He was, therefore, a holder of both a Diploma and a Degree in Mechanical engineering. Mr. Molweni had taught at another TVET college in a different province from 2012 until he came to Acacia in 2016.

Principal (Ms. Nare)

Ms. Nare had been the Principal of Acacia since 2013. She had started as a lecturer at a college of education and was then promoted to a senior lecturer position. When the colleges of education were dissolved, she became a chief education specialist which is the same level as that of a deputy director in government. Ms. Nare's responsibilities at that time were curriculum development for learner ships, assessments of examinations, and skills development in general for FET Colleges. She had vast experience in the TVET sector, had a Master's Degree in Education and also sat on various councils in the higher education sector.

Conclusion

What is emerging from the profiles of these women students is that almost all of them come from very low socio-economic backgrounds. Except for one student, whose one parent was a policeman, none of the parents or guardians had a professional qualification. In addition, most of them were first generation students to attend post-school education. All the students were black women students. This study population points to the type of type of students that TVET colleges in South Africa generally attract.

CHAPTER 7: WOMEN'S PATHWAYS, PERSPECTIVES AND EXPERIENCES IN TVET

Introduction

In South Africa, there has been greater focus on TVET colleges through improved funding and marketing strategies. TVET colleges have been marketed as 'institutions of first choice' (Department of Education, 2007) in an effort to improve their image. TVET colleges, however, are still to be embraced by most South Africans as such. In addition, despite all these resources being channeled into the sector, 'very little is known about why students enroll at TVET colleges and even less from the perspective of the learners' (Powell 2012:152). This section, therefore, sets out to understand those reasons and looks at the pathways of women students studying engineering. It explores how the research participants ended up at a TVET college and the circumstances that led to a choice of engineering as a programme of study. In an effort to maximize the voices of women students, this section draws substantially from the participants' accounts. Although I also draw from the accounts of the four lecturers that were interviewed, the main aim of the chapter is to understand the women students' pathways to TVET. This is, ultimately, aimed at understanding their experiences in the system and the intersections between the constraints, opportunities, freedoms, conversion factors and the agency that these women exercised in choosing TVET as a form of post school education.

Below is a summary of the profiles of the students that took part in the study. This will help to understand the participants' circumstances that eventually led to their choice of TVET and engineering.

Table 7.1 Summary of students' profiles

Name	Age	Marital Status	Parents' information	Parents' occupation	Source of Funding	Reasons for enrolling in TVET	Area of Study
Ntabiseng	22	Single	Mother single parent Father not known	Mother a cleaner at a college	NSFAS, Mother	Did not meet university requirements	Mechanical engineering
Palesa	24	Single	Both parents died.	---	NSFAS, Domestic work	Financial Could not afford university fees	Electrical engineering
Puleng	23	Single with 1 child	Both parents died	----	NSFAS, Brother and sister	Did not qualify for university	Electrical engineering
Thatho	23	Single	Stays with both parents	Father runs own business	NSFAS, Father	Did not meet university requirements	Electrical engineering
Dineo	21	Single	Has both parents	Father self-employed	NSFAS, Father	Did not meet university requirements	Mechanical engineering
Hazel	29	Married with 3 children	Mother died	Father not working	Husband, She runs a cleaning business	Financial Could not afford university fees	Electrical engineering

Karabo	27	Single	Mother single parent	Mother not working	Self Runs a small business selling stationery	Financial Dropped out of university	Electrical engineering
Lebo	23	Single	Has both parents	Father retrenched, does odd jobs	Parents	Financial Did not qualify for university	Electrical engineering
Lesedi	20	Single	Has both parents	Father does odd jobs	Father	Failed to qualify for a medical/ engineering degree	Mechanical engineering
Mabatso	26	Single	Has both parents	Father a general hand Mother a caregiver	Parents	Did not qualify for university	Mechanical engineering
Mtswaki	21	Single	Mother single parent	Mother not working	NSFAS, Aunt	Financial Could not afford university fees	Electrical engineering
Naledi	27	Engaged	Has both parents	Father retired	Sister, Father	First studied at university bridging course, failed Lost funding	Mechanical engineering

Noni	23	Single - has 1 child	Has both parents	Both parents not working	NSFAS, Parents	Did not qualify for university	Electrical engineering
Tumelo	22	Single	Has both parents	Father is a policeman	Parents	Financial Could not afford university education	Electrical engineering

As shown in Table 7.1 above, what emerged from the participants' accounts is that none of the students initially wanted to study at a TVET college. All of them wanted to go to an academic university or a university of technology. It is important, therefore, to understand the circumstances that led to these women choosing TVET, when they wanted to obtain degrees from institutions of higher learning.

The research question that is being answered in this section is:

1. Why do women study at a TVET college and why do they choose engineering?

7.1 Choosing post-school education-the journey to TVET

As the above summaries indicate, most of the participants came from very low socio-economic backgrounds. This is determined by the parents' level of education, their occupation and, in some cases, the family structure. All these factors determine the amount of resources that are available for the women students to pursue post-school education. Only one of the parents held a professional job as a policeman. The rest were either not working formally or they held low-paying jobs, such as a cleaner and caretaker. This had a significant impact on decisions for post school education.

7.1.1 ‘I could not afford university education’-Lack of finance as a determinant of post-school education.

Out of the 14 women students interviewed, five ended up in a TVET college because they could not afford university fees but had good passes. They had hoped to study at universities but the fact that they could not afford university fees or the educational costs associated with higher education led them to TVET. This is a challenge considering the high costs of higher education in South Africa (Wangenge-Ouma, 2012). In this case, TVET became an alternative form of post-school education. Tumelo, whose father was a policeman, opted for TVET after realizing that they were not in a position as a family to afford university education⁵. She was aware of the availability of funding in university but could not be certain about qualifying for the funding. She did not want to take chances and potentially waste time, since her high school results were not competitive enough. Tumelo had this to say:

The main reason why I chose a TVET college is that financially, as a family we were not very stable, so I had to come here because I could not opt for a university because you never know if you will qualify for a bursary, so since this was a cheaper option, I came here. Actually, my first option would have been studying psychology at the university, and engineering was my second option and I saw that doing it at a TVET college would be cheaper. (Tumelo)

⁵ In December 2017, the then President of South Africa, Jacob Zuma announced that from January 2018, the government through the NSFAS will provide full bursaries for tuition and study materials to poor and working class students in universities. According to the plan, eligible students will also get financial assistance on accommodation and transport as well. The threshold for annual family income of the beneficiaries was also raised to R350 000, 00. If this is implemented effectively, it may result in the number of students who opt for TVET because of failure to afford university fees being reduced.

On the other hand, Lebo's father left his job, so she felt university education was out of reach for her because of expenses;

As I was growing up we had money to take us through school until my father left his job.

So by the time I finished matric, the financial situation of the family had changed. (Lebo)

Palesa was an orphan who says that, because of her circumstances, she could not afford university education. She went further to explain her challenges in taking herself through college, as she had to do domestic work over the weekends for her to have bus fare for travelling to college and stationery. Her grandmother, with whom she stayed, could not afford the educational expenses, and she relied on the bigger portion of the fees being paid by the government through NSFAS.

I grew up not knowing my father so I found out from my father's family that my father passed away like a few years ago. So I never got to see him. I only knew my mum and she died in 2004, when I was still young. Now, I live with my grandmother where I am staying.

I was like ... after, I finished my matric, I did not have money to go to school (university).... I do piece jobs over the weekend at home, I wash windows, I clean people's houses and clothes for people then they give me money for transport. So that is how I have been surviving. (Palesa)

Hazel also faced the challenge of funding. Though she wanted to go to university, this could not happen as her father insisted on her attending a TVET college, which is cheaper. Being economically dependent on her father, she ended up attending TVET. It is interesting to note how Hazel's father encouraged her daughter to be in engineering, a male dominated field. This reflects a historical shift of perceptions about science education by the father, challenging the conventional understanding that women, especially black women, should not study engineering. The story helps

us to understand how young women might be encouraged to engage in science education by their parents. Her sister had studied engineering at the same college. It could be that the father considered this a viable profession for his daughters because of the belief that the engineering field commands higher wages than non-STEM professions. This account points to the limited freedoms that she faced in choosing where to study. Even though this was not her preferred choice, she had to do it because her father said so. As such, the role of parents or family in choosing what to study comes out in this case. They are usually responsible for educational expenses, and so have a role to play in the choice of where and what to study. Hazel says:

I always wanted to do some B Com Accounting or Management at a University, but my father insisted that I do engineering because my sister did an engineering course at this college. So I did not have enough support and coming here was the cheapest for me. (Hazel)

It can be seen that the availability of funding is a major determinant of choice of post-school education. When the women realised that they could not go to universities, they adjusted their aspirations in relation to what they viewed as affordable. As noted in Chapter 1, 80% of fees in TVET education in South Africa is funded by the government. Students only pay 20% of the fees, and some can also qualify for bursaries. This makes TVET education affordable for most of the students. It is, therefore, understandable to see how the students adjusted their desires from university education to TVET education, which they could afford. Sen (2002: 634) explores the tendency of people to ‘consciously adjust their preferences’ as in the case of these women for whom adaptive preferences were formed under conditions that were not conducive to their flourishing (Khader, 2011), such as a lack of finances. They had wanted to go to university but could not do so because of finances. Even though the South African government supports students who pass their school-leaving exams and aspire to attend higher education, the available funding

is often not sufficient to meet the demand. While bursaries and loans are available for students, the application process is usually rigorous and, in the end, not everyone will access this funding. Thus, it can be seen that the capability set of some of the women students in the case study was severely constrained. Coming from low-income families meant the resources available for their education were limited and this, in turn, limited available educational opportunities. This led to their enrolling in TVET, even after obtaining enough points to qualify for university education. The fees were just too exorbitant for them.

7.1.2 ‘I did not pass matric well’-Matric passes and their effect on choice of post-school education.

Another major reason cited by the students for choosing to study at a TVET college was that they had not passed their matric/secondary school-leaving examinations well. Eight out of fourteen of the respondents cited this as their reason. Noni says:

When I was growing up I wanted to be a doctor and engineering was not on my mind. My second option was becoming a nurse or a teacher. So I came here because of the circumstances, I did not do very well in my matric exams, so I had no choice but to choose a TVET college. (Noni)

Noni explains how she had wanted to go to university and become a doctor, a nurse or a teacher. However, because she did not do very well in her matric examinations, she could not pursue her desired career choices. This again may be related to adaptive preference. In other words, when Noni failed to reach her desired career, she shifted her preferences to what was accessible to her at the time, which is TVET education. Lesedi also faced the same situation:

At first I was ... it wasn't easy for me to choose a career. I tried to go to varsity but my application was not successful. I wanted to be a doctor. My brother told me that since ever I did science, I can try mechanical engineering because he did electrical and he told me about [Acacia] and the way things are done here. Since ever I was desperate I then decided to come. (Lesedi)

Lesedi had a different career path in mind but, after her results, she realised that she could not reach the goal of becoming a doctor. Medicine requires very good passes in science subjects and, because she could not attain these, it meant that it was not possible for her to study medicine. Lesedi talks about how 'desperate' she was, which shows that she had very limited options in terms of pursuing post school education. This is a situation that most matriculants face when they do not perform to a certain required standard; their choice of professional programmes is constrained. They may have very high ambitions, such as Lesedi's being a medical doctor, but, it becomes difficult to pursue such goals because of poor passes.

Lebo wanted to study architecture at university, but also ended up at a TVET college because she had failed subjects required for entry into architecture at university.

I wanted to study architecture at the university but my marks for maths and science were not that good. So I thought I could come here and get an N3 at least with good marks and start looking for a job. But when I came to the college I fell in love with electrical engineering and I ended up continuing up to N6 level. (Lebo)

Lebo had to change her career ambitions from architecture to engineering at a TVET college because at least she could qualify to study at a TVET college. She reported being happy with this change.

Thatho could qualify to study at a university but not for a course that she wanted. She was offered teaching because usually the faculty of education at the local university has lower entry requirements compared to other faculties. Thatho did not want to be a teacher and wanted a career in science; she, therefore, opted for TVET education. This points to the extent to which Thatho exercised her agency, even in the face of limited choice. Thatho refused to be drawn into a field that she did not really want because of her circumstances and opted for a TVET college instead.

I wanted to go to... [University of Technology] and then they told me that my points were low. I could only study teaching and I did not want to teach. That is when I applied and came here. (Thatho)

The lecturers also had the same sentiments about the reasons why the students end up in a TVET college. Mr. Zulu used the word ‘rejected’ to refer to the student population in TVET colleges. This means that most of the students would have tried enrolling at universities and when that fails, they go to TVET colleges.

Some of them come here because of financial reasons but most it's because they do not qualify for a university entry. They still need to be groomed, they still need to be given guidance because students that we are taking here, its raw students who are rejected from [University of Technology] or universities. (Mr Zulu- Lecturer)

Mr. Zulu’s assertion even paints a bad picture of some of the students at the TVET College. Use of the words ‘raw’ and ‘rejected’ seem to show that the lecturer saw these students as less able, academically underprepared and needing more attention. Coming from a lecturer, one would think that the stereotypical image that is associated with TVET institutions in South Africa is influencing his view. Mr. Zulu was aware of the fact that some students enrol in TVET colleges because of

finances, but he also believed that most of the students were not academically talented. This then runs contrary to the agenda of the DHET in marketing TVET colleges as ‘institutions of first choice.’

These women’s stories help us to understand the experiences of some young women in choosing post-school education in South Africa. Aside from helping us to understand the circumstances of women students after completing high school and how they end up in TVET colleges, the notion of freedoms is significant, since it offers a space to understand these experiences further. The social arrangements and freedoms of these women were constrained owing to their school-leaving examination results, which determines their entry into mainstream university or a university of technology. This means that, in the end, they were faced with limited freedoms regarding choice of post-school education and were left with the option of TVET colleges as a last resort. Khader (2011) talks about preferences that form because of lack of options. This is what we see when women end up in TVET because they could not qualify for what they really wanted, which is university education. Unequal circumstances, such as poor passes, meant that these young women had unequal chances in choosing post-school education. Such circumstances may lead people to choose options that they really did not want in the first instance.

7.1.3. *‘I want to go to university’-TVET as a second chance route to higher education*

TVET colleges are also taken as a route to higher education (DHET, 2012), as students are prepared both for employment as well as higher education. It is against this background that some students enrolled in TVET colleges in order to pursue higher education in future. Since it had been

almost every respondent's desire to get into university, some of them consider this as a route to university. Mabatso says:

I am actually going to upgrade again so that I see myself at the University to complete at least a (what do you call it?)... BTech... and study further engineering and working. I don't want to end up being only an artisan, I also want to be senior electrician ... (Mabatso)

Mabatso believes that through TVET she will be able to pursue her career aspirations of being an electrical engineer through graduating from university. As such, while TVET may not have been her first choice, if successfully completed, this may give her the opportunity to access higher education.

Noni was aware of the possible challenges in getting a place at the university but was willing to try. In universities, there is often competition for places, as more and more students leave high schools each year. This is seen in the high numbers of students who apply for university entry each year against the limited university spaces available. According to Boka (2017), of the students who start at TVET colleges in South Africa, only a small percentage of them end up in universities or universities of technology. Thus, the transition from a TVET college to university is not always smooth because of competition, funding and poor passes. While some of these women may aspire for higher education, they may lack the capability to realise their aspirations.

Ok, I have applied at the [University of Technology]. So next year after the results come I will register and continue with electrical engineering at degree level. To get the place is not easy but I will write a selection test, since as I said, my matric results were not good especially English. I want to continue with my education. (Noni)

There are some students who wanted to pursue further education in a rather unconventional way. Ntabiseng and Thatho were planning to finish their TVET education, get jobs and then attend evening classes;

I want go to [University of Technology] but for evening classes.... So I will go to work in the morning and in the evening I will attend class at [University of Technology]. A degree programme in mechanical engineering because I am capable. (Ntabiseng)

I intend to work and study. Get an internship and pursue still on electrical at [.....University]. So I intend to just continue in the engineering field. I will study part-time... engineering degree. (Thatho)

These two students were aware of the structural limitations that they were faced with, one of which was funding. They believed that, if they could do their higher education studies part time, they would be able to pay for their education by working and sponsoring themselves. These were only aspirations, as these students were still to finish their education; yet, these women considered TVET as a future pathway to higher education, to which they had failed to gain access in the first place. The experiences of these students also point to the dynamic nature of their aspirations (Hart, 2013), which changed, especially after they received their school-leaving examinations results. In most cases, career aspirations changed when they could not qualify for university or could not afford higher education fees. Such aspirations can be termed ‘adapted’ (Alkire, 2007; Hart, 2013). It is also possible that the students of the study may have been aspiring to go to university to attain degrees because they were aware of the challenge of unemployment that lay ahead. In other words, by acquiring a degree, they would increase their chances of being employed. According to Langdon et al. (2011), those with a science qualification command an average of 26 percent more income than those who do not have this; moreover, the rate of unemployment is lower among

individuals with higher qualifications. Thus, engineering would be a financially lucrative discipline if the students of the study eventually managed to realise their aspirations.

7.1.4. ‘I dropped out of university’-TVET as an alternative to higher education

Students, such as Naledi, Karabo and Ntabiseng, managed to enrol at universities but could not continue for various reasons, and thus attended a TVET college by default. Naledi could not gain entry into a mainstream graduate programme because of poor Matric passes, so she decided to register for an extended programme. However, she failed one of the courses and lost her funding. She explains:

I matriculated in 2007. I did not pass maths well and decided to do chemical engineering. So I thought of doing chemical engineering at... [University] and they said my points were low. So I had to do a bridging course, got a bursary, started the bridging course, but then I failed maths again. So the bursary stopped paying, saying I should pass first. So I did not have money to pay for myself for the whole year because I had to do it for the whole year. So I decided to leave it and do IT at the... College. ... I did IT. After that I looked for a job, applied, applied, no job... It was just a certificate in IT. (Naledi)

Though Naledi was able to receive funding for university, she could not complete the engineering course for which she had registered. Moreover, not only did Naledi drop out from university she also enrolled, later, at a private college where she studied information technology but failed to find a job afterwards. After all this, she decided to enrol at a TVET college. Thus, Naledi’s journey to post-school education became very long because of poor matric passes, poor performance at university, completion of an IT qualification, and subsequent failure to find remunerated

employment. Moreover, structural circumstances limited the available options for Naledi. Nevertheless, despite all these challenges, she navigated her circumstances in an effort to acquire skills training with a view to improving her employment opportunities by acquiring a TVET qualification.

Then I went to the [University] but then my Matric results... I did not meet the requirements for a Bachelor's Degree, then I went to a campus here, I did the extended programme in physics and engineering subjects, the BSc course. Then I left it because I wanted something to do with engineering and at the orientation I told them I would want engineering course. But then, after 3 months, I realised that it was not engineering while they told me that it was engineering at orientation. (Ntabiseng)

Ntabiseng also failed to complete a university degree, as she felt that she had enrolled in a wrong course. She had been given the opportunity to register for a general science degree programme, not an engineering one; and, since she really wanted to study engineering, she had opted to drop out. Ntabiseng's story shows how sometimes lack of knowledge affects the selection of courses. She spent three months studying for a degree that she did not really want to do and ended up by dropping out. However, she was so determined to study engineering that she decided to drop out and study at a TVET college.

Karabo, on the other hand, had enrolled at a university of technology, studied marketing, lost funding and then dropped out, as she could not afford to pay university fees for herself. That is when she finally decided to go to a TVET college. Karabo said, by that time, there were issues with the NSFAS funding system, which led to her and a number of other student losing their funding before they could finish studying.

I studied at [University of Technology], I studied marketing but we were financially excluded, when I was doing, second year. I was studying for a national Diploma and so did not finish because that time NSFAS had issues, I took a gap year. I have always wanted to be an electrician and from high school, I did these subjects, technical drawing, electrical and so forth. So I took a gap year, and you know, during a gap year you do your introspection, what do you wanna do, yes, then I decided, let me not sit, and let me do something. Then I came here... (Karabo)

The stories of the three students above show that sometimes students' educational trajectories are fraught with difficulties, especially when choosing post school education. These three students share one common desire, which is to improve their lives through skills training and their future prospects. It is also apparent that their journeys were prolonged by their structural circumstances, such as a poor quality educational system that often underpins poor performance, and a lack of funding for higher education. Although they had limited opportunities, the women decided to take control of their lives by taking up engineering studies at a TVET college. This shows the levels of agency that these women had in choosing a life they had reason to value.

The following diagram summarises the factors that generally affected the women student's choice of TVET as post-school education, as discussed above, although the factors may be different from one student to the other.

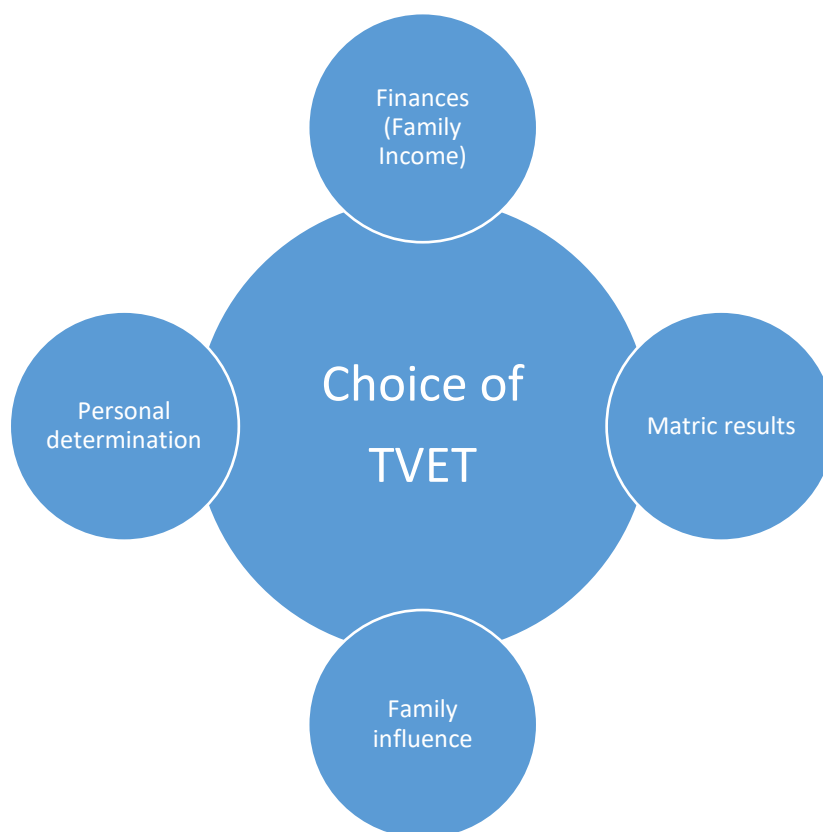


Figure 7.1 Summary of the factors that influence choice of TVET

Students may have career aspirations but their personal, social and environmental circumstances will greatly influence whether they will achieve their valued beings and doings. For the students in this study, family income, matric passes, personal determination and family influence all contributed to the choice of TVET. Sen (1999: xii) argues that ‘the freedom of agency that we individually have is inescapably qualified and constrained by social, political and economic opportunities that are available to us.’ In other words, the women in the study had limited opportunities for higher education owing to their personal and social circumstances. They were faced with ‘unfreedoms’ (Sen, 1999) that led to inadequate opportunities for them to achieve what they really valued. This situation left the women with little choice and limited opportunity to

exercise their agency. The freedom of choice, which diverse people have, has a far reaching effect on our understanding of women's empowerment through TVET. Having discussed the factors that influenced the women students' choice of TVET, the next section looks at why the women then chose engineering as a course of study.

7.2 Why engineering? Can a woman pursue engineering studies?

The above section has looked at the reasons behind the women students' choice of TVET for post-school education. I now turn to an exploration of why these women chose engineering education and not one of the other female-dominated courses that are offered at the institution. There are some students like Lesedi, who had always considered engineering as their career of choice, but for others, the decision to study engineering was less obvious.

7.2.1. '*I attended a technical school*'-Schooling background as a determinant in choosing engineering

Four of the respondents chose to study engineering because they had attended technical secondary schools. This meant that they had already been exposed to engineering courses earlier in the schooling system. Mabatso is one of them:

I didn't pass Matric. I failed two major subjects but at high school. I was attending a technical secondary. So I did electrical engineering, basically from high school at a technical secondary.... (Mabatso).

Mabatso had also not performed well in her school-leaving examinations. However, although she had wanted to go to university, this was not possible after having failed two major subjects. She then ended up adjusting her aspirations to the area of study that she was familiar with. It can be

seen how schooling influences career choice, as in the case of Mabatso. She had been exposed to technical subjects at school, and so choosing to further her career along that line was informed by the experience.

Other students also cited prior experience of engineering studies at school level as a reason for attending a TVET college. After students realised that they could not go to university because of poor passes or finances, they ended up choosing a TVET college, as they had been exposed to technical subjects at school. Having attended a technical school then becomes a key conversion factor that influences choice of engineering as a course.

I went to a technical school from grade 8 and so I feel like I restricted myself to engineering. I liked technical drawing and civil engineering at school so I had restricted myself to this field. So I came here after graduating from the technical school and started from N2 and now I have completed N6. (Lebo)

Lebo's background in technical subjects facilitated her choice of engineering owing to early exposure to engineering subjects at school. This points to the importance of schooling, in particular mathematics and science for girls, as a foundation for challenging gender bias in engineering. Early exposure to technical subjects, therefore, is reflected in their choice of engineering and becomes a conversion factor that enables women students to study engineering. After having done such subjects at high school, the women of the case study felt comfortable because they would have developed the learning and cognitive skills needed for engineering education. In the case of Lebo, however, because this was not her initial choice, she felt that she had 'restricted' herself to engineering. Such sentiments go to explain the limited choices that these women were faced with. In the end, Lebo was in a field that she initially did not want because of lack of options. This is a further example of choices made in the face of limited options.

7.2.2. ‘I never wanted engineering’-Parental and family influence in choice of engineering

There are some students who studied engineering because their family wanted them to do so. Hazel uses the term ‘never’ to show how she had wanted to go to university and study for a commerce degree but could not do so, as her father wanted her to go to a TVET college. In this case, therefore, not only did her father play a significant role in the choice of post-school education, but he also chose engineering for her. This resonates with the assertions by the lecturer, Ms. Khotso, who argued that some of the students come to TVET because that is what their parents want them to do. Due to the role that parents play in terms of funding the studies for their children, this gives them control over the choices made, and so it limits the choice that these women had in choosing what they have reason to value. Hazel could have chosen a course in commercial subjects at the same TVET College, since there are such courses, but she did not have the freedom to do so.

I never wanted to study engineering, I always wanted to do some B Comm Accounting or Management at a University, but my father insisted that I do engineering because my sister did an engineering course at this college. So I did not have enough support.... That's how I came here. (Hazel)

The case of Lesedi, however, was different, as her male cousin who had studied at the same college advised her to study engineering. The use of the word ‘desperate’ may point to the circumstances under which she chose engineering at a TVET college. Being ‘desperate’ points to limited options. Since she had not qualified to be admitted at a university, she now had limited choice and, eventually, the choice of engineering was influenced by the science subjects she had studied at school and her cousin.

At first I was... it wasn't easy for me to choose a career. I tried to go to varsity but my application was not successful. My cousin told me that since ever I did science, I can try mechanical engineering because he did electrical and he told me about [Acacia] and the way things are done here. Since ever I was desperate I then decided to come. (Lesedi)

Thatho had a say in her choice of engineering and said that, together with her brother, they decided that she should attend a TVET college, since she had failed to go to university.

I wanted to go to [University of Technology] and then they told me that my points were low. Then me and my brother decided that I should come here and do engineering. That is when I applied and came here. (Thatho)

It can be seen how family in the lives of the women students influenced the choice of engineering as a subject. Although the family (male figures in this case) play a role in the choice of engineering as a subject, Thatho and Lesedi had the freedom to choose otherwise. Hazel, on the other hand, could not exercise her agency in the choice of a course to study. It can be seen how the social environment influences and shapes women students' preferences. Gender structures in the lives of some women had converted individual choice into a collective decision. Robeyns (2008) argues that men and women's capability sets are not equal mainly because of the influence of gendered norms, and we see some examples of this in these accounts.

7.2.3 ‘I have never seen an engineer stay at home’-Better employment opportunities and their influence on choice of engineering

Some women chose engineering with the hope of finding employment or venturing into self-employment after their studies. This instrumental vision of TVET comes out strongly from participants in this study. Lesedi says:

A lot of people that studied engineering have money and stuff, so I see myself there, with money, and a good job. I think if I can get training I can get a good job, buy my own car and so forth. I have never seen an engineer staying at home, they have good jobs. (Lesedi)

Puleng’s aim also was to look for a job so that she can look after her family and her son. She fell pregnant while she was still very young and was not married. Her siblings were looking after her and her son, so she hoped to get a job and take over some of the responsibilities herself.

I will look for a job after this. Maybe get a good one and start working and earn money, look after my son and family. I could not do this if I was just seated at home after Matric. (Puleng)

Karabo who was already running her own stationery supply business, wanted to expand her business and venture into selling electrical products, partnering with schools.

After this, as I said I would want to have my mini shop where I sell those components that they use to make products... then I can venture and go into schools and say, this is what I have, how about we partner so that you can buy from me and show your students how things are done. (Karabo)

For others like Hazel, TVET had opened doors to a teaching profession:

I am no longer thinking of being an artisan, I also want to be a teacher because they (teachers) gave me the excitement of teaching. (Hazel)

Hazel said she had been inspired by her lecturers at the college, and so would pursue a teaching profession, teaching engineering subjects at a school or TVET college. Thus, there was a diversification in the future plans of these women students, and engineering education is believed to open these doors. It can, therefore, be seen that, for these students, the prospects of finding a good position or running their own business was the ultimate aim. Education is, therefore, important for broadening human capabilities (Saito, 2003). Drèze and Sen (2002) argue that education has both instrumental and intrinsic roles. These women students felt that, by studying engineering, they would widen their opportunities for employment and expand their capability set. These opportunities were not in their capability sets before TVET. In addition, TVET became important since the women came to be autonomous in being able to choose the way of life they had reason to value. Education, in this case, would give these women more freedom in future. Nussbaum (2000) explores the benefits of women's education, including having an option of leaving an abusive relationship, meeting and collaborating with other women, as well as increased bargaining power in the home. It was noted in Chapter 3 how TVET is believed to play a role in employment creation and, ultimately, poverty alleviation as well as addressing inequality (DHET, 2012; The World Bank 2007). The women in the study also saw engineering education as a pathway to employment, self-employment and, ultimately, better lives. For these women students, pursuing an engineering career is seen as a sign of upward mobility and increases the chances of finding employment. Since most of the participants came from very low socio-economic backgrounds, aspiring for a better life through education is, thus, not unexpected.

Leathwood (2006) pointed out that, in the labour market, professions such as engineering, construction and plumbing tend to be more valued and have higher returns than the caring professions, for example. This may help to understand why the women chose to study engineering despite the gendered norms that sees more women in the caring professions. Lesedi was aware of this and pointed out that people in the engineering field 'have money and stuff'. This may have led the women to choose engineering as a course of study, as compared to other female-dominated professions. The underlying assumption is also that transition to the middle class is facilitated by education and professional work. Engineering education, in this case, supports aspirations for a path towards upward mobility. TVET education then also becomes a source of aspiration of female success. It appears that one of the main motivators for choosing engineering was the hope for better employment opportunities in the near future.

However, it is important to note that, considering the challenges facing TVET education and the South African economy, some of these aspirations may not be realised. A lot has been written about challenges faced by TVET graduates in finding employment in South Africa (Cosser, 2003; HRDC, 2014; Kraak et al. 2016). All these studies point to the challenges of unemployment and under employment of TVET graduates. Thus, transitioning from education to employment may be a challenge for these women. This may result in the delay of fulfilment of these aspirations. Follow-up interviews conducted with the participants confirmed the challenges that are faced by TVET students in securing internships after their studies. None of the students had managed to find an internship or apprenticeship, except for the three students were already in an apprenticeship during the first contact. The follow-up interviews were done after about five months after completing their theory studies. This gives a glimpse into the challenges that students generally face irrespective of gender, which may delay or impede the realisation of their aspirations. Even

though these women students aspired to good lives, they may not have had the opportunities to choose the lives they had reason to value. Considering the challenges facing the TVET sector in the country, not all aspirations will be converted to capabilities or be realised as functionings. While the students often have aspirations and great career ambitions, conversion factors may mean that some of these aspirations will never be converted into capabilities and functionings. It means that the factors that affect the transformation of aspirations to capabilities may require practical changes in the policies of the country. The challenges faced by women students in getting internships will be explored in Section 7.5.7.

7.2.4 ‘I wanted to be an inspiration to other ladies’-Confronting gender stereotypes

Puleng, Palesa and Dineo felt that studying engineering, even though it benefits them, was going to inspire other women to do the same. Palesa says:

So I ended up telling myself that there is a college I can go. Maybe because I saw around the world that women like, they have careers where they sit behind computers and write on papers. So I said I can change from that. Maybe to be the first one in my street to do engineering. So I came here and studied engineering. (Puleng)

Puleng’s desire was to do something different instead of being in clerical positions and ‘sit behind computers’ that she saw most women doing. She came from a township and, therefore, believed that she would be a role model in her community by doing engineering. Palesa shared the same view:

I wanted something for a change. I wanted to be like an inspiration to other ladies, not like engineering is for men. We as women we can do better. We still have a chance to prove ourselves that we can do it. We can study engineering. (Palesa).

Dineo thought that she could do engineering and motivate other women to venture into engineering:

I do think other women will be motivated and not to be biased thinking that engineering is specifically for boys. There is no such thing as... no woman can be an engineer. If you put your mind and tell yourself that I am going to be what I am set up to be. (Dineo)

These three accounts show how social norms and traditions may influence women's aspirations and choice. Palesa and Puleng, therefore, chose engineering in an effort to move away from the circumstances, which they did not like, of women being confined to clerical jobs and men to engineering; and, they wanted to show other women that it can be done. The particular context in South Africa was that, during apartheid, black women were virtually excluded from engineering and science training (see Chapter 1). It is against this background that some women wanted to be engineers, and to challenge these deeply rooted structural factors. They strove to make an impact in a male-dominated environment. This resonates with another study of university students in South Africa, which revealed that black women students were influenced by the desire to 'prove themselves in a career dominated by white males' (Jawitz et al. 2000:471). Jawitz et al.'s (2000) study was aimed at understanding why women had chosen engineering as a career. In my study, the reason why some women students chose engineering was also that they wanted to show other women that engineering that can be done by women.

7.2 Enabling choice or constrained choice?

Choice of TVET as post-school education is framed by structural constraints in the lives of the respondents. These are mainly poverty and poor performance at school, which could be due to the unavailability of quality schooling (Spaull, 2013). Sen (1992; 1999) explains how the adoption of capabilities as an evaluative framework would look at a person's real freedoms of choice from a range of options. This, however, cannot be said for the respondents in this study who lacked genuine choice, as they did not have the 'quality or quantity of available opportunities' (Sen, 1985:69). In addition, the choice that was made by the women students to study at a TVET college cannot be said to have been made from enabling or just opportunity sets (Robeyns, 2000). Since all of them wanted to go to university and ended up at a TVET college, this means that there were social structures and constraints that influenced and shaped their choices. The following are excerpts from interviews with lecturers, which help to understand the circumstances under which TVET colleges recruit their students. According to Ms. Khotso, a mathematics lecturer in the engineering department, the college takes 'rejects', which refers to those students rejected by universities because of poor passes. She says, because they do not have many options, the parents would encourage them to go to TVET colleges instead:

The problem is that we accept rejects from schools. Some they just came here because their parents want them to come to school, so that is why they came here...They tell you that my parents want me to do this, that's why I am here. (Ms Khotso)

Ms Khotso seems to have a stereotypical image of the student population in the TVET College. Although a number of the research participants attended TVET colleges as a result of poor passes, there were those who did choose these institutions for specific reasons, as discussed in the previous

section. Therefore, it seems that Ms Khotso was underestimating the capability of her students, which is undesirable in a lecturer who should rather be motivating her students.

Mr Molweni, a lecturer in the Civil engineering department, expressed the same sentiments. He argued that it is everyone's wish to go to university, but, because of poor performance at matric level, they are advised to go and look for places at TVET colleges not universities. However, according to Mr Molweni, some students choose to be at the college, and these have no problems. This means that the lecturers are aware of the type of students that their college attracts, that is, those who had constrained choice. It is also evident that TVET education is not a preferred choice for almost all the students; but, those who do wish to be at the college fare better.

Its reality, its reality you know, these students when they come out of matric, they want to go to... [University of Technology] and other universities, but then, there, they are going to be limited by performance because maybe they did not do so well. So when they go there, they are told go back to.... [Acacia] and you will upgrade from there and the morale of the students is very low.... Students who perform better here are those who are already mentally oriented, to say I want to go to a college and study there. Such students do not have a problem because they are here by choice. (Mr Molweni)

Limited choices, as created by different circumstances, have a potential to undermine the women student's flourishing. Nussbaum (2000) explores how the unjust backgrounds of women can sometimes limit their choices. This is what we see in the case of the women of the case study who opted for TVET in the end because of their financial situation, unjust background, or poor matric passes. After secondary school, their options were quite limited. These women's experiences point to the fragile nature of South African black young women's circumstances and the issues of well-being of some women in TVET. The two lecturers' accounts reveal how the women students'

freedom to choose was constrained. Robeyns (2005: 102), when referring to choices, argues: 'It is however important to question to what extent people have genuine access to all the capabilities in their capability set, and whether or not they are punished by members of their family or community for making certain choices of the kind they value.' This assertion by Robeyns helps us to understand issues of choice with regard to TVET as post-school education by the women in the study. It is clear how social, environmental and personal conversion factors influenced the choice of both TVET and engineering.

One recurring finding is that TVET is considered a last resort by most of the students. Despite marketing and funding of the TVET sector in the country, none of the students had considered enrolling at a TVET college as a first choice. South African still needs to embrace TVET as a viable form of post-school education. In all the cases, it was after the students had exhausted other options, such as higher education, that they thought of TVET. This show that there is still a lot that the government could do in order for TVET colleges to be considered as institutions of choice.

One more theme that recurs from the findings is the interplay of structural circumstances of the students in the choice of post-school education. As alluded to earlier, the financial situation of these students' families, lack of knowledge about funding options in higher education and poor matric passes all constrained their choice. It can be seen how limited the choices of the women were, even though they had high career ambitions. Although some could qualify for university and educational loans, in the end, they chose TVET because it was what they could afford without putting a strain on themselves and their families.

In addition, contrary to the gendered belief that women may not choose engineering, the women in this study had to challenge such stereotypes in an effort to pursue a life that they had reason to value. Some of the women exercised their agency despite their circumstances and prevalent gender stereotypes. They had to choose to attend a TVET college and study engineering, instead of staying at home and face an uncertain future or go into traditionally female-dominated fields. Some of them continued to hold higher education ambitions despite engineering being male-dominated. Thus, they took TVET as a route to their desired future of good employment in the engineering sector.

Evidence presented in this section points to the challenge of parity of esteem between TVET colleges and universities in the country. It was clear how all of the students aspired to go to universities and universities of technology, and only considered TVET after all this had failed. Colley (2006) attributes this to the differences in the rates of return from the two institutions and TVET being associated with those from lower social classes. A graduate from a TVET college typically earns less than a university graduate. The other challenge is the operational challenges that some of these colleges face (See Chapter 2). Kraak et al. (2016) argue that some of the TVET colleges in South Africa have become ‘impervious to change’. This points to the need for an educational system that facilitates what the women students really want and the freedom to choose a life that they have reason to value.

7.3 Gender and academic experiences

The above section looked at the reasons why women students enrolled into TVET and why they chose engineering. The next section now turns to their experiences in TVET. These experiences include teaching and learning experiences as well as experiences in interacting with men students and with lecturers. The research question that is being answered is:

2.) What are the experiences of the women students studying engineering at Acacia TVET College?

Understanding the teaching and learning experiences of women in engineering studies remains a priority. This is because, like elsewhere in the world, engineering continues to be male-dominated in both the student and lecturer population in South Africa (DHET TVET College Times, 2016; DHET, 2015). This case study is no different. Men dominated not only the student population but also the staff of the engineering department. For example, there was no woman lecturer teaching engineering subjects. The three women lecturers in the engineering department were teaching mathematics and were not trained in the engineering field. Haupt and Chisholm (2007: 74) argue that ‘a less frequently asked question is how young women who have successfully negotiated their way through school and into conventionally male terrains experience and negotiate often contradictory gender expectations of them.’ This is one of the areas that I intend to understand from the perspectives of the women students in engineering. It is, therefore, important to investigate how the young women who have broken barriers into ‘men’s fields’ are experiencing the college contexts and how they are constructing their identities.

7.3.1. Interaction between women students and lecturers

Most of the students explained how they had been motivated and encouraged by their lecturers, which enhanced their learning experiences. Hazel, Karabo, Mtswaki and Noni were some of the students who had positive comments about the interaction with lecturers;

You know, what I like here, the teachers are very passionate about their work and it is only a learner who can be lazy but the teachers are very good. As far as bad experiences or discrimination, I haven’t experienced it. (Hazel)

Personally, I don't have a problem with my lecturers. If I have a problem, I consult and they assist. Even if he/she is not teaching you or they are not my lecturer, they can assist.... So I will say that my relationship with my lecturers is good. I don't have any problems.
(Karabo)

What I liked here are the lecturers when you have a problem, you went to them, they are friendly, and they welcomed us and helped us. I don't have problem when asking lecturers, the lecturers don't have problems when you come to him/her coming and asking questions even though he doesn't teach you. (Mtswaki)

You know, in colleges, lecturers favour girls especially when studying engineering. So the experiences were good. The lecturers were on our side. (Lebo)

The above accounts underscore the value of lecturer-student interaction in the learning process. The women students explained how they had opportunities to consult with lecturers and ask if they had challenges. This is important, as it provides a conducive environment for student flourishing (Wilson-Strydom and Walker, 2015). The interaction between lecturers and students both within and outside the classroom is believed to be important for student well-being. Student support is even more important for these women, as the majority of students and lecturers in the engineering department are men. Lebo's account that male lecturers 'favour girls' may point to the effort that lecturers were making to retain women students in engineering. Mr Molweni had the following to say about his interaction with women students:

They seem to be enthusiastic regarding engineering coz, I normally motivate them that, guys you are few in this field and it's dominated by men ..., you stand a better chance like job opportunities because things like business studies and tourism they are congested with

women so you must use this to your advantage. So really, some of them will listen, they are positive and will do well in class. (Mr Molweni)

Based on the above extract, it then seems that, for many of the women students, the relationship with their lecturers was positive. If this was the case, then it presented an opportunity for them to achieve, as they could consult the lecturers if needed and get help. Noni talks about how the treatment by her lecturers had even built her confidence and she began to like engineering. Noni initially did not want to study engineering but when she enrolled she ended up liking the course.

I think it was the same treatment that we got. I did not see any difference between the treatment especially from the lecturers. We could go to the lecturers for help when we need it and there was no problem. ... When I came here, the lecturers here motivated us so much and it built my confidence and I started working hard. I began to like engineering. (Noni)

It is important to look at this kind of relationship between students and lecturers, as it has a bearing on how resources are converted into capabilities for the women students. For most of the women, however, a good relationship facilitated and contributed to positive learning experiences.

7.3.2. Sexual harassment

While most of the women experienced academic support, there are other women students who experienced the learning environment negatively owing to sexual harassment. Out of the fourteen students interviewed, there were two women who had male lecturers soliciting relationships from them. Thatho had this to say;

Well, I had this lecturer once, who taught me from N1- N4, then started acting weird and I had to stop going to him for help. He started asking me out and he did call me and I was

like where did you get my number? So he was like, when you registered you left your number so I took it from there. And I was like, you don't do that, you don't! (Thatho)

When asked how such an experience had affected her as a student, she said that:

I can say that in a way it affected my talking with the male lecturers. I don't know what they think about me and I end up not participating sometimes and not asking questions. It can affect your performance especially on the tests, because for you to get high marks, you have to do what that lecturer wants. (Thatho)

Mabatso had the same experience with a male lecturer who was interested in her and started asking her out. For her it was unthinkable to go out with her lecturer, but he persisted and she ended up failing the course that the lecturer was teaching. Mabatso believes that the lecturer deliberately made her fail because she had turned him down. She says she eventually passed when she repeated and was now being taught by a female lecturer.

I was doing Maths N2 by that time, and unfortunately, I was taught by a male lecturer. So, he was young and was into that kind of a thing... like... 'Can I take you out?' And if you reject those kinds of things then they act like somehow, even when they mark your scripts they just mark according to your attitude toward them. Somehow they don't have that mercy. I ended up failing. I ended up failing N2 for the first time. Then I repeated it and I got to pass it while I was taught by a female lecturer, the same subject the following trimester. (Mabatso)

The experiences of the two students above, had a negative effect on their learning experiences and their well-being. Thatho explained how she had become cautious about approaching male lecturers for help, and even her participation in class was negatively affected. Although not raised by the

majority of the women, these two women's experiences of sexual harassment need to be seriously considered. It means, therefore, that the opportunity to achieve what they had reason to value was constrained, since they had to overcome these challenges. They were expected to pass and graduate just like every other student, yet they did not have the freedom to participate effectively in class or ask male lecturers if needed. Sen (1999) acknowledges the need for the removal of unfreedoms and expansion of real freedoms as critical in the measurement of people's well-being. For these two women, it was difficult, as the college does not have an office that deals with sexual harassment; neither are there grievance handling procedures for students who face such challenges. These two cases went unreported because of this⁶. Since cases of sexual harassment are rarely reported, we can speculate that the numbers of students affected by this could be more, although this was not disclosed to the researcher.

One lecturer felt that sometimes the students are the ones who may see a chance for relationships with male lecturers. Mr. Zulu felt that considering his age, some of the women students would see him as a potential partner. Mr. Zulu said that, before he was married, he would have women in his classes who wanted to be in a relationship with him. He therefore, argued:

Since I have started teaching, teaching women is not something that is easy to do. It was difficult to teach women because they were girls, seeking favours that are related to what I am doing. They change the way they treat you when they see a ring on a finger. It changes for the better because now they see that you are taken already. Yaah mainly because of my age, when I came here I was very young, so most of them were the same age as mine, so if they think yaah, he is not married, we can get a chance.... (Mr Zulu)

⁶ During an interview with the Principal she says she was aware of the challenge of grievance handling procedures. Because of this, she had not received any complaints of sexual harassment to her office.

Such experiences may make a male lecturer uncomfortable teaching women students and may affect the learning environment generally. Mr Zulu went on to say that, because of this experience, he had become gender sensitive in his teaching approaches (although we may question his assumptions and approach in class). It is possible that he was telling me what I wanted to hear as a researcher.

I realised that they are people who need to be treated with care, like in class. It is not the same like when you are talking to boys- you just say things as they are. If you are having women in a class you have to choose words carefully so that you do not have to step on their feelings incorrectly or unexpectedly. So for me it is interesting, it keeps me awake all the time, I have to prepare, I have to know exactly what I am going to say to them in class. Being gender sensitive has helped me a lot and has helped me and I understand them better.

(Mr Zulu).

7.3.3 Feelings of alienation by women students

Dineo, Mabatso and Puleng, are three of the students who felt that at times lecturers would make them feel out of place by the comments they made. This also made them as women students, feel like they did not belong to the engineering field or were not academically able. The three students reported that some male lecturers had made negative comments about them studying engineering. Women may find themselves in a difficult space, especially when negative comments are coming from lecturers who are supposed to support them. This may make it difficult for the women to thrive in the engineering field, a profoundly masculine environment. Such women face hostile environments in their learning experiences when they are constructed as not belonging to engineering because of their gender. If such traditional practices and beliefs persist, it makes

interactions between lecturers and students problematic. The following quotations from some of the students express how they felt under the circumstances;

Well like the time we were doing diesel and motor mechanic in N2 and N3, our lecturer kind of thought we only chose mechanical engineering just because of the name but we don't understand anything about it. But I told him no, we did research about this and I told him that I have come far with these subjects, since high school. That's why I chose it even here. So, at some other point I find myself doing much better than male students who are studying diesel and motor mechanics which is good then. It's more like people, stereotype, and they think that mechanical is for male not female that's what runs up in their mind. Yeah, because there are only 5 girls and the rest is boys especially in this field in mechanical engineering. (Dineo).

Puleng and Mabatso also felt some of the male lecturers were not supportive;

Yaah, some of them. Yaah. There are others who are not supportive. Like they discourage us that even if we can do this engineering, we are women. They say this in class that even if we do engineering as women we won't get jobs! (Puleng).

My experience... well others were good but somehow you feel offended by the comments that were made in the classes, more especially like if one of the teachers ... they do not like you. They say you are not good at this, you are a woman, it's for men (engineering). (Mabatso)

From the above excerpts, there is some indication that classroom practices can sometimes be hostile to women students. In such contexts, therefore, education can be said to be playing a role in the exacerbation of male dominance. This highlights the persistence of the attitudes and culture

of women's subordination in engineering education, as was also observed by other researchers (Colley et al., 2003; Makarova et al. 2016). Moreover, the case is more pronounced in science and engineering courses, as both male students and lecturers have problems in accepting women in this field. Instead of supporting women students, lecturers may be seen to contribute to the culture of subtle bullying of women in science and engineering courses (Makarova et al. 2016). This, however, has a negative effect on the learning experiences of women students. It becomes difficult for them to convert the available resources into valued functionings. The freedom for such women to participate freely in classrooms is taken away through the stereotypical assumptions that some lecturers may still hold and express.

7.3.4 'I felt left out'-Classroom experiences

One reason why women can be considered to be at a disadvantage, even before they decide to enter into engineering, is what Stonyer (2002) refers to as the lack of 'tinkering'. From an early age, boys are exposed to mending household utensils, for example. They may imitate male models in the household, while women tend not to be involved in experimental efforts at repairs. Thus, Ntabiseng lamented on how, as a woman, she had not really been exposed to 'tinkering'. She was studying mechanical engineering and explained how difficult it had been for her to conceptually grasp the engine parts. Thus, it becomes difficult for a woman student to be at the same level with men in class, as they may not have had the same prior learning experience. It is not unexpected, therefore, for women to feel alienated. Tumelo also felt left out, as men students tended to participate better in class.

'Especially for theory subjects, it has been difficult, because of like I said, the male dominated power structures negatively affect the ability of women to access and to control the available resources. So, like it was difficult for us. Take for instance the mechanical

class group. A lecturer comes for the first time and talks about engine parts in the car. Then females are not really exposed to those things.’ (Ntabiseng)

Because you find out that the males are the ones answering and they are moving fast. Sometimes we feel left out and all that. So it was very challenging... (Tumelo)

Mr Zulu and Mr. Molweni, who are lecturers, supported the view that women may not be exposed to engineering or electrical gadgets at home, and the situation is further exacerbated by the fact that there are no workshops for the students at the institution.

So we need physical models so that women can be able to know and relate with what they are learning. For men it is different because most of them already know a bearing on a car because they are interested in cars, may be at home. But for most women, they get to hear about such things here at school. I realised that women students they become very happy when I take them out during surveying class and show them real models. You can see they are more interested than boys and you show them, this is what we talk about in class and you show them how it works....

We teach about compressors and transformers here in theory but if you do not show them and they do not get to see it and use it. If you ask them questions about them they can answer so well but operating it they cannot. That is a challenge, we need models, and we need those compressors and transformers for our (women) students to operate. (Mr. Zulu)

Our curriculum here is based on theory. So most of these boys you find out they are exposed to this technical stuff, unlike women who just come here without experience with say for example with cars, they have not seen a spanner, they have not seen an engine

before. Whereas guys have been exposed and have seen what an engine is. So that really makes them feel a little bit lost but they are eager to learn.... (Mr. Molweni)

Thus because of their gendered experiences outside of the college, women become disadvantaged and this a challenge that they have to overcome in class. As a woman, Ntabiseng was aware that she was not knowledgeable about engineering issues, whereas men who, because they are exposed to tinkering, are at an advantage. Moreover, they will catch up easily and their learning experiences will be better. The opportunity for most women to achieve what they have reason to value is, therefore, constrained by socialisation, which often does not encourage women to tinker. This means that the capabilities of women students are different from men students, and women, in this case, have a constrained capability set (Robeyns, 2008). Socialisation and tinkering are the conversion factors that will influence how women can be or are free to convert resources into functionings. Robeyns (2017), therefore, argues that conversion factors compel us to know more about a person's circumstances and their conditions of living. If we know more about women students in engineering, for example, it leads us to also acknowledge the effect of gender and socialisation and how it even affects the learning experiences of both men and women students. Such knowledge will help in policy formulation around improving women's the learning experiences by pointing to the cultural, social and academic changes that need to be made in order to enhance women's capacities to function. The aim will be to transform the conversion factors that perpetuate inequalities in TVET.

Lack of experience in tinkering may have an effect on the participation of women in class, as they may not be confident of their knowledge in engineering. From the accounts collected in this study, it was clear that men students participate in class better than women. This points to a culture in the classroom that results in some voices being silenced. In most cases, these voices are women's

(Makarova et al. 2016), and thus women do not participate as much as they should. I talked to lecturers to hear their views on the participation of women students, and this is what they had to say:

No, not hundred percent, you know the participation of women- usually they see engineering as a qualification that has to be done by males and they think they cannot do it. No, participation is not good. I cannot give them hundred percent. They still need to be groomed, so they need to be groomed so that they participate effectively. (Mr Zulu)

I always try to make them compete, but then always, women they are behind. Sometimes I give them some work to present in front of the class but sometimes they don't want to do that. It seems like they are just afraid to stand in front of other people though some will do it with no problems. I think lack of confidence is a challenge for women and that does not affect men. (Ms. Khotso)

As I said, I think women are scared of making fools of themselves and that the male students will make a joke of them and think they are not so clever and everything that goes with it. (Ms Rooyen)

Women themselves may fail to participate effectively in classrooms because of internalised notions and beliefs that it is natural for men students to dominate in science and mathematics subjects (Liu, 2006). As an educational researcher reflecting on reports of male dominance, I also suspect that this is because of socially constructed behavioural expectations where men tend to speak louder and with more confidence compared to women. It then becomes difficult for a woman student to adopt the behaviours that are traditionally ascribed to men. This may explain why women students fail to participate actively in classrooms and in the learning environment

generally. This is similar to adaptive preferences whereby women seem to have internalized the view that they are not capable because they are in the engineering field, which is dominated by men. These women's experiences suggest that Khader's (2011) view of adaptive preferences developing under conditions that are not conducive to human flourishing is correct. The women in this study seem to have internalised the notion that engineering is not for women, and men are the ones who speak louder and participate better. This is not in tandem with their basic flourishing in the education system as they eventually feel left out.

7.3.5 Interaction between women and men students

The previous section looked at the experiences of women students in classrooms. It has been noted that this interaction sometimes has a negative impact on the experiences of women students and sometimes is reported as positive. It is, therefore, important to look at the interaction between women and men students, as this plays a role in how women experience TVET engineering education as well. Except for the tendency of men students to laugh at other students, as noted by Palesa, none of the students reported any negative experience with men students

... because sometimes I will be afraid to ask a question and I will say maybe people will laugh at me. (Palesa)

According to Palesa, men students had a tendency of laughing at other students in class and this often affected her participation in class. After probing about such an experience in classrooms, Ms. Rooyen supports this view and says that it was not uncommon for men students to laugh at others, especially if they said something wrong. She went on to say that as a lecturer, she did not support it and often punishes those who laugh at other students with the result that this happens

less in her classes now. However, it was not clear if men students laughed specifically at women students or at students in general.

Apart from the above finding, therefore, women students reported that they worked amicably with men students. There were positive comments from women students, as they explained how they helped each other. From most of the participants, there were outright denials of any negative experiences with male students:

Well, with this course it was different and it's not like old days where more men used to study engineering and only a few women. I am not sure about the exact figures but what I can say is that more and more women are taking up engineering as a course and its balancing. In our class, we were almost half- half. This means that I did not experience any problems or challenges related to me being a woman. Things are changing now.

(Tumelo)

Karabo even used the word 'never' when she had been probed about possible gendered experiences;

No. Never. Actually the boys assist us in so many ways. We work together and sometimes they help in doing the work. The relationship is actually very good. (Karabo).

The conversation below with Lesedi, a mechanical engineering student, also highlights the way women perceive gendered experiences in classrooms:

Lesedi: *Boys, like the majority of people, its boys, there are a few girls.*

Interviewer: *Does that affect your learning experiences as a woman?*

Lesedi: *No. Not at all, I only focus on my studies, not how many people are there.*

Interviewer: *How is the interaction in the classroom like?*

Lesedi: *No challenges at all, because most of my friends are boys.*

Interviewer: *Can you say you have not had any negative experiences in the classroom?*

Lesedi: *No I don't have.*

Though there are a few that noted gendered experiences, most of the women denied that these were especially negative when interacting with male students. Responses like the ones above were prevalent in the study in that there was mostly a denial or rejection of any gendered experiences, which questions the real extent of gender inequity in TVET. Did the women deny having gendered experiences because there was indeed no inequality in both classrooms and the institution itself? Or it is that these women had developed 'gender blindness' to use the words of Haupt and Chisholm (2007:81). It is possible that issues of gender might often be masked by the subtle realities of accepted gendered behaviours and beliefs. Khader (2014) argues that, at times, women accept and endorse patriarchal norms if they are to gain socially or materially from compliance. In the case of these women, they may have become gender-blind because they benefit from men when they work together. Khader (2014:2) notes that such women also gain a sense of self-esteem and will 'often have to subordinate themselves to achieve social recognition.' Further research is needed to explore these dynamics, however.

7.3.6 Coping with academic pressure

Another recurrent theme with regard to the experiences of women students was the pressure of academic work. This is, however, unlikely to affect women students only, as men students may also struggle with the pressure of academic work. A number of respondents expressed their concerns about too much work having to be done during the period of theoretical training at the

institution. It takes a great deal of adjustment from high school to post-school education. This is especially so with the students in this sample who were often faced with poor schooling from public schools in rural, townships and peri-urban areas where they come from. As seen earlier, most of the students were the first generation to attend post-school education. This means that preparedness is likely to be lacking, as most of these students do not have role models in their families or even in their communities.

A particular challenge facing the women students was that of the large volume of work to be completed in a trimester. Many of the students mentioned that engineering was very ‘difficult’ or ‘hard’ for them, especially during the first few trimesters. Studies conducted by Jawitz, Case and Tshabalala (2000), Shackleton et al. (2006) and Chisholm et al. (2007) support this finding and maintain that coping with workload was a challenge for women engineering students in higher education, which seems also to be the case with the TVET students in this study. One particular student, Thatho, had enrolled at the college in 2013 but had not managed to complete a one and half years’ course at the time of the interview. When asked about her challenges, she explained how she had struggled at every stage and had to repeat some courses over and over again. The conversation below detailed Thatho’s challenges;

Thatho: *I have been studying engineering from since 2013.*

Interviewer: *Why did it take you so long? Did you take a break in-between?*

Thatho: *No. I did not. Engineering is very challenging. It needs a person who works very hard so that’s why I took so long. And sometimes when you write exams, you write well, but when the results come, you see you failed. You ask yourself, what happened here?*

Though most of the students interviewed managed to complete their studies within the stipulated time, they explained how they had to work under pressure in order to finish. Puleng, who had begun her studies in 2014, and Naledi, who had restarted in 2013, were both facing the same challenges.

I have been here 2014. I have started N1, then N2, N3, N4 and at N5, I did it three times! I did it first, second and then third time I passed. Engineering is difficult and there is a lot of work to be done in one trimester! (Puleng)

I got here in 2013, and this is a one year six months course but I have been here since 2013 when I started my N1. You know, you fail one subject and everything stops. (Naledi)

Hazel, who was married, had two small children and was pregnant at the time of the initial interview, mentioned that engineering was demanding on three different occasions, more than any other respondent. In fact, she had repeated several courses. This is what she had to say at different stages of the interview:

You fail and pick yourself up, re-write and continue because engineering is not a play thing. You must study and you need time for all the subjects. (Hazel)

When asked if she had time for social activities and sports at college, Hazel chuckled:

No, no, there is no time for that because of the pressure of academic work.

Apart from the short period of time and the pressure of work, I have no problem with the curriculum because even if you fail you can always repeat. That is upon the management, I don't know why they pile a lot of work in a short period of time!
(Hazel)

When probed about how she was coping with demands from her family, she said her husband was supportive and would hire household help when he could, but generally the primary responsibilities fell on her. Thus, unlike other women students who rented a room in the vicinity of the college or stayed with family and needed only to look after themselves, Hazel had to shoulder more responsibilities as a mother, student and wife. Though other students felt that engineering was demanding, they were not as overwhelmed as Hazel. Situations, such as Hazel's, which involve shouldering responsibilities other than those of their studies, have been well documented with respect to women students in tertiary institutions (Bhalalusesa, 1998; Lee and Myers, 2005; Matangi and Kashora, 2012). These findings suggest that some women students have different conversion factors to overcome in an effort to reach their goals. The study conducted by Mawoyo and Hoadley (2007) study revealed that women students from working class backgrounds struggled in their academic performance, especially in their first year. Although this study was at a university, the findings resonate with those from my sample, as some of the women students had struggled, failing several subjects. Although Mawoyo and Hoadley (2007) could not draw explicit conclusions from their sample, they had this to say: 'It appears generally that young women who attended advantaged schools had an advantage in their university studies over their counterparts from disadvantaged schools.' (Mawoyo and Hoadley 2007: 49) This observation can be used to explain the experiences of the women students in my study, who encountered immense challenges as a result of having attended poorly resourced schools. Even if this challenge may not have been distinctly gendered, but was more about social class and schooling background, it had an influence on the experiences of women in this study and needs further investigation with respect to women TVET students' backgrounds, family, institutional support and language use. Available data, however, point to the under-preparedness of students from disadvantaged schools due to the poor

teaching skills of their teachers, insufficient guidance, a lack of role models, and inadequate language, (Wilson-Strydom, 2011, 2012, 2015; Jones et al. 2008; Mawoyo and Hoadley, 2007). On the other hand, students from middle class backgrounds tend to attend well-resourced schools that offer information and career guidance. This means that, from the beginning, students are confronted with challenges and progression may be a problem. Smooth progression, therefore, can be considered to be bound to issues of gender and determined by other factors, such as social class, language, family structure and responsibilities. These become key conversion factors for the students to achieve their well-being.

7.3.7 Challenges in getting internships

Evidence from the accounts of women students in the cohort so far point to a challenge that is faced by women in finding internships. While all students, including men, may face challenges in securing internships, women do face additional hurdles because of their gender. The NATED Engineering course is divided into two parts, theory and practical. The first 18 months entail theoretical studies, but, for the following 18 months, students have to find work at an engineering company to acquire relevant practical experience. The institution assists students as far as possible, but not everyone is placed through the college, so they have to actively seek internships on their own⁷.

Participants like Hazel were adamant that differences between men and women may hinder women from achieving as much as men. Hazel was pregnant at the time of the first interview and expressed pessimism about her chances of securing an internship while pregnant. By the time of the follow-

⁷ The Principal Ms. Nare reiterated that through her office, they had made arrangements with various companies in the province to provide practical experience to all engineering students. She said, however, it might take time for everyone to be placed through the office owing to the large number of applicants at one time.

up interview, she had given birth and explained how she had postponed the search for an internship because of pregnancy and childbirth. She could not afford child care services, so she had to wait until the baby was at least six months, when she could leave him with her husband. Hazel had this to say:

Maybe it is because women sometimes get pregnant, so boys are always around and can get a job even if his woman is pregnant. I don't know if an employer would take a pregnant woman for an internship especially in the engineering field. What would happen by the time the employers need staff and you are pregnant? Even here at college what I have noticed is that there are more and more women at N6, but still women struggle to get jobs/internships. So I don't understand why women face such challenges. I think at the workplaces they consider men than women. (Hazel)

Hazel's account points to the concept of individual conversion factors; as a student, mother and wife, she had many hurdles to overcome in the process of acquiring her education. The constraints she faced had an impact on her capability set. Hazel did not have the freedom to go out there and look for a job, as she was bound by other responsibilities to her family.

Thatho concurred with Hazel on the challenges that women face in trying to secure internships. According to Thatho, women tend to find employment later than men because engineering is a male-dominated field and recruiters are likely to be male as well. She adds that women in engineering may be looked down upon, thus facing challenges.

Men are the ones who get a job first. In most companies you have to work extra hard as a woman, to prove that you can still do the same job with the men. So I don't think we stand equal chances with men. They are used to seeing men there in the industry and the ones

that recruit are male. So they are more likely to take men as well. People look down at women... and say she is a woman. (Thatho)

Dineo had the same sentiments:

I think those companies they look more into boys, let's say maybe there is a post about a diesel mechanic, that is being wanted - it's rare for a girl to get that post, because they look more into males, that's the challenge that we are being faced with. They don't think women can be diesel mechanics. (Dineo)

I also sought to understand the opinions of the lecturers concerning the challenges that women face in finding internships. They concurred with the students, as Mr. Zulu said:

No. No. Especially in engineering. I have visited a number of companies which I cannot mention, and I have tried to talk to people there and they will tell you straight that we don't need women. They say women do not do work properly, we need people that will stand for the job that we are offering here. So women, do not have enough support in the industry. But if they go out there and start looking for a job, for the fact that she is a woman and she is going to be fixing cars and machinery, it is a problem.

Yes, it is a challenge, especially, I have checked with a lot of companies and you find out that there are guys' superiors in the companies, men only on top positions. There are no ladies in the top positions at all. You find ladies in offices and you ask the question why it is like that? They can even take an artisan and put her in an office. Somebody who was trained to do the work. This is because of lack of trust. Because, she is a woman, we cannot trust her with this job. But it is all in the mind. It needs to be changed. (Mr. Zulu)

Mr. Molweni argued that there are other departments where women would not manage. That becomes the reason why women face challenges in getting internships.

In engineering, there are departments where you feel that women do not survive there. For an example, welding, there are very heavy stuff that you must lift. So if a woman is there with men, they will say you have to carry these because it's fifty-fifty. The bottom line is as a manager I would say that No, no. I know she wants a job but she is not gonna make it here. Instead, it is gonna cost.....eh and slow the process because you will be seeking help all that time. Really, there are some jobs that you cannot expect a woman to work under. Even in the mines, I have heard that underground work is only done by men. Maybe women will focus on something else. (Mr. Molweni)

Yes, so after one and half years that is when they get their diploma. But you find out that some they are still staying at home and are doing nothing, but there are those who are working. But there are not many. Most of our students are not getting those internships. Yes it is a big challenge that needs to be addressed. (Ms Khotso)

As she had anticipated challenges and that it would be difficult for her to get an internship, Naledi had to adapt her aspirations to something else, which was furthering her education.

Umm, [sigh]..... I think the thing is.....I am not being negative but it's not gonna be easy to get the training (apprenticeship), being a woman, they prefer men there. It will be better if I go to varsity and do maybe, Safety course. (Naledi)

Of the four students who were interviewed in November 2016, one was already an intern at Eskom, where she was acquiring practical experience while studying. The other three, by the time of the follow-up interview five months later, were still searching for internships and were facing various

challenges. Of the second sample of ten students included in the follow-up interviews, none of had managed to secure internships, apart from those who were not in one already. Moreover, the students' statements reported above paint an uncertain future of their prospects of practical training and eventual employment. Some of the lecturers interviewed felt that the chances of women students finding work or internships were lower than those of men. Nussbaum (2000: 1) argues that women in much of the world 'lack support for fundamental functions of human life', and thus face obstacles including sexual discrimination in the workplace. Their gender, therefore, becomes a negative conversion factor and often results in decreased opportunities for women to flourish and live a life they have reason to value. If a woman faces challenges in securing internships because of gender, then this suggests that she has unequal capabilities to those of men. This seems to be a challenge in TVET and will need further investigation for the problem to be addressed.

There were some students who were not as pessimistic. When asked about the possibility of gender playing a role in finding internships or work, a few women argued that gender is unlikely to be at play. They cited some companies who had purposefully targeted women in their recruitment of interns. Palesa, who had managed to find an internship at the time of the interview, had this to say:

Yes there are more females because they asked for 60 percent of the ladies and 40 percent of males (students). (Palesa)

But there are those companies who offer them (internships). Like this one an internship at ... Services, they came here and took mostly women. (Thatho)

The respondents also talked about how parastatals, such as Eskom and the army, would take women interns, and some of the women interviewed noted that they knew other women in the industry. Thus, for these respondents, gender did not seem to play a role in the recruitment process.

They argued that women were as good as men and that, if academic performance was to be considered, most of them would stand a chance, since they had good passes, which in some cases were better than those of men.

When they advertise they do not specify to say man or woman. So if I apply I think I stand a chance of getting a job. In addition, things are changing. I see woman engineers and artisans there. So if we are given a chance, I think we can do the same engineering job as men. (Puleng)

It is important to note that Palesa, one of these optimistic women, was in a better position because she had already started an internship programme at a local company. For the majority, however, the future remained bleak, and they hoped that the central office would assist them in finding the much-needed practical training. Baker (2017:1204) noted how aspirations ‘often run ahead of the chances of them being realised.’ This is due to the perceived role of education in availing better opportunities. People often see education as a ladder for upward social mobility and, therefore, creates aspirations among people. Some participants were able to maintain high occupational goals despite their chances in the labour market being constrained. In the same vein, some of the young women in my study expressed high aspirations despite the fact that the job market is restrained, and that they are in a male dominated field.

In addition, most of the women come from poor socio-economic backgrounds. Thus, they face challenges, which include unavailability of internet services, lack of finances for buying newspapers and other forms of communication, and therefore lack of information about possible job opportunities. Apart from the challenges of finding internships due to gender, other socio-economic factors also impact on the ability of the women students in securing internships. Thus, faced with a number of conversion factors negatively impacting on women, we see that being able

to achieve their valued functioning of employment as an engineer is likely to be a challenge for many of the participants in this study. There are so many obstacles to be overcome along the way and this may delay the realisation of their aspirations.

Conclusion

This chapter has explored the reasons why women students ended up in TVET. In addition, I looked at the reasons why they chose engineering as a professional course. What emerged is the constraining effect of their structural circumstances. The fact that none of the students aspired to be in TVET meant that lack of available options led them there. The main conversion factors that influenced choice of TVET were lack of finances and poor matric passes. The women may have faced limited options as far as choosing post-school education is concerned, but this did not mean that their capacity to make meaningful decisions about what they wanted was diminished. They proved to be individuals capable of imagining better lives for themselves despite the numerous structural and personal constraints they faced. While there is the opportunity for women to participate in engineering studies, it has been noted that some women students still face challenges along the way, such as feelings of alienation due to lack of prior knowledge about engineering, negative comments from lecturers, in some cases sexual harassment, and challenges in getting internships. These findings, therefore, point to deeply entrenched forms of gender inequality in TVET, which need to be addressed in order to see TVET as a possible tool for women's empowerment.

CHAPTER 8: CAPABILITIES FORMATION FOR WOMEN STUDENTS THROUGH TVET

Introduction

This chapter sets out to argue for TVET education that is capabilities informed, by formulating a list of capabilities relevant for women students in TVET. Valued capabilities provide the most useful space to answer questions on the opportunities that TVET colleges offer, and which capabilities matter for the women students. Powell and McGrath argue that:

In terms of the [TVET] colleges specifically, do these institutions serve to expand or to constrict the capabilities, functionings and freedom of [TVET] college students? South Africa's policy ambition is to create increased participation in an expanded [TVET] college sector, but what valuable opportunities will these larger colleges offer, and how do we identify which opportunities matter to these students? (Powell and McGrath, 2014: 138)

It was noted in Chapters 2 and 3 how current approaches to the evaluation of TVET are largely silent on issues to do with the well-being of TVET college students, in particular women in engineering. By looking at the capabilities valued by women students, I offer a practical application of the capabilities approach in the evaluation of TVET in South Africa. Various scholars have different views on the adoption of a capability list as a minimum criteria for measurement of justice. Nussbaum (2000:70) proposes a list of ten capabilities that she says should be used as a foundation 'for basic political principles that should underwrite 'open-ended and humble' constitutional guarantees' (Nussbaum, 2000:77). Nussbaum further argues that a list of capabilities is essential, as it is through such core areas that the quality of life for women can be measured and compared to that of others. In addition, Nussbaum (2000) contends that education should be able to develop capabilities, such as numeracy and the ability to acquire scientific

knowledge. Taking the same stance, I come up with a list of capabilities that relate to women students in TVET, in an effort to answer the following research questions:

- i.) What are the valued capabilities for women engineering students in TVET?
- ii) To what extent are these capabilities being developed?

I begin this chapter by extrapolating valued capabilities from the findings. I then give a list of eight capabilities, as this chapter will show. I end the chapter by returning to my conceptualisation of empowerment to present an assessment of the extent to which the women in my study could be considered empowered as a result of their education.

8.1 Capabilities and functionings valued by women in TVET

This chapter considers how the capabilities approach can be operationalised in the context of TVET, by providing a list of educational capabilities based on the experiences of women students. In Chapter 3 of this thesis, the CA was proposed to offer a normative evaluation tool on equality and well-being. Thus, for Sen (1992, 1999) the use of economic growth or primary social goods (Rawls, 1971) as an indicator of the quality of life was not adequate. Sen (1992: 81) defines capabilities as what people are actually able to do and to be. An individual's circumstances will determine their ability to convert the available resources into functionings. These may be gender, race or disability. In the same manner, women in TVET studying engineering may have more obstacles in navigating through college education. Thus, the need for a list of capabilities that emanates from the lives of women students in TVET. Walker (2006: 166) argues that 'resources, (or we might say distribution) are only part of the story, what matters is the opportunities each person has to convert their bundle of resources into valued, rationally chosen doings and beings.' We need, therefore, to understand if the women students are able to convert available resources into valued outcomes in the same manner with men.

Robeyns (2003: 547) argues that:

The cultural and non-material social constraints on choice that influence which options a person will choose from her capability set, must also be critically examined. In the capability approach, preference formation, socialization, subtle forms of discrimination, and the impact of social and moral norms are not taken for granted or assumed away but analysed upfront.

This means that by extrapolating valued capabilities for women students, one will be analysing issues that may be taken for granted. Unterhalter (2007) defines gender equality in capability terms and emphasises the need to transform social arrangements in order to expand the freedoms and opportunities for students, women in particular, to facilitate their active agency and empowerment. Having argued for the value of the CA in theorising gender equity in TVET, I have developed a provisional list of capabilities for women students in TVET. The list of eight capabilities emerged through analysis of interview questions that intended to understand their experiences, after which it was possible to identify the enablers and constraints before, during and after TVET. All of the eight capabilities were mentioned by the women students under investigation, but some more than the others. The process began by identifying the functionings that are valued by the women students from the data and then from there went on to ‘extrapolate the underlying capabilities’ (Loots and Walker, 2015:366). From the experiences of these women, I opted to focus on the significant capabilities that emerge from the empirical data, thereby honoring the voices of the women students. Each capability, therefore, is supported by empirical evidence from my findings. For a more detailed discussion on the need for a list and the reasons why I drew from Powell’s list, see Chapter 3. The following is a list of capabilities that emerged from my findings, drawing from Powell’s (2014) list:

Table 8.1. Proposed list of capabilities

Capability	Definition	Number of respondents who valued capability
1. Capability for work	<p>Having access to fair and equal opportunities for career progression.</p> <p>Being able to make a valuable contribution in the workplace</p> <p>Having employment stability and security</p> <p>Earning a living wage</p>	14
2. Recognition and respect	<p>Being treated as a dignified human being, not being diminished or devalued because of one's gender, social class, religion or race. Considering other person's view in dialogue and debate in and out of class. Not being discriminated against for any reason including religion, gender, race, physical handicap and age.</p>	9
3. Occupational knowledge and skills	<p>Having the qualifications needed for entry into the labour market</p> <p>Having skills to do a good job</p> <p>Having the learning skills that allows for experiential learning in the workplace</p>	14

	Having the opportunity to learn throughout one's lifetime. Having the learning skills required for further study	
4. Bodily integrity	Being able to move freely from place to place. Being able to be secure against assault, including sexual assault from peers and lecturers. Making own choice about sexual relationships	3
	<u>4 Capabilities that are additional to Powell's list</u>	
5. Capability to aspire	Motivation to learn and succeed, to have a better life, to hope	14
6. Educational resilience	The ability to negotiate or persevere and succeed despite being faced by adverse conditions or circumstances.	10
7. Capability for voice	The ability to express one's views and be listened to.	7
8. Practical reason	Being encouraged to live a full life. Being able to have choices, planning life after college, reflection, independence. Belief in one's abilities.	11

In extrapolating the valued capabilities, I left out three of the capabilities from the list by Powell. These are as follows: active citizenship; senses and imagination; and confidence and personal empowerment. The capability of confidence and personal empowerment is almost similar to practical reason. The two capabilities, active citizenship, on the one hand, and senses and imagination, on the other do not emerge from my findings. I added four capabilities which came out from the data but were not included in Powell's list: educational resilience; practical reason; capability for voice; and the capability to aspire. Each of the eight capabilities, which were gleaned from the research and listed above as being relevant to women in TVET, is discussed and defended in the sections below.

8.2 Valued capabilities

8.2.1 Capability for work

The capability for work is defined by Bonvin and Farvaque (2006:126) as 'the real freedom to choose the work one has reason to value.' In this case, TVET should provide the opportunity to participate effectively in the type of work content, conditions, and remuneration that one has reason to value. For the participants in this study, the economic opportunities come in the form of formal employment or even self-employment. In order to understand the capability for work in a person's life, this needs to be taken in the sense of social values connected to those opportunities. These can be self-fulfillment, personal development and social belonging (Bonvin and Farvaque, 2006). It is, therefore, important to understand the extent to which TVET enhances this capability in the lives of women students. From a capabilities perspective, therefore, the capability for work that matters is **not** the

mere possibility of getting an adequate wage: it focuses on the agency dimension, on the capability of participating in society. In terms of well-being, the non-material aspects of work are particularly emphasised and depicted as freedoms workers enjoy or wish to enjoy (Bonvin and Farvaque, 2006: 128).

This capability goes beyond the human capital approach, which aims to provide skills for employability. Thus, skills provision, without corresponding chances of employment would not be compatible with the capabilities perspective. While women are no longer formally excluded from TVET or the male dominated domains, such as engineering studies, it is important to note that their numbers in engineering are much lower, and their gender may have an influence on how they experience the labour market. As was noted in Chapter 6, the labour market is still being controlled by men, which presents challenges in securing internships and, eventually, jobs that matter. Finding an economic opportunity that matters is the ultimate aim of every participant in the study. Some wanted to start or expand their own businesses and use the knowledge that they acquired from their education. Karabo wanted to venture into the electronic business since she had studied engineering. This, she hoped would be an economic opportunity not only for herself but for the others she hoped to eventually employ:

I personally, after this... I am gonna open my mini shop you know, then I can employ people so that they can have something to do and look after themselves- create employment. I don't have permanent employees at the moment, I only have those that will help me when I need them. (Karabo).

Palesa also had the same desire to venture into entrepreneurship;

I am still busy with the learner-ship so it's for three years. So, I want to study installation I can have my own license, open my electric company. (Palesa)

TVET had presented Palesa and Karabo with a chance to create employment for others. Most of the students wanted to look for jobs in the engineering sector. Engineering is considered to be one of the scarce skills in the country, so by obtaining a qualification in the field, they hoped to improve their chances of finding employment. For Noni and Thatho, finding employment in a big company and earning a good salary was their desire:

Because I have completed N6 and will have a diploma, I can end up getting a good job and earning a good salary especially if I am lucky to get a job in a big company. (Noni)

It's going to help me a lot in future. Education is important to finding a job, if I get one especially that pays well. (Thatho)

Hazel's conception of economic opportunities was to take the teaching route using the knowledge that she acquired through TVET. Thus, she saw TVET offering her an opportunity for teaching, a profession that she had reason to value.

I have weighed my options and realised that there is an opportunity in teaching so that is what I will do. I will go and study for a Certificate at ... [University] which is for those who want to go into teaching after graduation. It takes about a year. (Hazel)

Thus, the capability for work for women can be considered as a matter of justice. From the findings, not only is paid work a capability for fostering financial autonomy, it is also a matter of survival. Considering the fact that most of the respondents came from poor backgrounds, earning an income will not only help these women themselves but also their families. Puleng also hoped to one day find a job that pays well so that she will be able to look after her son. Being a single parent meant that she was not able to provide adequately for her son and had to depend on family

members. This seems to have been an undesirable situation that she finds herself in and wished to change when she finds a job.

Since I told you that I did not do very well in my matric, it means if it was not for TVET, I will not be looking forward to a better future. I think TVET gives women like me that second chance. I got pregnant while I was still very young but now I will be someone in my life and maybe drive a car one day... [Laughs]. (Puleng)

From such accounts, one can note the importance of the capability for work as it has the ability to help women to do what they have reason to value. Thus, Nussbaum (1995: 55) argues; ‘the opportunity for gainful employment would be seen as an essential good, one of the basic human capabilities, without which a basic life is often not possible.’ This means that a women’s right to (gainful) employment should be seen as a form of social justice and needs to be fostered.

Bonvin and Galster (2010) argue that ensuring the fostering of the capability for work requires potential employees to be appropriately equipped with competencies, which make them employable. Looking at these students, this cannot be said about their competencies. Most of the students were of the opinion that the curriculum needs to be changed so that the students acquire both theory and practical experience at the college. Since some of them faced challenges in finding internships, which meant that the possibility of getting a job later on became far-fetched as they needed to complete practical training first before looking for a job. Mr Zulu and Mr Molweni, lecturers, had this to say:

There are subjects where you feel like there needs to be changed for example, the structural surveying- in my field, the curriculum, the syllabus that we’re using now is totally different

from what is happening at sites out there. I think it's time for us to take the curriculum and change it to suit the times. (Mr. Molweni)

But then the problem is our students are having a tough time to get the experience in the industry. So the employers would say why do you want me to take you without experience and yet I have one from the university with experience. If our curriculum can be beefed up to meet the standard of those universities, then our students, it will be easy for our students to get experience. (Mr. Zulu)

...but now there is something that I have noticed with our period here. We have only eight weeks, we have limited time. Even if you would love to introduce them to the workshops to see these, or maybe visit the industry or maybe take them to universities to see the labs and so forth, there isn't enough time for such. I think the trimester is very short for exposure. (Mr. Molweni)

They are applying but they just can't get the jobs. Sometimes we take others here for part-time jobs, just to teach the theory. We can just take some of them, but most of them are not working. (Mr. Zulu)

Lesedi and Ntabiseng supported the lecturers' assertions by arguing that:

I have never been in the field before and I don't know anything about practicals, I just come to school and learn theory. (Lesedi)

After being asked if she would be able to apply what she had learnt if she were to find a job or apprenticeship, Ntabiseng had this to say:

No, I am not confident. I am doing mechanical engineering but I don't even know how to fix a car or to even take out a wheel. At home we do not have a car so I do not know where to go to see all those things. (Ntabiseng)

From Mr. Zulu's and Mr. Molweni's perspective, students are not being equipped with the skills needed to be employable later in life. This, however, does not only affect women students but men as well. Mr. Molweni argued that this is mainly because the syllabus is not compatible with what is happening in the industry. The type of education that the institution is imparting does not respond to the changes in the industry. In addition, the students only learn theory at the institution and would need to be attached to the industry for practical experience. Thus, students do not have practical knowledge, and this is a contributing factor for not finding an internship. For example, a student might learn about machinery, such as compressors and transformers, but does not really know about them in reality. Moreover, a lack of workshops at the institutions will result in students not acquiring relevant skills for them to secure internships and eventually employment. This poses a problem and, according to Mr. Zulu, employers might prefer university graduates, who have practical experience, instead of TVET students. However, even though it would be desirable to introduce the practical component into the syllabus, it might not be possible as there is a lot to learn in a short space of time. In this regard, Mr. Molweni mentioned the short length of the trimester, which he believes is too short.

The mismatch between skills development and the needs of the market is not a new phenomenon. This has resulted in the transition from college to the labour market, especially for TVET students (regardless of gender) being a great challenge (Allais and Nathan, 2014; Gewer, 2010; Cosser et al. 2003). The overall picture portrayed in available literature on the pathways between education and the labour market for South African students shows massive challenges faced by TVET

graduates. Gewer (2010) and Papier (2017) argue that TVET colleges in South Africa need to play a meaningful role in exposing students to the workplace, which usually results in employment. Students in Gewer's (2010) study felt that they were only provided with 'abstract' preparation in the classroom, and therefore the transition from education and training to the labour market was complex. Papier (2017: 41) contends that: 'The theory courses lack both a life skills and a practical component, which have been shown to be important for the workplace.' These findings resonate with those from my study in that most of the students felt that they were not being equipped for work. TVET graduates are faced with underemployment and unemployment, and this is supported by both the students and lecturers in my study. As noted in Chapter 6, the circumstances of women are further constrained because of their gender. I noted how the employers felt that there are other jobs that women cannot do in the engineering field, and therefore tend to side-line the women job-seekers. Hazel pointed out the challenges faced by TVET graduates in the labour market:

You know what, they always say that there are opportunities for engineers but now from my experience, there are no companies that look for women artisans, many of the women are sitting at home with their N6 qualifications and some are working at Pick'n Pay and Checkers. Some with N3 or N4 because you start from N1. (Hazel)

She also said that her sister, who had studied engineering at the same college, had faced challenges in finding work and had to settle for working as a cleaner in some government offices. When asked about her sister, Hazel said; '*Ooh! She is working as a cleaner there at the Public Works.*' Mr. Zulu also supports the view about the unemployment rates of the TVET graduates generally:

I have a number of artisans that I know who are seated there, not working. They have been trained for three years, good qualifications and now are not working. They can't get the

jobs. I have people who are selling clothes in the streets and they are artisans. They will tell you 'there are no jobs, let me sell clothes to survive.' (Mr. Zulu)

And again, they say there is a shortage of artisans And sometimes, I begin to wonder, how can they say there is a shortage when everywhere, there are lots of people who are not working out there and they say we have a shortage of artisans, engineers....qualified but struggling to get jobs. (Mr. Molweni)

But you find out that some, they are still staying at home and are doing nothing, but there are those who are working. But there are not many. Most of our students are not getting those internships. It's true because if you check, some of these students were very good students from N1- N6 and were passing very well. So if you did very well like that, you become frustrated staying at home, and you have nothing. (Ms Khotso)

The discussion above paints a gloomy picture about the development of the capability for work for all engineering students, but particularly so for women. From a capabilities perspective, people should be equipped so that they have the opportunity to choose the work they have reason to value. As shown through the excerpts from both the women students and lecturers, TVET cannot be said to be creating the capabilities (genuine opportunities) that the women students value. Thus, while pressure in the South African context is placed on combating high levels of unemployment through TVET, the outcome may not necessarily be working towards that. Apart from the challenges that TVET graduates generally face, the circumstances of women students are made worse owing to the stereotypes and perceptions of the employers. It was noted in Chapter 6 how the labour market has remained sexist, making it difficult for women in engineering to acquire the much needed internships. From the above findings, it can, therefore, be argued that TVET education (engineering education in particular) in its present state, does not enhance women students'

capability for work to its full potential. It was noted how TVET does not necessarily enhance women's freedoms to choose the work that they have reason to value.

8.2.2. Recognition and respect

Walker (2008: 473) defines the capability of recognition and respect as 'being able to have respect for oneself and for others, to be treated with dignity, being recognised and valued equally with others by lecturers and one's peers.' This capability is important in post-school education and more so in engineering studies, a predominantly male domain. All women would value being recognised in this field as human beings who are entitled to the same opportunities as men students. It was clear, however, that most women in TVET did not feel that they were valued or recognised. This capability is similar to Nussbaum's capability of affiliation, which is defined as being; treated as a dignified being whose worth is equal that of others. This entails, at a minimum, protections against discrimination on the basis of race, sex, sexual orientation, religion, caste, ethnicity, or national origin (Nussbaum, 2000:79).

From the experiences of women students in this study, it was evident that engineering education is still marked by gendered social arrangements. Thus, the capability sets of women in engineering can be said to be constrained by gender inequality. The opportunity for such women to achieve valued functionings is, therefore, limited by these gender inequalities. As noted in Chapter 6, there were issues of sexual harassment and sexist remarks from male lecturers that still point to women being devalued in the TVET system. This points further to the constrained nature of the capability of recognition and respect. The following excerpts point to the challenges that women in TVET often face, which is not conducive to their flourishing and is a conversion factor that has a negative effect in the lives of the women students. Dineo, a mechanical engineering student, says one of the lecturers thought that, as women, they had chosen engineering for its name and they did 'not

understand anything about it'. Ntabiseng also found the classroom environment 'challenging' as she felt men students were 'moving fast' because they were participating better in class. Mabatso also was weary of some lecturers who would say in class, 'you are a woman, it's for men (engineering).' Dineo had this to say:

There are only 5 girls and the rest are boys especially in this field in mechanical, at least in electrical there are more girls It's more like people... they stereotype, and they think that mechanical engineering is for males not females that's what runs up in their mind.
(Dineo)

Stereotypical assumptions about women in engineering still persist. These need to be understood in the educational process as they frame the experiences of women students. A lot has been written about gendered classroom dynamics, and Liu (2006) concludes that male centeredness is most evident in schools and colleges. Classrooms are 'deeply gendered and heterosexual regimes...' (Liu, 2006:427). These assertions are confirmed in this study. In the end, it means that the capability of recognition and respect is not likely to be enhanced under such inequality, especially in the classrooms. Instead of the women students being respected and recognised as individuals who are pursuing an education that they have reason to value, they end up on the receiving end of a gendered education system. Student-lecturer interactions are influential in the development of a student (Liu, 2006). This means that, if these interactions reflect gender biases, the development of the capability of recognition and respect is highly compromised. Gender then becomes one of the structures that constrain the development of capabilities for women students. In addition to increasing the enrolment of women into predominantly male fields, understanding how they experience education becomes critical. These findings point to the fact that sometimes education may not enhance an individual's capabilities or substantive freedoms. As Sen (1999) argues, social

arrangements play a key role in the expansion or contraction of an individual's freedoms. In this case, however, social arrangements are influencing the development of the capability of recognition and respect in a negative manner.

There were instances when the women students did feel recognised and respected outside the college system. Some women students would assist in their communities by helping students with their homework, thus using the knowledge that they acquired. Out of the fourteen students, four of them indicated that they assist school children in their families and communities with homework whenever they can. Some students also felt recognised when they were able to assist in solving electrical problems or challenges in their homes. Thus, to an extent, there was some recognition and respect for these young ladies when their expertise was valuable in the households and in the communities where they come from. This, however, cannot be said about the general experiences in the educational system of the women students. Hazel and Ntabiseng argued that

The only thing that it has been able to do is to assist other kids in the township with knowledge on maths and science you know. (Hazel)

Now I can also help others. In the sense of education. Like I have those kids at home who come to me, sister help us with this and I can recall that at N1 I did this and I help them. So I am able to contribute to the community, other kids and so forth. If I had not come here, I would not be able to do this. (Ntabiseng)

Powell (2012:225) argues that the capability of respect and recognition involves three functionings: being treated as a dignified human being; having self-respect; and not being discriminated against for any reason including religion, gender, race, physical handicaps and age. These functionings however are not being enjoyed by the women students in this study. For

example, women faced numerous experiences of discrimination based on their gender, as noted above.

8.2.3 Occupational knowledge and skills

Bonvin and Galster (2010) defined occupational knowledge as being equipped with skills and qualifications not only to be employable but also to work effectively. Findings from my study point to the development of this capability to a limited extent. Gewer's (2010:3) findings also point to the fact that students felt that TVET education was providing them with 'abstract preparation in the classroom'. Gamble (2006: 101) argues that 'knowledge has to feature prominently in the vocational route, as it does in the general academic route, but it also has to be tied to practical work experience to give the vocational pathway a distinctive character'. There has been an ongoing debate within the TVET sector as to what it is that this type of education should foster. Wedekind (2014) argues this about the role of TVET education:

What needs to be foregrounded is the educational role of the college in deepening knowledge, developing capabilities (including hard and soft skills required to work) and strengthening (occupational and wider social) identities that enable learners to become both workers and citizens.

Findings in this study point to a lack in the development of the capability of occupational knowledge and skills. When asked about the curriculum and knowledge generation, only two of the students from the women interviewed indicated that they were in a position to apply what they learnt at home or if they managed to get a job or internship. This points to the challenge that these women students face, as most of them lack the relevant occupational knowledge. I also asked those who were already doing their practical work, and they indicated that it was not easy at first as they only had theoretical knowledge and lacked practical knowledge to apply what they had learnt. Hazel and Lebo argue:

If something is broken, I do not know how to fix it, I cannot apply my theory knowledge. If they could give us more practical skills, then I can say it is contributing to something in my life. I am business minded, I want to be able to employ even my classmates, but I can't do that now if its only theory and we do not get practical skills. (Hazel)

So, I have a friend who studies here and is working so now she is doing the things that we learnt here practically. This means that we need more practical here so that it will not be something new when you start working. What I mean is that we need more practical lessons so that we won't face challenges when working. (Lebo)

All of the students reiterated the need for workshops at the institution so that they will be able to 'see' the engineering equipment and eventually be in a position to apply the theory. Women students in the mechanical engineering group gave the example of a motor engine. Even though they were taught about the engine parts, they felt that they will not be able to recognise them when they started working. Karabo and two women lecturers had this to say:

We have never.... they must have something like that... where we go to the workshops.... something that you learn in class you can see it and this is how it's done. To say this is what we were talking about in class, yaah. We have not been to the workshops. I think they need to improve that... a training centre or something. (Karabo)

Just like I said, as at university, they are doing both theory and practical, so it means that it would be better, instead of teaching for a trimester, we must have a semester, so that they have at least three months for practical. I think that will be better if they have both. Because they would not need to look out for themselves to get training. This means that something that you did practically you won't forget and it is better that way. (Ms. Khotso)

To be honest with you, there is a lot of students, not only females who are struggling to get work after N6 you know, there are no opportunities. Sometimes they are not prepared to start at the bottom, but what I would want to say is I think, umm I saw an article in the morning, this NC (V) that we have here, to me, I don't know, they say its practical and everything but the system that worked, three months, you learn three months you work or whatever, even six months, then you have the knowledge and you come and practice.. Instead of the current NATED programs, because, they have got no work experience, they finish and they have to go and look for work and the first thing that they are asked is how do you do this job and they don't know how to do this job. Then how do you employ somebody that's got the book knowledge and not the practical knowledge? (Ms. Rooyen)

Mabatso was one of the students who had managed to secure an internship. I sought to understand her experiences when she started working. She reported challenges in applying theory to practical work:

Interviewer: *How was your experience when you started your internship?*

Mabatso: *Yooh! A lot of challenges! I would say that maybe they should improve somehow while we studying theory, if maybe we do this chapter, at the end of that chapter they should also organize some practicals for us to learn more about that thing because when we go to the sites or companies, you struggle. (Mabatso)*

Interviewer: *So when you started working, where you are, did you find such a challenge?*

Mabatso: *Yes I did, I did. I was struggling. More especially, when you have been taught that a transformer does one, two and you get to the industry and you see the things live and*

can't connect. You can't do anything, you have to go back consult a book or ask somebody, other people who have experience.

The above interaction points to the theory-practice challenge that the women students (as well as men, as seen from the quote above) faced in the development of the capability of occupational knowledge and skills. This challenge is exacerbated by lack of tinkering on the part of women as they grow up, as argued before. This means that by the time that they leave college, this capability will still not have been developed. This challenge, coupled with the challenge of finding internships as explored in Chapter 6, may mean that the women's freedom to pursue what they have reason to value is limited. This can lead to unemployment or under employment when the students fail to apply the knowledge that they acquired. Thus, a number of researchers in South Africa point to the need for a TVET education that ties together practical work experience and theoretical knowledge (Gamble, 2006; HRDC, 2014; Papier, 2017). By so doing, students will have the opportunity to be employable. The DHET (2013:9) White Paper underscores the importance of both theory and practical knowledge:

For much education and training, a combination of both theoretical knowledge and practical experience is important, indeed essential. Theory provides knowledge of general principles and laws, which allows additional learning and adaptation to new technologies and circumstances. Practical experience builds applied knowledge and develops self-confidence in someone's ability to act effectively.

The DHET TVET Colleges Website⁸ states three purposes of TVET as preparation for employment and self-employment: reskilling; upskilling training; and providing a route to further education. A student with a National Certificate Level 4 may be eligible to pursue higher education. Students in the study valued the capability of occupational knowledge and skills as it presented them with a chance to go to university or university of technology for a degree

⁸ www.tvetcolleges.co.za

programme or specialised training within the engineering field. As the quotations below show, almost all of the students wanted to upgrade their skills. I noted in Chapter 2 how students in TVET colleges are often perceived as low achievers or less academically talented, which is, however, contrary to the ambitions that the women in my study portray. They intended to study further to increase the chances of finding better work and improve their well-being. Dineo and Lesedi wanted to do the Government Certificate of Competency (GCC), which is a specialised training for engineers:

Yeah, cause right now after doing mechanical I am planning to do electrical so that maybe I might do GCC. I will become an engineer. Yeah, more like combining mechanical and electrical and therefore, it's more like a scarce skill. So not everyone is doing it. So I just wanted something that will challenge me at least. (Dineo)

Ok, I am doing mechanical engineering now, I was hoping that next year I do electrical because I want to do GCC [Government Certificate of Competency] (Lesedi)

Since Palesa was doing electrical engineering, she intended to pursue specialised training, installation. According to her, this would help her to set up her own company in future. Mabatso, Mtswaki and Thatho wanted to go to university for further studies in the engineering field.

My diploma, I am actually going to upgrade again so that I see myself at the University... I also want to be senior electrician ... (Mabatso)

I want just to further my studies in engineering; if I get a bursary, because I am still applying for a bursary, for next year.... (Mtswaki)

So I intend to just continue in the engineering field. I will study part time... engineering degree. (Thatho)

The challenge, however, is that research so far points to a very low percentage of students who end up in institutions of higher learning from TVET institutions (Cosser et al. 2003; Gewer, 2010; Boka, 2017). This is due to poor passes, lack of finances to fund higher education or specialised training and lack of information about the progression routes. This also becomes a constraint for the students to pursue the life that they have reason to value. The government of South Africa needs to facilitate the development of this capability by having a clear policy on progression from TVET colleges to universities or universities of technology. With the assertion that TVET colleges in South Africa should be the ‘cornerstone of the country’s skills development system’ (DHET, 2013:12), it is important to understand whether the experience of the women students in the study point to that. Can we say skills are being developed or the capability of occupational knowledge is being cultivated? This cannot be said from the experiences of the women students in this study as noted above. Though this research did not do a curriculum analysis, or what the students actually learned, it is evident that most of them felt that they had not been able to acquire relevant occupational knowledge.

8.2.4 Bodily integrity

The capability of bodily integrity is defined by Nussbaum (2000:78) as:

‘Being able to move freely from place to place, having one’s bodily boundaries treated as sovereign, i.e. being able to be secure against assault, including sexual assault, child sexual abuse and domestic violence; having opportunities for sexual satisfaction and for choice in matters of reproduction.’

This capability entails being free from both harassment and violence. This also includes inappropriate comments from men, both students and lecturers. Only three students from the respondents made reference to this capability, which was the least often referenced in the study. Although the women students reported no gendered experiences when interacting with men

students, two students, Thato and Mabatso, they did report incidences perpetrated by men lecturers in the form of sexual harassment. As noted earlier, unwanted sexual advances from lecturers constitute sexual harassment and, therefore, this capability is of significance, as this experience had a negative effect on the learning experiences of the two women students. The two women students desired to be able to make their own choices about sexual relationships.

Naledi is also another participant who makes reference to the capability of bodily integrity. She valued being safe and free from violent attacks. On her way to school one morning, she had been robbed of her phone and other personal belongings. Considering the crime rate in South Africa, especially in the low income residential area where one of the college campuses of the case study is located, it would be common to experience violent crimes. The capability of bodily integrity needs to be fostered, especially for these women students taking the NATED course, which is a part- time course and they finish late at night. Naledi argues:

[A]t night. You are just worried about the guys. I think three weeks back, I was coming to school, and it was around past eleven in the morning. I met this guy, he took my phone, with a knife. Like you are traumatized, you come to school and class ends at ten past eight at night. You are already thinking about that experience. Like safety, it's important. I think if they can take that into consideration. (Naledi)

Though only three students mentioned the importance of bodily integrity, it is clear that they value this capability and the functionings thereof. So for these three students, the capability of bodily integrity needs to be fostered to make their educational experiences better.

8.2.5 Educational resilience

This is defined by Wilson-Strydom (2012:236) as when students make ‘progress with their education despite overwhelming constraints in their personal contexts, at their schools, and in the broader social, political and economic environment in which they live.’ From the accounts presented by the students in this study, it is clear how they persevered despite their negative situations in an effort to attain skills training. The South African context requires a lot of resilience for someone to pursue, and graduate from, post-school education. The circumstances of these women was exacerbated by a background of poor schooling and low socio-economic status due to coming from mostly rural and high density residential areas. However, they managed to overcome these challenges and finished high school with passes that could help them enrol in a TVET college. I noted in Chapter 6 how three students Naledi, Karabo and Ntabiseng dropped out of university for various reasons and then ended up attending a TVET college. Naledi failed a major course and had to withdraw since she lost her funding when she failed. Ntabiseng also dropped out of university because she had been offered a programme that she did not really want to do. Karabo lost funding at university and had to drop out, since she could not afford to pay for herself. The stories of these three students demonstrate how they exercised their agency to achieve desired career aspirations. Dropping out of university did not deter them from achieving their well-being in the form of pursuing post-school education. Ntabiseng and Naledi had failed to be admitted through the conventional programmes at university and had to enrol in the extended programme. Yet, when they failed to progress, they thought of alternative post-school education, that is, TVET, although it was not really what they wanted either.

Persisting in the engineering field required resilience on the part of the women students, even when faced with sexual harassment, from lecturers, as was the case with Mabatso and Thatho. Moreover,

Mabatso reported that she even failed a course because she refused to go out with the lecturer who was soliciting a relationship. Thatho reported that she could no longer trust male lectures and her participation in class was negatively affected. The circumstances of these women meant that their freedoms to participate and progress through education were constrained; this, however, did not stop them from continuing with their education, as was the case with Mabatso, who never gave up despite failing a course that she had to repeat. As noted in Chapter 6, some lecturers in the engineering department had a tendency to discourage women students or devalue their competences. Nevertheless, the women who experienced this sexism showed resilience by carrying on regardless, even though they felt alienated in class because of the sexist comments or male dominance. Thus, they demonstrated that it is possible to exercise agency and navigate through the educational system despite the odds against them.

Resilience is also seen in how students soldiered on despite failing several times. Naledi is an example of how students persist in light of challenges such as failing:

Yaah, umm, I got here in 2013, and this is a one year six months course but I have been here since 2013 when I started my N1. You know, you fail one subject and everything stops. You just have to do that one subject and then proceed to the next level. So when you fail you stop and ...that's why I am saying umm..... [Laughs].....I am learning to be patient. In 2014, I said, now I have my N2, I can just go and like, look for a job. But yoo, when I was applying I would see that now they no longer want N2, they want N3, N4. And then in 2015 I came back and then did my N3, N4. When I got to N4, yoo, I failed like nobody's business! Yoo! I failed, I think three trimesters, it's a year, failing one subject. That's where I saw that you know, if you want something in life you have to be patient. Sometimes things

they don't just happen the way you want them to happen or come the way you want them to come. So, but as long as you know that this is what you want, in due time, you will be okay. So, I pushed and pushed and pushed. I was so discouraged but then ended up passing it. (Naledi)

Noni also had to drop out of college because her family was facing financial problems. She said:

Last year (2016) I was not here full time I was here only for the first trimester but I managed to complete this year I was having financial problems so I took a break. I only failed once and so far I have been passing very well. (Noni)

Palesa and Tumelo are further examples of how women students had to make progress with their education despite overwhelming constraints in their personal, social and economic contexts. Palesa talked about how she had faced challenges in balancing her internship with her lectures, which ended late and led to travelling at night. To balance the practical and theoretical components of the course, she had to opt for only two subjects at a time. Tumelo also spoke about the challenge of managing her time and workload:

The only thing is up to me to push like now I am doing N6 and I got a learner-ship at... Services so there is too much pressure for me. The late classes end at eight o'clock so I have to ride a bus and arrive home late which means I do not have time to read, so I have to take only 2 subjects so that I can balance these things. (Palesa)

It was not easy, I had to put a lot of effort and time for it to work. There are times when you fall but stand up and move on. (Tumelo)

Mtswaki explained how she had to persevere even when things got difficult.

Right now, I can say there are problems in my school work but when I struggle, I still ask, and somehow financially, I can say yes there is, but I cannot just say that I give up because of my financial problem. Yes... I had a challenge when I was doing N2, I had a challenge whereby there was still a lot of money problems but I didn't just let it go and just give up, you know but I pushed myself harder. Yes. (Mtswaki)

It is important to note that the capability of educational resilience does not work in isolation. Being able to persevere through TVET in the face of sometimes overwhelming difficulties would depend on several other capabilities, such as aspiration and occupational knowledge and skills. The fact that women soldiered on was often because they aspired for a better life that could be facilitated by skills training and acquisition. It would have been difficult for the women to successfully navigate through the system if they did not have the support of family and friends.

8.2.6 Capability to aspire

The capability to aspire can be defined as having hope for a better life and being motivated to work towards achieving this life. Ray (2003) argues that one's aspirations are influenced by people in one's aspiration window as well as available information. Women in the study expressed what Walker (2006) refers to as 'aspirational narratives' and argues that, in the context of South Africa, it is important to look at issues of aspiration as it is a 'country which for so long denied and diminished the aspirations of the majority of its population, and a country in which femaleness is less valued than maleness' (Walker, 2006: 173). It is apparent that education has the potential to develop the capability to aspire as seen from the findings. However, experiences in the education system may cause this capability to contract. It is, therefore, important to understand the role that TVET has played in the lives of women students in developing or contracting this capability.

As alluded to earlier, most of the students in the study came from very low socio-economic backgrounds and some of them had not performed well in their matric examinations. Such situations have a significant impact on aspirations, particularly in the case of those who come from poor families. For these students, the chances of aspiring for different futures is limited, it is difficult for them to think beyond meeting basic needs. Individuals have a tendency to limit their aspirations to what they and their family can afford. However, for most of them, TVET presented them with an opportunity to imagine alternative futures. The aspirational narratives for most of the students who had strong educational and occupational goals, was towards employment or further education, which would in turn open doors for good employment. I noted how Palesa, Karabo and Hazel had ambitions to run their own businesses and even employ others. Others like Thatho hoped to *'find a job that pays well.'* Puleng also hoped to be *'someone in my life and maybe drive a car one day.'*

Hart (2013:79) argues that 'Understanding the nature of aspiration tells us more comprehensively about the freedom an individual has to develop capabilities and to choose to pursue the future they have reason to value.' Hart further points out that, because of constraints, young people may not have the freedom to aspire. That is where the concept of adaptation comes in, which means that the circumstances around an individual may influence their aspirations. This is what we see in some of the women students in this study, who had limitations to their capability to aspire to the life they really wanted, as the capability to aspire is either constrained or nurtured through the relations that one has with others (Hart, 2013). Hazel is an example of how aspirations are adapted or moulded by circumstances, as she had realised the difficulty faced by engineering graduates from TVET in securing work or internships but adapted her aspirations to a teaching career that she thought she would be able to do easily. As noted earlier, Hazel's sister had studied engineering

at the same college but, because she could not find an appropriate position, ended up working as a cleaner. Hazel may have adapted her aspirations owing to her sister's experience as she explained in the interview:

I completed my N4 in 2007 and I started looking for a job but I have been struggling to get a job, so I do not know what the barrier is. You know what, I have been trying to apply before and I have realised that I do not want to go to work for Pick'n Pay like the other girls who studied engineering here. I know what I want now, I don't want to work as a cleaner somewhere. So I have weighed my opportunities and realized that there is an opportunity in teaching so that is what I will do. Jobs for engineering are scarce (Hazel)

Other students, such as Noni, decided to further their education by going to university to obtain degrees, as this would increase their chances of finding employment, as opposed to trying to find work with only an N6 qualification.

Ok, I have applied at the.... [University of Technology]. So next year after the results come I will register and continue with electrical engineering at degree level. To get the place is not easy but I will write a selection test, since as I said, my matric results were not good especially English (Noni)

I am hoping to get a job and fund my studies with ... [university] since it is part time degree. If I do not get a job, then I will wait and see what happens or I can go to another institution and study another course. (Lebo)

Umm, after completing my N6, like, most people are advising me to look out for a job and then study electrical as part-time, because it is difficult to find a job when you complete

the course.... I was hoping that next year I do electrical because I want to do GCC and then after that, that is when I can try to find training. (Lesedi)

After asking Naledi what she wanted to do, she said:

Umm... [Sigh]..... I think the thing is.....I am not being negative but it's not gonna be easy to get the training. It will be better if I go to varsity. (Naledi)

Palesa's aspirations were also influenced by her financial background. Despite the fact that she wanted to study for an engineering degree as soon as she finished her studies, she realised that she could not afford to do that, and so had to postpone the plan until being in a position to afford to fund herself through higher education.

I am also planning to do a degree in engineering but because of my financial background, we do not have money at home so I will do that after I find a job and I will go to university with my own money. (Palesa)

It can be noted that, although the young women in the study developed the capability to aspire, the extent to which it was developed was limited. This is due to different conversion factors, such as the following: financial background; gender, as the chances of women finding employment and internships in the engineering field are limited; and performance at N6 level, which determines entry into university and job opportunities. Women seem to have a limited capability to aspire to other beings and doings that they may have reason to value, which means that their aspiration set was limited. Findings from the study also illuminate the changing nature of aspirations as influenced by the different conversion factors. Education and training, in this case TVET, should play a role in enhancing the capability to aspire (Powell, 2012). Walker (2018:128) argues that:

For the less well-off it is not that they do not aspire towards a better future, but for iteratively connecting and navigating between the immediate context and the distant, their real-world pathways offer thinner imaginative possibilities.

8.2.7 Capability for voice

Bonvin and Farvaque (2010:127) define the capability for voice as ‘the ability to express one’s opinions and thoughts and to make them count in the course of public discussion.’ In addition, according to Bohman (1996), three conditions need to be met in order to achieve the capability of voice: first, there is need for everyone involved to be able to express their views and be listened to; second, all involved should be aware and participate in the decision making process; and third, the concept of adaptive preference should be overcome by giving the freedom to everyone to express their true preferences. Bonvin and Thelen (2003: 127) note that ‘the capability of voice is not only a matter of adequate discursive or cognitive competencies, but also of power’, which means, therefore, that considering the women students in my study, the question to ask is ‘Are women students able to meaningfully express their opinions?’ (Bonvin and Thelen, 2003). However, considering the pedagogical approaches and the institutional arrangements at Acacia, one can conclude that not all students have the same opportunities for voice or participating effectively. It was noted in Chapter 6 how the women students felt that they did not have the opportunity to participate effectively in class. The lecturers in the engineering department corroborated this, as all four of them felt that women students were not participating to their full extent. This means that the development of the capability of voice is below standard, and the patriarchal arrangements in society may be replicated in the TVET system. However, as Loots and Walker (2015) observe, the capability of voice is important in education, as it helps in the expansion of other capabilities, such as critical thinking and confidence. Ongera (2016:161)

observes that (higher) education 'has the potential to shift some cultural constraints and inequalities in women's lives such as lack of voice, non-recognition and inactive participation in public life.' The importance of women's participation in education is not a new phenomenon; however, in the engineering field, it should be fostered, as the area is predominantly male. Lebo is one of the students who knew that for her the capability of voice was lacking. She suggested that the course include a course in communication skills so that she may be able to communicate effectively:

There are no communication skills as well, they could add that so that I will be able to communicate. (Lebo)

Similarly, two of the lecturers, Mr Molweni and Mr Zulu, noted the need for a course in communication skills:

But on the other hand, according to your question, I believe that we can add like a course to do with that, maybe like an extra subject, like communication skills, maybe.....at the entry level there, at N1. Other than that, time here limits our curriculum, its affecting everything here. The trimester is very short. Even if we prepare them, but eish, we have very limited time... eish. (Mr. Molweni)

Interviewer: *You mentioned something about communication skills. How do you think it can be helpful especially for women students?*

Mr. Zulu: *From my experience, especially the black students, they have a fear of communication in English. If we can have such lessons, it will make things easy in classrooms. Everybody will be free to say something. Students, you can hear, they want to*

say something, but they cannot convey the message clearly to the class or me. So communication skills are very important.

Mr. Zulu talked about how language affects participation of students whose first or home language is not the language of teaching in colleges. Though this may have had an effect on the development of the capability of voice, it did not come from the women themselves but only from one lecturer. For the women in the study, it can be said that for others, the capability of voice was both expanded and contracted. As noted in the previous section, some women gained better confidence and self-esteem when they were studying at the college. Noni said, ‘this has helped me... to be independent, to stand for myself’, whilst Thato declared, ‘now I have a voice out there’, and used the words ‘walk boldly’ in reference to her college studies. Except for these two students, this capability was lacking in most of the students. They did not have the freedom to express themselves in and out of the classroom. Some lecturers constrained the development of the capability for voice by discouraging women students in class. In addition, it was noted that some male students had a habit of laughing at other students in classrooms, which made students like Palesa afraid of asking questions, even if she did not understand aspects of the course. One lecturer, Ms Rooyen said, although she did not condone this habit, men students sometimes laughed at other students in class. All these experiences lead to women’s inability to participate and further thwart the development of the capability of voice. A quotation from Ms. Khotso sums up the experiences of the women students in the study. She argues:

I always try to make them compete, but then always, women, they are behind. Sometimes I give them some work to present in front of the class but sometimes they don’t want to do that. It seems like they are just afraid to stand in front of other people though some will do

it with no problems. I think lack of confidence is a challenge for women that does not affect men. (Ms Khotso)

8.2.8 Practical reason

The capability of practical reason is defined by Nussbaum (2000:79) as ‘being able to form a conception of the good and to engage in critical reflection about the planning of one’s life.’ This capability is concerned with the personal benefits of education that go beyond certification and being employed. It includes being encouraged to live a full life, having choices, planning life after college, reflection, independence and belief in one’s abilities. For TVET to be able to contribute to this capability, it should be ‘empowering education that provides [them] with critical understanding, a broad knowledge and agency to carry out their life plans’ (Lopez-Fogués, 2014:173). From the findings in my study, it was clear how the transformative and agency enhancing role of TVET emerged. Women in the study considered themselves different from those who were just ‘staying at home’. A focus on this capability is important, as the analysis goes beyond human capital theory by also looking at the intrinsic benefits of education. This is an important aspect, as the economic discourse alone is insufficient in assessing human well-being. Thus, while policy fosters TVET for potential economic benefits, the skills development discourse needs to go beyond economic benefits and enhance the capability sets of the students. Surprisingly, women students in the study were aware of the benefits:

In a lot of ways, this has helped me to become a better person, to be independent, to stand for myself. This job of electrical engineering is not for men only, we women can work hard and perform better in the engineering jobs and so cannot discourage ourselves and say men can do this job better than me, NO, we must believe in ourselves and achieve better things. (Noni)

For Noni, TVET had contributed to the development of self-esteem and confidence, which she valued. Tumelo also valued being 'independent'. At the time of the interview, she was one of the women students who had managed to secure an internship at a parastatal, which gave her the confidence that she needed to foresee a future of economic independence. She had already started to assist family members with the stipend that she was earning that time. Tumelo said:

I am getting closer to becoming an artisan and being independent. (Tumelo)

Karabo also talked about self-esteem:

And I think, confidence, like self-esteem. To say I am soon to be qualified artisan. I think it [TVET] really empowers young women and it makes them want to be a better person, want to explore, to learn more, to understand things even in life and at home. It helps because you learn to make better decisions in life by being critical of issues. (Karabo)

Puleng mentioned how education had helped her to be independent:

I think being independent. Cause now I am staying alone, there is no family here. So I am learning hard and making my own decisions in life, something that I could not have done at home. (Puleng)

Thato spoke at length about how she had become a better person, capable of making personal decisions and her contribution to society;

If I was not here I would be like sitting at home doing nothing. Sitting there at the corners and doing the things that they do. But now I am a better person, can make my own decisions and also not get involved in such things. I use my time wisely. [Acacia] really helped me. You walk boldly, when you walk down the street there. You feel proud. It improves your

self-esteem. Now I can also help others. In the sense of education. Like I have those kids at home who come to me, 'Sister help us with this' and I can recall that at N1 I did this and I help them. So I am able to contribute to the community, other kids and so forth. If I had not come here, I would not be able to do this. (Thatho)

For these women, acquiring a TVET qualification helped in the development of confidence and self-esteem. Education gave them the confidence that they wanted. Puleng referred to staying alone while her family is in another province and how this had given her the opportunity to make personal decisions on her own. Karabo also spoke about having 'confidence and self-esteem' and becoming a 'better person'. This was important for her, as she was able to 'explore' and 'learn more' in life and at home. For her, TVET education had facilitated being open-minded and not taking things at face value. Thatho talks at length about how people in her community would just sit idle. She had, however, been spared this, as she learnt to use her time wisely. She felt that she could now 'walk boldly', have a sense of pride and use her education to help others as well, for example, through assisting school children in her community.

What emerges from the accounts above is the role that TVET plays in building the capability of practical reason. Some of the women interviewed were able to exercise agency and make use of the opportunities available through their TVET education. In this case, TVET can be considered as a facilitator for these women to live a life they have reason to value. What then is important for us to explore is the extent to which TVET was able to expand this capability in the lives of the women students beyond the college. Coming from very low socio-economic backgrounds and, especially, patriarchal societies, these women really need this capability. The DHET (2013) noted in the White Paper how patriarchy exacerbates the subordinate position of women in and out of the education system. However, an examination of the experiences of the students in TVET in

Chapter 6 revealed that the students were faced with various challenges, which played a role in constraining the capability of practical reason. It was noted in Chapter 6 how men students dominated in class and, in the end, the women students ‘felt alienated’. In addition, there were two cases of sexual harassment from male lecturers, which remained unreported. Some of the women felt that they did not belong in the engineering field and felt out of place owing to common perceptions of the unsuitability of women of women entering it. Although the women felt that their sense of confidence and self-esteem had generally improved, there were times when this capability was eroded, as observed in the previous chapter. For the women in this study, conversion of resources into this valued capability was not to the optimum. They did not reach the stage where they could question the gender norms and stereotypes that marked their experiences in the education system and in society. Critical agency is needed for a woman student to be able to question the patriarchal culture that is still pervasive in the South African context and, in particular, the engineering field. Acceptance of this culture may indicate that the women have not reached the stage of exercising their agency (Walker, 2018). The assumption is that TVET education needs to contribute to what Therborn (2013:41) calls the ‘equality of capability to function fully as human beings.’ This, however, is not the case for the women students in this study. This is the reason why the CA emphasises the need to focus on capabilities, as measurements, such as income, do not tell us about the freedoms that an individual has or the obstacles that they face along the way (Sen, 1999). One such obstacle in this case is gender inequality as noted above.

A capabilities based assessment of women’s empowerment through TVET

Evidence from the list of capabilities that are developed through TVET has shown how neither personal determination nor the availability of resources is adequate for women students to convert

opportunities into valued capabilities. There are a number of circumstances that impact on the development of valued capabilities for women students: gender; social arrangements; pedagogy; and the curriculum. This chapter has, therefore, explored the importance of TVET in developing valued capabilities. It has also investigated how TVET (N6 Engineering in particular) plays a limited role in the development of women students' capabilities. Unterhalter (2003: 12) argues: 'In this world, some forms of education do not enhance freedom, or may do so partially and in contradictory ways.' The use of the capabilities approach as a framework for analysis has helped this study, as the concept of capabilities implies multi-faceted benefits from education in enhancing individual well-being, economic security and social change (Sen: 1999: 293-6). The CA has also led to an understanding that TVET in its present state does not develop valued capabilities for women students to the fullest extent. TVET contributes partially to the enhancement of freedoms for women students. However, a lot still needs to be done in order for TVET to develop and enhance valued capabilities, and thus be used as a tool for women's empowerment. Table 8.2 below summarises the valued capabilities that have been converted into functionings (achieved functionings) and those that have not (aspired functionings).

Table 8.2 Capabilities and functionings

Valued capability	Achieved functioning	Aspired functioning
Capability for work		<p>Finding decent employment</p> <p>Earning a living wage</p> <p>Being able to start own business</p> <p>Finding work without discrimination because of gender</p>
Practical reason	<p>Planning life after college, reflection, independence, career aspirations.</p> <p>Being confident, improved self-esteem</p>	<p>Being encouraged to live a full life.</p> <p>Being able to be involved in political and social concerns of the day and provide solutions</p>
Recognition and respect	<p>Assisting school children in the community with homework</p> <p>Solving electrical problems in the home</p>	<p>Being treated as a dignified human being</p> <p>Not being devalued because of one's gender.</p>

Valued capability	Achieved functioning	Aspired functioning
Occupational knowledge and skills	Having the skills required for further study	Having qualifications needed for entry into the labour market Opportunities for lifelong learning as a woman.
Bodily integrity	Being able to move freely from place to place	Being able to make own decisions about sexual relationships Being free from crime Being able to secure self against assault or violence.
Capability to aspire	Motivation to learn and succeed Hope for a better life	Having a better life, afford what matters and is valued. Being employed/ self-employed Being able to study further Helping family and community
Educational resilience	The ability to negotiate, persevere and succeed	

Valued capability	Achieved functioning	Aspired functioning
	despite adverse conditions and circumstances	
Capability for voice		Being able to express one's views and be listened to, without being laughed at.

In Chapter 3, I examined the concept of empowerment and forwarded a conceptualisation of the term grounded in the capability approach (See Figure 3.1). The conclusion was that for a woman to be considered empowered, all four dimensions of empowerment should be realised: access to resources; autonomy; agency; and well-being. It was clear that one dimension, such as access to resources, alone would not result in women's empowerment. What emerged from the findings is that the extent of empowerment is limited because of various conversion factors. Women's empowerment through TVET needs to be investigated, as it has been seen from the profiles of the students that this type of post-school education tends to attract marginalised, black students from very low socio-economic backgrounds. Thus, the expected outcome of empowerment will eventually lead to reduced inequalities and marginalisation.

However, an examination of the valued capabilities and functionings developed through TVET showed that TVET as a potential tool for empowerment is not able to contribute effectively to women's empowerment. From the eight valued capabilities, it has been seen that the extent to which each of them has been cultivated and nurtured through TVET is minimal. For example, with

regard to the capability for work, constraining factors, such as lack of practical experience, challenges in securing internships, a sexist labour market and the negative perception of a TVET qualification by potential employees, hinder its development to a great extent. Looking at the capability of practical reason, male dominance in class, sexist comments from lecturers, feelings of alienation and sexual harassment all have a negative impact on its development. Findings from this chapter, therefore, add a new outlook on the role that TVET could play in the human development agenda. Empirical evidence from this chapter showed that most of the valued capabilities were developed to a limited extent. This shows that, even though TVET has the potential to contribute to empowerment, as a study by Hilal (2017) in Palestine showed, this cannot be said in the context of this study. Findings demonstrate that a lot needs to be done to overcome the conversion factors that hinder the development of the valued capabilities (See Table 9.1 for the conversion factors).

Resources, such as access to education, can be a step towards women's empowerment. However, access to just one type of resource cannot be taken as empowerment, as has been seen from the findings in this chapter. Thus, even providing access to TVET and funding its institutions to improve staff competencies would also not be enough to ensure empowerment.

Van Der Burg et al. (2011) acknowledge that education in South Africa provides opportunities in this post-apartheid era to counter the challenge of inequality. However, although there is hope for education to change individual lives, transform social structures emanating from apartheid and, eventually, contribute to women's empowerment, findings from this study indicate that TVET as an education system can be seen as actually reinforcing these inequalities. For example, from the experiences of women students in TVET, it was apparent that they faced gendered experiences, such as sexist comments from lecturers, sexual harassment, males dominating in class and

consequent feelings of alienation. This points to a form of education that fortifies a patriarchal system, which is the cornerstone of the South African society. In addition, women still find it difficult to navigate the engineering field because of their gender. The experiences of women students described in Chapter 7 reveal that the labour market remains sexist, and so it becomes difficult for women to develop the capability for work and eventually find work they have reason to value. In the end, what can be said is that TVET education in its present state tends to create and reinforce inequalities. Failure to find employment a woman values, although they are qualified, leads to a perpetuation of income inequalities as well. Women students coming from poor backgrounds hope to overcome poverty and increase their earning potential by studying at a TVET college. However, due to the quality of education that the women students receive there, they end up in a situation where they are less likely to find employment, which would improve their well-being. Therefore, a poverty cycle is likely to develop, as these women from poor backgrounds receive poor quality education, which does not enhance their capabilities, results in very poor job prospects and, ultimately, hinders their social mobility and women's empowerment.

As seen in the conceptualisation of empowerment, Chapter 3, Figure 3.1, empowerment cannot be achieved without the four pillars: access to resources; autonomy; agency and well-being opportunities and achievements. If women do not have the opportunity to achieve their well-being as presented by TVET, then it cannot be seen as playing a significant role in the empowerment of women. Although the South African government considers TVET as a tool for overcoming unemployment, poverty and inequality, this is not the case, as seen from the findings based on the experiences of women students as well as the valued capabilities that are developed through TVET. Thus, despite the reforms in the TVET sector, the findings portray a negative picture of the potential role of TVET as a tool for women's empowerment. This shows that improving access to

resources alone is not equal to women's empowerment (Malhotra et al. 2002; Tripathi, 2011). An increase in the resources would not automatically convert to improvement in the quality of education. Findings from this study point to the lack of quality of education that is being offered by TVET institutions in South Africa. What emerged from the study is that TVET education enhances the capabilities of women students only to a limited extent. Though there are numbers of women who have studied engineering and are economically and socially active as a result of their education, more could be done in order for TVET, N6 engineering course to be effectively used as a pathway out of poverty, and as a means of addressing inequality.

Van Der Berg et al. (2011) observe that the quality of education that one receives is directly linked to the type of employment one is likely to find. As seen in Chapter 2, the TVET sector in South Africa is marred with different challenges that impact on the quality of education offered by these institutions. The disadvantaged will continue to be channeled into TVET because of poverty, poor matric passes and other reasons and, consequently, the poor quality education they receive entrenches inequalities instead of contributing to empowerment. South African academic literature shows that students from disadvantaged and marginalised backgrounds, which are often rural and township, usually attend under-resourced schools. Bozalek, Leibowitz, Carolissen and Boler (2013) refer to these as 'dysfunctional' schools, which make up to 75% of schools. Nevertheless, in spite of this, some disadvantaged students do manage to even qualify for university but, for various reasons, others still end up enrolling in TVET colleges.

For us to be able to say that TVET is contributing to women's empowerment, education needs to effect political, personal, social and economic dimensions of empowerment. Widening access to TVET only is not enough, as it should be accompanied by desirable outcomes, such as the development of valued capabilities. Spaull and Taylor (2014) and Pritchett (2013) explain that the

expansion of access to education is not only about increasing the number of students in classrooms. Spaul and Taylor (2014:1) states that access is also about ‘increasing the number of students acquiring the knowledge, skills, values they need to participate in modern society.’ Thus, while access to a resource (TVET) is a necessary condition to attain women’s empowerment, it is not enough on its own, as all four dimensions mentioned above need to be positively included. Moreover, empowerment through education cannot be measured according to access to, and the enrolment rates of, TVET but through its ability to impart the capabilities that women students have reason to value. The conceptualisation of empowerment presents a focus on the opportunities for women students to live a life they really want. This perspective is important as it compels the government not only to focus on widening access to TVET but to also go beyond and assess the outcomes.

For empowerment to take place, the political, personal, social and economic dimensions of a woman’s life need to be changed in a positive direction. For example, to achieve autonomy and to access the power of decision-making, which emanate from the capabilities of practical reason, on the one hand, and recognition and respect, on the other, women need to succeed in gaining the respect of their families, who should consult them when decisions need to be made. From the findings, it was clear that these capabilities were developed but not to the fullest extent. Women students reported that, through TVET, they were now able to make independent decisions and were in a position of being able to plan their own lives. However, as noted in Section 8.2.2, there were experiences that constrained the development of this particular capability, including sexual harassment, negative comments from lecturers, being laughed at by male students and male dominance in class.

Malhotra et al. (2002) note that agency is important in the conceptualisation of empowerment and that access to resources alone would not contribute to empowerment if women lack the power to act. To reach the stage of being empowered, women should achieve their well-being by being active agents of change, which could involve individual or collective agency. For example, in addition to individual action taken in the pursuit of the lives they have reason to value, students should also be involved in collective action that seeks to address certain issues that matter to them as a group. Thus, Ibrahim and Alkire (2007) conceive empowerment as the expansion of agency (See Section 3.3 of this thesis). As noted in Section 3, the conceptualisation of empowerment in the capability space helps to examine the role of the structural arrangements in TVET and how these can be changed in order to facilitate effective agency for women students. The findings from the analysis of the women students' experiences revealed that institutional arrangements, such as the alienation of women in engineering and male dominance, constrain women's abilities to exercise their agency. For TVET to be used as a potential tool for women's empowerment, changes need to be made in the structural arrangements. An example would be proper handling procedures for sexual harassment, which would encourage women to report it, and thus improve their well-being as students, enhance their experiences of TVET and facilitate the use of TVET as a tool for women's empowerment. Wilson-Strydom (2017:121) contends that 'the CA asks us to broaden our metrics of assessment to take account of how people's lives are going, their well-being or quality of life.' By situating the definition of empowerment in the capabilities space, I was able to understand aspects of TVET as a development intervention and its resulting impact on the wellbeing and empowerment of women students.

I conclude that the four dimensions of empowerment are interrelated and, as noted earlier, for empowerment to be fully achieved, it is necessary that they all are realised in the lives of women

TVET students, in particular. However, not everyone experiences empowerment in the same way and what is valued and viewed as a 'good life' may vary from one woman to that other. For example, levels of agency and the kinds of actions, which women may take to address or achieve a desired goal, may vary based on factors, such as family context, aspiration, background or basic capabilities. The findings of this study indicate that, although TVET expanded the women students' choices in terms of economic opportunities, these opportunities were quite limited because of the highlighted structural challenges. Thus, TVET provides a range of alternative futures only if the constraining factors could be addressed.

Conclusion

This chapter examined the valued capabilities of women students in TVET and explored the extent to which each capability was being developed through TVET. From the list of eight valued capabilities, it was evident that TVET education enhances them only to a limited extent. The list of achieved functionings was also noted to be lower than aspired functionings, which indicates what needs to be changed in order for TVET to be used as a tool for women's empowerment. I also examined how TVET had impacted on the four dimensions of empowerment, which are access to resources, autonomy, agency and well-being. I concluded by arguing that for women's empowerment to be achieved, these four dimensions need to be impacted positively. Thus, there is a lot that can be done for TVET to contribute to women students' well-being and for them to be able to exercise their agency and autonomy. It was noted that access to TVET alone is not adequate in achieving women's empowerment. The next chapter examines possible recommendations for a type of education that facilitates the empowerment of women.

CHAPTER 9: CONCLUSIONS, RECOMMENDATIONS AND THE WAY FORWARD

Introduction

This study set out to investigate the role of TVET in women's empowerment. Thus, I explored the reasons why women enrol in TVET, their experiences while studying at a TVET college and the valued capabilities developed through TVET. The South African government's perception of TVET education, as a solution to three challenges of unemployment, inequality and poverty (DHET, 2012), has driven the research as well. In an effort to suggest that education should equip learners for life in its broadest sense (Nash et al. in Lopez-Fogues, 2014), I employed the CA as a framework in exploring the role of TVET in women's empowerment. Thus, apart from the fact that TVET should address the above three challenges, it was important to explore its other roles besides economic benefits in the lives of women students.

In this study, I adopted the CA framework as an evaluating tool that Robeyns (2003, 2006) considers as most appropriate for the assessment of inequalities, particularly between men and women. The CA is a normative framework that can be used for (i) the assessment of individual levels of achieved well-being and wellbeing freedom; (ii) the appraisal and assessment of social arrangements or institution; and (iii) the design of policies and other forms of social change in society (Robeyns, 2017:24). Thus, the CA emerged as a critique of quantitative measurements, such as those used in assessing improved enrolments of women in engineering studies in TVET colleges. The DHET (2015) Report states the number of women who registered, wrote and completed the engineering N6 part qualification as 6634. This is a significant figure considering that during apartheid in South Africa, engineering studies was almost exclusively a male domain. In this study, therefore, I argue that it is not enough to make funding available to TVET women

students in South Africa on the basis of a mere increase in numbers. Assessments need to go beyond this and explore the issues about what the women students have reason to value or really want. After enrolling in colleges, how do they experience the learning process? After graduation, do they have the opportunities to flourish and improve their well-being? In Chapters 1 and 2, I argued for TVET education that fosters women's empowerment, since women in South Africa could not easily access TVET, especially during apartheid in South Africa. In addition, despite increases in the enrolments of women in TVET, engineering education remains male-dominated. Most women TVET students are studying business, social care and teaching. Not much research had been done in South Africa on the experiences of women students, which is the focus of this study. Previous studies had mainly been focused on the profile of TVET colleges, racial composition of enrolled students, staff complement and curriculum changes. In addition to its focus on TVET women students, my study brings in the dimension of qualitative research, informed by an alternative theoretical framework, the capabilities approach. Thus, the emphasis has, in fact, been on increasing the numbers of students but with special regard to those who had previously been side-lined under apartheid: women; blacks; and minority groups, such as coloureds and Asians. I argued that it is important for the TVET sector to go beyond issues of mere access and also understand how those who have been enrolled in the colleges are experiencing the learning process and how, if at all, they are benefiting from acquiring a TVET qualification, especially in a male-dominated area like engineering. Thus, informed by the capabilities approach, this study sought to examine the impact of TVET in women's lives and the extent to which this form of education contributes to women's empowerment. In Chapter 3, I examined human capital theory, which has generally been adopted as the foundation of skills development policies in South Africa (Vally and Motala, 2014), especially in terms of its shortcomings. After exploring the key

tenets of the CA, I proposed it as an alternative framework for TVET policies and examined how other scholars, for example, Powell (2012, 2014), Lopez-Fogues (2014) and Tikly (2013) have applied it to TVET policies assessments. In Chapter 4, I carefully examined the concept of women's empowerment in relation to the capabilities approach. Different definitions of the concept were explored, and I offered definitions situated in the capabilities space as the most useful for conceptualising empowerment. I also reviewed other scholars' reflections on the link between women's empowerment and education, which led to my concluding that education has the potential to contribute to women's empowerment but needs to be relevant to women students' lives in terms of the following: curriculum; teaching methods; enhancing the development of critical thinking capacities; inspiring them to act; and nurturing a sense of self-worth and self-esteem (Murphy-Graham, 2012, Murphy-Graham and Lloyd, 2016). In Chapter 5, the methodology chapter, I justified the adoption of qualitative research methodology and the case study approach. The study population, sampling methods and the data analysis process were explained in detail in this chapter, whereas Chapters 6, 7, and 8 dealt with the findings. Chapter 6 introduced the participants who took part in the study. The sample consisted of fourteen women students, four lecturers and a college principal. This chapter referred to the general socio-economic backgrounds of the students and the professional qualifications and experience of the college personnel interviewed. Chapter 7 described and discussed the women students' pathways, perspectives, experiences and the reasons why they chose TVET in engineering. Chapter 8 explored to what extent the valued capabilities and functionings are developed through TVET.

9.1 Revisiting the research questions

An analysis using the CA places the women students at the centre of the research in understanding their beings and doings. With a study population of 14 women students, four lecturers in the

engineering department and the college principal, I sought to answer five research questions. The first research question that I answered was the following:

1. Why do women study at a TVET college and why do they choose engineering?

This research question was answered in Chapter 6 which aimed to examine the reasons why women students enrolled in TVET colleges and why, as women, they chose to study engineering, a male dominated career path. My aim was to explore the freedoms and constraints that they had as far as choice of post-school education was concerned. What emerged was that TVET was considered as a last resort by all women students in the study, after unsuccessfully exploring higher education. This depicts the constrained choices and limited options experienced by women from low socio-economic backgrounds as far as choice of post-school education is concerned. The women included in the study were all from such backgrounds and aspired to attend a university or university of technology but ended up in a TVET college owing to, for example, poor matric passes, an inability to afford university fees, dropping out of university for diverse reasons or seeing a TVET college as an indirect route to higher education. With regard to choosing engineering, prior knowledge of the field due to a technical schooling background played a role in the case of four of the fourteen students, who also had poor matric passes and were unable to afford university education.

Parents and family members encouraged some women students to study engineering, as they were responsible for their upkeep, including educational expenses, and they directed their children's career paths. This constrained choices of three of the students, who indicated that they 'never' wanted to study engineering but were under parental or family pressure, especially male figures in the form of fathers and brothers, which shows the persistence of family influence in the lives of some of these women students.

Women students often chose engineering believing that it offered better employment opportunities and could even lead to self-employment. Engineering is mostly held in high esteem because of the perceived freedoms that one anticipates after studying engineering. Thus, more than half of the women students hoped to find good jobs, and therefore improve their socio-economic statuses. Others also had entrepreneurship ambitions and hoped to start their own business, as was the case with two of the students who already had their own businesses. Although these were not in the field of engineering, the students hoped to use acquired knowledge in venturing into the engineering business field. Three of the women students also chose to study engineering because they wanted to challenge prevailing gender stereotypes, that is, engineering is mainly for men and wanted to encourage other women to study engineering.

The findings show that many of the women students who are in TVET institutions are faced by constrained choice as far as choice of post-school education is concerned. There are various reasons for this but the main reason is that TVET colleges in South Africa consist predominantly of students from poor households, who do not have many options in pursuing further education. Thus, the findings also brings to light the issues of social justice in education. Due to one's poor background, one may not be in a financial position to choose post-school education of one's liking. In addition, most of the black women who find themselves in TVET colleges were faced with poor schooling, which meant that they underachieved and may have failed to perform in their final high school examinations because of poorly resourced schools. These factors increase the hurdles that face black women from low socio-economic backgrounds in pursuing further education, which means that they may settle for less than what they desired, as in the case of all of the women in this study for whom the freedoms to choose what they really want in life is constrained due to their

circumstances.⁹ These findings point to the need to increase the opportunities and freedoms that black women from poor backgrounds have in choosing post-school education.

The second research question that I answered is the following;

2. What are the experiences of women students studying engineering at a TVET college?

This question is answered in Chapter 6 of this thesis where I examined the interactions between women students and lecturers, on the one hand, and women students and men students, on the other. Women students mostly revealed that they felt that the lecturers were generally motivating and encouraging, for example, by reminding them of possible future opportunities in the engineering field. In some cases, the positive relationship between students and lecturers helped in the development of self-confidence and nurtured well-being. Most of the students in the study had the opportunity to interact with lecturers, which meant that the conversion of resources into capabilities was enhanced. However, it emerged that there were cases when the freedoms of some of the students to flourish in TVET was limited due to negative experiences such as sexual harassment, feelings of alienation and male dominance in classrooms. For example, there were two cases of sexual harassment. Two different lecturers tried to solicit relationships from two of the women students. One of the students, Mabatso reported that her performance was affected negatively and she ended up failing the course that was taught by the lecturer who wanted a relationship with her. Even though such experiences were quite few, they show that harassment does occur and can have a negative impact on the students' well-being and learning and that women students are exposed to 'unfreedoms' in the education system. This situation was made

⁹ I noted however how the government had reviewed the funding system in higher education in Chapter 6. This review is in favor of students from poor backgrounds. If effectively implemented, this could have a positive impact and is likely to increase the number of students from low socio-economic in universities.

worse by the lack of grievance handling procedures at the institution, which meant that both cases went unreported and no action was taken.

In some cases, women students felt alienated by negative comments from some lectures, which had a negative impact and implied that, as women, they did not belong to the engineering field and that they were not very bright. Findings point to the persistence of culture and attitudes of women subordination and inferiority, especially in a male dominated areas like engineering. Further, evidence suggests that men students participated better in classroom activities, which was supported by comments from both the women students and the lecturers. One student felt that socialisation plays a role in such experiences because girls are not exposed to technical activities at home when growing up, and thus are unfamiliar with tinkering. This means that men students have prior basic, if limited, knowledge about engines, for example, and it is easier for them to participate effectively in learning activities. What exacerbated inadequate participation and the alienation of women students was the lack of practical, hands on experience at the college. The college did not have workshops to put theory into practice, which further alienated women students and adds to the evidence showing that TVET education needs to enhance students' capabilities, leading to women's empowerment.

An examination of the participants' views of the interaction between men and women students revealed that, apart from the tendency of men students to laugh at other students in class especially when they give wrong answer, the relations were largely positive, and it was not clear whether the men laughed only at women. Most of the women students reported that they received support from men students if needed and some even mentioned being friends with them. However, further research is needed to explore gendered experiences in TVET and whether adaptive preferences are

at play. It could be that the women students have accepted and endorsed gender imbalances in the classrooms because they tend to benefit from working with men students (Khader, 2014).

Findings pointed to the challenge of finding internships (See Chapter 1 for the structure of the NATED programme), which most of the women students perceived as a challenge mainly due to engineering firms still being male-dominated and favouring male recruits, who are believed to be more capable. Moreover, as indicated by one woman student, Hazel, pregnancy and childbirth make it difficult for women to get internships. The women students' assertions were supported by lecturers, who concurred that gender played a significant role and women faced hurdles in securing internships and, consequently, employment, although there were three students who felt this was not a challenge. Gender becomes a conversion factor preventing the women students from achieving what they really want, as finding an internship becomes a precursor to employment if students are hired permanently at the same company after it. This means that the internship is not only the practical component of the course but is also a way to find employment.

The findings in Chapters 7 and 8 demonstrate that, while TVET institutions in South Africa have made strides in increasing access for women to predominantly male fields, such as engineering, women still find it difficult to navigate the education system owing to challenges, such as male dominance in the learning environment, which lead to feelings of alienation. Sexist comments from lecturers, the negative attitudes of men students, sexual harassment, and challenges in getting internships are examples of challenges that affect the conversion of resources into valued functionings by women students. Thus, while the DHET, strives to improve the image of TVET institutions, increase funding and provide access, more needs to be done to go beyond these issues and consider interventions that would make the experiences of women in TVET better. Although more research is needed in exploring the experiences of women in TVET in South Africa, this

study may inspire future thinking about what needs to change in order to enhance the opportunities and freedoms of women in TVET.

3. How do these experiences shape the construction of aspirations, agency and well-being for women students?

This research question emanates from the capabilities approach that was used to explore how women students' experiences influence their future goals, ability to act and well-being, which is determined by the freedoms and capabilities available to them (Loots and Walker, 2015). The ultimate aim of this investigation is to understand the extent to which TVET has contributed positively or negatively to the lives of the women students. Interactions between women and men students and lecturers illustrate that the aspirations, well-being and agency of the women were not being realised fully. For example, lecturers who passed sexist comments and discouraged women students alienated them from the engineering field where they were perceived as not being as capable as men. This particularly affected the well-being of the students, who suffered as a result of the unhealthy relationships between students and lecturers. Moreover, some women students had stopped participating in class because men students would laugh at them, which affected their ability to learn effectively, as they could not ask questions. This kind of relationship affected their self-esteem, self-worth and aspirations as well. For example, a lecturer who continued to remind women students that, even if they acquired a qualification, they would not be able to find work, simply reinforced gender stereotypes and inequalities. This behaviour does not encourage women to pursue a life they have reason to value and, thus, women students may not aim high because it has been ingrained in them that they are inferior to men. Moreover, these assertions on the part of lecturers may influence the women students' ability to exercise their agency, even later in life, in choosing the life they really want.

Sexual harassment affects students' well-being and learning experiences (Loots and Walker, 2015), as highlighted by the woman student, Thatho, when referring to her sexual harassment experience, after which she had reduced interactions with male lecturers owing to fear of experiencing the same with others. The experience robbed Thatho of the opportunity to learn more from lecturers by forming productive relationships. It was also noted how another student, Mabatso, failed a course taught by a lecturer who had sexually harassed her, had to repeat it, and only passed after being taught by a woman lecturer. These examples demonstrate how sexual harassment affects not only the well-being of students but also the agency. Thus, if such practices are not addressed, it means that some women students' well-being will continue to be compromised. Women need to be seen as active agents of change.

Challenges in finding internships affect the aspirations of the women students, as noted in Chapter 6 with regard to how most of the students acknowledged this challenge, and therefore had become pessimistic about their futures. Education needs to provide economic opportunities that matter to an individual (Bonvin and Farvaque, 2006; Lopez-Fogues, 2014). However, most of these women students felt that it would be difficult to obtain valued positions of employment owing to the perceived sexist nature of the labour market. In addition, a lack of workshops at the College meant that they were not being equipped with the necessary skills. Moreover, as the College only provided theoretical knowledge, their aspirations were further affected in that they did not have the required competences for future internships and employment. Thus, from a CA perspective, it is important for students to be adequately equipped to choose a life they have reason to value. Thus, engineering education should also advance human well-being (Walker, 2015), which it is not doing, considering the experiences of some of the students in this study.

Education has the potential to develop aspirations or the capability to aspire (Baker, 2017); yet, the development of the aspirations of the women students in the study were constrained. In the case study, the ability of women to aspire to a life they have reason to value was limited mainly by gender inequality in TVET and the labour market. Leathwood (2006: 166) claims that post-school education, in particular vocational education, has been marred by issues of gender inequality in terms of access, participation and outcomes, which indicates the need for a type of education that challenges such practices (Stromquist, 2013). If stereotypes about what women should and may do persists in TVET, women's empowerment will not be realised and the marginalisation of women and gender inequalities will be perpetuated. The experiences reported in this study are not unique to TVET, as research points to women who venture into traditionally male domains, such as engineering, have difficulties in being accepted, and feel insulted or diminished (Arnot, 2002; Kenway et al. 1994, Leathwood 2006).

The study of the women students' experiences, which had an effect on their aspirations, agency and wellbeing, also reveals that they were aware of educational opportunities. The students were also cognisant of discriminatory conduct, such as sexist comments and sexual harassment. Although these experiences differ from one woman to another, it can be said that the structural and social arrangements of the education system still do not expand individual agency, freedom and opportunities to the fullest extent. There is, therefore, a need to reduce the effect of conversion factors, such as sexual harassment, male dominance and sexist comments, so that TVET can be used as a tool for women's empowerment. Conversion factors are the factors which determine the degree to which a person can transform a resource into a capability and ultimately a functioning (Robeyns, 2017: 45). It is important to look at conversion factors, especially for students, as the analysis enables us to know what people are able to do and to be as well as know the constraining

factors. Robeyns (2017:47), therefore, argues that ‘the advantage of having a clear picture of the resources needed and the particular conversion factors needed, is that it also gives those aiming to expand the capability sets information on where interventions could be made’. For the women students in this study, some of the conversion factors with negative effects, such as sexual harassment, can be addressed through policy. Lack of practical experience can be addressed through curriculum changes.

The next question that was answered was about the development or the enhancement of valued capabilities for the women students. The research question was:

4. What are the valued capabilities for women engineering students in TVET? To what extent are these capabilities being developed?

Chapter 7 answered this question, the aim of which was explore how TVET had expanded or contracted the opportunities and freedoms for women students to live the lives they have reason to value. Thus, from the findings I was able to extrapolate the following capabilities;

Table 9.1 Capabilities and conversion factors

Capability	Enabling conversion factors	Constraining conversion factors
1. Capability for work	<ul style="list-style-type: none"> ▪ Knowledge and information ▪ Employment opportunities in the engineering field 	<ul style="list-style-type: none"> ▪ Challenges in getting internships ▪ Lack of practical experience ▪ Reduced employment chances
2. Practical reason	<ul style="list-style-type: none"> ▪ Improved personal confidence and self-esteem ▪ Personal independence 	<ul style="list-style-type: none"> ▪ Male dominance in class ▪ Sexist comments from lecturers ▪ Feelings of alienation ▪ Sexual harassment
3. Recognition and respect	<ul style="list-style-type: none"> ▪ Being able to assist students in the community with homework ▪ Solving electrical problems at home 	<ul style="list-style-type: none"> ▪ Sexual harassment ▪ Negative comments from lecturers ▪ Male dominance in class
4. Occupational knowledge and skills	<ul style="list-style-type: none"> ▪ Acquisition of knowledge and information, a TVET qualification 	<ul style="list-style-type: none"> ▪ Lack of practical experience, due to unavailability of workshops at the college ▪ Challenges in finding internships ▪ Lack of funding for further education ▪ Reduced employment chances

		<ul style="list-style-type: none"> ▪ Lack of information about progression routes
5. Educational resilience	<ul style="list-style-type: none"> ▪ DHET funding ▪ Family support and networks ▪ Personal determination 	<ul style="list-style-type: none"> ▪ Poor schooling ▪ Sexual harassment ▪ Negative comments from lecturers ▪ Poor performance in some courses ▪ Male dominance ▪ Too much workload
6. Capability to aspire	<ul style="list-style-type: none"> ▪ Family support and network ▪ DHET funding ▪ Personal determination ▪ Excellent performance at college 	<ul style="list-style-type: none"> ▪ Poor socio-economic background ▪ Poor job prospects ▪ Challenges in getting internships ▪ Negative comments from lecturers ▪ Lack of funding for further education
7. Capability for voice	<ul style="list-style-type: none"> ▪ Personal confidence and self esteem ▪ Support from lecturers ▪ Gaining knowledge and information 	<ul style="list-style-type: none"> ▪ Pedagogical approaches ▪ Male dominance ▪ Sexual harassment ▪ Lecturers' negative comments
8. Bodily integrity	<ul style="list-style-type: none"> ▪ Personal independence 	<ul style="list-style-type: none"> ▪ Sexual harassment ▪ High crime rates

5. What needs to change in TVET in order to foster women's empowerment in and through TVET?

My starting point in answering the above research question was to look at issues of access to TVET. In Chapter 6, I identified the reasons why women students ended up in TVET, which generally involved constrained choice. This is, however, beyond the realm of the influence of TVET institutions and may require government intervention. I also noted that the main reason that more than 50% of the students from my sample entered TVET was a poor matric pass. Although there are many factors that lead to poor passes, what emerged from the findings is that TVET colleges generally attract students from poor backgrounds, who have gone through poorly resourced schools. Interventions should, therefore, try to offer solutions taking into consideration the historical context of South Africa. There is a need for the government, through its structures, to continue to support schools especially in rural areas and townships, from where most of these students come. This would mean that students coming from poor backgrounds have the same opportunities to perform in schools as affluent scholars, and it increases their chance to access higher education. If students have good matric passes, they are able to make genuine choices about which post-school education institution to attend as well as what to study. Poor matric passes have been seen to confine students to choosing TVET colleges, which they did not want in the first place.

In Chapter 6, I noted how a number of students failed to access higher education because of lack of funding. Coming from low socio-economic backgrounds meant that they could not afford university fees, even though they had good passes. Such an issue falls into the realm of the government to address, as education needs to be accessible to everyone according to the South African constitution. Funding should be extended to those who really deserve it, but the challenge is that, in South Africa, demand often outstrips supply, and the government is not able to support

everyone. Although there is funding in place, this should be monitored so that it benefits those it is supposed to target, the poor students with higher educational aspirations. If no action is taken, TVET colleges in South Africa will continue to attract socially and economically disadvantaged students, who in most cases are black. This leads to the replication of inequality in the education system.

In addition, experiences of women students, which include sexual harassment, male dominance in classrooms, and sexist comments by lecturers, will continue to result in the continued subordination and subjugation of women. Though these experiences were reported by a relatively smaller population of students interviewed, it may point to the existence of patriarchal tendencies that continue to persist in the education system. Instead, there should be support structures for women students so that, when they experience sexual harassment for example, appropriate action should be taken, even if the perpetrators are lecturers. Institutions should have channels of grievance handling so that the women students' educational experiences are positive. To summarise, issues of gender experienced by women students should be addressed through institutional, pedagogical and policy changes in order to enhance their freedoms and to ensure that TVET is used as a tool for women's empowerment. Although the DHET (2013) claims that education and training in South Africa should be accessible regardless of social class and gender, data from this study shows that in TVET, these inequalities continue to persist and need to be addressed; however, this requires political will (Butler and Ferrier, 2000). TVET colleges should put in place interventions to improve the well-being of women students and provide an environment conducive to equal participation irrespective of gender. Lecturers should embrace pedagogical methods that do not exclude women students, and engineering classes should cease

to promote the labeling of engineering as a masculine subject. Women students need encouragement and their contribution to the learning environment should be valued.

Vally and Motala (2014) maintain that, if education and skills development in South Africa continues to be informed by the human capital theory, the social roles and purposes of education will continue to be sidelined. Instead, education and skills development should have both intrinsic and instrumental benefits and, students in TVET institutions need to acquire ‘deeper disciplinary knowledge in particular domains’ Motala and Vally (2014:34). This is not currently the case, as reiterated in Chapter 7 where it was seen that the capabilities of work and professional knowledge were not developed to their full extent in most of the students.

Government responsiveness should focus on the needs of the students instead of the labour market. Thus, women students’ capabilities of recognition, respect, confidence, personal empowerment, aspirations and resilience, which are just as important as the capability of work, should be enhanced through education. Although employers may not be keen on developing these capabilities, they are especially important to women students and need to be fostered through TVET, which should contribute to societal development and go beyond the discourse of skills development. By adopting the capabilities perspective, the benefits of TVET can be measured in terms of what students have reason to value. Policy changes, therefore, should focus on issues that need redress and enhance practice that fosters the development of capabilities and removes the negative conversion factors that hinder their enhancement. In order to address the issues of underemployment and unemployment of TVET graduates, the required capabilities need to be developed. Baatjes et al. (2014) acknowledge the need for curriculum changes to ensure the learning of skills that are not only appropriate to the requirements of the labour market but also to the students in terms of social skills. In fact, the adoption of an instrumental view of education

deprives students of a socially useful skills training programme that would enhance both occupational and social opportunities for students and could be achieved by revamping curriculum and pedagogical approaches. Baatjes et al. (2014: 94) emphasise the type of vocational education that ‘support(s) all citizens with opportunities for intellectual growth, vocational enrichment and social improvement.’ In light of the findings of this study, education that develops the whole person could contribute to women’s empowerment.

This section of the study has looked at different experiences of women students in TVET as supported by evidence described in Chapters 5, 6 and 7. It was noted that access to, and participation, in TVET and the labour market are still marked by gender and social inequalities. Therefore, I suggested different ways for policy makers and planners to improve the well-being of women students. I also pointed out that adopting the capabilities approach might be helpful, as the proposed nine capabilities valued by women students in TVET could become a framework for debates on improving their situation. This might not only contribute to the well-being of women students but also address issues of social justice and ensure women’s empowerment through education.

9.2 Contribution of the study

Over the last few years, there has been considerable promotion of TVET in South Africa in the form of increased funding, investment in infrastructure, improving the working conditions of staff and encouraging enrollment in colleges. This has meant that more women are now being enrolled into predominantly male fields, such as engineering. However, the system has continued to be informed by the human capital theory, as the idea behind investing in TVET is to boost skills development, which might lead to employability and economic growth (Baatjes et al. 2014; Wedekind, 2014; McGrath, 2012).

In line with the need to come up with alternative normative theories that inform educational policies, I examined the experiences of women students from a CA perspective. Using the CA not only contributed to theoretical ways of viewing TVET but also to a different way of seeing women students, who should be pursuing an education they have reason to value and not only seeking qualifications for future employment. This study, therefore, makes a contribution to literature on TVET and women's empowerment. In Chapter 2, I noted how qualitative research is an emerging phenomenon in research on TVET in South Africa. This means that my study, by putting the voices of women students at the forefront to understand their experiences, a concept that has not been dominant in research on TVET, contributes effectively to literature on TVET in the country.

My argument was that education should not only contribute to employability and, consequently, economic growth but also to improving the well-being of women students. Thus, I came up with a list of capabilities that women students collectively value. These capabilities tell us about the role of education, which should be multi-dimensional. The analysis showed that the human development approach goes beyond the potential economic benefit of education. Therefore, it is important to embrace an approach that strives to enhance the capabilities of students. The desire to increase employability tends to reproduce inequalities and conceal injustices in the TVET sector, which impacts on the well-being of students. My findings, therefore, point to the need to divert focus from the concept of employability and economic growth only in order to foster human well-being. The experiences and perceptions of the lecturers and students brought to light the need for the adoption of a social justice framework as an informant of TVET policies and a move away from a human capital approach to a human capabilities perspective.

Research informed by the CA also helped me to understand that sometimes individuals do not have the opportunities to make genuine choices. It then becomes necessary for relevant intervention to be taken to improve the opportunities of individual women to choose a life they have reason to value. The young black women in this study showed that they lacked the opportunity to make valued choices about post-school education but they, nonetheless, managed to navigate TVET. Further research may be needed, but this study revealed how these women could benefit if they had the chance to make effective choices concerning their lives, and structural challenges could be addressed through government intervention.

Although much has been written on the role of education in women's empowerment and women's experiences of TVET, combining these two topics and adopting the CA approach in the study is my original contribution to literature. Combining the viewpoints of both women students and lecturers also offered a new perspective in viewing the value of education in women's lives, and thus provided a new understanding on the role of TVET in women's empowerment. By using the CA, I was able to identify the capabilities valued by women students in TVET. In addition, various positive and negative conversion factors were analysed to understand how the realisation of students' well-being is enhanced or constrained. Such an analysis goes beyond the quantitative measures predominantly adopted in TVET in South Africa.

This study makes it clear that education can contribute to women's empowerment, and thus contributes to available literature on the topic (see Murphy-Graham, 2012; DeJaeghere and Lee, 2011; Murphy-Graham and Lloyd, 2016). Although faced with a lot of challenges within the education system, TVET has provided a way for women students to lead the life they have reason to value. Benefits, such as individual autonomy, aspirations for a better future, having a voice, gaining knowledge, and learning skills were reported by some students. By examining the potential

role of TVET, I also suggested ways in which opportunities and freedom for women students could be expanded, which is especially important for women students who come from poor backgrounds. Thus, education can provide an opportunity for women to achieve their well-being.

9.3 Limitations of the study and future directions in research

There are a few limitations to this study that need to be acknowledged. My case study is an urban TVET college in one of the provinces of South Africa, which means that findings from this study cannot be generalised to other institutions, especially those that are not performing well or are in rural areas. Although I made an effort to interview women students and a few lecturers, the views of the participants in this study cannot represent those of other TVET colleges. In addition, the women students that I interviewed were from one discipline, the Engineering NATED programme, which means that the experiences reported may be confined to this particular discipline and programme. A study conducted with students from a different discipline or a different programme may yield different results. Thus, further questions are raised as to whether the experiences would have been different if the study population had been mixed in terms of gender and area of study, or if the college was a private institution. All these questions should direct future research that could attempt to address them.

The qualitative research methodology that was adopted for this study could have been combined with other methods, such as participant observation. By being an observer, I could have seen first-hand some of the experiences of women students and learnt how the participants interpreted the events. I was not able to see classroom interactions, for example, which could have brought a new and enriched perspective on the experiences of women students in the learning system. In this study, I did not include the views of men students. Although I interviewed male lecturers, it would be beneficial for future research to include the views of male students. Further analysis is also

needed to understand lived experiences when accessing the labour market for these women students. Although I was able to follow up students after their studies, it was not enough to gain the needed understanding of the challenges women face in accessing the labour market. The other shortcoming is that I was not able to interview employers. The views about the labour market were from students and lecturers who believed that women find it difficult to get jobs and internships because of their gender. For future research, it would be beneficial to gain more by including employers in the engineering field. There is a need to investigate the complex relationship between skills development and employability. Moreover, further examination is required of the extent to which women students are able to exercise their agency or to have opportunities to flourish outside the college system.

9.4 Final word

This thesis has in some way addressed issues of human development in the TVET sector. As the South African government continues to invest and support the skills development sector, it is important to examine the benefits of investments, which should not only be economic. A study of the experiences of women students clearly reveals that they wanted more than just jobs. Women students valued other benefits, such as confidence, the ability to speak out and be heard, autonomy and being able to contribute to their societies and families. Thus, by conducting this study, I provided an alternative way of thinking about the role of TVET, particularly engineering education, in the lives of women students.

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APPENDICES

APPENDIX A -Interview guide for Women students

Theme	Guiding Questions
Biographical information	<p>Tell me more about yourself.</p> <p>Age, Schooling, Grades, Family structure, marital status, children, highest education for parents, siblings information; anyone done post-schooling, home language, ethnic background, value placed on education, division of labour in the home. How she came to study engineering and why at a TVET college?</p> <p>Contact information: phone and email address.</p>
Experiences in the TVET education	<p>Learning experiences</p> <ul style="list-style-type: none"> • What is it that you like about the curriculum of the engineering course? • Is there anything that you dislike about the curriculum? • Explain to me the general composition of your class in terms of gender. Does this play a role in your learning experiences? • Explain to me the gender composition of the teaching staff in the engineering department. Does this influence your learning experiences? • Tell me more about the interaction between the students and the lecturers.
What valued capabilities are being developed	<ul style="list-style-type: none"> • Apart from the technical and academic benefits; do you think you gained the opportunity to learn about life issues and dealing with social challenges? Explain.

<p>through TVET education?</p>	<ul style="list-style-type: none"> • Do you think you have managed to grow as an individual and become able to evaluate everyday life experiences independently? Explain. • Do you think you have gained socially useful education from TVET education? • Has TVET education enhanced your role as a citizen in society? Explain.
<p>The transformative role of TVET education.</p>	<ul style="list-style-type: none"> • What do you intend to do after completing your diploma? Do you foresee any challenges? • What has TVET education enabled you to achieve or hope to achieve? • Explain to me the opportunities for social improvement that you have gained through TVET education.
<p>What needs to change in TVET education?</p>	<ul style="list-style-type: none"> • What changes would you want in order to make the experiences of women students better? • Anything you would want to share about your experiences as a woman student?

APPENDIX B. Interview guide for Lecturers

<u>Theme</u>	<u>Guiding questions</u>
Background information	Subjects taught, Qualifications, Work experience; any other relevant information.
Experiences with female students	<ul style="list-style-type: none"> • Can you talk about the participation of man and women students in your class? • Do you think women participate effectively?
Curriculum and the teaching methods and capabilities.	<ul style="list-style-type: none"> • Explain to me what kind of teaching method you find effective? • What is it that you like about the curriculum and teaching methods in the engineering department? • What is it that you do not like and why? • What do you think about the curriculum, according to you, does it meet the requirements of the female students? If so, how? • What do you think can be improved in the curriculum and teaching methods to equip female students for life in its broadest sense?
Views on TVET	<ul style="list-style-type: none"> • What do you think should change in order to make the learning experiences of women students better?

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APPENDIX C. Interview guide for Principal

INTERVIEW GUIDE

Thank you _____ for your time today. I need to thank you again for your assistance and willingness to work with me during my research. I managed to interview 14 women students doing N6 and 4 Lecturers in the engineering department. At the moment I am writing about the findings. I really appreciate your facilitation.

The purpose of this interview is for me to gain more insight about gender issues in TVET. I will also share with you some preliminary findings from the interviews.

Background Information	<ul style="list-style-type: none"> ➤ Qualifications? ➤ Experience in TVET. How long have you been the Principal? ➤ What changes have you seen in your time as the Principal?
Gender and TVET	<ul style="list-style-type: none"> ➤ Can you please explain to me the college Gender Policy? ➤ How important is gender in strategic planning and operations of the college and why? ➤ Has there been any specific interventions to bring women students into engineering? ➤ Which challenges does the college experience in the area of gender (broadly)? ➤ Which challenges does the college face within engineering education? ➤ Has any other research (formal or informal) been done on gender issues at the college, on women students or on women in engineering?
Curriculum and teaching methods	<ul style="list-style-type: none"> ➤ What can be improved about the curriculum and teaching methods to equip women students for life in its broadest sense? ➤ What challenges are there with the curriculum and pedagogy in TVET? ➤ What challenges are there with the curriculum and pedagogy in engineering education? ➤ How are staff prepared to manage gender issues? ➤ What staff professional development activities are being implemented in the college? ➤ What steps do you take in order to foster practical skills development in students? <ul style="list-style-type: none"> ➤ What about skills like critical thinking? ➤ Has the college had to deal with any disciplinary issues regarding gender?

Preliminary findings (Students' Experiences)	<p>Perhaps the most consistent challenge raised by all the students interviewed was that of a lack of practical experience, the challenge of not having workshops and difficulties getting internships. Is this something the college is aware of?</p> <ul style="list-style-type: none"> ➤ Do you think there is any difference for men and women students? Explain, why or why not. ➤ Does the college have any measures in place to deal with this challenge? ➤ What effect does this lack of practical experience have on graduates looking for employment? ➤ The entrepreneurial center - progress, plans, when will it open, what opportunities might it provide for women engineering students? ➤ Business skills training for students? Some students say they need them to start their own businesses.
Lecturers	<p>Several of the interviews pointed to challenges regarding the lecturers in engineering, for example, lecturers who do not have sufficient training or background in engineering, as well as strikes by lecturers.</p> <ul style="list-style-type: none"> ➤ Can you comment on these specific issues and any other things that are relevant in terms of lecturing staff?
Funding	<p>We all know funding is a major challenge in the post-school sector. The students I interviewed noted that they were grateful for government funding.</p> <ul style="list-style-type: none"> ➤ Can you tell me about more about student funding at the college? ➤ How has the TVET sector been affected by the fees in higher education announcement? ➤ Do all students qualify, is there specific funding available for engineering students? ➤ In your view, is the funding provided by government sufficient to meet the needs of students, why, why not?
	<p>Emerging findings about women's empowerment and engineering education so far point to the fact that TVET provides some form of empowerment in economic and social terms. Students however, do not feel empowered personally as in confidence building, critical thinking or communication skills. Can you comment on that?</p> <ul style="list-style-type: none"> ➤ Any other comments on TVET and women's empowerment? ➤ Is there anything important about women and engineering education in the TVET sector that I have not asked about?

THANK YOU SO MUCH FOR YOUR TIME AND INSIGHT.

APPENDIX D. FLYER FOR RECRUITING PARTICIPANTS

Supervisor: Dr. Merridy Wilson-Strydom
The University of the Free State
Center for Research in Higher Education and Development
Phone: 051 401 9856 / 7566
Email: wilsonstrydomMG@ufs.ac.za

Researcher: Sophia Matenda
The University of the Free State
Center for Research in Higher Education and Development
Benito Khotseng Building
Cell: 0619 266 065
Email: sophia.matenda@gmail.com

Dear Participant

My name is Sophia Matenda and I am a PhD student at the University of the Free State. I would like to invite you to take part in my research study: **The role of technical and vocational education and training in women's empowerment: a capabilities perspective**

The study aims to understand the experiences of women students who are studying engineering here at [redacted] College. There has been an increase in the number of women who study engineering at TVET colleges so the study seeks to understand what women go through as they access and participate in this college and to learn more about the contribution of engineering studies to women's empowerment. The study aims to understand whether engineering education is contributing to the creation of opportunities for the women students to live the lives they have reason to value, (women's empowerment).

If you would like to participate in the study or if you want to know more about the study please feel free to contact me using the above contact details.

Yours sincerely,

SOPHIA MATENDA

APPENDIX E. INFORMED CONSENT

Supervisor: Dr. Merridy Wilson-Strydom
The University of the Free State
Center for Research in Higher Education and Development
Phone: 051 401 9856 / 7566
Email: wilsonstrydomMG@ufs.ac.za

Researcher: Sophia Matenda
The University of the Free State
Center for Research in Higher Education and Development
Benito Khotseng Building
Cell: 0619 266 065
Email: sophia.matenda@gmail.com

Date: 12 September 2016

INFORMED CONSENT: FOR WOMEN ENGINEERING STUDENTS

Dear Participant

I would like to invite you to take part in this research study: **The role of technical and vocational education and training in women's empowerment: a capabilities perspective**

The study aims to understand the experiences of women students who are studying engineering here at [redacted] College. There has been an increase in the number of women who study

engineering at TVET colleges so the study seeks to understand what women go through as they access and participate in this college and to learn more about the contribution of engineering studies to women's empowerment. I am requesting you to take part in this study because you are an engineering student here at [redacted] College. It is important to understand the experiences of students.

These range from gendered experiences, learning experiences; with the curriculum and teaching methods, experiences interacting with the lecturers and other students. The study aims to understand whether engineering education is contributing to the creation of opportunities for the women students to live the lives they have reason to value, (women's empowerment).

This will help in recommendations on how TVET education can be used as a vehicle to foster women's empowerment and to emphasise on the other roles that TVET can play apart from economic development. There are no major risks in participating in this study. The information you provide will be used for the purpose of this study and your identity will not be revealed in reporting the results for anonymity and confidentiality reasons, names are not going to be used in the final research document. The interview will not take more than two hours.

All the recorded material will be kept locked and disposed of once the data analysis is done. You may benefit from this study as a woman student because the information gathered will help in bringing to the light the experiences of women as they participate in TVET engineering education since this can lead to some policy changes in order to make these experiences better. This may not benefit you directly but other students at TVET institutions and the country at large.

While I greatly appreciate your participation in this study and the valuable contribution you can make, your participation is entirely voluntary and you are under no obligation to take part in this study. If you do choose to take part, and an issue arises which makes you uncomfortable, you may at any time stop your participation with no further repercussions.

If you experience any discomfort or unhappiness with the way the research is being conducted, please feel free to contact me directly to discuss it, and also note that you are free to contact my study Supervisor (details above). Should any difficult personal issues arise during the course of this research, I will endeavor to see that a professional is contacted to be able to assist you.

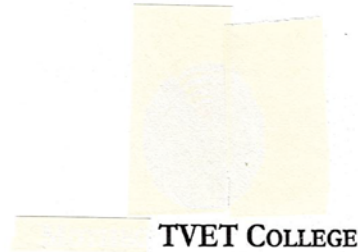
Yours sincerely,
SOPHIA MATENDA

APPENDIX F. PERMISSION TO DO RESEARCH



higher education
& training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA



15 September 2016

Ms Sophia Matenda
PHD Student
Bloemfontein Campus
University of Free State
Bloemfontein
9301

Dear Madam

Permission to do research

Your request to do research on the following topic was approved by the management of the institution: **"The role of technical and vocational education and training in women's empowerment: a capabilities perspective"**

The researcher will protect the participants as well as institution and will secure that no harm or damage will be caused to the institution in the research process. The researcher must provide a copy of research article to the college.

The College wishes you success with all your research efforts.

Yours sincerely



The Principal

APPENDIX G. CODE BOOK

CODE	DESCRIPTION
Benefits from TVET	Any references to positive outcomes from TVET.
Decision making	Any decision about pursuing post school education, choice of subjects, career, about working hard.
Employability	Expressions of employment chances/challenges in the future.
Family	This includes all the information about participant's parents' level of education, employment status, participant's domestic responsibilities and information about siblings.
Future Plans	Any goals, plans for the future, career ambitions material ambitions, transformation of self, family, helping others.
Funding	Any information to do with finances, fees, educational expenses.
Gender	Anything about relationships, experiences, and achievements of boys and girls, men and women.
Great quotes	Intriguing quotations

Hard work	References to how hard students work at college.
Information	Access to information about subject choices at post- school level, course to study.
Personal change	Expressions of personal change or not.
Schooling	Where one attended school, type of school, preparation for post- school education etc.
Self- determination	Expressions of how a student takes control of her life.
Teaching, studying, academic progress, facilities and resources	<p>Quality of teaching, methods, contact hours and assessments.</p> <p>Time spent, where, when, relationships with lecturers and students.</p> <p>Knowledge on subjects being studied, passes.</p> <p>Workshops, labs, computers, buildings.</p>
Voice	Occasions where one speaks out, becomes active, challenge and confront.