Experiences of women students in Engineering studies at a TVET college in South Africa

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ABSTRACT

This article explores the experiences of women students in an Engineering programme at a South African technical and vocational education and training (TVET) college. Drawing on the capabilities approach as the study's theoretical framework, the author interprets what women go through as they navigate college and transition into the labour market. While there is a growing literature on post-school education, particularly on TVET, few studies focus on the experiences of women students in traditionally male-dominated programmes such as Engineering. Furthermore, South African education and training policies since 1994 make reference to a commitment to resolving the inequalities under the previous apartheid government, specifically with regard to gender inequality. Through a case study approach, the research reported on in this article sought to understand how the democratic government's commitment to social justice was being implemented and experienced on the ground, and, more particularly, whether it is improving the position of women students. Qualitative data obtained through in-depth interviews were collected in two phases from 14 women in their final trimester of the National Accredited Technical Education Diploma (NATED) programme and about six months after that. The findings show that the students face various challenges while they persist with their education, and also in obtaining either internships or employment. By highlighting the experiences of women in TVET, it is hoped that this understanding will help to persuade the government to embrace social justice in the post-school sector so as to enhance the study and employment opportunities of women who enrol in Engineering.

KEYWORDS

Technical and vocational education and training (TVET); post-school education; women students; social justice; capabilities

Introduction and background

The development of technical and vocational education and training (TVET) in South Africa can be traced back to the apartheid era, when the growing mining industry required trained artisans and technical colleges were instituted to provide skills training (Badroodien, 2004). The training of mining engineers began at the South African College (now the University of Cape Town) and catered exclusively for whites (Barnes, 2004). It was not until the mid-1970s, however, that African black[1] students were admitted into skills training, but this training was offered at segregated institutions of a poorer quality and which were less well-resourced than the comparable institutions for white students. Badroodien (2004:21) notes that 'TVET has always been characterised by apartheid education, located within a salvation paradigm for the poor whites, Africans and coloured urban workers'. Although colleges were established in rural areas, these were meant to provide skills for rural black people and to prevent urban migration (Badroodien, 2004). Not only was technical and vocational education racially segregated; women could also not easily access training in courses such as Engineering until after the end of apartheid (McGrath, 2004).

The 150 technical colleges that existed in 1994 were merged into 50 institutions in terms of the Further Education and Training Act 98 of 1998. These institutions then became more diverse in their racial composition. TVET colleges have since been placed at the core of artisan development in South Africa and are projected to support industrial and economic growth (DHET, 2013). During the past 20 years, there have been extensive policy changes and financial investment in the sector in order to expand access to skills development irrespective of race or gender. Table 1 shows the enrolment of students in public TVET colleges in South Africa by gender and qualification type (explained below) in 2017.

Table 1: Enrolment cycle count of students in TVET colleges by qualification category and gender (DHET, 2019)

Qualification Category	Female	Male	Total	Female (%)	Male (%)
NC(V)	90 099	52 274	142 373	63.3	36.7
Report 191 (N1–N6)	282 609	227 544	510 153	55.4	44.6
Occupational qualifications	6 677	4 292	10 969	60.9	39.1
Other	13 116	11 417	24 533	53.5	46.5
Total	**392 501**	**295 527**	**688 028**	**57.0**	**43.0**

1 This terminology is being used in its historical sense and it does not imply acceptance of such racial categorisation.

The South African government, through the Department of Higher Education and Training (DHET), has restated its commitment to promoting social justice in the post-school sector. In a White Paper (DHET, 2013), the government identifies the injustices in the education sector perpetrated by the apartheid government, the legacy of which will require some effort to overcome. Poor black people are still 'being served by [lower-quality] public services and institutions, than the well-off' (DHET, 2013:4). In addition, patriarchy affects young women's experiences even in the education sector (DHET, 2013:4). In the light of the TVET background described above and the country's social justice agenda, this article draws attention to the experiences of women students at a public technical and vocational college.

The next section outlines a working definition of social justice and some key concepts associated with the capabilities approach (CA) which has framed the research. Key tenets of the CA, such as capabilities, functionings, well-being, freedoms and agency, are briefly explained before the method that was employed in the study is described. The empirical findings are then presented, followed by a discussion and the conclusions drawn.

What is social justice?

Brennan and Naidoo (2008:287) argue that the term 'social justice' and other terms such as 'social equity' have no precise definition, although they commonly have a '[feel-good] flavour to them'. Zajda, Majhanovich and Rust (2006:13), on the other hand, suggest that the question ,'How can we contribute to the creation of a more equitable, respectful, and just society for everyone?' is, in effect, a definition of that term. The authors add that:

> Most conceptions of social justice refer to an egalitarian society based on principles of equality and solidarity, that understands and values human rights, and that recognises the dignity of every human being (Zajda et al., 2006:10).

It is reasonable to assume, therefore, that for a government to claim a commitment towards a socially just society, policies should reflect this and should 'ensure a more equitable and fair[er] access to resources, and socially valued commodities' (Zajda et al., 2006:10). Education is one such socially valued commodity, as it is also guaranteed in the Constitution of South Africa; and policy would need to aim at removing inequalities of gender, race and social class. Whereas the rhetoric about the value of TVET in South African policy has been pervasive, the low status that is accorded to TVET may disadvantage those who choose this route, even though a socially just education system should enable all learners to achieve their full potential regardless of their background.

Tikly (2011) argues that the social justice framework is based on three basic principles that can also be used to evaluate an education system. The first is that education should be inclusive and that, in order to achieve social justice, all learners should achieve specified learning outcomes. This goes beyond access to a resource such as education: it needs to

extend to 'overcoming economic, social, and cultural barriers that prevent individuals and groups from converting these resources into desired outcomes' (Tikly, 2011:91).

The second principle is the relevance of education: learning outcomes should be 'meaningful to all learners, valued by their communities and consistent with national development priorities in a changing global context' (Tickly, 2011). The third principle is that 'education should be democratic, in the sense that learning outcomes are determined through public debate and ensured through processes of accountability' (Tickly, 2011). Furthermore, socially just education needs to challenge undemocratic principles – for example, the perpetuation of sexist or racist norms and values (Tikly & Barrett, 2011:12). A socially just education can, in sum, be said to be inclusive while at the same time being relevant and supportive of democratic participation.

Having arrived at a working definition of social justice, I turn now to the tenets of the CA.

Capabilities approach

The CA seeks to promote social justice and encourages an education system that fosters not only skills development and work preparedness, but also the development of 'complete citizens who can think for themselves' (Nussbaum, 2010:2). Wilson-Strydom (2011:415) argues that the CA provides 'a conceptual framework for exploring the complex processes underlying education outcomes in a manner that exposes injustices that are otherwise masked'. Applying the capabilities lens to issues of social justice in the post-school sector could bring to light the unequal opportunities that perpetuate injustices. The CA draws our attention to issues beyond outcomes alone – if outcomes only are considered, the assumption would be that, by making resources such as funding and a place at a TVET college available, all students would be able to graduate and improve their well-being. As availing oneself of resources alone is not enough, it is important to understand how students enrol in and navigate through the educational environment.

In applying the CA to TVET, this article also criticises human capital theory, an approach that generally informs policy and research in TVET (Powell, 2014). According to the CA, economic growth is essential to development, but it is not all-encompassing (Powell, 2014). Adopting conventional approaches such as human capital theory may lead to the embracing of entrenched societal inequalities and the marginalisation of certain groups of people instead of their overcoming the effects of apartheid (Vally & Motala, 2014). Supporters of human capital theory argue that massive investments should be made in education in the hope of contributing to economic growth, which is its major focus. A human capital perspective might therefore not expose gender inequalities, given its prioritisation of economic growth. The World Bank (1995) established that there was a direct correlation between women's education and development, and several research studies conducted at the time supported this theory. The general findings then indicated that educating women and girls led to reduced poverty levels and lower fertility rates, and that educated women also tended to encourage their children to go to school. Recent studies continue to support this, as Psacharopoulos and Patrinos (2018:445) point out:

> Women continue to experience higher average rates of return to schooling, showing that girls' education remains a priority. Returns are higher in low-income countries.

Human capital theory then prioritised women's education in policies; however, the perceived benefits would not accrue to women themselves but to their families and to society more generally. Unterhalter (2007) criticises the policies emanating from human capital theory for not recognising that education should enhance the freedoms of women and expand their choices rather than overemphasising economic growth and societal development. Such policies would also not consider the quality of education that women receive, the presence or absence of sexism, or the level of expertise of the teachers (Unterhalter, 2007:42). The following sections briefly set out the key tenets of the CA, that is, capabilities, functionings, well-being, freedoms, and conversion factors.

Capabilities and functionings

Capabilities are the opportunities or freedoms that individuals and groups possess in order to achieve 'what they have reason to value' (Sen, 199:3). Capabilities are more than the attainment of skills – they are also opportunities for individuals to convert their resources into achievements, or 'functionings'. In addition to basic literacy and numeracy, there are other capabilities related to education; these include 'access to knowledge, critical thinking, problem-solving, emotional literacy and autonomy' (Tikly, 2011:91). From the perspective of capabilities, an education system could be labelled 'socially just' if it enables students to expand their capabilities to both economic productivity *and* individual well-being.

Well-being and freedoms

'Development' is defined as 'a process of expanding the real freedoms that people enjoy' (Sen, 1999:3). Simply put, development necessitates the eradication of 'unfreedoms' such as poverty, tyranny, poor economic prospects, systematic lack, inadequate public facilities and intolerance (Sen, 1999). In order to evaluate the well-being of individuals, we have to ask whether the freedoms that individuals have are indeed fostered. For instance, education can help women to enhance their freedoms from poverty, hunger and reliance on others (usually males) (Nussbaum, 2000). As framed in the CA, education should broaden individuals' choices in all areas of their lives. Zajda et al. (2006:11) summarise the link between social justice and individual freedoms as follows:

> One of the key factors in achieving social justice, is the emergence of a consensus that society is working in a fair way, where individuals are allowed as much freedom as possible given the role they have within the society.

Within the capabilities framework, women are seen as agents of change. Sen (1999:19) defines an agent as 'someone who acts and brings about change'. This conception is valuable,

especially for South African women whose agency may have been suppressed by both patriarchy and the apartheid system. TVET, and engineering education in particular, has historically been a predominantly male domain. Education as a development initiative, particularly for women, should therefore strive to remove the 'unfreedoms' women are subjected to in order for the system to be considered socially just.

Conversion factors

The choices that women students make may be conditioned by social, personal and environmental factors. Robeyns (2017:46) classifies conversion factors into three groups:

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

By way of example, to explain the conversion factors, making funding available to students in TVET will not be enough to ensure a successful end result. Conversion factors require one to understand not only the end results, but also the process. The ways in which women have been socialised can be a significant conversion factor that influences the manner in which they convert resources into functionings. In most cases, girls are not exposed to 'tinkering' as they grow up; nor are they encouraged to fix gadgets in the home. This can be a disadvantage in the learning environment, especially in the case of learning technical subjects such as Engineering. Therefore, gender and socialisation are important conversion factors in women's learning experiences. Applying CA would compel one to pay attention to those personal, social and environmental conversion factors that may influence the conversion of capabilities into valuable functionings.

Having outlined the conceptual framing of this research, I proceed to explain the methodology that was adopted in the study.

Methodology

The research question sought to investigate the experiences of women students studying Engineering at a TVET college with a view to understanding the notion of social justice in TVET. Interviews were conducted with a sample of women students who were studying Engineering at a TVET college in South Africa during 2017 and 2018. The targeted sample comprised 14 women students in their final trimester of the N6 programme of the Engineering NATED. This programme is offered at TVET colleges in order to train artisans and it consists of 18 months of theoretical training at the college and 18 months of practical training in a workplace in order to qualify for a Diploma in Engineering studies.

The interviews were undertaken in two phases:

- Phase 1 occurred at the end of the 18 months of college study, and Phase 2 took place about five or six months after they had completed their theory examinations and had exited the college.
- The follow-up interviews, in Phase 2, were conducted to ascertain the nature of their transitions from college to work or apprenticeship and how the interviewees had navigated their way once they were in employment.

Of the 14 women students, only one student had a father who had had post-school training, in this instance as a police officer. The remainder of the students came from a background where none of the parents or guardians had had any post-school education. The majority of the students were first-generation students and had experienced poor schooling conditions in the townships and rural areas where they had originated and grown up. In-depth interviews with open-ended questions were used to probe their college experience as women in an Engineering programme.

Qualitative research entails asking questions about the why and how in order to understand the lived experiences of the studied individuals (Hesse-Biber & Levy, 2010). The research question required descriptive data to be gathered about the experiences of the women students in the NATED course; therefore, quantitative research was not suited to this purpose. In addition, although students may study at the same institution and receive the same education, various conversion factors may affect the experiences of each individual woman. These unique experiences are therefore best captured through face-to-face, in-depth interviews. Letherby (2003) adds that, unlike quantitative research methods, which rely on numbers to explain social realities, qualitative methods have the ability to place researchers in the world of the participants in order to understand their experiences. Therefore, qualitative research – in-depth interviews in particular – was the most appropriate method for this study, since, as a researcher, I was better placed to explore the experiences of the women students.

The required ethical procedures were upheld in the collection of the data, participation in the study was entirely voluntary, and pseudonyms have been used to protect the identity of the participants.

Findings

The data were open-coded to accommodate the views of the students, who drew on their personal experiences. The coding was intended to accommodate themes such as biographical information, teaching and learning experiences, valued opportunities as presented by TVET, the transformative role of TVET, and what women students wished they could change in order to enhance their learning experiences. Whereas the dataset was extensive, the extracts provided here are intended to support and illustrate the focus areas of this article.

Why women chose TVET and Engineering

For some of the women students interviewed, the choice to attend a TVET college was not an easy one. Almost half of the women students interviewed (six out of 14) could have enrolled at a university but said they had opted for TVET because they could not afford the cost of university education. TVET was therefore a practical choice for these women. Branson and Kahn (2018) argue that a student's socio-economic background is an important determinant in the choice of post-school education. The following extracts illustrate these women students' choice of Engineering at a TVET college:

> 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. Engineering was my second option and I saw that coming here to a TVET college would be cheaper. (Tumelo)

> I live with my grandmother outside the city. After I finished my matric, there was no money for me to go to university. Even now, I fend for myself by doing domestic work for others in my community. I clean windows, houses and clothes for people, so they give me money that I use for transport. (Palesa)

In the case of the following respondents, they were at a TVET college because they had not passed their matriculation examinations very well, as these extracts illustrate:

> I did not do very well in my matric final examinations; this left me with no choice but to come to a TVET college. (Noni)

> It was not easy for me to choose a course, because of my matric passes. I tried to go to the university, but my application was not successful. I really wanted to be a medical doctor. (Lesedi)

> I wanted to go to the nearest university to do Architecture but my results for maths and science were not very good. So, I came here. I thought I would get a job after N3, but I could not. That is why I proceeded to do N6. (Lebo)

> I wanted to go to the university of technology in our province. Because of my passes, they offered me teaching. I did not want to teach, so I came here instead and enrolled for Electrical Engineering. (Thato)

These responses and several others illustrate how the choice of post-school institution can be severely constrained due to poor academic performance at the exit level of high school. TVET colleges have tended to attract poorly performing black students, who are mainly from the

lower social class (Branson & Kahn, 2018). The literature on social justice comments on the perpetuation of inequality through the education system, where better-performing students who have attended well-resourced schools enter the universities and have better prospects of securing jobs and promoting their well-being. Typically, this applies in most cases to white and middle-class black students (Rogan, 2018).

Reay (2020:591), writing about the English education system, argues that, 'although choice has become a popular buzz word in education, the working classes predominantly constitute those people who are not able to exercise choice'. This is because they lack the resources needed, lack knowledge or are 'crowded out' (Reay, 2012:591). Reay (2012:592) concludes that, until it is understood that

> [c]hoices are powerfully determined by the amount and type of resources individuals can bring to the decision-making, moving towards socially just education will remain far-fetched.

The lack of parity of esteem between TVET colleges and universities has also long been an issue for TVET graduates. This is evident from the number of students in the study who aspired to go to university and considered TVET as a last resort. This could be a reflection of the disparities in the rates of return from the two institutions, in that a TVET graduate generally receives a lower income than a university graduate.

Drawing on the experiences of the women students in this study, one can conclude that they had limited opportunities and freedom to choose. Deprez and Wood (2013:146) argue that the lack of freedoms often leads to 'learning to desire what one is being socially constructed to want rather than what one has reason to value'. Since South Africa is a country that purports to be striving towards social justice, not only in the education sector but in all aspects of human life and well-being, one would expect there to be more freedom of choice. Sen (1999) refers to the 'real freedoms' that individuals have when they are able to choose from a range of options. The experiences of these women students point to their limited range of options and the choices they had to make in view of their social and economic circumstances.

Experiences of women students of Engineering at a TVET college

While many positive experiences at college were reported, for the purposes of this article the following were examples of the negative experiences that were shared by the women students in the study:

> Well, I had this lecturer once, who taught me from N1 to 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.' 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. (Thato)
>
> 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 towards 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)

Some male lecturers were reported to have been making undesirable comments about women in Engineering classes, which had a detrimental effect on the way in which these women experienced their education. Other women students said they felt that their abilities were being questioned simply because they were women:

> *Well, the time we were doing diesel and motor mechanics 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. It's more like people stereotype, and they think that mechanical engineering is for males not females; that's what runs up in their mind. (Dineo)*
>
> *There are some male lecturers who are not supportive at all. They would discourage us and say that even if we study Engineering, we are women. They even say that if you do Engineering as women, you will not get jobs! (Puleng)*
>
> *I would feel offended by comments from some of the lecturers. They would say such comments if they do not like some girls. They would say you are not good because you are a woman and that Engineering is for men. (Mabatso)*

These findings suggest that classroom practices can at times be alienating or intimidating to women students. This resonates with other findings, such as those of Makarova, Aeschlimann and Herzog (2016), where lecturers were reported to have contributed to the 'subtle bullying' of women students in Science and Engineering studies.

The stories of the women in these extracts help us to understand how classroom experiences can and do have a negative effect not only on the well-being of students, but also on their agency. When women's ability to participate effectively in the learning environment is constrained as a result of either sexual harassment or negative or demeaning comments, their sense of agency could also be affected. However, more research needs to be done into this in a TVET context; but this study offers us a window into what a 'socially just' system that expands the freedoms and agency of all students, including women, might entail.

Coping with academic pressure

Most of the women interviewed were finding it difficult to cope with their academic workload. Ten out of the 14 respondents expressed their concern about having too much work thrust upon them during the period of theoretical training at the institution. It was clear that these women students found the adjustment from high school to college difficult. They mentioned that Engineering was very 'difficult' for them, especially during the first few trimesters.

The following comments exemplify the ways in which some of the students struggled academically:

> I came here and have been studying since 2013. Engineering is very challenging. It needs a person who works very hard so that's why I took so long. Sometimes when you write exams, you write well, but when the results come, you see you failed. You ask yourself, what happened here? (Thato)
>
> I have been here since 2014. I started from N1, then N2, N3, N4 and at N5, I did it three times! I did it first, second, and then [the] third time I passed. Engineering is difficult and there is a lot of work to be done in one trimester! (Puleng)
>
> I started N1 here in 2013, and although this is a one-year, six-months course, I have been here since then. If you fail one subject, everything stops. You have to rewrite it until you pass. (Naledi)

The comments show that, in some cases, access to TVET does not mean instant success. Some of the women found it difficult to navigate through the system and took longer than expected to complete the courses and obtain the qualification. Since bursary funding does not cater for repeat enrolments, students would usually have to use their own resources to complete their studies if they had to repeat subjects they had failed. Whereas there has been a significant increase in the number of women studying Engineering at TVET colleges, the low pass rates and progression statistics show that many students are finding it difficult to cope with the academic pressure.

Poor performance in TVET colleges still persists in the country, with certification rates for the NATED programme at 61% and National Certificate (Vocational) at 39% (HRDC, 2014). Mawoyo and Hoadley (2007), in an earlier study, found that women students who were from low socio-economic backgrounds and studying Science at universities often struggled in their studies, especially during their first year. This was attributed to such students being underprepared for post-school study. Therefore, the type of schooling received by the women in the present study may have been an important conversion factor affecting their college performance and resulting in prolonged study periods.

Experiences of women students after they exit college

At the time of the follow-up interviews five to six months after the first round of interviews, most of the students in the study were still searching for internships and were facing various challenges. None of them had managed to secure an internship. Their feedback in the follow-up interviews pointed to an uncertain future and perceptions of discrimination against women by potential employers, as is evident from the following extracts from the data:

> I think men are the ones who get jobs first in Engineering. In many companies, you have to work harder 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. Men are the ones who dominate the industry and are the ones who recruit employees in most cases. So, they are likely to be biased against us women. In many cases, people look down on women. (Thato)

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

> Umm, [sigh] … I think the thing is … I am not being negative but it's not going to be easy to get the training (apprenticeship), being a woman, they prefer men out there. (Naledi)

Studies that have been conducted to date in South Africa on the transition from college to the labour market reveal results that are not very encouraging (see Papier, 2017; Papier, Powell, McBride & Needham, 2018; Cosser, McGrath, Badroodien & Maja, 2003). Papier (2017) noted that a lack of practical training or exposure to the work environment has a great influence on a person's transition to the labour market. In their study, Papier et al. (2018) found that 48% of 2013 NATED graduates were not employed either full-time or part-time and they were not in internships or apprenticeships at the time of the research, and only about 52% of the respondents among the group of 2013 NATED graduates had managed to secure employment. More worrying was that there were significant gender differences in employment outcomes. Women were found to be employed on short-term contracts and in short-term internships, whereas men were on long-term contracts and in permanent jobs. The statistics point to the challenges that women students face when looking for and trying to secure appropriate jobs and internships, and such findings highlight how gender inequalities may affect women's freedom and their agency as they navigate the post-school system and beyond.

The information above also points to the need for an analysis of these women's conversion factors, since these factors determine the ability of an individual to achieve valued functionings. Robeyns (2008) argues that, in most cases, women have lower conversion rates in translating

resources into valued capabilities because of gender injustices in society. Therefore, norms and values may sometimes limit women's freedoms in different ways. In this vein, Walker (2005:109) asks: 'Do some people get more opportunities to convert resources into capabilities more than others?' Asking these questions is important when striving for social justice. Therefore, while women students have a range of aspirations as they leave college, their gender may be a significant conversion factor: if they face difficulties in getting the jobs that they really want, they fail to convert their capabilities into functionings or achievements.

The South African government has been making strides in moving towards a socially just post-school system by widening access, increasing funding, and trying to resolve the challenges faced in accessing the labour market. But the experiences of the women students in the current study reported on in this article indicate that the government's efforts will have to be intensified in an effort to prevent the disadvantaging of women and to move towards a socially just system.

Issues for discussion

Based on the findings set out above, a number of issues have been raised: attaining social justice, equitable funding that does not disadvantage women students, and the real barriers to entry to the marketplace that women experience. Each of these is discussed below.

Social justice is more than widening access

It was noted above that social justice should go beyond merely making equal opportunities available. More than this, socially just education should be committed to reducing inequalities and should help to ensure that all people, regardless of their backgrounds, are adequately prepared for meaningful participation as citizens.

Providing grants to students in the TVET sector could be regarded as being an effective means of removing the significant barrier of a lack of financial support. Through increased funding and an increase in enrolments of women students, TVET colleges are making substantial progress in the pursuit of a socially just education system by increasing opportunities to study. However, this funding model could unwittingly also become the basis for a binary post-school education by which young people from low socio-economic backgrounds (in most cases black) are enrolled in vocational colleges, whereas middle-class students are enrolled in universities. Such channelling of poor young people into one type of institution could continue only to serve to exacerbate existing inequalities.

Extrapolating from the number of enrolments of women in TVET (see Table 1), one could argue that women have benefited more than men in gaining access to training. On the face of it, this would appear to be the case. But this and other studies have highlighted the challenges that women students face during their studies and in, or on entering, the labour market after they have exited college. What emerges is that women in TVET are hindered by

several obstacles, including harassment, feelings of alienation, and the challenges they face in obtaining internships or employment. These impediments prevent them from achieving the success they had set out to attain when they commenced their college studies.

From the capabilities perspective, success in post-schooling is often marred by various conversion factors which a socially just approach would need to take into account and make an effort to deal with.

Funding

While the South African government provides extensive funding for university students, this occurs mainly through grants that result in accumulated debt. Tuition at TVET colleges is relatively cheaper than that at universities and, in addition, 80% of college tuition fees are paid by the government (in addition to which study bursaries are also made available). For these reasons, a TVET education has become a popular destination for students from low socio-economic backgrounds. But the danger exists that this funding model could become simply another tool that entrenches stratification in the post-school sector.

Universities in South Africa receive the bulk of state funding: from the fiscal allocation to post-schooling of R40.5 billion for the 2017/2018 financial year, 78% (R31.6 billion) was allocated to universities, whereas the TVET and community education and training (CET) sectors were allocated only 16.7% (R6.7 billion) and 5.3% (R2.1 billion), respectively (DHET, 2019:72). A commission of inquiry in 2017 concluded as follows:

> This situation is unsustainable and has disastrous consequences for the sustainability of institutions. The CET and TVET sectors particularly need attention as they are severely underfunded and cannot perform at their current funding levels. (Heher Commission Report, DHET, 2017:542)

Barriers to women accessing the labour market

The findings in this and other studies such as Papier et al. (2018) suggest that TVET graduates, particularly women, face more challenges or barriers in accessing the labour market than either men who graduate from the same institutions or students at universities. While it should be noted that the career progression of graduates from the same institution may not be linear, it is a matter of social injustice when one group faces more or greater hurdles than others. The TVET college in this study is in a province of South Africa that does not have a strong industrial base; therefore, it is highly likely that students from this province will face more challenges than those from major cities in the country – in addition, that is, to the gender barrier that women already encounter in traditionally male-dominated careers. The perception of TVET institutions as generally being inferior to universities (Baatjes, 2014; HRDC, 2014) further complicates women's navigation into the labour market when those women choose to study Engineering at TVET colleges.

Conclusion

In recent years, priority has been given to increasing access to TVET, and, as a result, 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 an Engineering education is able to enhance the opportunities and freedoms for these women. The use of the CA helps us to understand the facilitators and the constraints that present themselves to women students in the TVET sector. An examination of the experiences of a group of 14 women has revealed various challenges, such as sexist comments from lecturers, feelings of alienation, sexual harassment, a too-heavy workload, the inability of the women students to participate effectively in the learning environment, as well as challenges in accessing the labour market. All of these were noted to be the conversion factors that affect the conversion of resources into valued functionings. Such experiences also hinder the agency of women, which is an important aspect in social justice. This article has therefore described an example of the under-researched field of the experiences of women students in TVET colleges.

Evidence from this relatively small-scale study revealed that women tend to reap fewer benefits from the post-school system than men. Women students in TVET who start out from lower socio-economic backgrounds face even more and greater obstacles. Archer (2003:134) argues that social mobility will remain unattainable as long as students from lower social classes continue to attend less prestigious institutions, because they will continue to experience challenges in securing appropriate jobs that enable them to climb the social ladder. The assertion made by Archer (2003) about the system in the United Kingdom ironically also applies to the current South African context. The South African government's desire to strive towards social justice in the post-school sector is a step in the right direction. But policy and practice will have to extend beyond widening access, participation and funding to issues of retention, dropout rates and enhancing student experiences, particularly with regard to women students.

Acknowledgements

Funding for this article was provided by the National Research Foundation (NRF) (SARChI Chair Grant Number 110640). The content of the article is, however, the sole responsibility of the author and does not necessarily reflect the views of the NRF.

I would like to thank Professor Joy Papier for her support and also for her comments on earlier drafts of this article.

REFERENCES

Archer, L. 2003. The 'value' of higher education. In L Archer, M Hutchings & A Ross (Eds). *Higher education and social class: Issues of exclusion and inclusion*. London: Routledge, 141–148.

Baatjes, B. 2014. Skills, jobs and deception: Examples from the South African workplace. In S Vally & E Motala (Eds). 2014. *Education, economy and society*. Pretoria: Unisa Press, 153–170.

Badroodien, A. 2004. Technical education provision in South Africa from 1920–1970. In S McGrath, A Badroodien, A Kraak & L Unwin (Eds). 2004. *Shifting understandings of skills in South Africa: Overcoming the historical imprint of low skills regime*. Cape Town: HSRC Press, 20–45.

Barnes, CF. 2004. *The transformation of technical colleges into further education and training colleges: A decision-oriented evaluation of the Northern Cape Urban Further Education and Training College.* Unpublished PhD thesis, University of the Free State.

Branson, N & Kahn, M. 2018. The post-matriculation enrolment decision: Do public TVET colleges provide students with a viable alternative? In M Rogan (Ed). 2018. *Post-school education and the labour market in South Africa.* Cape Town: HSRC Press, 37–59.

Brennan, J & Naidoo, R. 2008. Higher education and the achievement (and/or prevention) of equity and social justice. *Higher Education*, 56(3):287–302.

Cosser, M, McGrath, S, Badroodien, A & Maja, B. 2003. *Technical college responsiveness: Learner destinations and labour market environments in South Africa.* Cape Town: HSRC Press.

Department of Higher Education and Training (DHET). 2013. White Paper for Post-School Education and Training. Building an Expanded, Effective and Integrated Post-School System. Pretoria: DHET.

Department of Higher Education and Training (DHET). 2017. Ministerial Committee on the Review of Funding Frameworks of TVET Colleges and CET College Report. Pretoria: DHET.

Department of Higher Education and Training (DHET). 2019. *Statistics on post-school education and training in South Africa 2017*. Pretoria: DHET.

Deprez, LS & Wood, DR. 2013. Teaching for well-being. Pedagogical strategies for meaning, value, relevance, and justice. In A Boni & M Walker (Eds). 2013. *Human development and capabilities. Re-imagining the university of the twenty-first century.* London: Routledge, 145–161.

Hesse-Biber, SN & Leavy, P. 2010. *The practice of qualitative research*. Los Angeles, CA: SAGE.

Human Resources Development Council of South Africa (HRDC). 2014. TVET Colleges Technical Task Team Final Report. Pretoria: HRDC.

Letherby, G. 2003. *Feminist research in theory and practice*. Philadelphia, PA: Open University Press.

Makarova, E, Aeschlimann, B & Herzog, W. 2016. Why is the pipeline leaking? Experiences of young women in STEM vocational education and training and their adjustment strategies. *Empirical Research in Vocational Education and Training*, 8(2):1–18.

Mawoyo, M & Hoadley, U. 2007. Social academic integration of young women at the University of Cape Town. In L Chisholm, U Hoadley, T Lewin, R Moletsane, I Haupt, M Mawoyo & P Moorosi (Eds). 2007. *Gender, success and institutional culture: Draft report.* Pretoria: HSRC Press, 27–52.

McGrath, S. 2004. The shifting understandings of skills in South Africa since industrialisation. In S McGrath, A Badroodien, A Kraak & L Unwin (Eds). *Shifting understandings of skills in South Africa. Overcoming the historical imprint of a low skills regime.* Cape Town: HSRC Press, 1–19.

Nussbaum, M. 2000. *Women and human development. The capabilities approach*. Cambridge: Cambridge University Press.

Nussbaum, M. 2010. *Not for profit: Why democracy needs the humanities*. Princeton, NJ: Princeton University Press.

Papier, J. 2017. Improving college-to-work transitions through enhanced training for employment. *Research in Post-Compulsory Education*, 22(1):38–48.

Papier, J, Powell, L, McBride, T & Needham, S. 2018. Exploring graduate pathways: From NATED programmes into employment. In M Rogan (Ed). 2018. *Post-school education and the labour market in South Africa.* Cape Town: HSRC Press, 165–184.

Powell, L. 2014. *Reimagining the purpose of vocational education and training. The perspectives of further education and training college students in South Africa.* Thesis submitted to the University of Nottingham for the degree of Doctor of Philosophy.

Psacharopoulos, G & Patrinos, HA. 2018. Returns to investment in education: A decennial review of the global literature. *Education Economics*, 26(5):445–458.

Reay, D. 2012. What would a socially just education system look like? Saving the minnows from the pike. *Journal of Education Policy*, 27(5):587–599.

Republic of South Africa (RSA). 1998. Further Education and Training Act 98 of 1998. Cape Town: Government Printer.

Robeyns, I. 2008. Sen's capability approach and feminist concerns. Paper presented at the Conference on Sen's Capability Approach at St Edmunds College, Cambridge.

Robeyns, I. 2017. *Well-being, freedom and social justice. The capability approach re-examined.* Cambridge: Open Book Publishers.

Rogan, M. 2018. Reflections on post-school education and training: Access and outcomes. In M Rogan (Ed). 2018. *Post-school education and the labour market in South Africa*. Cape Town: HSRC Press, 243–252.

Sen, A. 1999. *Development as freedom*. Oxford: Oxford University Press.

Tikly, L. 2011. A roadblock to social justice? An analysis and critique of the South African education roadmap. *International Journal of Educational Development*, 31(1):86–94.

Tikly, L & Barrett, AM. 2011. Social justice, capabilities and the quality of education in low-income countries. *International Journal of Education and Development*, 31:3–14.

Unterhalter, E. 2007. *Gender schooling and global social justice.* London: Routledge.

Vally, S & Motala, E. 2014. *Education, economy and society*. Pretoria: Unisa Press.

Walker, M. 2005. Amartya Sen's capability approach and education. *Educational Action Research*, 13(1):103–110.

Wilson-Strydom, M. 2011. University access for social justice: A capabilities perspective. *South African Journal of Education*, 31:407–418.

World Bank. 1995. *Priorities & strategies for education. A World Bank review*. Washington, DC: World Bank.

Zajda, J, Majhanovich, S & Rust, V. 2006. Introduction, education and social justice. *Review of Education*, 52(1):9–22.