Technical and Vocational Education and Training (TVET) systems within Sub-Saharan Africa have, for much of the past century, been critiqued for their inability to demonstrate that investment in TVET leads to productive employment (see, for example, Foster 1965; Psacharopoulos & Patrinos 1994; Middleton et al. 1993). The latest consolidated UNESCO-SADC report (UNESCO 2013) on the status of TVET within the Southern African Development Community (SADC) region notes a lack of empirical data that makes it impossible to evaluate the efficacy and efficiency of TVET provision or its contribution to employment. The research presented in this chapter therefore makes a decisive contribution as it provides key insights into the learning and career pathways of public TVET college graduates in South Africa as part of the larger Labour Market Intelligence Partnership (LMIP) project.

This chapter presents the results of a 2016 survey of 4,050 TVET college graduates enrolled in National Accredited Technical Education Diploma (NATED) N3 and N6 business and engineering programmes across the 50 public TVET colleges nationally. The NATED programmes have historically been offered in South African public Technical/Further Education and Training Colleges (renamed TVET colleges in 2014) and were developed to provide theoretical training for learners already in employment, and to support the training of artisans. The N3 in engineering represents an exit level for college learners at approximately the level of Grade 12 schooling, while N6 would be the end-point for both engineering and business studies programmes, at a one-year, post-Grade 12 level, which is NQF level 5. These NATED programmes, explained more fully in the sections below, are in need of upgrading and modernisation since, in most instances, technology has advanced rapidly; to give but one example, the advances in computerised diagnostic systems in the automotive industry. However, college curricula have remained static and not been updated to take account of new developments.

The research presented in this chapter intends to answer the following questions:
1. Who participated in the NATED qualification route in 2013?
2. What have been the destinations of NATED graduates at key exit points since 2013?
3. What has been the take-up of NATED college graduates within the labour market since completion of their studies in 2013?

Equally important are the methodological lessons that were learned during the course of this research: the research project represents an important first step in developing a national system for tracking college graduates into the workplace and resulted in the construction of a dataset of NATED graduates...
which can be used as the basis for a systematic TVET research and monitoring framework. The key focus of this chapter, however, is the analysis of the survey data with a focus on the state of graduate employment for N3 and N6 business and engineering programmes.

In order to provide some context, the chapter begins with a review of the literature on public TVET college provision, its policy environment, and some comparative literature on TVET graduate destinations. The detail of the research methodology, which has itself yielded critical findings, is contained in the appendix hereto. Therefore, what follows from the TVET context section is a presentation of the key research findings on student pathways into public TVET colleges, their learning trajectories within the college, and their destinations on exiting the college. We conclude with a discussion and some reflections on both the findings and the methodology that might inform future research in the TVET sector.

The TVET college context in SA

The NATED Report 191 Programmes (also known as N-programmes) were traditionally linked to apprenticeships through the Manpower Training Act of 1981. These programmes were offered as pre-Grade 12 (N1–N3) and post-Grade 12 (N4–N6) programmes. They provided predominantly theoretical components of the apprenticeships for engineering programmes which were offered on a trimester basis and business programmes which were offered on a semester basis.

During the 1980s and early 1990s, these programmes were typically offered on a ‘block release’ basis using a ‘sandwich model’. Alternating between college and work, students completed a level per trimester, worked in industry for a similar period of time and then returned for the next level. Toward the end of apartheid, however, the apprenticeship system fell into decline. Increased numbers of black African students enrolling in the college system coincided with the delinking of the college system from this direct relationship with companies. Trimester or semester theory courses were then offered to pre-employed students instead of only to students in apprenticeships with a mandated employment contract (Kraak 2004). The decline was rapid: apprentice training peaked in 1985 with 13 500 artisans but declined to only 2 500 by 2004 (Kraak 2009).

In the post-apartheid period, enrolment in NATED programmes for both employed and pre-employed learners has continued to be the dominant form of TVET provision. By 2002, 86% of students at public TVET colleges entered NATED programmes (Powell et al. 2004). Since 2007, these public colleges have offered a range of programmes from the traditional N1–N6 programmes associated with apprentice and artisan training, to outcomes-based learnership qualifications, National Senior Certificate (NSC or Grade 12) programmes, a range of skills programmes, competency-based modular training (CBMT), industry-specific training, trade-test preparation and testing, higher education certificates and bridging courses. Traditionally associated with the important task of artisan training, TVET colleges still prepare artisans in the engineering disciplines such as construction, electricity, metalwork and modern mechanics, but they now also provide training in intermediate-level skills in a range of occupations such as information technology, business studies, hospitality, tourism, educare and other caring professions (for example, development studies and law and policing), as well as various second-chance programmes for youth.

In addition, a new programme, the National Certificate: Vocational (NC(V)) was introduced into the college system in 2007 as a modernised, flagship programme and colleges were asked to phase out the N-programmes (see Mashongoane, this volume). This decision impacted on NATED enrolments, as Cosser et al. (2011) show, through the decline in enrolments from 139 251 learners in NATED
programmes in 2007 to only 89 473 learners in 2009. Following an outcry from industry, the NATED programmes were reintroduced, accompanied by National Student Financial Aid Scheme bursary funding, which saw a sharp increase in the number of students entering the N-programmes from 2010 onwards.

The explicit goal of the N-programmes, and of the PSET and TVET sectors more broadly, are to connect learners with the labour market, as mentioned under Objective 2.4 of the White Paper for a Post-School Education and Training System (Department of Higher Education and Training [DHET] 2013):

One of the main purposes of the post-school system is to prepare workers for the labour market, or to enable individuals to earn sustainable livelihoods through self-employment or establishing a company or cooperative. Everyone should be able to make a living for themselves and contribute skills to a developing economy.

In line with this objective, the National Skills Accord (Department of Trade and Industry [DTI] 2011) commits companies to providing 12 000 internship/apprenticeship opportunities to TVET college graduates. Ministerial targets have also been communicated to colleges requesting that they track students, and graduate placement targets have been set for colleges. Currently however, there is limited data on the absorption of NATED graduates into employment (apart from Cosser 2003, and Gewer 2009). Anecdotal reports are conflicting in terms of the value of the NATED qualification within industry. Some accounts suggest that employers value the N-qualifications above the NC(V) while others contend that the NC(V) is finding purchase with employers (see also Mashongoane, this volume).

On the demand side, the skills development strategy of South Africa has increasingly emphasised the critical need for intermediate-level skills in the economy and the constraints on growth and economic inclusion due to the small size of the TVET college sector. On the supply side, the PSET White Paper (DHET 2013) anticipated that enrolments would increase to 1 million by 2015 and to 2.5 million by 2030 from its 2013 base of about 650 000 headcount enrolments. One of the aims of the PSET White Paper is the formation of ‘a single, differentiated but highly articulated’ post-school education and training system which contributes to an inclusive growth path by connecting young people and adults to work and higher education through education opportunities and the upgrading of their skills. This policy objective is intended to make education more relevant to the needs of the economy by promoting better articulation and partnerships between post-school education systems (see also Lolwana, this volume), meeting the needs of the South African labour market, and becoming more relevant to the social and economic transformation imperatives of South Africa.

Comparative studies on TVET graduate destinations

In many developing countries, TVET is seen as an essential element of economic upliftment through technological advancement and in reducing high levels of unemployment (Essel et al. 2014; Günbayi 2015; Harris 2014; Ibrahim et al. 2012; Khalid 2015; Mwaura & Mwangi 2015; Ngure 2013; Pierre 2012; Raimi & Akhuemonkhan 2014). In many contexts, however, TVET qualifications still have a low status in comparison with academic qualifications (such as certificates, higher certificates and diplomas on the South African Higher Education Qualifications Framework at the NQF5–6 levels), and a vocational certificate is often associated with low income work, low school achievement, and second chance or second choice education (Oketch 2007; UNESCO 2013).

Internationally, some research has found that TVET education has had limited impact on employability or broader development goals (Raimi & Akhuemonkhan 2014) and that both domestic and
multinational firms report low levels of satisfaction with TVET education (Bappah & Medugu 2013). The reasons for this have been attributed to the TVET system itself, which is seen as failing in primarily two areas. Firstly, employers often view the TVET curriculum as outdated and as preparing students poorly for the world of work, being rigid and irrelevant to industry, and creating a mismatch between the skills produced by the training institutions and those demanded by industry (Ngure 2013). Secondly, TVET education is seen as failing to produce sufficiently skilled workers that can make an impact on the economy by addressing the shortage of qualified workers such as engineers and technicians. The TVET sector has been criticised for failing to supply developing countries with trained workers for the growth or revival of manufacturing (Triki 2013).

A key concept within this research on TVET education and the labour market is the notion of ‘transitions’. This term has itself come under scrutiny, with some (Pollock 2002; Swartz et al. 2012) holding that the metaphor is inadequate for describing current student progressions. Other terms like ‘trajectory’ and ‘pathways’ similarly are metaphorically inadequate. The difficulty with these terms is that life course research studies show that students tend to ‘zigzag’ (Swartz et al. 2012; Van Rensburg et al. 2011) through the post-school system rather than follow a linear pathway. These non-linear pathways include oscillation between full or part-time education and full or part-time work or a combination of work and study alongside leisure and family obligations (Pollock 2002). Furthermore, the idea of a ‘pathway’ assumes that such pathways exist or that adequate institutional arrangements exist, and transitions presuppose that youth can, or even want to, reach formal employment as a destination. Pollock (2002: 60–61) argues that transitions are often qualified by terms such as ‘fractured’, ‘fragmented’, ‘protracted’, ‘blocked’, ‘incomplete’, ‘delayed’ and ‘cyclical’, so often that these ‘exceptions’ may be becoming commonplace (see also Brzinsky-Fay 2014; Furlong 2009).

The general lack of research which tracks the destinations of TVET completers in many African countries notwithstanding, the available empirical work raises a number of issues around TVET ‘college to work’ transitions. For example, the level at which students terminate their college studies appears to impact on employer perceptions of TVET college graduates (Barnes & Meadows 2008; Lomey & McNamara 2008) as the minimum required exit qualification appears to be too low for some industries. Furthermore, work experience contributes significantly to increasing students’ subsequent employment, suggesting that work-based education routes are still relevant (OECD 2016).

**Employment outcomes among South African TVET completers**

One of the earliest and most comprehensive surveys of South African TVET college completers (Cosser 2003) found that both students and employers rated the TVET curriculum and TVET educators very highly. Cosser (2003), however, noted that this assessment was incongruent with the poor labour market outcomes of TVET completers. Thus, while completers and the colleges themselves were viewed positively in the research, graduates were still unable to find work. The Cosser (2003) study is now dated, and its results have not been revisited, leaving a gap in the research data, but the finding stands in stark contrast to the general understanding of a shortage in artisanal skills in South Africa.

It is possible that employers and students were correct in their assessment, but that a strong TVET curriculum and TVET educators are insufficient for a positive labour market outcome, and that the low absorption of TVET completers into employment is related to other factors. Aliais and Nathan (2012) and Vally and Motala (2014), for example, suggest that the poor employment outcomes, rather than being a failure of the TVET sector is a function of a reduction in labour market demand that has resulted, quite simply, in an insufficient number of jobs. This is further supported by studies that show that even students with some form of artisan training in areas of presumed skills shortages have been
unable to find jobs after graduation (Further Education and Training Institute [FETI] 2013a; Mukora 2009). While it has been argued that this is due to lack of sufficient or appropriate work experience (Breier 2009), this requires further investigation. Evidence on these matters is at best contradictory. On the one hand, low absorption rates for college graduates exist in areas that are reportedly areas of skills shortage (see, for example, Akoojee 2010; FETI 2013b; Mukora 2009), and employer surveys on the NATED graduates in their employ express high levels of satisfaction with college graduates that they employ (see, for example, Cosser et al. 2003; FETI 2014). On the other hand, employer organisations and public officials on public platforms have reportedly denounced the quality of TVET colleges.

Employer studies have suggested that problems with the implementation of curricula as well as the lack of soft skill provisioning may explain the poor employment outcomes associated with a TVET qualification. One recent study (FETI 2012) found that, while employers proposed changes to the curriculum that entailed more work exposure, up-to-date or job-specific knowledge and career guidance, they generally appeared to regard these suggestions as curriculum enhancements rather than fundamental flaws to be addressed. In several studies, employers have emphasised the importance of non-cognitive, non-technical skills such as motivation, reliability and hard work in addition to a broad understanding of the sector and how it is organised (FETI 2012; Handel 2003).

Gewer’s (2010a) large scale tracer study of cohorts of pre–NC(V) students from 17 colleges suggests that poor labour market outcomes vary along a number of factors. Gender, province and high school results affect the likelihood of obtaining employment. In terms of the factors which were positively associated with finding employment, work experience during college and family connections (social capital) were identified as important. This is consistent with Altman’s (2007) observation that black African students remain disadvantaged by limited access to networks and prior work experience.

At the broader level, systemic rigidities and constraints within the TVET system itself are likely to be playing some role in limiting the employment prospects of completers. TVET colleges are bound by national curricula, national examinations and national pass and entry requirements. College offerings are thus limited by funding linked to nationally approved programmes. Moreover, various mandates of the college such as linkages with businesses, work-based experience, graduate tracer studies and the like are still unfunded mandates in the sense that earmarked funding is not made available for these. Colleges face capacity and other constraints in terms of creating the conditions for enhancing college to work transitions, particularly in the engineering fields where there are high levels of ‘opt out’ (opting to leave at lower exit points) and dropout (not completing), or failing for a range of reasons (Papier 2009). The N-programmes lack a significant work-preparation programme and a consistent practical component, both of which are important for the workplace. Moreover, functions such as work experience, graduate placement, stakeholder management and curriculum responsiveness are uneven across colleges (FETI 2014).

On the positive side, the limited available research in South Africa provides emerging evidence of potential factors that can enhance TVET college to work transitions. Firstly, access to work experience programmes or work exposure is positively correlated with future employment (FETI 2012; Gewer 2010b). Secondly, employer preferences appear to include higher marks and higher levels of education than the college minimum for certain sectors. Thirdly, employers tend to be favourably disposed toward particular TVET programmes (for instance the NATED/N-programmes). Fourthly, individual personal skills such as students’ tenacity in seeking work and their attitude on the job, for instance, initiative and work ethics, appear to play a role in recruitment and retention (FETI 2014). Fifthly, students are more likely to find employment via family and friends, even though this is less likely to lead to relevant (in line with their training) and/or longer-term employment than college linkages.
Thus, the relatively small literature base suggests that college-to-work transitions in South Africa are limited. On the one hand, there are signs of increased college commitment to linkages with workplaces. On the other hand, colleges operate in an environment which potentially involves an uncertain, fluctuating and sometimes hostile labour market (Vally & Motala 2014), low labour absorption rates, high unemployment (Statistics South Africa 2016), and weak labour market outcomes (Cosser et al. 2003; Gewer 2010b). Allais (2011) and Wedekind (2014) have further shown that employers tend to focus on immediate short-term skills, and structural economic constraints are not well represented in the literature. They argue for deeper understanding and more theoretical work to understand effective linkages between education and the economy (Vally & Motala 2014), which include the contribution of education to society as opposed to dominant human capital theory approaches. While the authors agree with this approach and note methodological concerns raised by Allais (2011) and Allais and Nathan (2012) on supply side surveys in the absence of demand-driven factors, there is still a critical paucity of knowledge on current learner destination pathways within South Africa’s TVET systems.

The study methodology

The research presented in this chapter was based on a graduate tracer study design in which graduates from NATED engineering and business studies programmes at public TVET colleges were surveyed. The study targeted N6 business graduates and N3 and N6 engineering graduates from all 50 public TVET colleges across South Africa. The sampling frame was drawn from the National Skills Accord (DTI 2011) lists of work placements provided by the DHET, and was supplemented by student contact data obtained from 26 TVET colleges (50% of the total number of colleges responded to a request for this information) as well as by the contact data obtained from four colleges in the Eastern Cape. Subsequent to cleaning of the data, there were 19,377 records with contact phone numbers.

The intended sample was 20% of the 2013 graduates (the total number of completers is 33,651), stratified in terms of the population of completers per province, programme area and level of programme (N3 and N6). The term ‘graduates’ used in this study refers to students who completed all four subjects for the N3 or N6 engineering and business programmes, as per the list received from the DHET. The sample was further stratified at the level of the college, with the service provider attempting to call 20% of the dataset provided per college. The telephone survey, undertaken in 2016, achieved 4,050 responses or about 12% of the total study population. The full details of the study methodology and survey response rates are reported in the appendix hereto.

Key findings from the NATED Graduate Destinations Survey 2016

The intention of the DHET, and the Department of Education before it, has been to establish TVET colleges as ‘institutions of first choice’, and to provide the historically excluded with opportunities to enter further study. However, there have been very few tracer studies among TVET graduates to ascertain how social participation and social outcomes are differentiated among target groups. In line with the literature which suggests that there have been changes in the demographics of TVET enrolments, Table 9.1 below begins by showing that black Africans form the vast majority of TVET completers.

Even in provinces considered predominantly ‘coloured’ like the Northern Cape and Western Cape, black African graduates are in the majority. Coloured graduates comprise 2.1% and whites 1.5% of the total cohort. This result supports the literature on the racial composition of the college sector.
There are also gender differences in the sample and, in particular, women are slightly over-represented (58%) relative to men (42%). This pattern is consistent across the provinces, with female predominance being more pronounced in certain provinces such as the Eastern Cape and Northern Cape, while the gender distribution is roughly equal in provinces such as Gauteng, Mpumalanga and North West Province. More notably, there are stark gender differences in the composition of NATED business studies and engineering studies completers. Within business studies, 72% of all graduates were women, whereas female graduates constituted only 35% of graduates in engineering. More broadly, the reasons for these gendered patterns of TVET completion require further investigation (see also Mashongoane, this volume).

The age distribution of the study sample was somewhat more homogenous with 77% of all respondents falling into the age category of 15–34 years, with 49% of the cohort aged 25–34 years. Less than 5% of respondents were aged between 35 and 44. This pattern is consistent across ‘race’ groups. It is important to note that the figures refer to respondents’ age at the time of interview rather than their age at enrolment or graduation (three or four years earlier). This result suggests that the N-programmes are generally attracting a younger cohort of student. However, the N-programmes are not exclusive to young people and there is evidence of an older minority returning to education.

The vast majority (95%) of the cohort had achieved a Grade 12 certificate before completing a NATED qualification. Most (72%) achieved an NSC followed by 17% with an NSC at diploma level and 5% with an NSC at bachelor’s level. Only 3.9% of the cohort entered NATED before completing Grade 12 at high school. It is surprising that so few students were early school leavers, but this could be the result of a larger cohort of business studies NATED students, where the programme starts at N4 level and where the entry requirement is NSC. NATED engineering courses start at N1, which students would be able to access with a Grade 9 school certificate. However, students who had already achieved Grade 12 could also enter N1 engineering programmes in order to embark on a trade-related pathway. Students with passes which enable them to access university degrees or diplomas are not absent from the sample, but they are in the minority.

### Table 9.1 Weighted respondents – by population group and province, row totals

<table>
<thead>
<tr>
<th>Provinces</th>
<th>Indian/Asian</th>
<th>Black African</th>
<th>Coloured</th>
<th>White</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastern Cape</td>
<td>0%</td>
<td>92%</td>
<td>8%</td>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td>Free State</td>
<td>0%</td>
<td>99%</td>
<td>1%</td>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td>Gauteng</td>
<td>0%</td>
<td>99%</td>
<td>0%</td>
<td>1%</td>
<td>100%</td>
</tr>
<tr>
<td>KwaZulu-Natal</td>
<td>1%</td>
<td>99%</td>
<td>0%</td>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td>Limpopo</td>
<td>0%</td>
<td>100%</td>
<td>0%</td>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td>Mpumalanga</td>
<td>0%</td>
<td>97%</td>
<td>2%</td>
<td>1%</td>
<td>100%</td>
</tr>
<tr>
<td>North West</td>
<td>0%</td>
<td>97%</td>
<td>1%</td>
<td>3%</td>
<td>100%</td>
</tr>
<tr>
<td>Northern Cape</td>
<td>0%</td>
<td>71%</td>
<td>28%</td>
<td>1%</td>
<td>100%</td>
</tr>
<tr>
<td>Western Province</td>
<td>0%</td>
<td>75%</td>
<td>20%</td>
<td>4%</td>
<td>100%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>0%</strong></td>
<td><strong>92%</strong></td>
<td><strong>7%</strong></td>
<td><strong>2%</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Source: Authors’ own calculations from the NATED Graduate Destinations Survey 2016
Notes: The data are weighted.
In summary, therefore, the cohort of NATED students in 2013 were mainly, though not exclusively, black Africans, were under 35 years old, and most had a Grade 12 (NSC) school leaving certificate. Women were over-represented in the business programmes and under-represented on the engineering studies programme.

**TVET completion and further study**

Only 17% of the sample indicated that they were studying at the time of the survey in 2016. Within the group who were currently studying, 45% were undertaking a university qualification, 24% were enrolled in a learnership, 16% were undertaking an artisan qualification (NATED courses) and 7% were studying an NC(V) qualification. Of those who were studying toward a non-university qualification, just over a third (33.9%) were re-enrolled at TVET colleges to undertake another N-programme or NC(V)-programme despite the fact that they had already achieved an N6 qualification. An analysis of their previous and their current qualifications showed learners moving through complex pathways into their NATED programme and then from their NATED programme into further study. For example, the main reasons provided for engaging in further study was reported as being to achieve higher qualifications (55%); to further their career options (35%); and personal interest (9%). In response to a question on future plans, the majority of respondents' first option was to continue studying (47%), followed by those wanting to further their careers (29%). A smaller number wanted to open their own businesses (13%).

As part of the study, student migration was also analysed. More than half (57%) of the NATED graduates stayed in their home town to study and remained there after completion. Just under a quarter (23%) migrated to another province to study and remained in that province after graduation. Approximately 9% studied in their home town but then moved to another province after completion. About 8% migrated to another province to study and then returned home after graduation and only 3% migrated to another province to study followed by a move to a third province to work. The overwhelming reason provided for migrating was better job opportunities (73%), followed by study opportunities (13%), and wanting to move back home (9%).

**Job placement support**

Given the historical role of the NATED programme as a theory course which was structurally linked to the workplace through learners who were in employment contracts (learners are now largely pre-employed), respondents were asked about the kind of college support that assisted them with finding a job. Graduates’ experiences differed among colleges and among students at the same college, but it should be noted that at each college there were graduates who reported receiving one or other form of support. The results suggest that support is provided by the colleges, but regarding the type of support received, less than half of the graduates (45%) received practical training, 42% received career guidance, and only 37% reported receiving work exposure. While there is evidence that support programmes are in place in some colleges, they are by no means uniform, and more importantly, there are no data to assess whether these figures represent progress from a low base or whether such curriculum enhancements had existed before. Further study is needed to consider the factors that affect the provision of these support enhancements as well as the reasons for the unevenness of experiences among and within the colleges themselves.
Employment transitions

A central concern of the research described in this chapter was the destinations of graduates and their pathways taken upon exit from the college. This section now examines the absorption of TVET completers into employment and their labour market outcomes. It considers whether graduates obtained employment after exiting college, and whether they were still employed at the time of the survey in 2016. We report on how many jobs graduates held between December 2013 and June 2016 and then proceed to describe their types of employment, employment stability, and remuneration.

A key finding of this research was that 52% of all 2013 engineering and business studies NATED graduates were employed at the time at which the survey was undertaken and 48% were not employed at the time. The term ‘employment’ here denotes and includes those who were employed on a part-time basis, those who were interns, and those undertaking apprenticeships.

There were no appreciable differences between engineering and business studies graduates’ employment rates when disaggregated by level. N6 business studies graduates had a 56% employment rate compared with N6 engineering graduates who had a 58% employment rate. There was however a marked difference between N3 engineering and N6 engineering employment rates, with N3 engineering graduate employment at 48% being significantly lower than N6 engineering graduate employment at 58%.

The disaggregation of employment rates by gender shows that male NATED graduates have slightly higher employment rates than females, with males having an absorption rate of 54.2% and females a rate of 49.8%. There are large differences in the probability of employment in terms of race – the employment rate for black Africans was just over 51% whereas white and coloured graduates had 88% and 71% absorption rates, respectively. However, the numbers of white and coloured graduates in the sample were very small (1.5% and 2.1%, respectively, of the total cohort of completers).

A disaggregation of employment rates by province of study for the NATED cohort (see Figure 9.1) shows that the highest employment rate was in the Northern Cape at 74.7% albeit this reflects a very small number of graduates, followed by the North West Province at 59.7%, the Western Cape at 59.1% and Gauteng Province at 56.9%. The lowest employment rates were found in the Free State (42.7%), Mpumalanga (46.1%), Eastern Cape (45.5%) and KwaZulu–Natal (48.8%). In total, nearly two thirds of NATED graduates were employed within private companies compared to one third employed by government. This indicates significant recognition of the NATED qualifications by business and industry.

Employment rates were also analysed against the NATED graduates’ prior high school qualifications. NATED graduates with high school qualifications had an average employment rate of 49%, which increased to 53% for graduates with an NSC and 55% for graduates with an NSC that provided access to university. Employment rates also varied according to the course of NATED study undertaken at the colleges. Within engineering studies, NATED graduates with N6 qualifications had higher employment rates at 57% compared with N3 graduates at 48%. For NATED engineering programmes, graduates in manufacturing reported 100% employment, although this is based on a small number of cases. This was followed by Electrical Engineering (59%), Chemical Engineering (57%), Fitting and Turning (53%) and Mechanical Engineering (51%). The NATED engineering programme with the lowest employment rate was Civil Engineering with an employment rate of 46%. Within NATED business studies programmes, Public Management (62%), Financial Management (61%), Management Assistant (58%) and Human Resource Management (57%) graduates had the highest employment rates. Business studies programmes with the lowest employment rates were Public Relations (40%), Accounting (50%)
and Business Management (51%). The above figures need to be treated with caution, however, as both the highest and lowest employment rates per programme are based on very low graduate numbers.

The duration of employment contracts was also investigated through the survey. Of the 1 576 graduates who were employed at the time of the survey, 530 (34.4%) were employed in internships or apprenticeships. Over a quarter (26.5%) were permanently employed and 23.7% were employed in long-term contracts. The remaining completers (15.4%) were employed in short-term contracts of less than six-months’ duration. In an analysis of employment contracts by age, the data showed that younger graduates had much lower rates of permanent employment (21% compared to 60%). The majority of young people aged 15–24 years were employed in internships (35%) and long-term contracts of more than six months (25%). The findings also showed that more women were employed as interns or apprentices in comparison with men, and fewer women occupied permanent jobs compared with men. In terms of race, 84% (only 32 people) of white employed graduates were in permanent posts compared with only 24% of employed black Africans. Among coloured graduates in employment, 43% were in permanent positions. The North West Province with 45% and Western Cape Province (34%) had the highest percentages of NATED graduates in permanent positions. Limpopo Province and the Eastern Cape Province had the lowest percentage of permanently employed graduates at 18%. The Free State and Eastern Cape had the largest proportion of graduates employed in internships or apprenticeships with 52%.

NATED graduates were also asked how many jobs they had held after graduating from TVET colleges. Almost 65% of employed NATED graduates reported having had only one job since graduating in 2013 and 27.5% had held two jobs. Further panel studies and longitudinal studies would need to be undertaken to determine the extent of short-term employment as opposed to stable, permanent employment.
Nearly two thirds (64%) of graduates obtained employment within one year after graduating from a TVET college and completing their practical 18-month work placement, with 38% employed in the first six months and 26% in six to twelve months. Of the 64% who had obtained employment in the first year, 22% were in an apprenticeship/internship, 9% in short-term contracts of six months or less, and 33% in either long-term or permanent employment. Of the employed graduates, 63% were employed in private companies, and 31% were in government posts, with the remaining 6% being variously in non-profit, informal employment or having missing data. Of some concern is that 58% of all employed graduates took at least six months to find their first job and 32% took over a year to find their first job. The majority of employed graduates (67%) indicated that they were mostly using the skills learned in the NATED qualification in their job, while 27% indicated that they were only partially using skills learned and 6% stated that they were not using any skills learned in the NATED qualification (see also Grapsa et al. and Rogan, this volume).

In total, 48% of respondents indicated that they were neither employed nor self-employed. Only 6% of the respondents indicated that they were self-employed and 31% of this group had employed others. Respondents were asked to mention the reason that they had become self-employed. Of 236 self-employed respondents, 46% responded that they could not find a job, followed by 19% who indicated that their qualification enabled them to work for themselves, and 13% who could not find a job linked to their qualification. A further 27% had a range of other reasons not listed in the questionnaire (they chose ‘other’). This result suggests that lack of formal employment was the most prevalent reason for self-employment. Further analysis however found that self-employment was not only of the survivalist type, with some individuals in the higher income bracket (over R10 000 per month) being self-employed. While most respondents (119 out of 189) in the self-employed category did not provide data on income, 12% of those who did provide data earned over R10 000 per month, 37% were in the R5 001–R10 000 category and 21% were in the R3 001–R5 000 category; 10% of those in the self-employed category earned under R1 000 and 20% earned between R1 000 and R3 000.

In terms of earnings, most (63%) employed NATED graduates earned above R3 000 per month. While 3.7% earned less than R1 000 per month, 33% earned between R1 000 and R3 000, 28.6% earned between R3 001 and R5 000, 20% earned between R5 001 and R10 000 and 14.6% earned more than R10 000. From a gender perspective, there are significant earnings differentials. Just under half (49%) of female graduates earned less than R3 000 per month compared with 28% of males. Only 27% of women earned more than R5 000 per month, whereas 40% of men earned over R5 000 per month. There were also differences in remuneration between business studies and engineering studies graduates. Almost half (49%) of business studies graduates earned less than R3 000 per month compared with a third of engineering studies graduates. Similarly, while a quarter (26%) of business studies graduates earned over R5 000 and 10% over R10 000, over a third (37%) of engineering studies graduates earned over R5 000 per month and 16% earned over R10 000 per month.

Unemployment

This section focuses on NATED graduates who were unemployed at the time of the survey, the length of time they were unemployed and the reasons provided to explain graduate unemployment more generally. As outlined above, 48% of the NATED graduates (1 437) indicated that they were unemployed at the time of the survey in 2016. Within this cohort 93% of the unemployed stated that they were actively looking for a job, and 7% noted that they were not looking for a job (were economically inactive). Of the unemployed 1 437 graduates, 5% did not answer the question as to whether they were looking for a job, 29% had been unemployed for more than a year and 46% for more than two years. The remaining 24% had been unemployed for between six months and one year.
Initially, all those not in paid employment were categorised as ‘unemployed’ and this was then further refined in subsequent analysis. When cross-tabulated against respondents who were still studying, and respondents who were economically inactive, 36% of the respondents could be considered economically inactive NEETs (not in employment, education or training).

Most (78%) of the unemployed graduates cited a lack of job opportunities as the reason they were not in employment, 20% stated that they did not have the right skills, and 1% stated that they had a lack of interest in pursuing jobs in line with what they had studied. Less than 1% reported that not having an NSC was the reason they were unable to obtain a job. Most unemployed graduates (78%) did not identify which strategies they were pursuing to find a job. Of the 22% who did provide an answer, 96% stated that they were looking for jobs by themselves through agencies and advertisements, and the remaining 4% were seeking jobs through contacts (0.3%) and their TVET college (0.7%).

**What do these findings tell us about NATED graduate destinations and pathways through employment?**

This first attempt at analysing NATED graduate pathways and destinations yielded important and interesting empirical insights, but also critical methodological lessons for future studies of this nature. While some trends were confirmed, for instance the gender disparities between business studies and engineering programmes where female students exceed male students in the former and the reverse gender proportions are true in the latter, there were also surprising findings, for example that the majority of entrants had completed Grade 12 before entering a college NATED programme at lower than NQF level 3. The reasons for this would need further exploration, since it could either indicate that such students were not able to progress to the next level of study at a university (because of low marks or not meeting subject entry requirements) and were therefore prepared to enter a college programme at a lower level than Grade 12. On the other hand, it could also suggest that colleges are deliberately targeting Grade 12 school leavers to improve college success rates in light of poor pass and throughput rates, particularly in engineering programmes where Mathematics is required.

Of equal concern should be the number of N6 graduates who return to the college to enrol for a lower N-level or NC(V) qualification. Even though the percentage of students to whom this applied was small (less than 5% of the weighted returns), this finding highlighted inefficiencies in the system, and the convoluted pathways that students undertake from school to work. It was clear that the route for young people entering NATED programmes at TVET colleges is not a linear progression from Grade 9, but often involves a post-secondary school option that is ‘cyclical’ and ‘zigzags’ through continuing education and training pathways (Kruss et al. 2011; Pollock 2002).

With regard to migration across provinces, students did so to obtain education and training opportunities but most entered colleges close to home. An exception perhaps was Gauteng where half of the TVET college student body there in 2013 was from Limpopo, as well as a substantial percentage of the students being from North West Province and Mpumulanga. The Western Cape also appeared to receive numbers of students from the Eastern Cape, many of whom return to the Eastern Cape after completing their studies. Additional migration for employment after college was relatively small, though there was an indication of migration back to the province of birth.

NATED students received varying levels of additional support in preparation for employment, but such forms of support are currently not funded by the state. Of some concern are the low levels of practical training, career guidance, and work exposure provided by TVET colleges, and that exposure to support programmes varies greatly across provinces and within colleges. Findings from the literature suggest
that these forms of support are critical for successful employment of college graduates, particularly in
the absence of social capital and networks as experienced by poor students (Breier 2009; FETI 2013c;
Gewer 2010a).

With regard to the destinations of NATED graduates at key exit points and the take-up of NATED
college graduates within the labour market, just over half (52%) of the 2013 NATED graduate cohort
obtained employment after exiting from TVET colleges. Younger people showed higher rates of
employment in internships, apprenticeships and short-term contracts than older students who had
higher employment rates in long-term contracts or permanent employment. There were significant
gender and race differences with regard to employment and earnings, in that women were more
frequently employed in short-term contracts and internships than men, and fewer women were
employed in long-term contracts and permanent employment.

With regard to employment, it was heartening to find that employment experiences for those
graduates in employment at the time of the survey had for the most part been fairly stable, with the
majority reporting that they had only held one job since graduating, or to a lesser extent two jobs. The
link between academic achievement and level of earnings was confirmed by the finding that graduates
with an NSC bachelor’s pass earned more than other NSC graduates.

The desired destination for most graduates appeared to be formal employment, as the numbers of
those reported to be in self-employment were very low. Furthermore, the private sector provided
employment to far more NATED graduates than the public sector, pointing either to increased
privatisation of former public-sector enterprises, or that NATED qualifications continue to be
recognised and valued by industry and business. Further research is required to ascertain the reasons
for the increased private sector employment of NATED graduates.

While the large majority of NATED graduates not in employment at the time of the survey were actively
job-seeking, some had been unemployed for more than a year and almost half had been unemployed
for two years. Unemployed graduates cited the lack of job opportunities as the primary reason for
their unemployment, a finding in line with Alais and Nathan’s (2012) assertion that there are not
necessarily sufficient jobs for TVET graduates with mid-level skills, and that demand side factors are
significant causes of unemployment. Nonetheless, from the supply side perspective, TVET colleges
face a number of challenges in proactively responding to labour market needs. In particular rigid
and outdated curricula, together with low levels of autonomy and limited funding to create effective
practical and workplace experience (Gewer 2010a) are likely to be key constraints. Despite these
challenges, the NATED student cohort interviewed for this research were generally positive about
their learning experiences at the college, even though these had not translated into employment for
about half of the sample. Only a small percentage of the cohort were continuing with further studies
after completing their NATED qualifications, of which a small proportion were undertaking university
qualifications. In spite of the small numbers of the latter group, it is encouraging evidence that NATED
programmes do assist at least some students to progress into higher education.

Finally, a significant outcome of the research was the learning related to the methodology. The
importance of tracer studies for ascertaining impact and informing policy, particularly in relation to
youth development, training and employment, is potentially huge, hence the critical need for
formulating effective and efficient strategies for data gathering. Currently the national databases on
enrolment and achievement are held by separate authorities and would need to be brought together
in a complementary manner that enables students to be tracked from enrolment to exit, and allowing
unitised records of courses passed, levels and so on, to be drawn. A national Education Management
Information System (EMIS) should be able to provide the range of reports necessary for planning and forecasting, and for monitoring and evaluation of performance.

Conclusions
An analysis of NATED graduates approximately three years after completion offers a window into the opportunities that have been available to such students, their trajectories upon exiting college, and their perceptions about the value of their college training. Furthermore, this research provides key insights into the type of employment that NATED business studies and engineering students obtained, the nature of the contracts and, to some extent, their earnings.

However, for a large number of the 2013 cohort who had managed to complete their courses, a qualification did not translate into meaningful work opportunities, and this should be of great concern going forward. It is evident that far more creative ways will need to be found to support TVET graduates into sustained employment to avoid the ‘revolving door’ syndrome of returning students, and to create places for new enrolees. But it is also important to keep alive the promise of improved life chances that students perceive education to offer. We cannot allow our youth to lose hope when, after overcoming all manner of obstacles to finally complete their courses, they are still faced with limited or no prospects of economic participation. A range of reasons for this have been put forward in the public domain, inter alia by economists, but the evidence in this study would seem to indicate that there is still much within colleges’ and employers’ power to change, for instance, in training more actively towards self-employment, and in addressing gender discrimination in the workplace.

References


FETI (Further Education and Training Institute) (2012) *Facilitating college to work transitions for FET colleges students in the Western Cape* (Report prepared for the Dr Murray Trust in collaboration with WCED). Cape Town: FET Institute

FETI (Further Education and Training Institute) (2013a) *FET college engineering programmes in South Africa: Content, uptake, completion and progress* (Report prepared for City & Guilds Centre for Skills Development). Cape Town: FET Institute

FETI (Further Education and Training Institute) (2013b) *Completion, progression and throughput in college engineering qualifications in the Western Cape* (Report prepared for City & Guilds Centre for Skills Development). Cape Town: FET Institute

FETI (Further Education and Training Institute) (2013c) *Artisan demand and supply in the Western Cape: Phase 2 Report* (Report prepared for DEDAT). Cape Town: FET Institute


Harris T (2014) *Secondary school students’ perceptions of vocational education in Barbados*. Major Research Project for MA in International Education and Development, University of Sussex


Appendix: Research methodology

In line with the Swiss-South African Cooperation Initiative (SSACI) et al. (2016) NC(V) destination survey, an employment tracer study was utilised as the methodology to study the destination pathways of public TVET college graduates in NATED engineering and business studies programmes. Given the lack of data on TVET college graduate destinations, an empirical investigation offered the best prospects of better understanding graduate destinations. Tracer studies provide retrospective analyses of populations and are often used in education to evaluate the impact of programmes after graduation. Typically, tracer studies occur a year or two after graduation, and consist of large scale ‘snapshot’ surveys with the possibility of future follow-up surveys to provide longitudinal data. Because of their specific nature, tracer studies normally ask a few questions in order to get a larger, clearer response. Given the lack of data, and the uncertain understanding of the nature of the TVET graduate population’s life course, and in order to align to the SSACI (2016) NC(V) destination survey so that a comparative study could be undertaken, this research sought to create a larger set of variables in the interests of exploratory research. It was the intention of this research that this initial report on the variables would point in the direction of areas requiring more detailed investigation.

The sampling frame

Difficulties were encountered with determining the population as official data available were based either on subject completions rather than unitised graduate records, or provided for both private and public TVET colleges, or on enrolments (not completers). Data received did not provide sufficient information on NATED N2 graduates, a first exit point to apprenticeships in South Africa or for the year 2012. As a result, the decision was taken to record available data on N3 and N6 engineering students as well as N6 business studies students and to focus the study on 2013 graduates only. Official figures published by the DHET and disaggregated by programme, level and year for the year 2013 cohort were used in the end as the population size for the study.

The survey was quantitative, with respondents selecting responses from a predetermined list of options set up in a consultative process, and covering the main research questions indicated above. Reporting was against 38 variables including characteristics of students entering the college (demographics, prior qualifications, motivation for entering college), student choices and experiences at college (college, programme, level and selected work related programmes), post-college destinations and experience (employment status, salary, contract type, and job search strategies) and inter-provincial migration.

The survey

The survey was developed to address the key research questions. In addition, an attempt was made to align to the key questions provided in the SACCI NC(V) destination survey. Exemplars were also drawn from the LMIP work done in the Eastern Cape among higher education students. Through collaborative efforts, the questionnaire underwent a number of iterations and refinements shaped by multiple engagements with the research team, key stakeholders and the call centre company who was engaged to undertake the telephonic survey. The final iteration was shaped by the findings of the survey pilot where the questions were tested by the call centre company on a protected online platform to assess where areas of confusion potentially existed.

A telephonic survey, rather than an online survey, was selected. The rationale for conducting telephone interviews was that TVET college students might not be able to complete an online survey due to inadequate internet access. Of the 19 377 respondents, only 208 responded positively to completing the survey online or via email, confirming our suspicions about limited access to appropriate technology. To this end, a call centre company was appointed to administer the telephonic survey. The specific nature of telephone interviews (as opposed to face-to-face or written surveys) required a research design that took into account the quality of responses, and not only the quantity. This is
because telephone surveys are prone not only to missed calls, but also to missing data and (more subtly) indifferent responses (see Cohen et al. 2007).

As the ‘cold call’ approach was considered to be undesirable and inefficient, the call centre recommended approaching the survey in a phased manner, and ‘warming up the market’ through an initial SMS contact. A series of ‘sweeps’ was included in the design of the fieldwork as follows. First a ‘blank’ call was sent electronically to the dataset to ascertain how many of the phone numbers were still operational, since students would have graduated at least three years before. Thereafter, an SMS was sent to all operational numbers informing them of the purpose of the research, the competition prize and requesting permission to conduct the interview. This included a response option. The option of completing an online questionnaire was also given to the student in this SMS. This was followed by emailing the questionnaire to those students who indicated this option. The telephonic interviews were then conducted with those who agreed to participate. In conclusion, a final ‘thank you’ email, which served to announce the winners of the competition, was sent.

Contact and response rate

The call centre adopted a strategy of contacting the sample target 20% of all NATED graduates in each of the 50 public TVET colleges in an attempt to arrive at a representative sample of completers across South Africa. The 20% were randomly selected using the approach outlined above. The administration of the survey commenced on 6 June 2016 and by 30 June, 4 050 NATED graduates had completed the survey.

In addition to the response rate, the contactability rate is important for future research of this kind. Of the 19 377 records, the survey was unable to connect to 10 121 (58%) cell phone numbers. In addition, a further 2 666 numbers were operational, but could not be used to contact the lead person in the sample. Therefore, of the 19 377 potential respondents in the sampling frame, the actual available number of respondents was reduced to only 4 561. From this total number of available respondents, a stratified sample had to be attempted in order to arrive at the 20% sample that had originally been envisaged. Taking into account the 4 561 respondents available to be surveyed, the 4 050 completed surveys represent an 80% response rate, albeit an unintended consequence of non-contactable telephone numbers. With reference to the number of rejected calls, the fieldworkers had to call 1.78 persons in order to obtain a willing respondent.

The data received from the call centre contained 4 049 cases but the analysis in this report is based on 3 013 cases as all 2012 graduates (n = 566) were removed from the database. In addition, cases that met either one or more of the following criteria were excluded: 1) all those who indicated that they were not enrolled at a public TVET college in 2013; 2) all those where the programmatic field was left blank; 3) all duplicate cases; 4) all cases whose course information suggested that they did not graduate from a NATED programme, but rather from a NC(V) programme in 2013; and 5) all cases where the province, N-level or programmatic field was left blank and where imputation from other fields was not possible. In total n = 1 049 cases were removed from the final database, leaving 3 013 valid cases for analysis.

Weighting

The data was subsequently weighted for the report, and although not optimal due to the foregoing, the results were as ‘representative’ as possible under prevailing circumstances. To correct for imbalances in the survey returns, the data presented in this report have been weighted and exist as a probability sample of graduates for whom contact details were available. Imbalances arose due to the usual survey error, but were further distorted by the varying management information systems in the public TVET college sector that resulted in uneven capacity to provide graduate contact information.
The population used to weight cases was based on the statistics provided in the DHET (2015) document *Statistics on post-school education and training in South Africa: 2013* (see Table 9A for a composite table of the population). Four factors provided by the DHET report were utilised to weight the data, namely: 1) the programme area, specifically business studies or engineering; 2) the N-level, specifically N3 and N6; 3) province; and 4) gender. The weighted respondents who participated in the survey were drawn from all 50 public TVET colleges in the country.

The sampling process itself is therefore a key finding of this research. While the targeted number of respondents was met, the conditions for data collection were less than ideal and will require systemic intervention going forward.

The Institute for Post School Studies (IPSS) observed ethical clearance protocols of UWC and the DHET. In line with its commitment to ethical research, the IPSS ensured that all graduates were made aware of the research and asked to provide their consent to be telephonically interviewed in the first contact sweep. On receipt of their consent, a subsequent guarantee was provided to all recipients that their anonymity would be preserved through ensuring that neither their names nor the TVET colleges they studied at would be identified. All telephonic interviews were recorded, which also recorded participants’ verbal consent to be interviewed.

**TABLE 9A  Study population**

<table>
<thead>
<tr>
<th>Province</th>
<th>Engineering</th>
<th>Business studies</th>
<th>Grand total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N3</td>
<td>N6</td>
<td>Total</td>
</tr>
<tr>
<td>EC</td>
<td>1 113</td>
<td>619</td>
<td>1 732</td>
</tr>
<tr>
<td>FS</td>
<td>1 094</td>
<td>479</td>
<td>1 573</td>
</tr>
<tr>
<td>GP</td>
<td>6 277</td>
<td>3 153</td>
<td>9 430</td>
</tr>
<tr>
<td>KZN</td>
<td>3 719</td>
<td>1 689</td>
<td>5 408</td>
</tr>
<tr>
<td>LP</td>
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<td>1 394</td>
<td>3 402</td>
</tr>
<tr>
<td>MP</td>
<td>2 117</td>
<td>469</td>
<td>2 586</td>
</tr>
<tr>
<td>NC</td>
<td>113</td>
<td>65</td>
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</tr>
<tr>
<td>NW</td>
<td>1 148</td>
<td>270</td>
<td>1 418</td>
</tr>
<tr>
<td>WC</td>
<td>794</td>
<td>473</td>
<td>1 267</td>
</tr>
<tr>
<td>Total</td>
<td>18 383</td>
<td>8 611</td>
<td>26 994</td>
</tr>
</tbody>
</table>

Source: DHET 2015
Notes: The population represents the number of ‘completers’ in 2013. The number of completers refers to the number of students who were eligible to complete and successfully completed the NATED Report 191 (N3 and N6) certificates in the 2013 academic year.