NSFAS
National Student Financial Aid Scheme

NSFAS Research Report 08:

Impact of funding on academic performance: TVET completers for 2017

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IMPACT OF FUNDING ON ACADEMIC PERFORMANCE: TVET COMPLETERS FOR 2017

The National Student Financial Aid Scheme (NSFAS) research reports contain original research designed to inform and improve internal NSFAS operational efficiency, as well as the wider stakeholder community, and form the base for policy proposals.

In this report the reader will find:

- The profile and distribution of TVET college completers by socio-demographic indicators.
- The profile and distribution of TVET college completers by institutional indicators.
- The profile and distribution of TVET college completers by funding status.

Summary findings:

- This study confirms a positive result of being NSFAS-funded in comparison to not being NSFAS-funded, in terms of average performance
- Contrary to similar research, this study found that for Technical and Vocational Education and Training (TVET) students, there is a converse outcome in terms of the impact of gender on performance, with males on average performing slightly better than females.
- The results for age are consistent with our findings for university students, where the lower the age, the higher the average academic performance.
- Students in the National Certificate Vocational (NCV) programme on average have higher levels of academic performance in comparison to those in NATED programmes.
- Colleges in the Northern Cape province perform on average the best and those in the Free State Province the worst.

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1. Introduction and Background

Post-School Education and Training (PSET) comprises all education and training provision for those who have completed school, those who did not complete their schooling, and those who never attended school. TVET includes a range of intermediate level training that offers alternatives to university education, which is accessible only through successful completion of a matric qualification at the requisite pass levels. In South Africa, PSET programmes are offered through three main public and private education and training institutions, these are; Higher Education and Institutions (HEIs), TVET colleges, Community Education and Training (CET) colleges (DHET, 2018). TVET, according to United Nations Educational, Scientific and Cultural Organisation (UNESCO) are those aspects of the educational process involving, in addition to general education, the study of technologies and related sciences and the acquisition of practical skills, attitudes, understanding and knowledge relating to occupations in various sectors of economic life. It incorporates technical education, vocational education, vocational training, on-the-job training, and apprenticeship training (Tripney & Hombrados, 2013).

Post-School Education and Training (PSET) comprises all education and training provision for those who have completed school, those who did not complete their schooling, and those who never attended school. TVET includes a range of intermediate level training that offers alternatives to university education, which is accessible only through successful completion of a matric qualification at the requisite pass levels. In South Africa, PSET programmes are offered through three main public and private education and training institutions, these are; Higher Education and Institutions (HEIs), TVET colleges, Community Education and Training (CET) colleges (DHET, 2018). TVET, according to United Nations Educational, Scientific and Cultural Organisation (UNESCO) are those aspects of the educational process involving, in addition to general education, the study of technologies and related sciences and the acquisition of practical skills, attitudes, understanding and knowledge relating to occupations in various sectors of economic life. It incorporates technical education, vocational education, vocational training, on-the-job training, and apprenticeship training (Tripney & Hombrados, 2013).

While, the role of Higher Education in reducing inequalities and poverty has been questioned over the past few decades, there has always been a strong argument that improving intermediate level skilling and having a strong TVET system is critical to addressing the triple challenge of unemployment, inequality and poverty (Reddy, Wildschut, Luescher, Petersen & Rust, 2018; DHET, 2019). Compared to higher levels of education, TVET is seen as particularly critical in integrating groups that are marginalised (such as women and young people) into local labor markets and improving their earnings, thereby providing pathways to decent employment. The South Africa National Development Plan (NDP) also situates TVET colleges as critical pillars of the emerging post-school system, vital for social and economic development as it must provide mid-level technical and occupational qualifications, that articulates directly into the world of work (National Planning Commission 2012).

While policy and thus implementation focus, internationally, and in the South African context (Wildschut et al, 2018) has traditionally been skewed towards higher education (Wildschut et al, 2018), there is now a clear plan and policy drive to change both the size and the shape of the sector and to improve the range and quality of qualifications on offer, with a target of 2.5 million students in TVET by 2030 (DHET 2014; Branson et al, 2015). At the same time however, TVET institutions are faced with high attrition rates (Gaffoor & van der Bijl, 2019; Sabtu et al., 2016; Zulu & Mutereko) together with signs of weaker demand for participation in TVET programmes. Not only does such trends hinder planned expansion but also limits the impact this subsystem can make.

While there is substantially improved monitoring and reporting in the system, we know very little about how NSFAS funding is contributing to completions in the system, and whether there are any identifiable differences in the performance of such students.

2. Objectives

Given a clear government drive to not only increase access to higher education, but also specifically focus on expanding and strengthening the TVET system, interest has grown to better understand the factors predicting academic performance and success at university, but also to grow this understanding within the TVET space. Much less is known on the effectiveness and impact of government funding in this subsystem, while much recognition is given to the importance of this sector in growing the economy and ensuring that development is inclusive.

In this research report, we provide recently collected data on the performance of the entire cohort of TVET completers in 2017, disaggregating where appropriate, by funding status. The report also models the performance of TVET students, proxied by the average score the individual achieved in the examinations completed in the relevant year. This will form an important baseline for further study and refinement, as this a very crude measure of performance of TVET students. However, in the absence of tracer data, this approach remains useful.

3. Methods

3.1 Sample and data

The master dataset was constructed by merging essentially three separate datasets into a novel dataset for analysis:

- Dataset 1_TVET Completers: A dataset with 2017 TVET Completers containing 107,795 entries, with the following set of variables (Identity number, names, age, date of birth, gender, disabilities (seeing, hearing, waling, remembering), selfcare rating, home language, nationality, resident status, population group, student province, college province, contact numbers, fax number, email address, postal address, home address, college code, college name, campus number, campus name, examination number, course code, course name, province code, province, exit level, and NSFAS fund). After the removal of 'duplicate' identity numbers[1] (1,929), the final dataset had a total of 105,866 records.

- Dataset 2_TVET Enrolment Dates: A dataset containing 122,207 entries, with the following set of vari ables (Identity number, names, age, date of birth, gender, disabilities (seeing, hearing, waling, remem' bering), selfcare rating, home language, nationality, resident status, population group, student province, college province, contact numbers, fax number, email address, postal address, home address, college code, college name, campus number, campus name, examination number, course code, course name, province code, province, course level, and enrolment date). After the removal of duplicates (2,037) the final dataset had 120,170 entries.

- Dataset 3_TVET Exam Scores: A dataset containing 783,257 entries, with the following set of variables (Identity number, course number, examination number, subject code, subject scores (raw), subject scores (percentage). After averaging the course marks for each student/ID number, 663,107 records remained[2]. In merging with the main dataset of 2017 TVET completers, 557,241 inputs were removed.

As in this study we are interested in the public system, we further removed the private colleges from the dataset, which equalled 1,898 student entries. The final cleaned dataset for analysis thus consisted of 103,968 entries. Results are considered alongside a review of literature around predictors of academic performance and the role of financial aid in performance. The significance of the findings is clear in that this data consists of the total number of public TVET completers for the 2017 year, and thus is representative and generalisable to the entire public TVET system.

[1] One individual could write more than one exam in a year if they were not registered for an annual programme.

[2] The inflated number of records is due to the fact that

3.2 Variables

Academic performance of TVET college students is the dependent on outcome variable, and it is proxied in this study by the average annual individual score. The average annual individual score is generated by dividing the total score achieved by the number of courses taken during the academic year. It is in continuous form. While acknowledging the limitations of this measure, given differential grading practices across departments, this represents a reasonable quantitative measure of performance. Grade or score is also a predictor of likely retention or graduation.

The major independent variable was the type of funding received by the student. This variable had only one possible status: National Student Financial Aid Scheme (NSFAS) bursary, which each is represented by a dummy i.e. yes=1 and No=0. Other independent variables are; age, gender (0 = female, 1 = male), exit level (1= L4 1; 2= N3 2; 3=N6), course of study (1= Engineering; 0= Business & Management), province of college where each of the provinces is represented by a dummy, for instance (1= Eastern Cape; 0= Otherwise).

Table 1: Summary of variables

Variable	Description	Type of variable
Academic performance	Grade, average score for the 2017 academic year	Continuous
Gender	Gender of student (0 = Female, 1 = Male)	Categorical/Nominal
Age	Age of student as at 2017	Continuous
Programme type	Type of programme in which student is enrolled in. (1=NATED; 0 = NCV)	Categorical
Exit level	1= L4 1; 2= N3 2; 3=N6	Categorical
Province of College	1= Eastern Cape; 0= Otherwise 1= Free State; 0= Otherwise 1= Gauteng; 0= Otherwise 1= Kwazulu-Natal; 0= Otherwise 1= Limpopo; 0= Otherwise 1= Mpumalanga; 0= Otherwise 1= North West; 0= Otherwise 1= Northern Cape; 0= Otherwise 1= Western Cape; 0= Otherwise	Categorical/Dummies
NSFAS Funded	If student is funded by NSFAS (0= No; 1= Yes)	Nominal

3.3 Analytical Techniques

The data obtained were analysed using both descriptive and inferential statistics (Analysis of Variance, Correlation and multiple regression):

- *Descriptive*: Descriptive statistics are used to describe the basic features of the data and the sample constituted for the study; it provides simple summaries about the sample. The statistics include frequency distribution, mean, median and mode.

- *Analysis of Variance*: A one-way analysis of variance (ANOVA) is used when there is a need to test for differences in the means of the dependent variable broken down by the levels of the independent variable. In this case the categorical independent variable (with two or more categories) and a normally distributed interval dependent variable. Specifically, the method is used to test the difference between two groups. In this report, a one-way ANOVA test was used to determine whether average academic performance differed based on selected demographic and academic variables and being a recipient of NSFAS funding or not.

- *Bivariate Correlation*: A correlation is used when there is an aim of examining the linear relationship between two (or more) normally distributed interval variables or between a dichotomous variable and a continuous variable. In other words, it is a test to ascertain whether there is a relationship between one or more variables, as well as the direction of that relationship (positive or negative). If a positive relation ship is found this means that an increase/decrease in the dependent variable is related to an increase/ decrease in the independent variable. If a negative relationship is found, this means that an increase in the dependent variable is related to a decrease in the independent variable, and vice versa. In this report the linear relationship between average academic performance and being a recipient of NSFAS funding was explored.

- *Multiple Regression*: Multiple regression is a predictive analysis which is used to explain the relation ship between one continuous dependent variable and two or more independent variables. First, it can be used to identify the nature of the effect that an independent variable has on a dependent variable as well as understanding how much the dependent variable changes when there is change in any of the independent variables. In this report, we explore, amongst other things, the nature of effect and the magnitude of being a recipient of NSFAS funding on average academic performance. The statistical analysis was performed using the Statistical Package for Social Sciences (SPSS).

3.4 Limitations

The complexities of the duration of programmes within the TVET system makes the use of examination scores the best available indicator of average levels of performance and likely success in completion. The following limitations apply thus with regards to the use of this measure:

- An individual that wrote only one exam and received an examination result of 70, would score a higher average mark in comparison to an individual that wrote 3 exams with three results (80, 65, 60) that would average out at 68.3%. The amount of examinations will have a bearing on the average perfor mance, somewhat artificially.
- These data relate to 2017 completers, which could be successfully completing in 2017, but could have enrolled in 2005 already and taken a very long time to successfully complete a set of examinations.
- These completions relate to successful completion of an exam or set of exams, and not necessarily a full programme.
- The data only captures completers and thus would not include those TVET students that did not suc cessfully complete an exam or set of exams in the relevant year.

4. Sample distribution

The total sample for analysis consisted of 103,968 individuals that completed exams at public TVET Colleges in 2017. This is consistent with other available data for 2015 (DHET, 2015) where the number of total TVET completions was recorded at 107,029. In this section we detail the distribution of the sample in terms of firstly, demographics and then in terms of the remaining independent variables available for analysis: NSFAS funding status, exit level, programme and college location.

4.1 Demographic profile of 2017 TVET completers

The majority of completers fall into the 15 to 24-year old age group (67%). This trend is even more pronounced for NSFAS funded students, with 72.8% of NSFAS funded students being in this age category, compared to only 64% of students in the non-NSFAS funded category falling into this age group. If we consider cumulative percentage, 97.5% of NSFAS funded completers would be under the age of 35, compared to 94.9% of the non-NSFAS funded group falling under the age of 35. This is in alignment with the focus on uplifting particularly the youth cohort of our population, showing clearly how NSFAS funding is facilitating achievement and access for particularly the youth cohort of our society.

Table 2: Distribution of TVET completers across age group and funding status

Age Group	NSFAS Funded		Non- NSFAS Funded		Total	
	Frequency	Percentage	Frequency	%	Frequency	%
Youth 15-24 (Years)	21,655	72.8	47,614	64.1	**69,269**	**66.6**
Adults 25-34 (Years)	7,350	24.7	22,855	30.8	**30,205**	**29.1**
Elderly 35+ (Years)	727	2.4	3,767	5.1	**4,494**	**4.3**
Total	**29,732**	**100.0**	**74,236**	**100.0**	**103,968**	**100.0**

In terms of gender, women form the majority of completers (59%). There is no difference in their representation based on NSFAS funding status. Women's representation is quite consistent with the representation we find in our NSFAS funded students (as per the NSFAS Vital Statistics for 2018) as well as the wider post-school education and training system (DHET, 2019).

Table 3: Gender distribution of completers by course levels

NSFAS Funded					Non-NSFAS Funded					**Total**				**Grand Total**
Male		**Female**		**Total**	**Male**		**Female**		**Total**	**Male**		**Female**		
Freq.	%	Freq.	%		Freq.	%	Freq.	%		**Freq.**	**%**	**Freq.**	**%**	
12,194	41	17,538	59	**29,732**	30,550	41	43,686	59	**74,236**	**42,744**	**41**	**61,224**	**59**	**103,968**

Furthermore, in terms of race, the sample is dominated by Africans, followed by Coloureds, Whites and Indians. The proportional representation for NSFAS funded students is consistent with the overall sample, for non-NSFAS funded students, Africans are slightly under-represented, Coloureds, Indians and Whites are over-represented in comparison to the total sample.

Table 4: Distribution of completers by population group

Course Level	**Non-NSFAS Funded**		**NSFAS Funded**		**Total**	
	Frequency	**Percentage**	**Frequency**	**%**	**Frequency**	**%**
African	70,230	94.6	28,987	97.5	**99,217**	**95.4**
Coloured	3,225	4.3	640	2.2	**3,865**	**3.7**
Indian	192	0.3	40	0.1	**232**	**0.2**
Unknown	12	0.0	11	0.0	**23**	**0.0**
White	577	0.8	54	0.2	**631**	**0.6**
Total	**74,236**	**100.0**	**29,732**	**100.0**	**103,968**	**100.0**

4.2 Profile of TVET completers by education related variables

Roughly a third of the population was found to be funded by NSFAS. Of the total 103,968 students, 28.6% was NSFAS funded, with the majority not being funded by NSFAS. It is important here to just be reminded of the fact that this is not a direct illustration of graduations and cannot be interpreted as a throughput rate.

Table 5: 2017 TVET college completers disaggregated by funding status

Funding	Freq.	Percentage
No	74,236	71.4
Yes	29,732	28.6
Total	**103,968**	**100.0**

TVET Colleges offer mainstream programmes through NATED (N) 191 programmes (N1-N6) and the National Certificate Vocational (NCV) programmes. It is possible to exit NATED programmes at level 3 and thus traditionally there are three levels at which reporting is done in terms of progression through the TVET system:

- L4, which is the exit from the NCV and equivalent to a matric and at NQF level 4
- N3, part one completion of NATED and at NQF level 4
- N6, part two completion of NATED and is equivalent to NQF level 5 (HRDC, 2014).

If we consider the distribution in terms of NSFAS funding status, we find that the majority of completers completed at N6 level. This is consistent for both non-NSFAS funded and NSFAS funded students, with the NSFAS proportion being slightly lower than the average for the entire sample. A sizeable proportion of completers are completing at N3 level, as part of their eventual progression through the NATED programme to level 6.

Table 6: Distribution of TVET completers by funding status across exit level

Exit Level	NSFAS Funded		Non-NSFAS Funded		Total		(NSFAS Funded @ course level)
	Frequency	%	Frequency	%	Frequency	%	%
L4	1,123	3.8	5,631	7.6	**6,754**	**6.5**	17%
N3	10,915	36.7	19,651	26.5	**30,566**	**29.4**	36%
N6	17,694	59.5	48,954	65.9	**66,648**	**64.1**	27%
Total	**29,732**	**100.0**	**74,236**	**100.0**	**103,968**	**100.0**	

Given concerns about the under-representation of women in particular programmes, we further disaggregate by gender. In doing so, the following is notable; women dominate completions particularly at the highest exit level (N6). This is true, whether NSFAS funded or not, but particularly so for non-NSFAS funded women.

Table 7: Distribution of TVET completers by funding status, gender and exit level

	NSFAS Funded				Non-NSFAS Funded				Total			
	Male		Female		Male		Female		Male		Female	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	**Freq.**	**%**	**Freq.**	**%**
L4	326	2.7	797	4.5	1,615	5.3	4,016	9.2	**1,941**	**4.5**	**4,813**	**7.9**
N3	5,963	48.9	4,952	28.2	11,399	37.3	8,252	18.9	**17,362**	**40.6**	**13,204**	**21.6**
N6	5,905	48.4	11,789	67.2	17,536	57.4	31,418	71.9	**23,441**	**54.8**	**43,207**	**70.6**
Total	**12,194**	**100**	**17,538**	**100**	**30,550**	**100**	**43,686**	**100**	**42,744**	**100**	**61,224**	**100**

The sample is dominated by individuals that enrolled between 2014 and 2017. This wide distribution in enrolment date can be explained by the fact that programmes lead to exit levels quicker than university programmes, which requires longer period of education to complete[3], whereas in TVET Colleges one can exit after 1 year with a certificate and return back after a break and continue to finish a full programme. The other complexity is around the programme cycles, which in the university system tends to be annual, whereas in the TVET system can be either by semester, trimester or annual.

Four types of qualifications are offered at TVET Colleges, the NCV, NATED, occupational programmes and higher certificate programmes, although the occupational programmes have not yet been well integrated, and the higher certificates are a very small part of college offerings. We further report on the dynamics and patterns of distribution with respect to both NSFAS funded and non-NSFAS completers.

Figure 1 illustrates the distribution by programme and NSFAS funded proportion. It is clear that the majority of completers come from the N3: Engineering Studies programme, followed by N6: Engineering Studies and completers from the N6: Management Assistant programme. The minority of completers come from L4: Management, L4: Civil Engineering and N6: Public Relations fields. NSFAS funded students are best represented as a proportion of completers in the N3: Engineering Studies, N6 Public Management and N6 Public Relations.

[3] For example, completing NATED level one can be between 3 – 6 months, whereas university programmes traditionally run for at least a year.

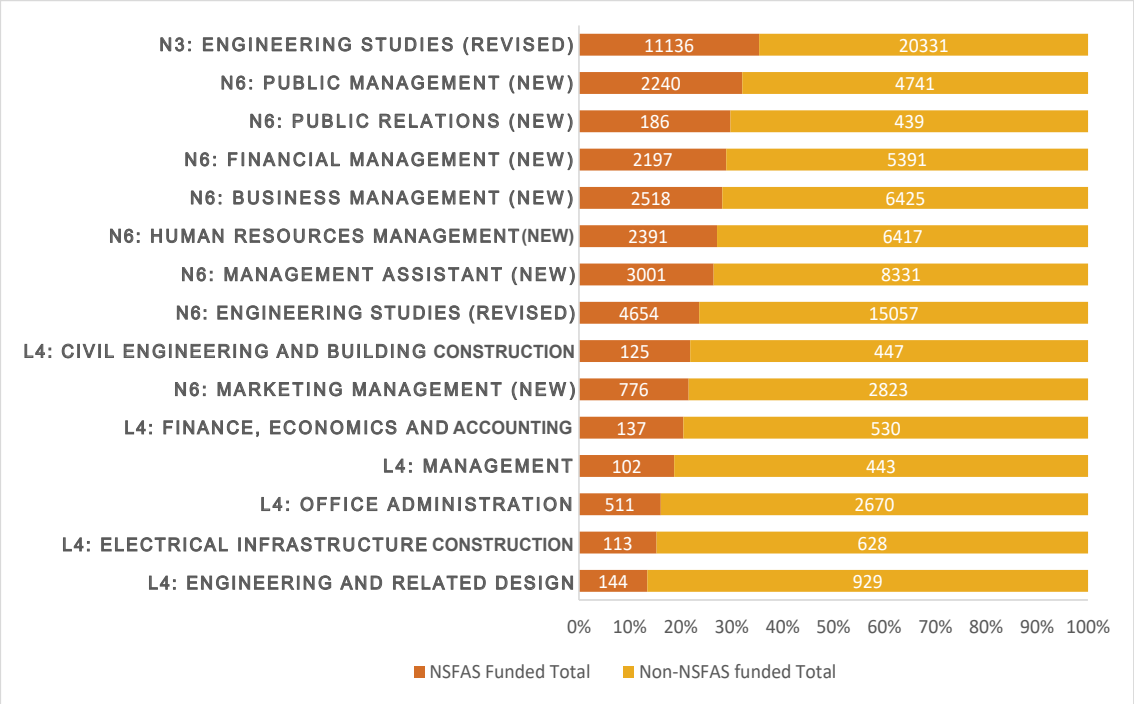

Figure 1: TVET completers across programme of study

Figure 2 shows that women completers dominate in the Office Administration and Management Assistant programmes, while most poorly represented in the Engineering and Related Design and Engineering Studies programmes. Similarly, NSFAS funded female students are best represented in Office Administration and Management Assistant programmes. However, they dominate completions in comparison to non-NSFAS funded females in quite a few programmes (Engineering and Related Design, Engineering Studies, Marketing Management, Business Management and Public Relations for example).

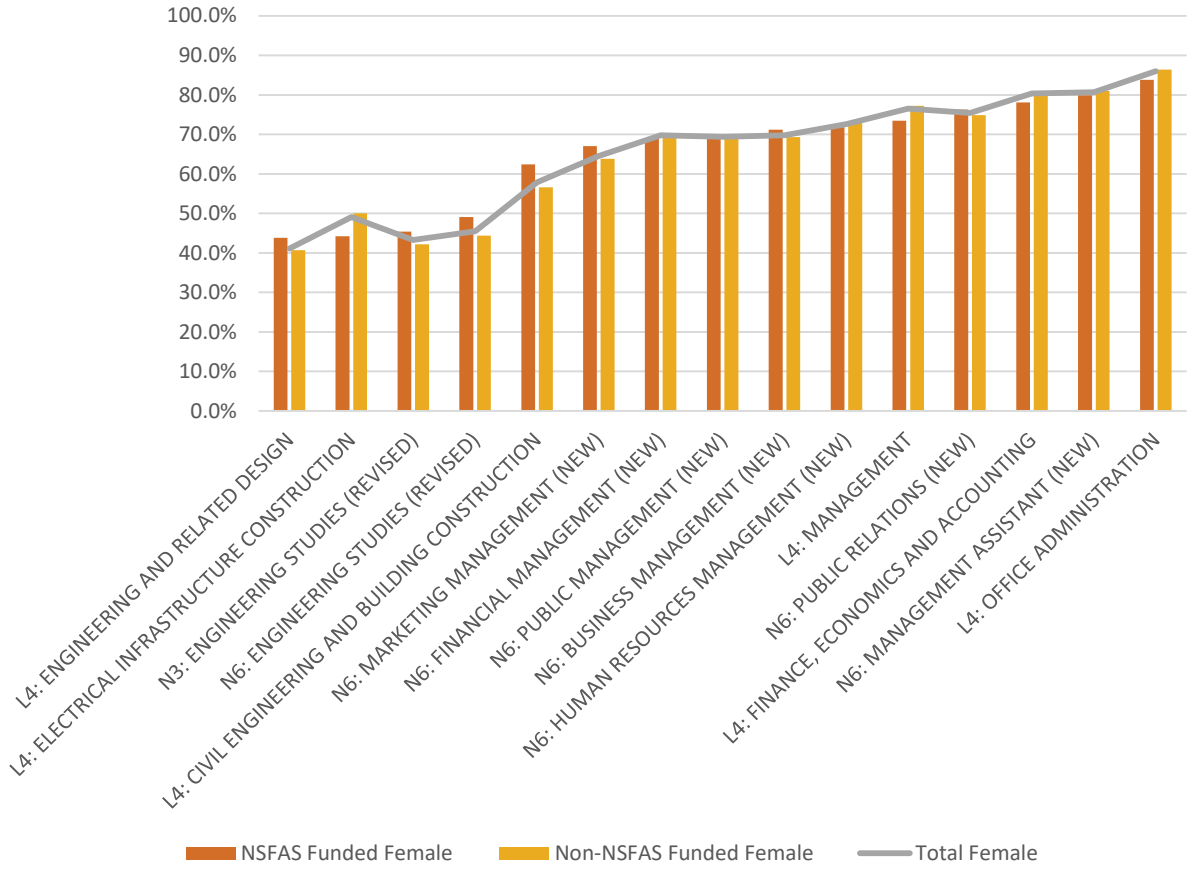

Figure 2: Course of study distribution of TVET completer by female representation

It must be acknowledged that while reports on the poor performance of the TVET system, there are indeed colleges that are doing well and whose qualifications are well respected (NPPSET, 2017). To ascertain how this statement bears out in the population of 2017 TVET completions we further present a distribution by college of attendance. The figure disaggregates and ranks the proportion of completions by being NSFAS and non-NSFAS funded. Taletso has the highest proportion of NSFAS funded completions, whereas Goldfields has the lowest.

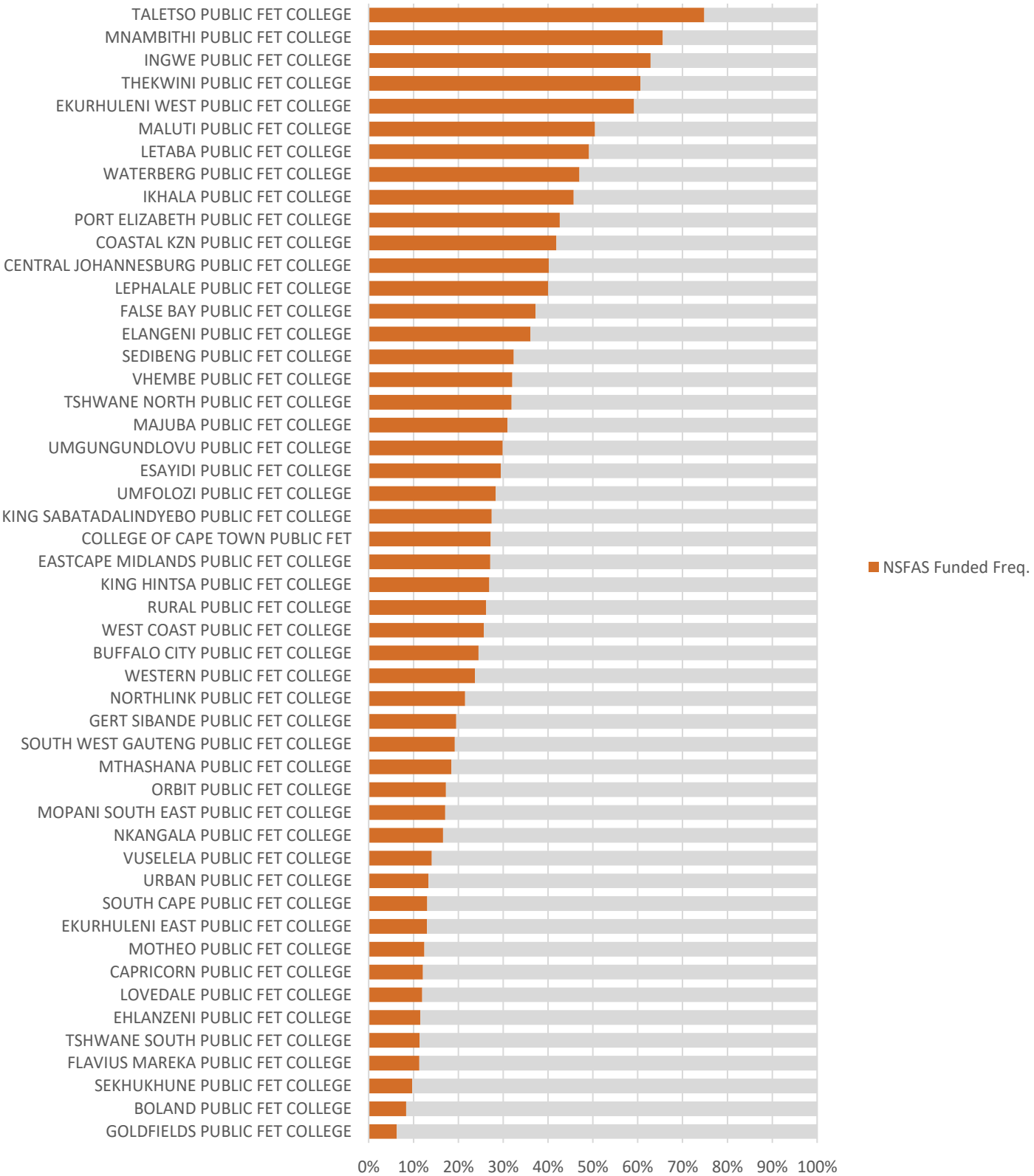

Figure 3: Distribution of TVET completers by college attended

5. Results

5.1 Testing the difference in average academic performance

A one-way analysis of variance (ANOVA) is used when there is a need to test for differences in the means of the dependent variable broken down by the levels of the independent variable. Here, the independent variable is expected to be categorical (with two or more categories), while the dependent variable has a normally distributed interval dependent variable. For example, we can explore whether being male is associated with a higher average performance in comparison to a female.

Table 8: Test of difference (ANOVA)

	Total	NSFAS Funded	Non-NSFAS Funded
Gender			
Female	**51.225**	52.150	50.853
Male	**51.130**	53.377	50.233
Total	**51.186**	**52.653**	**50.598**
ANOVA, F- test	**0.406**	32.832*	10.756*
Course			
NC(V)	**56.771**	58.007	56.524
NATED: (N3&N6)	**50.798**	52.443	50.112
Total	**51.186**	**52.653**	**50.598**
ANOVA	**407.926***	101.567*	334.289*
Province of College			
Eastern Cape	**52.452**	54.228	51.375
Free State	**47.182**	51.153	46.165
Gauteng	**51.738**	53.189	51.141
Kwazulu-Natal	**52.680**	53.079	52.441
Limpopo	**50.274**	52.236	49.689
Mpumalanga	**51.526**	54.257	51.013
North West	**48.552**	46.988	49.388
Northern Cape	**53.515**	53.384	53.548
Western Cape	**50.752**	52.201	50.326
Total	**51.186**	**52.653**	**50.598**
ANOVA	**53.932***	33.287*	35.051*
NSFAS			
No	**50.598**		
Yes	**52.653**		
Total	**51.186**		
ANOVA, F-test	**162.082***		

From the ANOVA the following points emerge (as illustrated in the table above):

- At an aggregate level, there is a statistically significant difference in the average performance of NSFAS funded completers based on programme type, province in which the college is located, and NSFAS funding status, with no statistically significant difference between the average performance of TVET completers, based on gender.
- Completers in the NCV on average have higher performance scores in comparison to the NATED pro grammes.
- Based on province, Free State colleges have the lowest performance, with the Northern Cape colleges having the strongest performance.
- Significantly, it is very encouraging to find that NSFAS completers perform on average better than non-NSFAS funded completers.
- For all of the variables, except gender, the statistical significance of the impact of the independent variable on the dependent variable, remains whether NSFAS funded or not.
- It is interesting to note that while at an aggregate level there is no statistically significant difference in the average performance of male versus female completers, this changes when funding is taken into account. Specifically, male NSFAS funded students perform on average better than non-NSFAS funded male, non-NSFAS funded female and NSFAS funded female groups.

5.2 Bivariate correlation

The bivariate correlation is slightly different to the ANOVA in that it compares the outcome in the de pendent variable only in terms of establishing whether there is a correlation with a specific category (in this case NSFAS funding status) with achievement. Correlation values are all significant at the 0.01 level (2-tailed), although the correlation values are weak. This confirms that there is a significant, but weak correlation between being NSFAS funded and average performance, regardless of programme type.

Table 9: Bivariate correlation between performance and NSFAS funding across selected variables

Funding Source	**Academic Achievement among Undergraduate Students**		
	Total	**Programme type**	
		NATED	NC(V)
NSFAS	**0.039****	0.044 **	0.038 **
Non-NSFAS	**-0.039****	0.038 **	0.044 **

5.3 Regression analysis

The regression analysis is the most sophisticated approach in that it not only establishes whether there is a relationship and the direction and strength of the relationship between independent and dependent variables, but can test a range of independent variables and their relation to the outcome variable at once. The F-value of 147.445 which is significant at one per cent level of significance indicates that the specific collection of independent variables reliably predicts the dependent variable. This group of independent variables (age, gender, programme type, provinces and NSFAS funding) can be used to reliably predict academic performance which is the dependent variable. The variance inflation factor (VIF), is (1/ tolerance) and as a rule of thumb, a variable which has a VIF value greater than 10 is problematic. In the study the VIF values reported in the table are all less than 2 after 1 variable (Gauteng Province) was removed, hence multicollinearity is not a problem in the model.

Table 10: Regression (Pool)

Variables	Pool		NSFAS		Non-NSFAS	
	β	Std. Error	β	Std. Error	β	Std. Error
(Constant)	67.521*	0.497	69.188*	0.842	67.336*	0.602
Age	-0.433*	0.016	-0.465*	0.026	-0.416*	0.019
Gender	0.006	0.148	1.062*	0.213	-0.430**	0.188
NATED (N6&N3)	-6.139*	0.296	-6.096*	0.549	-6.122*	0.352
Eastern Cape	0.763*	0.262	1.646*	0.342	0.268	0.351
Free State	-4.248*	0.321	-1.890*	0.530	-4.869*	0.393
Kwazulu-Natal	0.797*	0.226	0.442	0.300	1.056*	0.300
Limpopo	-1.600*	0.224	-0.815**	0.343	-1.839*	0.280
Mpumalanga	-0.402	0.297	1.015***	0.542	-0.698**	0.357
North West	-3.055*	0.337	-5.143*	0.450	-1.875*	0.447
Northern Cape	1.818*	0.666	0.435	1.134	2.120*	0.805
Western Cape	-0.661**	0.306	-0.755	0.481		0.379
NSFAS fund	1.553*	0.164	-	-	-	-
F	147.445		66.492		98.747	
Sig.	0.000		0.000		0.000	

Note * indicate significance at 0.05 level of significance; **indicates significance at 0.01 level of significance

The B statistic indicates the unstandardised beta (B). This value represents the slope of the line between the predictor variable and the dependent variable. For example, for age this would mean that for every unit increase in the age of the student, the dependent variable (in this case academic performance) decreases by 0.433 units. Age in the multiple regression model is significant at the significance level of 0.05, thus the single asterisk. Values with two asterisks indicate significance at a higher level of probability.

Since gender is coded 0/1 (1=male, 0=female), the coefficient of 0.006 implies that for male, the predicted academic performance would be 0.006 points higher than for females, holding all other variables constant. The predicted performance of the NATED variable in the model is significantly negative in relation to performance in the NCV, if all other variables are held constant.

The results of the provincial variables show diverse effects on academic performance. Being enrolled in the Eastern Cape, Northern Cape and KwaZulu-Natal provinces, increases the academic performance of TVET students by 0.763, 1.818 and 0.797 points respectively if all other variables are held constant, noting that the positive effect is most pronounced in the Northern Cape. Whereas, a negative effect is observed when a TVET student is enrolled at colleges in the Free State (-4.248), North West (-3.005), Limpopo (-1.600) and Western Cape (-0.661) Provinces, noting that the impact of the negative effect is most pronounced in the Free State.

The variable "NSFAS" which is an indicator of being a recipient of NSFAS funds has a positive coefficient of 1.553 and it is significant at $p<0.01$. This suggests that the predicted academic performance of a TVET student is increased by about 1.5 points when they are a recipient of NSFAS funds in comparison to not being funded by NSFAS, all other variables held constant. Comparatively thus, NSFAS funded completers perform on average better than non-NSFAS funded completers.

The F-values of 66.492 and 98.747 of both NSFAS and non-NSFAS models are significant at one per cent level of significance. It means that the independent variables in each of the models reliably predict the dependent variable (academic performance). What is observable in the model is that almost all the variables have the same pattern of effect on performance of NSFAS and non-NSFAS funded students with the exception of gender (male).

We highlight in detail as follows:

- NSFAS funding is positively associated with performance, where NSFAS funded students perform on average better than non-NSFAS funded students.
- Age has a consistently negative impact on average academic performance, whether NSFAS funded or not, with the impact being stronger for NSFAS funded students.
- At an aggregate level gender is not significant in impacting on academic performance, but becomes significant when NSFAS funding status is considered, with the impact being positive for NSFAS funded students and negative for non-NSFAS funded students. In other words, male NSFAS funded students performing better than females, where the converse is true for non-NSFAS funded students.
- Programme types has a consistent impact on performance, whether NSFAS funded or not, where being in a NATED programme means that you would on average perform poorer than those individuals in an NCV.
- For colleges in the Free State, Limpopo, North West and Western Cape, there is a consistently negative and significant association with performance, whether NSFAS funded or not.
- For colleges in the Eastern Cape, Kwazulu-Natal and the Northern Cape, there is a consistently positive association with performance, although the significance is not consistent when taking NSFAS funding status into account.

6. Key findings and insights for policy

It is important to compare the outcomes of this research with recently completed research on the same topic, in the university system. Although the university research was limited to only two institutions. It is important to highlight that this study confirms a positive result for being NSFAS funded in comparison to not being NSFAS funded, in terms of average performance.

The findings in relation to the impact of gender is also important to highlight as it contradicts the university findings. In the university study we found women to perform on average better than males, while in this study, for TVET students, there is a converse outcome in terms of the impact of gender on performance, with males on average performing slightly better than females.

The results for age are consistent with our findings for university students, where the lower the age, the higher the average academic performance. Students in the NCV programme on average have higher levels of academic performance in comparison to those in NATED programmes and Colleges in the Northern Cape perform on average the best and those in the Free State the worst.

Such findings are important to feed into policy engagement and to initiate further areas for research. The draft national plan for post-school education and training (NPPSET) provides the implementation framework for policy goals of the White Paper for PSET. Enrolment growth in TVET colleges has been rapid since the recapitalisation of the TVET (formerly FET) colleges, almost doubling between 2010 and 2015, but slowing down recently in response to funding and capacity constraints. In 2015, the 50 TVET colleges with 260 campuses enrolled 737,880 students, and had 10,592 lecturers, 433 management staff and 7,210 support staff (DHET, 2017).

From a purely academic perspective, we know that a range of factors can contribute to the successful completions of students, within the TVET system, but many challenges have been noted (Badenhorst & Radile, 2018; Gaffoor & van der Bijl, 2019; Van der Bijl & Lawrence, 2018; Zulu & Mutereko, 2020; Ojo, 2014). It will always remain important to continually explore and provide further quantitative understanding of the factors for TVET students' academic performance, attrition, retention and completion in South Africa. We know much more on this topic for the University system which facilitates clearer and more efficient planning.

From a policy perspective, there is also a very strong motivation for this type of research exploration and work to be deepened. The objectives of the NPPSET recognises that the system can improve implementation through systemic monitoring and evaluation, and analysis of system data for evidence-based decision making (DHET, 2017). The plan further recognises that equally critical to the development and delivery of relevant and responsive programmes, developing the capacity of the system, and strengthening workplace-based learning is monitoring and evaluation (DHET, 2017). In this regard, the data analysed in this report contributes immensely to the establishment of such a platform and baseline level data on the relationship between different variables, most notably NSFAS funding status and academic performance in a very important cohort of TVET students (completers).

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