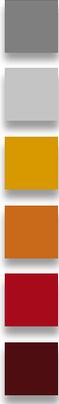




**Working Paper Series 2:
A cohort analysis on the NSFAS-funded
students – A review of existing studies and
implications for future cohort studies**

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ABBREVIATIONS

CESM	Classification of Educational Subject Matter
CHE	Council on Higher Education
DHET	Department Of Higher Education And Training
EFC	Expected Family Contribution
FTE	Full Time Equivalent
ID	Identity Number
HEMIS	Higher Education Management Information System
LMS	Loan Management System
NSFAS	National Student Financial Aid Scheme
PER	Performance And Expenditure Review (National Treasury)
UDM	Universal Data Model
TVET	Technical Vocational Education and Training

University Abbreviations

CUT	Central University of Technology
DUT	Durban University of Technology
MUT	Mangosuthu University of Technology
NMMU	Nelson Mandela Metropolitan University
NWU	North West University
UCT	University of Cape Town
UFH	University of Fort Hare
UFS	University of the Free State
UKZN	University of Kwazulu-Natal
UL	University of Limpopo
UJ	University of Johannesburg
UNISA	University of South Africa
UNIVEN	University of Venda
UP	University of Pretoria
UWC	University of the Western Cape
UZ	University of Zululand
SUN	Stellenbosch University
TUT	Tshwane University of Technology
VUT	Vaal University Of Technology
WITS	University of the Witwatersrand
WSU	Walter Sisulu University

EXECUTIVE SUMMARY

Understanding how well students are performing once they access higher education is critical to determining how effectively the money invested by the State is being utilised. It is not simply enough to count the number of bodies entering a public university or college, as this is only a quantitative indicator of the size of the system. It says nothing about the quality of the system or how well government's funding is being spent. To be able to comment on the quality, government needs to be able to show how many of the students who enrol and register and are then funded by the State are successfully in completing their studies and graduating.

While there are many different cohort studies on students admitted to public universities in South Africa, there are only two cohort studies that currently speak directly to the NSFAS-funded students over two/more successive years of study. However, the intent, scope and parameters of these studies - like the remaining studies that look at the full cohort of all students admitted – are different and so the outputs from these studies are not fully comparable.

They do however tell some interesting stories. As a whole, NSFAS-funded students do not seemingly perform more poorly than non-NSFAS funded students, with one study indicating that NSFAS-funded students perform better than non-NSFAS funded students, and another suggesting that the opposite is true. Headcount and enrolment is increasing over time, with the DHET suggesting that this increase in numbers is associated with better retention of these students over the past ten years with fewer dropping out, and more students graduating. Of concern overall, is that students are taking significantly longer to complete their studies than the regulation time suggests, with most taking two to three years longer to complete. Beyond six years, the drop-out rate increases. Of particular concern is the non-completion rate for distance education programmes as a whole, and this is to be confirmed for the NSFAS-funded cohort.

A more coherent, coordinated and integrated mechanism for pulling data together, for tracking students over time and into the workplace is required for the data to tell a richer narrative of the success of the Scheme in providing access and facilitating the success of students into, through and out of higher education.

INTRODUCTION

Enrolment, participation, retention, throughput, completion and graduation are common indicators used to diagnose the health of an education and training system¹. In particular, when looking at the higher education and training system, discussion on these indicators forms the dominant discourse, with there being a wide variety of methodologies, terms of reference and ultimately outputs from the studies prevalent. Indeed, the recent summit on higher education in South Africa asked the question – are we making progress with the structural transformation in the sector, and particularly in respect to access and success?² For NSFAS, these indicators form a core part of the evaluation of the impact of the funding allocated to students. The purpose of this paper is to not only demonstrate the contribution of NSFAS to the growth of the sector, but also to be able to account for the spending of public funds.

This paper is intended to outline key studies that have examined the performance of NSFAS funded students as a subset of the cohort of students who enrol in higher education. It will undertake this by first outlining the primary cohort studies that have been done in the sector recently, and comparing and contrasting these in terms of the assumptions that have been made, how this has influenced their methodology in response to the terms of reference and ultimately, the narratives on the evidence that result from these studies (where information is available). One of the recent critiques on the studies that have been done on the sector to date is that “most studies have worked with aggregate numbers and not with individual student records”³, this despite the availability of individual student level information held both by NSFAS and the Department of Higher Education and Training (DHET)’s Higher Education Management Information System (HEMIS).

Much of the literature reviewed attests to the growth of enrolments within higher education, and particularly NSFAS’ role in broadening access for students from previously disadvantaged communities. Clearly, the most efficient use of NSFAS funds is to minimise the number of drop-outs and fund students that graduate within regulation time, so that students “get in” (access), “get through” (pass and progression criteria) and “get out” (successfully by graduating). The best mechanism

¹ Lewis, F. (2012). *Traffic jams or trees? How are South African youth progressing through the post-school sector? And what lessons can we learn from current studies*. LMIP Working Paper 27. Pretoria: Human Sciences Research Council.

² Department of Higher Education and Training (2015). *Annexure 3: Are we making progress with systemic structural transformation of resourcing, access, success, staffing and researching in higher education: what do the data say?* Paper prepared for the second national Higher Education Transformation Summit.

³ De Villiers, P. & van Wyk, C. (2013). *Opening the black box of higher education with the aid of longitudinal cohort analysis*. Paper read at the biannual conference of the Economic Society of South Africa.

for measuring this is to track students as a group or a cohort over time, to establish how long they take to complete, what types (and how many) of qualifications are funded ultimately, and then where possible, to track the time to employment. However, what a review of these studies has revealed is the importance of defining the parameters for a cohort, for the period of time to be tracked and for the assumptions about what a NSFAS-funded student is. These will be more fully explored in the next sections.

Four key cohort studies will be reviewed in this paper. The first cohort is that of the NSFAS-commissioned cohort study undertaken in 2010 and 2011 – commonly known as the “First Five Years study” (also referred to as the Stellenbosch study). The second study that will be considered is the limited set cohort analysis undertaken as part of the National Treasury commissioned a Performance and Expenditure Review (PER) of NSFAS in 2015. The third study will be the four successive cohort analyses undertaken by the Council on Higher Education (CHE) as part of their VitalStats series, and finally, the initial cohort analysis undertaken by the DHET as part of the preparation for the summit in October 2015.

ASSUMPTION AND PARAMETER SETTING AND METHODOLOGY

As a general statement, the value of longitudinal cohort analysis⁴ in understanding the patterns of student performance in university is well researched and acknowledged. In South Africa, cohort analysis forms the backbone of the assessment of the efficacy of the education system in producing learners at all levels, from time of entry to a phase of education (e.g. primary schooling) to time of completion (e.g. secondary education, grade 8 to grade 12). In the higher education sector, cohort studies are used by many different stakeholders to show how different institutions are performing, how policy implementation influences educational outcomes, and to advocate for funding on the basis of these outcomes.

A cohort is a group of students who enter a higher education at the same time³. By using this parameter, performance information on progression, completion, exit and re-entry can be determined for each cohort set analysed. In higher education, cohort analysis often follows the group of students who are entering a university for the first time and then tracking them through to the point of exit, usually over a long period such as 10-15 years. It requires longitudinal data coverage that is substantive enough

⁴ Voorhees, R. & Lee, J. (2009). *Basics of longitudinal cohort analysis: principles and practices of student success*. A publication by Lumina Foundation for Education: Achieving the dream: Community Colleges Count. Accessed at https://www.ccsse.org/center/ssbnt/docs/Publications/ATD_Longitudinal_Cohort_Analysis.pdf

to be able to tell the story of individual student level movements so that analysis of how many students from a particular subset have progressed or dropped out or are still studying can be determined.

For each of the studies below, the following high-level parameters and assumptions will be discussed in relation to the assumed purpose of the study:⁵

- Defining the subset of students being studied – all, some, particular subset;
- Determining the year of the cohort being studied and for how long;
- Identifying the data sources and the data fields that are required; and
- Defining the basis for evaluating the performance, e.g. courses passed rate, graduation rate, drop-out.

The comparability of outputs from different studies is intrinsically linked to the extent to which these high-level parameters and assumptions are aligned to one another. A table in Annexure A will highlight the key differences between the four studies to be discussed for comparability.

i. The First Five Years Cohort Study⁶

NSFAS commissioned this study to enable NSFAS to assess the extent to which the Scheme had achieved the twin goals of access and equity in higher education, matched to success for students from previously disadvantaged communities. It was scoped to undertake this by doing an analysis of each cohort of students in terms of success rates such as retention, throughput, graduation, time to complete and where possible, employability and repayment of their loans. Through this, NSFAS also intended to assess the extent to which strategic policy choices made over time may have impacted the access and success rates of the students being funded. It was proposed at the time that the exercise be repeated in 2014/15 for the 2005 to 2009 cohort of students, and that this study would therefore form a baseline for reviewing NSFAS' impact over time.

This cohort study tracked students through the higher education system, using student unit-record datasets captured and maintained by higher education institutions in the Higher Education Management Information System (HEMIS). HEMIS is the key higher education data collection programme designed and implemented to report annually to the Department of Higher Education and Technology (DHET) on the

⁵ Where this is not explicitly known.

⁶ Also frequently referred to as the “Stellenbosch study”, as it was undertaken by a group of researchers based at Stellenbosch University, Department of Economics.

status and performance of the higher education sector in South Africa. HEMIS collects data on individual students in all higher education institutions in the country. Databases for HEMIS have been in existence long enough to generate long-term enrolment unit-level records. Using the ID number as the unique identifier, the First Five Years study was able to match HEMIS student-level information to the NSFAS student-level information. However, it should be noted that caution needs to be exercised as this cohort was unable to match about 10 per cent of NSFAS-funded students across the datasets because of missing or incorrect ID numbers.

ii. The PER Cohort Study

The intention of the PER was to examine the planning, implementation and financing of the Scheme as a whole, and the cohort analysis was one of many methodologies employed to understand this further. Its' primary purpose was not to undertake a full longitudinal analysis, but to highlight areas that need addressing. The PER cohort study recognised that NSFAS funds only a subset of the student population whose characteristics may differ from the aggregate student population. Most notably, differences such as economic background, parent education level, and schooling may have profound effects on downstream decisions such as choice of university, choice of qualification type and field of study.⁷

The PER cohort study could not match 38 871 records in the NSFAS datasets for 2006 through to 2012 with the HEMIS datasets. However, the PER cohort study nevertheless found 20 per cent more matching records than had previously been reported to DHET. This may need further investigation as it may be due to the use of different categorisations (data definitions may need refining) between the data reported to the DHET by NSFAS and the data used by the PER.

iii. The CHE Cohort Analysis

The full methodology for the CHE cohort is provided in Annexure B.⁸ As the CHE is not provided with the ID numbers from HEMIS, the analysis required the creation of a registerID which was a unique random number created based on student number and institution code, used to mask student identity. In addition, the CHE cohort does not specifically differentiate between students funded by NSFAS and those not funded by NSFAS.

⁷ Cornerstone Economic Research (2015). *Performance and Expenditure Review of NSFAS - First draft v3*. Research commissioned by the National Treasury. Internal report.

⁸ Per email correspondence from Dr Charles Sheppard (19 March 2016, 09:06am).

The CHE cohort analysis provides details on throughput rates (in terms of those who graduated and dropped out) for 360-credit diplomas (by broad field of study), 3-year degrees and 4-year degrees (by CESH) and the headcount and percentage of students who graduated within 6-years by broad field of study.

iv. The DHET Cohort Analysis

As the custodian of the HEMIS dataset for all institutions, the DHET is in a unique position to perform accurate cohort tracking for all registered and funded students and all funded programmes. This data is audited annually and verified through an independent process, which substantially improves its reliability and validity. This data is used for monitoring and evaluation of the higher education system as a whole and is a critical input for the norms and standards funding of the universities. The HEMIS student level unit information is available from as early as 2000, which makes longitudinal analysis possible, particularly for elements such as pass rates, success rates, retention of first-time entering students, throughput/completion rates, growth rates in graduation vs enrolments, graduation rates and the average time to complete⁹. In addition, the DHET have determined a set of calculation tools for each of these elements, which should be used as the industry standard.

However, the completion of one of the critical fields in the HEMIS data which would enable effective comparative studies of NSFAS- vs non-NSFAS- funded students is the HEMIS indicator (element 19). Unfortunately, this is not consistently or reliably completed by institutions, and so cannot be used by the DHET for the purposes of cohort analysis.

a. *The 2015 Cohort Analysis – As presented at the Higher Education Summit*

However, from 2015, the DHET had the “ability to regularly and reliably conduct cohort studies”² for the general student population, and presented outcomes of this analysis for the 2000 to 2012 cohorts at the Higher Education Summit in 2015.

This study included only South African students, and used the student ID number as the unique identifier. To measure the effectiveness of the higher education system, the DHET measured itself against the following parameter: the number of students that are admitted should be retained and enabled to complete their studies in

⁹ Parker, D. & Sheppard, C. (2015). *How HEMIS and the development grants can be used to improve SA student success*. A DHET presentation on 15 May 2015. Accessed 29 March 2016
<http://siyaphumelela.org.za/wp-content/uploads/2015/05/Parker-Sheppard-15-May.pdf>

regulation time (or as close as possible) without compromising quality. It is these findings which are reflected against later in this paper.

b. The 2016 NSFAS Cohort Analysis – In progress currently

In 2016, the DHET have initiated an analysis of the 2005 to 2014 NSFAS-funded cohorts, with a particular emphasis on the 2005 to 2008 cohorts (as per their Annual Performance Plan). In this cohort, the DHET will be matching the NSFAS student level records – by SA identity number – to the HEMIS student level records for first-time entering students for the years 2005 to 2014.

In this exercise, the DHET will be looking at the following:

- Students who received their first NSFAS award in their first year of entry to the institution (as an example, for the 2005 cohort, this amounts to approximately 18 000 students); and
- Students who may not have received NSFAS awards in their first year of entry but did receive in a subsequent year (for the 2005 cohort, this amounts to approximately 11 000 students); and
- All students who received NSFAS at any point of their studies, even if not for the full duration (for the 2005 first-time entering cohort, this would be 29 000 students).

From this, the DHET will be identifying any differences in the outcomes for these different scenarios, and comparing this with all first-time entering students (regardless of funding status). At the time of writing, only a preliminary run on the 2005 cohort had been undertaken, with initial results as below¹⁰ (although results by gender were provided, only the totals will be reflected):

Graduated within regulation time (2007) or by 2008, 2009 or 2010:

	2007	2008	2009	2010
First-time entering awarded in 2005	13.1	33.5	45.4	51.2
First-time entering not awarded in 2005 but in later year of study	14.2	35.2	49.8	58.1
First-time entering awarded NSFAS in any year, incl. 2005	13.5	34.1	47.0	53.7

Notes:

¹⁰ Per email correspondence from Ms J Skene to NSFAS EO, Mr M Daca (18 March 2016, 09:18:22)

- The graduation rate for females is consistently higher than males for all cohorts and all three scenarios;
- Graduation rate seems slightly higher for students awarded in subsequent years of study and not in their first year of entry – but the significance of this can only be verified by analysing subsequent cohorts; and
- As expected, the final scenario represents a mid-point between the two preceding scenarios, although there were more students in the first scenario than in the second scenario. Further analysis may be necessary.

Dropped out:

	2007	2008	2009	2010
First-time entering awarded in 2005	17.1	25.5	29.5	32.2
First-time entering not awarded in 2005 but in later year of study	13.0	15.8	18.3	19.9
First-time entering awarded NSFAS in any year, incl. 2005	15.7	22.1	25.6	27.9

Notes:

Surprisingly, the drop-out rate seems lower in the group of students who did not receive funding in their first year of entry to university, implying a higher risk for the funding of first-year students – with this difference increasing the longer the student stays at university. This significance of this observation is subject to this being consistently reported for other cohorts of students.

KEY FINDINGS FROM THE DIFFERENT STUDIES

i. Throughput – as an indicator of the efficiency of the whole system

As a construct, throughput is understood to be both the number of students that enter then progress through and complete their qualification, and the numbers of students who achieve this in regulation time (N) – both these give an indication of the health of the system as a whole. This is of equal interest for both NSFAS and non-NSFAS funded students.

The CHE and the DHET² cohort studies provide good evidence for successive cohorts of the percentage of students who graduate within regulation time – in the 2014 CHE study, of the students who entered higher education in 2007, only 20% completed within three years, 34.4% in four years, and 42.8% in five years. When

looking at this by race, the CHE cohort shows that more white students graduate within regulation time (42%) than Indian (26%), coloured (23%) and African (19%) students. The DHET study goes further to indicate that white females are the most likely to graduate within regulation time (61.4%) and that the graduation rate for African females is slightly higher than for African males. However, there is not such a significant difference in the drop-out rate within the first three years for this same cohort, with white students having a drop-out rate of 32% compared to Indian (36%), African students (38%) and coloured students (41%).

Of interest in the CHE cohort studies is that these throughput rates are provided per field of study, and in the DHET study, this is disaggregated to some extent by institution. The PER study suggests that the NSFAS-funded students graduation rate within regulation time for a three-year degree is less than half that of the DHET cohort, suggesting a performance gap. How significant this performance gap is would need to be tested by a more comprehensive cohort study that would directly compare NSFAS and non-NSFAS funded students undertaking the same qualification types over the same periods.

ii. Graduation Rates

Evidence from the CHE cohorts and the PER cohort does not indicate that NSFAS-funded students perform significantly better than non-NSFAS funded students in graduating within regulation time. This is in contradiction to the First Five Years study which shows that of the five cohorts which were tracked (2000 to 2004), a higher proportion of NSFAS-funded students had qualified after nine years (55%) than non-NSFAS funded students (48%), and a lower proportion of NSFAS-funded students had dropped out (38%) than non-NSFAS funded students (46%). This led the researchers to conclude that the financial support received by these students contributed to their persistence with their studies. However, even in this study, the percentage of students who graduated within regulation time (N = 3 years for a 3-year programme) is higher for non-NSFAS funded students (just over 22%) than for NSFAS funded students, although this relationship inverts from N+1 onwards.

The DHET cohort analysis for all the undergraduate students admitted into contact programmes shows that for 3- and 4-year programmes, 44.2% of the cohort admitted in 2000 had graduated within 5 years, and that in total over 9 years, 54.4% of the cohort had graduated. This seems to suggest that the NSFAS qualification statistics from the First Five Years study is no better or worse than the qualification statistics for the full cohort of students who entered in 2000. The data also demonstrates that for the 2009 cohort, this graduation rate had increased to 53.5%, indicative of a steadily improving higher education system.

iii. Academic pass rate

NSFAS uses the “courses passed rate” as the basis for the conversion from the loan to the grant (the 40/60 conversion). This data is collected annually from institutions for all students who were funded in that year. In the Annual Reports published by NSFAS, it is this pass rate that is used as a reflection of the academic progress of the students being funded. However, the courses passed rate is neither indicative of whether a student is on track to graduate within regulation time, or whether a student has accumulated sufficient weighted FTE credits to progress nor is it indicative of the credit value of each of the courses enrolled for or passed. The CHE definition of student success rate states that it is the “total number of courses passed by students in a given academic year relative to course enrolments, calculated by dividing the total number of FTE degree credits (courses completed) by FTE enrolments.”

Based on this understanding, the Stellenbosch cohort study notes that over the period 1996 to 2009, NSFAS reported an average course passed rate of 74.3%, as per the annual reports for each financial year.

iv. Drop-out rate

Evidence from the papers reviewed provides conflicting views on the drop-out rates of NSFAS and non-NSFAS funded students. Various studies show that 30% - 40% of students drop-out in their first two years of study, and approximately 53% of students never graduate ^(11,12).

At the time of the NSFAS Ministerial Review¹³, it was reported - based on a snapshot of all funded students taken from the annual student graduate and drop-out reports run by NSFAS - that 33% of NSFAS-funded students were still studying, and 67% were no longer at university although only 28% of the 67% had graduated and the remaining students had dropped out. What the Stellenbosch University study does tell us is that of the year 2000 first-time entering first-year student cohort (15 345 students), 8 768 obtained a qualification within 9 years (55%), with most students qualifying after four years (2 558), followed by those who qualified within three years

¹¹ Council on Higher Education (2015). *CHE 20-Year Review*. Briefing presented at the Parliamentary Portfolio Committee on Higher Education, Cape Town, August 19. Available at <http://pmg-assets.s3-website-eu-west-1.amazonaws.com/150819che.pdf> (accessed on 04 December 2015).

¹² Council on Higher Education (2014). *VitalStats: Public higher education 2012*. Pretoria: CHE

¹³ Department of Higher Education and Training (2010). Report of the Ministerial Committee on the Review of the National Student Financial Aid Scheme

(2 500) and five years (1 453)¹⁴. On the same cohort (year 2000), the study showed that after four years (2003), 29% were still studying, 34% had qualified and 37% had dropped out. After a full nine years (by 2008), 6% of this same cohort were still studying, 55% had qualified and 38% had dropped out.

In comparison, the DHET study shows that for the same year cohort (2000) of 98 095 students in both contact and distance programmes, after 1 year of study 31.5% had dropped out; after 5 years 44.3% had dropped out; and after 10 years, 47.1% had dropped out. For contact programmes only, this drop-out rate drops significantly for the same cohorts – of the 70 994 students in 2000, 23.6% had dropped out after the first year of study, 39% had dropped out after 5 years of study and 42% had dropped out after 10 years. The 2004, 2009 and 2012 cohort – for both contact only and contact/distance students - similarly measured showed much lower drop-out rates for ‘end-of-year 1’ and ‘end-of-year 5’ signalling improved retention of students.

On the basis of the data provided to the researchers, the First Five Years study concludes that non-NSFAS funded students have a slightly higher drop-out and a lower qualification rate, with 46% having dropped out, 6% still studying and 48% having completed their qualification. In this study, it was suggested that this could be because these students receive the financial support required to focus on their studies, and understand that the bursary conversion incentive offered by NSFAS will reduce the value of their loans.

The DHET cohort also presents some analysis of the drop-out by race and gender¹⁵:

		Dropouts (%) after one year of study			Graduates (%) after five years of study		
		2000	2012	Improvement	2000	2009	Improvement
African	Female	33.4	20.1	13.3	30.4	43.6	13.2
	Male	37.5	22.2	15.3	23.5	36.2	12.7
Coloured	Female	30.1	17.7	12.4	37.2	43.0	5.8
	Male	39.5	22.9	16.6	27.3	36.1	8.8
Indian	Female	21.0	12.9	8.1	42.1	50.3	8.2
	Male	24.6	15.3	9.3	33.8	40.3	6.5
White	Female	22.2	10.1	12.1	62.1	61.4	-0.7
	Male	27.1	13.9	13.2	46.9	52.0	5.1

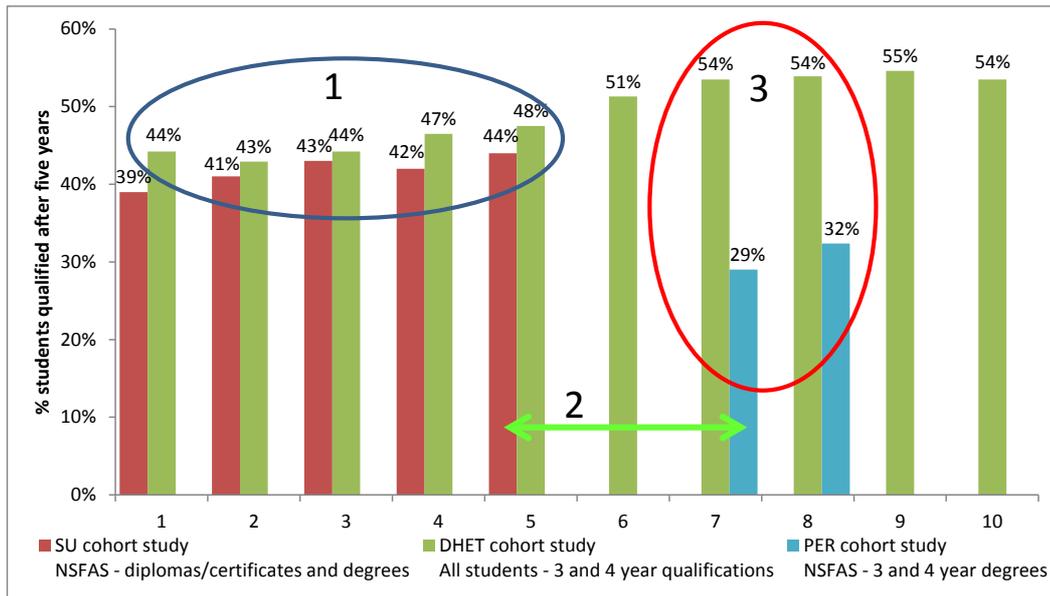
¹⁴ De Villiers, P. & van Wyk, C, (2013). *Opening the black box of higher education with the aid of longitudinal cohort analysis*. Paper read at the Biannual conference of the Economic Society of South Africa, Bloemfontein, 25-27 September 2013

¹⁵ DHET, 2015. Annexure 3, Figures 4.1 and 4.2

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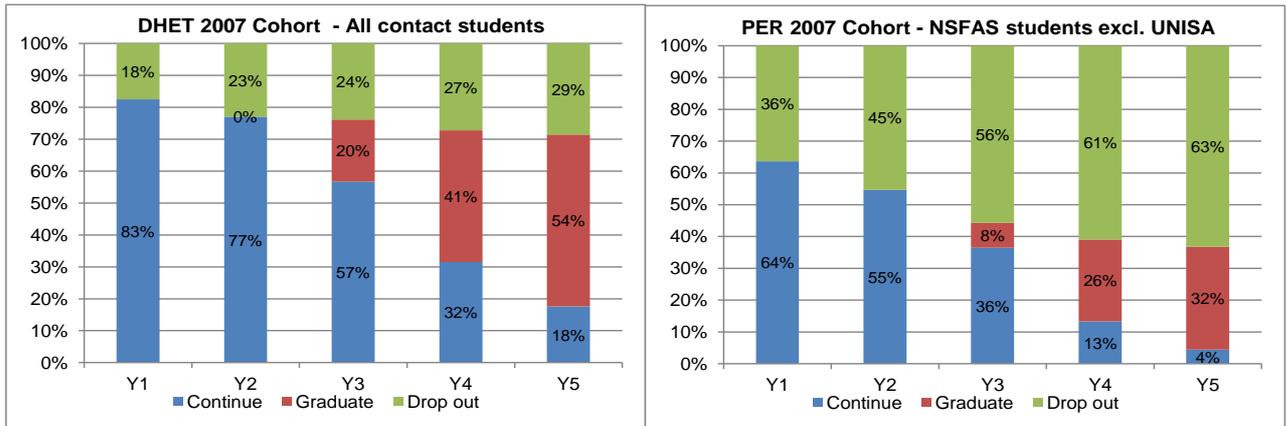
These figures show that female students have a lower dropout rate than males, and that coloured males are the group most at risk at the end of their first year, followed by African males and then African females.

The chart below plots the data from the First Five Year study, the DHET and the PER cohort analysis⁷:



- In the first circle, the comparison between the Stellenbosch study (red) and the DHET cohort for the same years indicates that NSFAS-funded students perform comparatively well as the students in the DHET study (all students) in terms of qualifying within 5 years. However, in this comparison, the types of qualifications being compared were not the same with the Stellenbosch study including 1-year certificate programmes;
- The arrow between the Stellenbosch study (red) and the first cohort examined by the PER study (blue) seems to show that even when only comparing NSFAS-funded students, the percentage of students who graduate within 5 years is higher in the Stellenbosch study than in the PER study. Again, this could be attributed to the fact that the first study included all qualification types and the PER study only examined 3- and 4-year qualifications. On this basis, this conclusion may be that throughput through 3- to 4-yr degree programmes lags behind students studying diploma and certificate programmes, but this would need to be confirmed;
- However, what is most concerning is the comparative data between the DHET cohort and the PER cohort (circle 3). Over these two years, the subset of NSFAS-funded students studying 3- to 4- year degrees performed worse than

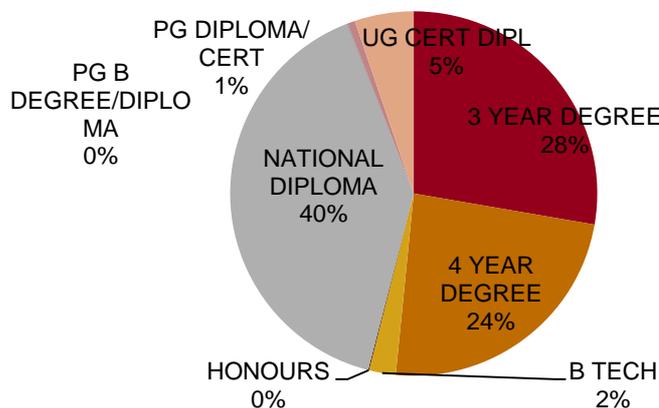
all students studying 3- to 4- year degrees in the DHET cohort study, with the students in the PER cohort study (the 2007 year cohort specifically) having a significantly higher dropout rate (63%) than the DHET cohort (29%), shown below:



The DHET cohort analysis shows that the number of students who are dropping out has declined over time since 2000 to 2012, which means that “the system is getting substantially better at retaining students, but needs to effectively convert retention into graduation in regulation time or as close thereto”.

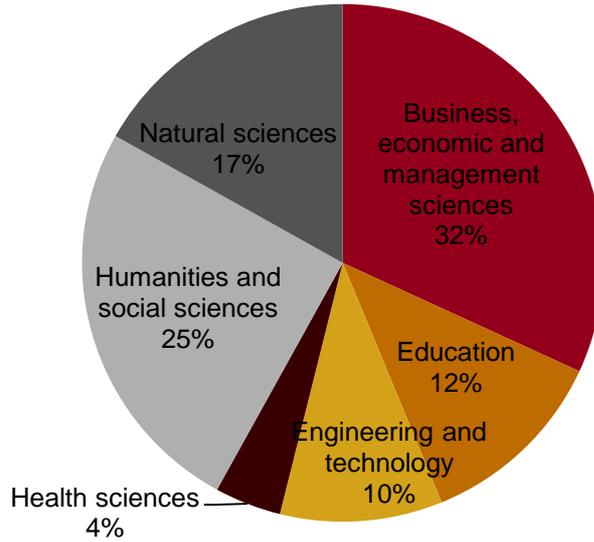
v. Qualification types and fields

NSFAS students in higher education institutions have increasingly obtained degrees rather than diploma. Interestingly though the Stellenbosch study provided evidence that for the first of these five cohorts (the 2000 cohort), NSFAS funded more diploma and certificate students (54.2%) than degree students (42.6%), and that over each successive cohort, the ratio changed so that for the 2004 cohort 54.5% had obtained degrees. From an examination of the source data for the PER study for the 2006 and 2007 cohorts, a deeper analysis of this has been undertaken:

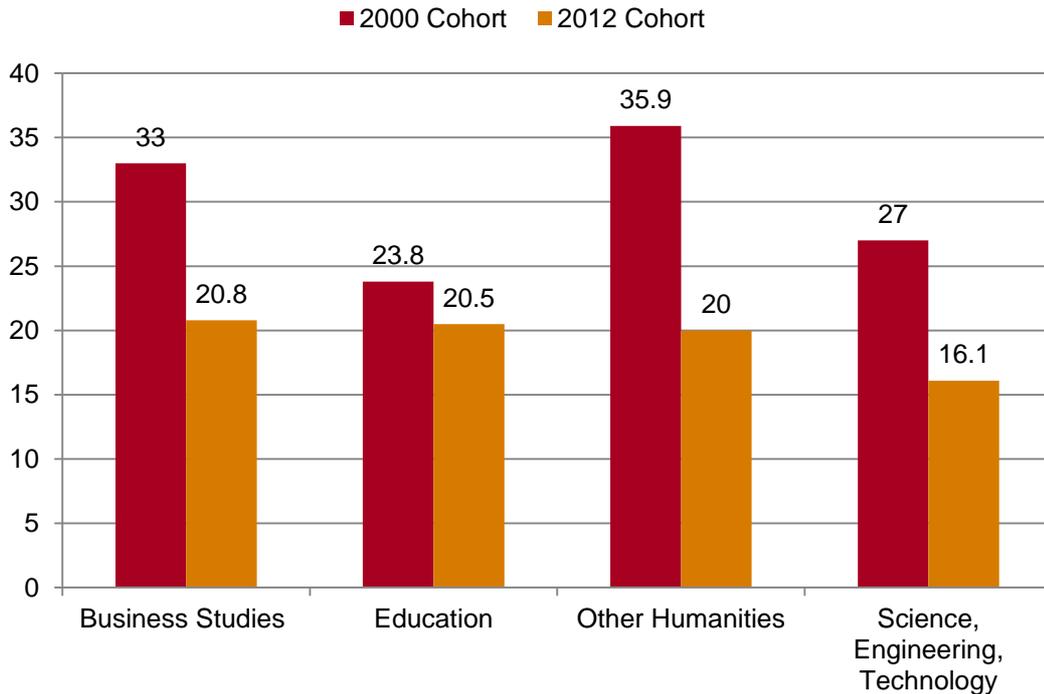


Some evidence from the Stellenbosch study has also demonstrated that NSFAS students have predominantly received their qualifications in the social sciences (67%) with the remainder in the natural sciences. The PER study showed the following:

Fields of study undertaken by NSFAS funded students



In the DHET study, the 2000 and the 2012 cohort were compared in respect to the first year dropout rate by field of study:



vi. Success differentiated by Institution

The DHET drew on data for 3-yr and 4-yr undergraduates in the 2005 cohort to establish whether or not some institutions were more successful than others in retaining students and in producing graduates.

In summarising the data, the DHET makes the following observations (listed in order):

- Universities that are better able to retain students after the first year (less than a 15% first year drop-out) included UCT, UP, UKZN, NWU, Rhodes, UL, SUN and WITS;
- Universities that were between 15% and the national average of 25.2% included UFS, MUT, UFH, UWC, CUT, UJ, DUT, VUT, NMMU, CPUT, UZ and WSU;
- Universities above the 25.2% national average included TUT, UNIVEN, and UNISA;
- UNISA had an alarmingly high first-year dropout of 44.9%.

In looking at completion within 5 years, the DHET examined the numbers of students who had completed by the end of 2009 in full-time programmes. Less than half of the universities (11 universities) had more than 50% of the 2005 intake completed by 2009 (appearing highest first, then in decreasing value): Rhodes, UCT, SUN, UKZN, NWU, UP, WITS, UL, CUT, UJ and CPUT. Three universities had a completion rate of less than 40% after 5 years: TUT, WSU and VUT.

vii. Summary comments on the findings from these studies

It is evident from the various cohort studies that have been undertaken that there are significant differences among the studies, both methodologically and in terms of the overall findings. It is reasonable to acknowledge therefore that where methodology, key parameters, key data definitions are not aligned amongst studies; the outputs will be different and therefore not strictly comparable. Comparing results amongst cohort studies is useful, but only when differences in the parameters are accounted for, as it is then that important trends can be identified and highlighted.

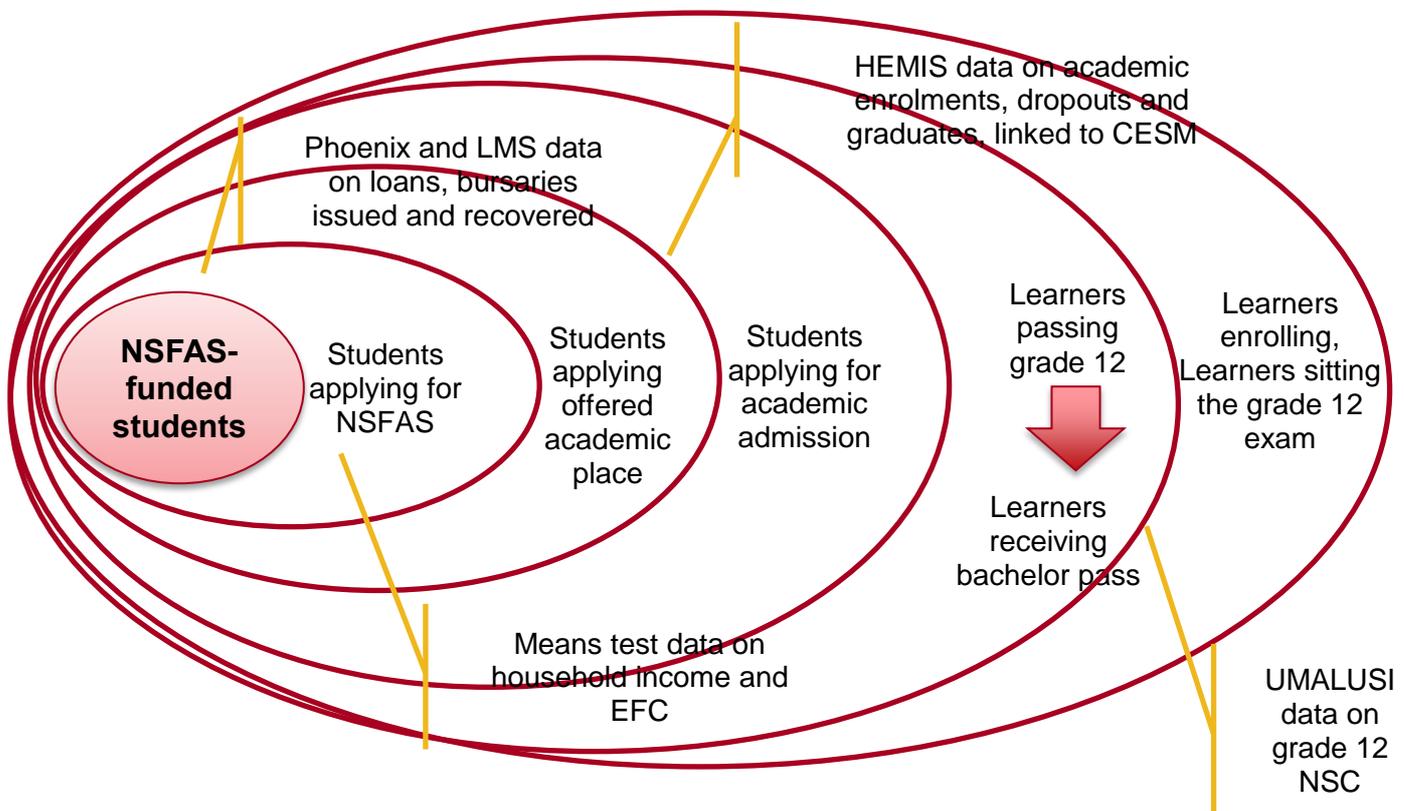
KEY RECOMMENDATIONS

i. The critical importance of data integrity and the creation of a universal data model (UDM)

One of the critical factors limiting NSFAS' ability to confidently draw conclusions on

the performance of NSFAS-funded students is the non-availability of a single source of data which combines the data on Phoenix¹⁶ (for migrated loans and bursaries) and on LMS¹⁷ for non-migrated loans and bursaries to HEMIS data to be able to track the progress of individual students through the higher education system longitudinally²⁶. In constructing a master dataset, the student ID number must by necessity be used as the unique identifier as NSFAS and the DHET data includes the ID number as the primary key. By using the ID number, the student can be tracked as he/she moves through each successive academic year, regardless of which institution he/she may be at or which qualification they are undertaking⁵, and this will enable analysis on completion within regulation time, and academic progression and course success rates. It will also enable matching of fields of study back to the CESM (classification of educational subject matter) codes for standardisation of reporting.

An organising framework for conceptually constructing this master data set could be as suggested below.



Each of these data points is available through existing agreements and partnerships

¹⁶ The NSFAS financial administration system for the management of loans and bursaries from 2014

¹⁷ The legacy system used for managing loans and bursarie – used up to and including 2013.

NSFAS has in place¹⁸.

In the process of creating this master database, consideration needs to be given to the inclusion of prior means test and family income and/or home background and/or school. If NSFAS serves predominantly students from poor backgrounds who are usually first generation university students¹⁹, from schools in poor communities, then determining the success rates of these students will provide rich material for understanding the narratives of resilience and persistence.

ii. **A follow-up study on the 2005 – 2009 cohorts: unpacking the performance indicators more precisely**

While the CHE are engaged in undertaking their annual VitalStats review for the 2014 academic year, there is a need for NSFAS to take key lessons from the First Five Years cohort study (commonly referred to as the Stellenbosch cohort), the PER cohort and the DHET cohort exercise. These can then be applied to a follow-up cohort in which the cohort of first time entering students that were funded for the first time by NSFAS (referred to as the first-first²⁶) in the years 2005 to 2009 can be tracked and performance data on these students reported on, in a similar or improved methodology to the initial project.

From these two studies, NSFAS can then draw more conclusive evidence of the impact of NSFAS over the first ten years, and can particularly reflect on the impact of any key policy changes that were introduced in this time. Given that the student centred model was introduced in 2014, this would mean that a follow-up study in five years could then examine the 2010 to 2014 cohort, and over time, track the impact of the student centred model on subsequent cohorts.

Of priority is the need to spend time ensuring that a master dataset can be created so that analysis on the performance of NSFAS-funded students relative to non-NSFAS funded students can be accurately undertaken. Resources need to be assigned to this function, and a core project team allocated to ensure that the full mapping of all data is done in a way that is sustainable and can be annually updated.

¹⁸ Lewis, F. (2012). *Traffic jams or trees: How are South African youth progressing through the post-school sector? And what lessons can we learn from current studies*. LMIP Working Paper 27. Pretoria: Human Sciences Research Council

¹⁹ De Villiers, P., van Wyk, C. & van der Berg, S. (2013). *The first five years project – a cohort study of students awarded NSFAS loans in the first five years 2000 to 2004*. Stellenbosch Economic Working Papers: 11/13. Report commissioned and initially internally published by NSFAS.

In undertaking a follow-up cohort, it would be useful to more fully interrogate some of the other questions on the research agenda, including:

- The labour market absorption rate of NSFAS funded students – there are a number of dependencies in respect to this project and research agencies that have access to better data on employment will be better positioned to undertake this project;
- The number of NSFAS-beneficiaries who are now registered tax-payers and can therefore be considered as successfully integrated within the labour market;
- The number of NSFAS-beneficiaries who were child support grant beneficiaries – have these young people continued to receive support from the State in accessing their funding, and have they been successful in terms of graduating from university or a TVET college; and
- The impact of final year funding – this should be considered more broadly as the impact of incentivising student. In the student centred model, the Final Year fund is a differentiated incentive offering to students rather than a separate funding product and while there are only four universities funded through this model in 2016, follow-up studies at a later time would include all universities. Such a study could be undertaken qualitatively, through a survey rather than a statistical analysis and could be seen as a policy brief rather than a full scale research project.

iii. Closer collaboration between NSFAS and the DHET on the cohort analysis

While the DHET cohort analysis on the NSFAS-funded students should present a view on the success rates of the NSFAS-funded students in the broader higher education system, there may be some need for further refinement of the parameters so that some of the following issues could be analysed and understood:

- Do students who receive full funding in any given year perform differently from students who are under-funded?
- Is there any difference in the performance of students who are funded by different funding products – loans versus bursary funded students?
- What is the impact of “funding for a qualification” on the success rates of NSFAS-funded students – do students who are funded for each year of study perform better than those funding does not extend across full duration of the N+2?
- Do students who receive a higher loan-bursary conversion perform any differently to those who have a lower conversion ratio – how effectively is this working?

- Are there particular categories of students (field of study, institution, qualification types) who are a greater risk in terms of loan funding?

CONCLUDING COMMENTS

There is no doubt that NSFAS' contribution to the higher education and further education sector over the past 25 years has been significant. Not only has NSFAS distributed over R50.5 bn to approximately 1,5 million students at 26 public higher education institutions and 50 TVET colleges, but the students funded by NSFAS are students who would not ordinarily have been able to access commercial credit to support their studies, and in so doing, NSFAS has played a role in the transformation of the post-school sector by directing funding at predominantly African students who represent the most poor in South Africa.

However, this has not been without its' challenges in this time, and while the success rates in the sector seem to suggest that there has been wastage (not only of NSFAS funds but also of grant funding allocated directly to universities and colleges), evidence points to an improvement in the performance of the sector as a whole in retaining and then graduating students out into the workplace. To fully assess this impact, much closer collaboration between various entities and agencies is required, to align data systems and structures and to track students into, through and out of the post-school sector.

ANNEXURE A: COMPARING THE DIFFERENT COHORT STUDIES

	First Five Years Study	The PER Study	The CHE Cohort Analysis	The 2015 DHET Cohort
Cohort Years	2000 to 2004	2006 and 2007	2005 to 2014	2000 to 2012
Institutions	All Universities	Only contact institutions	All universities	All Universities
Student Profile	<ul style="list-style-type: none"> - All fields of study; - First time first year NSFAS-funded students; - Based on ID number - Race and gender biased towards African students (funding bias) - Both loans and bursary funded students 	<ul style="list-style-type: none"> - All fields of study - NSFAS-funded students (all) - Based on ID number - Only loan students 	<ul style="list-style-type: none"> - All fields of study - All enrolments - Based on Student Number and Institution (registerID) 	<ul style="list-style-type: none"> - All fields of study - First-time entering undergraduate students - Based on ID number - All race and gender as per headcount
Qualifications	<ul style="list-style-type: none"> - All qualification types 	<ul style="list-style-type: none"> - 3yr and 4yr degrees only 	<ul style="list-style-type: none"> - All qualifications, not limited to undergraduate degrees only (although data analysed separately) 	<ul style="list-style-type: none"> - 3 and 4-year undergraduate programmes only - Data for postgrad analysed separately
Length of time students tracked	2000 cohort tracked for 10 years; 2004 cohort tracked for five years	5 years only – 2006 cohort until 2011 and 2007 cohort until 2012	10 years	10 years
Special characteristics²⁰ or assumptions	Data provided for 10 years - 2000 to 2009;	DHET reported 962 648 students received loans between 2006 and 2012, but the cohort study found 1 1546 476 records. 20% difference in reporting.	Students who discontinued their studies during the period of analysis and then continued were discounted against the drop-outs in the year for which they were counted, and if successful, were counted as graduated during the period of analysis	Students who change universities or courses were not treated as drop-outs; Students who dropout and then return were accounted for. For 3-yr/4-yr programmes, graduation should be within 5 years.

²⁰ These include: Rules for treating students who have changed courses or universities, how to class students who re-enter for other programmes (e.g. gap year students), how drop-out has been defined etc

ANNEXURE B: METHODOLOGY USED FOR THE CHE COHORT ANALYSES²¹

Data were provided by the DHET from the HEMIS submissions for the period 2005 to 2014.

The following variables were obtained on qualification records:

- 001 – Qualification Code
- 002 – Previous year's qualification code
- 003 – Qualification name
- 005 – Qualification type
- 053 – Minimum time - total
- 054 – Minimum time - experiential
- 063 – Institution code
- 081 – Activity in current year
- 082 - Qualifier
- 089 – Mode of delivery
- 588 – Submission
- 529 – Collection year

The following variables were obtained for individual student records

- 001 – Qualification code
- 005 – Qualification type
- 007 – Student number
- RegisterID – Unique random number created for students to replace ID number to mask student identity
- 009 – Qualification commencement date
- 010 – Entrance category
- 011 – Date of birth
- 012 – Gender
- 013 – Race
- 014 – Nationality
- 015 – Home postcode
- 024 – Attendance mode
- 025 – Qualification requirements status
- 026 – CESM category for first area of specialisation
- 027 – CESM category for second area of specialisation

²¹ By email correspondence from Dr C Sheppard.

- 028 – CESH category for third area of specialisation
- 029 – CESH category for fourth area of specialisation
- 063 – Institution Code
- 073 - % Research time for Masters qualifications
- 079 – Full-time/Part-time student
- 529 – Collection year
- 537 - Agriculture and renewable resources specialisation
- 538 - Architecture and environmental design specialisation
- 539 - Arts, visual and performing specialisation
- 540 - Business, commerce and management sciences specialisation
- 541 - Communication specialisation
- 542 - Computer science and data processing specialisation
- 543 - Education specialisation
- 544 - Engineering and engineering technology specialisation
- 545 - Health care and health sciences specialisation
- 546 - Home economics specialisation
- 547 - Industrial arts, trades and technology specialisation
- 548 - Languages, linguistics and literature specialisation
- 549 - Law specialisation
- 550 - Libraries and museums specialisation
- 551 - Life sciences and physical sciences specialisation
- 552 - Mathematical sciences specialisation
- 553 - Military science specialisation
- 554 - Philosophy, religion and theology specialisation
- 555 - Physical education, health education and leisure specialisation
- 556 - Psychology specialisation
- 557 - Public administration and social services specialisation
- 558 - Social sciences and social studies specialisation
- 571 – Age in years
- 588 – Submission
- 589 – Headcount indicator

Analysis

Based on CESH categories and data element 082 (Qualifier) qualifications were recoded into uniform qualification names, to have some uniformity in the groupings and to limit down the number of groupings to be analysed. Extended programmes were selected based on qualification names since there is not a particular identifier for extended programmes in HEMIS. There is however identifiers in HEMIS for extended modules.

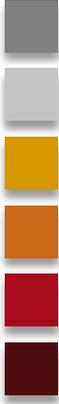
At undergraduate level, for qualifications that are first qualifications, the first-time entering students in a particular year were selected as the new entrants to the cohort. For second and further qualifications the categories of first-time entering, transfer and entering were selected as new entrants of the cohorts, to ensure that all new entrants to the cohorts were selected. For certificates it was decided to also select all first-time entering, transfer and entering students as new entrants, because the strict selection of only first-time entering students rendered too low numbers for new entrants compared to the enrolments reflected in HEMIS. For honours and postgraduate diplomas and certificates all three categories, namely first-time entering, transfer and entering were selected as new entrants. These decisions were made on the basis of the way in which universities coded their student records. For masters and doctoral students it was decided to select all students that were not enrolled the previous year as new entrants in the current year. So for 2006 all students that were not registered in 2005 were considered as new entrants. It was the only way in which Masters and Doctoral cohorts could be selected.

Any student in a cohort that graduated before the minimum expected duration of a qualification was deleted from the cohort on the assumption that the entrance category of the student was incorrect or that the student carried credits with him/her into the qualification being analysed.

Two types of analyses were performed:

1. Where cohort analyses were performed by uniform qualification name, any student that discontinued his/ her studies in the particular uniform qualification for the duration of the analysis was counted as a drop-out for that particular uniform qualification classification.
2. An analysis was also done ignoring the uniform qualification classification and any student that qualified in the same qualification type was counted as a successful graduate. This analysis showed slightly higher completion rates. Students that discontinued his/her studies in the qualification type being analysed and that moved to a different qualification type e.g. from a degree to a diploma was seen as a drop-out for the degrees.

It was evident for extended programmes that a large number of students in the system registered for another qualification code after completion of the extended programme code and therefore the only way to get a proper cohort analysis was to follow the student number and ignore the uniform qualification once identified as an extended programme student.



Students that discontinued their studies during the period of analysis and then continued was discounted against drop-outs in the year that they continued and was counted as successful if they graduated during the period of analysis.

ANNEXURE C: A COMPARISON OF THE KEY FINDINGS FROM TWO OF THE STUDIES

	NSFAS Cohort Study 2000 - 2004	CHE Study (2005 and 2006 cohorts)
Scope	All NSFAS university undergraduate students funded first-time entry in the above years. All qualifications, all universities	Only 3yr degrees and diplomas and 4yr degrees. All undergraduate students not limited to NSFAS eligible or funded students.
Enrolment	<ul style="list-style-type: none"> • 54% female; 46% male • 90% African • 70-80% were 22 yrs or younger 	<ul style="list-style-type: none"> • 54% female; 46% male • In 2004, African students accounted for 42.5% of the enrolment, but this proportion changed to 70.1% by 2013
Performance	<ul style="list-style-type: none"> • Of all the students who received NSFAS funding in 2000, 64% obtained qualification by 2009 • Of the students in the 2000 cohort, 54.2% obtained a diploma or certificate and 42.6% obtained a degree, although this ratio changed by the 2004 cohort (45% diploma or certificate and 55% degrees) • Less than 38% dropped out without a qualification 	<ul style="list-style-type: none"> • 30% of students dropout in their first year; • 55% of students never graduate; • Only 1 in 4 students in contact universities graduate within regulation time; • Only 35% of the total intake and 48% of contact students graduate within 5 years; • Estimated that 55% of the intake who take longer than 5 years or return after dropping out will not graduate; • Graduation racially skewed in favour of white students
Qualification Type	<ul style="list-style-type: none"> • More than 60% received degree qualifications at traditional universities; • 70% received diploma and certificate qualifications at universities of technology; • 30% degrees and 20% of diplomas/certificates at comprehensive universities • More than 1/3 of all first year students obtained a qualification in the Natural Sciences; less than 2/3 in the Social Sciences 	Not analysed.