



Differential pathways of South African students through higher education



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ABSTRACT

This paper reports on a six-year study (2005–2010) tracking a cohort of students from Grade 12 into and through the South African higher education (HE) system. The study sought to ascertain how the pathways of students from different socioeconomic backgrounds differed. Key findings were that socioeconomic status is a differentiating feature in student progression through and retention within HE and in completion of HE programmes. Confirming UK and US findings, the study simultaneously points up the need for further research locating student progression and performance within a broader developmental context that takes account of learning pathways from pre-school into HE.

1. Introduction

South Africa, with a Gini coefficient of 65.0 (The World Bank, 2015), is the most unequal country in the world.¹ Inequality is seen most pervasively in the education system of the country, which despite the creation of a single education department incorporating the many disparate education systems that existed in the apartheid period (1948–1993), effectively operates as a dualistic system. Spaull (2012), for example, shows through modeling student performance separately for the wealthiest 25% of primary schools on the one hand and the poorest 75% of schools on the other that there are striking differences in the factors influencing student performance, only 5 of the 27 factors being shared between the two models for mathematics and 11 of the 30 factors being shared for reading.²

This dualism extends to inequalities in education more broadly. Branson et al. (2012) show that white men and women have, nearly twenty years into democracy, significantly more years of education than do their African counterparts and that, while there have been large improvements in the average levels of education of the South African population over the post-apartheid period, the majority of the population has not completed secondary education.

While South Africa may fare well in comparison with other developing countries in terms of education coverage – the gross enrolment ratio (GER) for primary education is anything between 99 and 114, depending on the methodology used to calculate it (Gustafsson, 2012) – and while increasing numbers of children are accessing secondary education, years of schooling do not translate into greater equality.

Branson et al. (2012) argue that relatively high levels of primary and secondary school enrolment should issue in increasingly lower inequality and higher levels of growth. South Africa, however, has very high income inequality, high unemployment and relatively low growth rates. Even when years of education are controlled for, then, white, coloured, and Indian/Asian labour market participants continue to outperform their black African counterparts in terms of employment and earnings.

The reasons for such differentiation go beyond quantity (number of years of schooling), however. South Africa was identified in 2006 as one of the countries beset by achievement rather than attainment challenges in education (The World Bank, 2006). As the World Development Report 2007 expressed the problem, “The lesson from the massive education expansion in the 1980s and 1990s is clear – expanding places rapidly can come at the cost of quality, reflected in high enrolment rates but low achievement” (The World Bank, 2006: 11). Case and Yogo (1999) have found that factors such as pupil/teacher ratios and general school resources impact significantly not only on years of completed schooling but on the probability of employment and the returns to education of South African workers.

While inequality within the schooling system in South Africa is a known quantity, however, a nuanced understanding of how a cohort of students fare in the transition from school to HE and in progressing through the HE system – notwithstanding statistics on enrolment and completion rates at the systemic level (Bunting, 2004; CHE, 2013) – is not as well understood.

Data that enable the tracking of student pathways into and through

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¹ Its nearest rival, in 2011, was Namibia, with a coefficient of 61.3 (The World Bank, 2015).

² These differences explain the differential performance of South African students on the Boston College-based TIMSS (Trends in International Mathematics and Science Study), which measures trends in mathematics and science achievement at the fourth and eighth grades, and the PIRLS (Progress in International Reading Literacy Study), which measures trends in reading comprehension at the fourth grade (TIMSS & PIRLS International Study Center, 2015).

HE over an extended period have been available in the United States (US) at least since the introduction of the Department of Education longitudinal study of students in 1988. But it is only in the last ten years, with the increased access to HE of students from disadvantaged backgrounds, that socio-economic differentiation in student progression has begun to receive serious attention. Researchers in a number of countries, notably the US, the United Kingdom (UK) and Australia, have increasingly turned their gaze upon student persistence and completion.

While household panel studies have been conducted in South Africa since 1990,³ there was not a dedicated national focus on education institution-based tracking studies until the implementation of the student pathways project by [name of research agency] in 2001. That study tracked a 2001 cohort of Grade 12 students across all nine provinces of the country into their HE destinations in 2002.

Gender and race were the two main independent variables differentiating student pathways from school to HE in the 2001–2002 study. There was, in the study reported in this paper, a compelling argument to use SES rather than race as a key differentiating variable, however, given that race is not as closely aligned with socio-economic disadvantage as it was under apartheid. In 2005, just ten years into democratic rule, three-quarters of black African students fell within the low SES category and 8% the high SES category. At the other extreme, two-fifths of white students came from a high socio-economic background, 16% from a low SES background. Coloured and Indian/Asian students fell between these two extremes. As these figures illustrate, there has been some slippage between race and SES over the period – slippage that justifies the emphasis on SES as the primary unit of analysis. So while the architects of the National Qualifications Framework (NQF) would notionally have had race in mind in formulating the fourth objective of the NQF (“Accelerate the redress of past unfair discrimination in education, training and employment opportunities”), this slippage suggests that SES is more appropriate as a differentiating variable than race. SES is also more apt in a HE context because of the association between income as a key differentiator in access to HE and as a key component in the calculation of the SES variable.

Against this backdrop, this paper reports on a cohort study conducted between 2005 and 2010 that sought to ascertain whether South African students from low socio-economic backgrounds had been able to progress through HE with the same facility and had succeeded in completing qualifications at the same rate as students from high socio-economic backgrounds.⁴

2. Persistence and socioeconomic status in the student choice behaviour literature

Student choice behaviour is a complex subject, partly because it has been approached from a number of different perspectives (sociological, psychological, and economic), partly because it is informed by the experiences of different students in very different contexts, and partly because its subjects are students of different ages in and across different sectors. These intersections of age and sector are manifested, for example, in: primary school; junior secondary school, senior secondary school, or secondary school as a whole (see Tracey et al., 2005); in the transition from school or from technical or vocational college to higher education (HE) (see Cosser et al., 2004); within HE; in the transition from school, college, or HE to work (see Cosser, 2003); and in the transition from work to college or HE. Some studies are qualitative in nature, involving sets of interviews, often over an extended period, of specially selected subjects (see Hossler et al., 1999; Schneider and

Stevenson, 1999); some are quantitative in nature, involving large-scale surveys of subjects. Some are “macro-level studies” (Paulsen, 1990, 8), focusing on the relationships between the enrolment behaviour of student groups and various environmental, institutional and student characteristics; others are “micro-level studies” (Paulsen, 1990, 8), focusing on the relationships between the enrolment behaviour of individual students and various environmental, institutional and student characteristics.

Increasingly, studies of student choice behaviour have tried to pull together different strands into, and to extract from them the key elements for, models that explain the phenomenon.⁵ Thus we have economic models of student choice behaviour (see Hossler et al., 1989; Kotler and Fox, 1985), status-attainment models (see Sewell et al., 1969; Sewell and Shah, 1978), models that combine the economic and status-attainment models (see Jackson, 1982; Chapman, 1984; Hanson and Litten, 1982; Hossler and Gallagher, 1987), and information processing models (see Hossler et al., 1999).

Hossler et al. (1999) organize the findings of their research into student choice behaviour according to the model developed by Hossler and Gallagher (1987), in which three stages are posited in the college-choice process: predisposition; search; and choice. *Predisposition* refers to the plans students develop for education or work after they graduate from secondary school – plans influenced by family background, academic performance, peers, and other secondary school experiences. The *search* stage involves students’ discovering and evaluating possible institutions in which to enrol – identifying which characteristics the ideal institution should embody and which institutions actually embody them. In the *choice* stage, students choose an institution from among those they have identified during the *search* stage – the number of institutions they choose being based on such factors as proximity to home, their academic performance at school, and the socio-economic status of their families (high-ability students from high socio-economic status families, Hossler et al., 1999 posit, might be expected to apply to more than one institution).

The decision to enter HE may be seen as a multi-stage process involving a series of successive decisions finally resulting in enrolment in a HE programme (Hossler et al., 1989) – decisions not merely about institutional choice. The *choice* stage can therefore be broadened to include study programme.

Campaigne and Hossler (1998) take the somewhat narrow conceptualization of the three-stage process developed by Hossler and Gallagher (1987) a step further, identifying three broad stages in the student choice behaviour process: (1) Deciding to enter HE; (2) Selecting a particular institution and programme of study; and (3) Persisting in HE.

While this three-stage process provides a useful organising framework for reviewing the literature on student choice behaviour, it is the third stage, persistence, with which the current paper is concerned.

2.1. Persisting in, and the impact of SES on completion of, HE

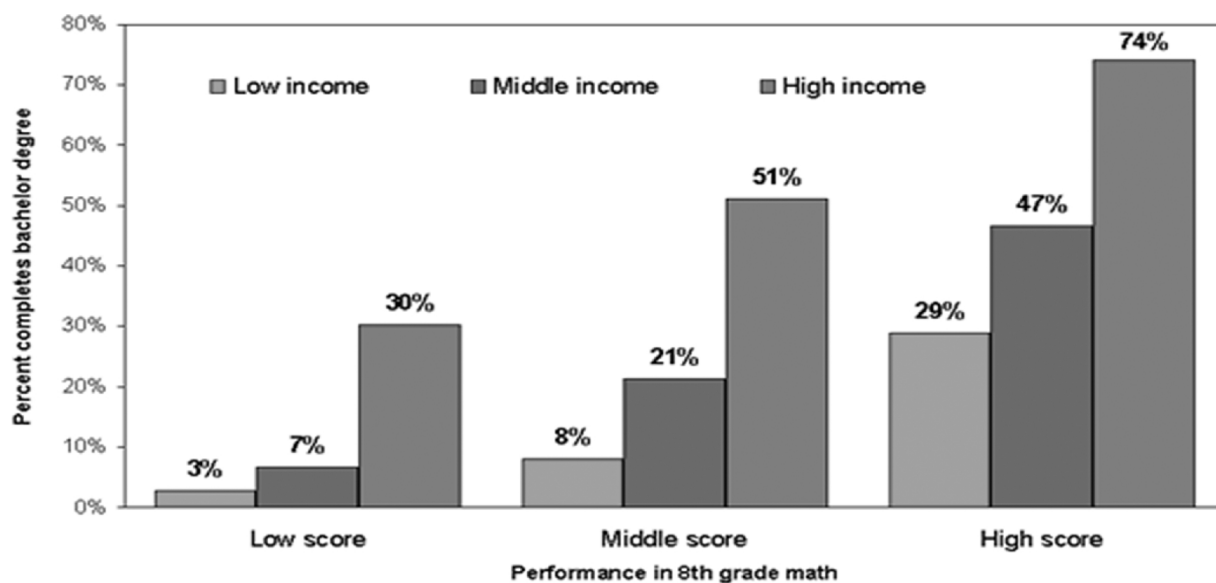
Research into student persistence in HE in the US has shown that, after all other factors at individual, institutional, and state level have been controlled for, there are substantial gaps in persistence rates by socioeconomic status (SES) at what Chen and St. John (2011, 652) dub “first-institutions”, with high-SES students having 55% higher odds of persisting than their low-SES counterparts.

Persistence and retention are critically important because of their implied link to programme completion. Various US studies show differential completion rates between low- and high-SES students. The

³ Four studies are worthy of mention: the Birth to Twenty (Bt20) Programme, launched in 1990 (Wits, 2015); the KwaZulu-Natal Income Dynamics Study, launched in 1998 (UKZN, 2015); the Cape Area Panel Study, launched in 2002 (UCT, 2015a); and the National Income Dynamics Study, launched in 2008 (UCT, 2015b).

⁴ Much of the text in this paper comes directly from the author’s unpublished PhD thesis (Cosser, 2015). Some of the text is also to feature in Cosser (2017, forthcoming).

⁵ I am indebted to Per Olaf Aamodt for his background paper on the Student Choice Behaviour project (Aamodt, 2001) subsequently conducted by the Human Sciences Research Council, South Africa. The background paper provided the foundation for the literature review underpinning that project, part of which is presented here.



Source: Fox, Connolly, and Snyder 2005

Fig. 1. Higher education outcomes and socioeconomic status in the US.

Source: Fox, Connolly & Snyder, 2005

1988 Department of Education longitudinal study of students, which followed 8th grade students over the next 12 years as they progressed from school into HE and thence into the labour market, found vast differences in university completion rates (as measured by completion of Bachelor degrees) according to SES when grouped according to students' 8th grade Mathematics test scores. Figure A (overwritten Fig. 1) shows these differences vividly.

As Fig. 1 shows, there is a strong and consistent correlation between income (a proxy here for SES), performance in 8th grade Mathematics, and completion of Bachelor degrees, the lower the income, the lower the 8th grade Mathematics score, the lower the Bachelor degree completion rate.

A variation on this study, deploying parental education and first-generation student status as a variable, tracked all US students who were in the 8th grade in 1988 who had earned a Bachelor's degree by the time they turned 26 years old. Completion rates ranged from 9% for students in the bottom-income quartile and whose parents had not graduated from university to 68% for students in the top-income quartile who had at least one parent who had graduated from university. Students in the high-SES group were therefore more than seven times likelier to have graduated from university than were their first-generation counterparts in the low-SES quartile (Chingos and McPherson, 2011). Similarly, Haveman and Smeeding (2006), in a study that did not deploy an additional variable like mathematics performance in Grade 8 or first-generation HE status, showed that while 51% of the highest SES quartile 8th graders in 1988 had obtained a Bachelor's degree 12 years later, only 7% of students from the lowest SES quartile had done so.

Also at a macro level, The Toolbox Revisited, a study of a national (US) sample of 8th graders (over 12,000 students) scheduled to graduate from high school in 1992 and who were tracked to the end of December 2000, found that SES played a significant role in Bachelor's degree completion, each graduation in SES (from low- to middle- to high-SES) increasing the probability of degree completion by about 6% (Adelman, 2006). In addition, Adelman (2006) found that being enrolled continuously increases the probability of earning a Bachelor's degree by 43%.

Low- and high-SES students are also differentiated on the basis of the immediacy of their entry into HE. In a 2007 US study, 52% of low-SES students enrolled in a HE institution within two years of leaving

high school compared to 83% of high-SES students (Rowan-Kenyon, 2007); and in 2009, 55% of low-SES versus 84% of high-SES school-leavers were found to have proceeded directly to HE (Aud et al., 2011).

US research has also established a link between rates of student persistence and state funding of HE (Titus, 2006; Chen and St. John, 2011). Lack of funding for HE is a well-established cause of student attrition in the South African HE system. For example, the Report of the Ministerial Committee on the Review of the National Student Financial Aid Scheme (NSFAS) found that only 19% (125,210) of the recipients of financial aid through the Scheme had graduated, while 48% (316,320) had dropped out or otherwise not completed their studies (DHET, 2010). The remaining 33% (217,470) of NSFAS students were still studying. Of the 67% of NSFAS students who were no longer studying, 28% had graduated and 72% had dropped out or had otherwise not completed their studies. Recipients of financial aid would by definition be low-SES students in need of financial assistance (NSFAS, 2015).

While US research shows consistent differentiation of low- and high-SES students in terms of HE persistence, retention and completion, Australian research paints a different picture. Low-SES students are said to perform far worse than their high-SES counterparts in high school (James et al., 2008) and to be strongly under-represented in the HE system across the continent (Van Krieken et al., 2014); but their pass rates and completion rates are said to be fairly close to those of other students (QUT Vice-Chancellor, 2004). This "levelling out" effect, in which there is strong differential between low-SES performance in Grade 12 (relative to high-SES performance) and subsequent improved low-SES performance in HE, low-SES students performing relatively better than in high school in relation to their high-SES counterparts, is supported by a study based on the Longitudinal Surveys of Australian Youth (LSAY) in which Marks (2007) reported that "a student's regional and socioeconomic background has little influence on their likelihood of completing university. Once students from a lower socioeconomic background enter university, their background does not negatively affect their chances of completing the course" (Marks, 2007, viii).

While there are mixed findings from the US and Australia with regard to the impact of SES on HE progression and completion, the evidence from the UK is less equivocal, showing that low-SES students are more likely to drop out of university, less likely to achieve a qualification, and less likely to achieve a first or upper-second class pass than are their high-SES counterparts. After an exhaustive analysis of the SES

effect in all English universities, [Powdthavee and Vignoles \(2008, 21\)](#) concluded that there were significant differences in dropout across the different SES categories, even once student characteristics and prior achievement had been controlled for. Similarly, in a study of all English-domiciled 18–19-year-olds entering a university in the UK for the first time between 2004/05 and 2009/10 – the same period under investigation in the present study – [Crawford \(2014\)](#) found that students from the highest socio-economic quintile group were 3.4% points less likely to drop-out, 5.3% points more likely to complete their degree and 3.7% points more likely to graduate with a first or 2:1 than those from the lowest socio-economic quintile group.

3. Methodology

The methodology followed in conducting the tracer study of learners from Grade 12 in 2005 into and through HE between 2006 and 2010 is outlined below.

3.1. Baseline survey

A baseline survey was conducted among a random sample of Grade 12 learners in schools across South Africa stratified by school pass rate in the 2004 Senior Certificate examination. A 10% sample of Grade 12 students ($n = 771$ schools, approximately 58,965 students)⁶ was surveyed. The survey was administered through the deployment of a questionnaire completed by Grade 12 learners in a classroom under the supervision of a senior school teacher. A total of 20,659 students participated in the survey.

3.2. Tracer surveys 1 and 2

In 2006, a postal survey was conducted among students who had participated in the Grade 12 baseline survey. The sample frame for the first tracer survey was derived from a database of the addresses of students who had participated in the 2005 survey – the realised sample – as supplied by students themselves. Forty-seven per cent of the baseline survey participating schools and 85.4% of the baseline survey students were represented in the Tracer study 1 sample frame. Just under one quarter (24%) of those students included in the sample frame responded to the survey.

As in the case of the first tracer survey, the research for the second tracer survey involved the collection of primary data by means of a cross-sectional quantitative survey research design. The key methodological steps for the survey design duplicated those followed in conducting the first tracer survey.

[Fig. 2](#) outlines the progression of the three surveys undertaken as part of the study:

As this illustration shows, the Tracer Survey 1 sample corresponds to the response profile from the 2005 baseline study – less the (large number of) students who failed to provide usable addresses in their responses in 2005. The Tracer Survey 2 sample corresponds to the response profile from the 2006 Tracer Survey 1 – preserving the methodological logic of the study and allowing for appropriate weighting of the data back to the total Grade 12 student population of 2005 (504,322 students).

While the 2005 cohort of learners were tracked into their HE destinations in 2008, the extent of survey participant attrition in [Fig. 2](#) – yielding a response profile of a meagre 920 respondents (fewer than 160 of whom were HE students) – revealed the need to increase the number of participants. The Department of Higher Education and Training (DHET) Higher Education Management Information System (HEMIS) contains the unit records of all students who pass through the

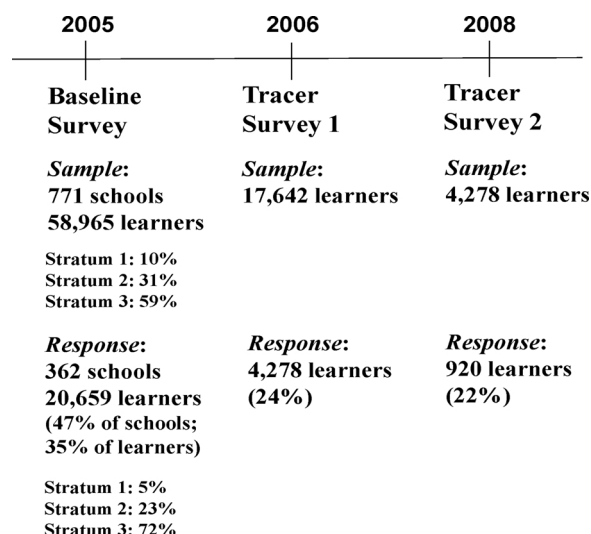


Fig. 2. Survey progression from baseline survey through Tracer Survey 1 to Tracer Survey 2.

South African HE system; linking the students in the present study's database to the unit records in HEMIS via student national identity numbers (IDs) both increased the sample and enabled the tracking of the cohort for an additional two years beyond 2008.

3.3. Tracking device

The device used to track students through the HE system was based on a methodology developed by [Robinson \(2004\)](#), who showed, through reference to student data from 1994 to 2000 supplied by a large public university to the Australian Department of Education, Training and Youth Affairs, how a technique for identifying and representing pathways of student progression through a degree course allowed one to capture information on both the process and outcomes of student progression.

Information from indicators of enrolment and completion status at the beginning of the year and the end of the previous year were amalgamated by Robinson into six categories: (1) Commencing student (first year of enrolment only); (2) Continuing with no repeats; (3) Unit of study repeat/s following failure; (4) Stopout (temporary); (5) Transfer (enrolment in another degree course at the same university); or (6) No enrolment at the university. Each student's enrolment status over the five previous calendar years was represented by a series of codes. For each student, the pattern of five digits represented his/her pathway of course progression. For example, the course pathway of a student classified as a "commencing" student in the first year, satisfactorily completing each of the subsequent three years and enrolled in the fifth year, would be indicated by the pattern 12222. If the final year of enrolment was successful, this student would have completed in 5 years, the minimum time taken to do the course. A pathway pattern of 12252 indicated that a student commenced in first year, continued in Year 2 and Year 3, transferred to another course within the university in Year 4 and returned to enrol back in the original course in his/her fifth year of enrolment. This student would not have completed in the minimum time. However, the student might possibly have completed another one-year course in the fourth year of enrolment, the "transfer" year.

The present study modified this technique slightly, using the following pathway codes: 0 = Not enrolled (in that particular year); 1 = First-time entering (institution, or new institution and new programme); 2 = Continuing (in the same programme for which previously registered); 5 = Entering (a programme not previously registered for); 6 = Transferred from a different institution and registered

⁶ Since the sample frame is based on the 2004 Senior Certificate database of 504,322 learners, the number of learners in the sample is an estimate.

for the same or for a different programme; and 7 = Completed. The symbol “/” was used to signify that a student enrolled in and completed a new programme in the course of the same year. So, for example, students who pursued the 1271/70 pathway enrolled for the first time in 2006, continued in the same programme in 2007, completed the same programme in 2008, enrolled in and completed (1/7) a new (postgraduate) programme in 2009, and did not re-register in 2010.

3.4. Unit of differentiation in the study

Socioeconomic status was the key differentiating variable in the study. The SES of students was determined through the establishment of an SES indicator based upon responses to two of the questions posed both in the baseline survey and in both tracer surveys: (1) What is the highest level of education of each of your parents/guardians (where applicable)? (2) Approximately how much do your parents/guardians earn per month before deductions (where applicable)?

The levels of education and income levels of both parents/guardians, where applicable, were taken into account in the calculation. The SES variable was therefore calculated using four variables from the survey databases: education level of the father/male guardian; education level of the mother/female guardian; income level of the father/male guardian; and income level of the mother/female guardian. Categories within these variables were re-categorised into three categories of an inherent order to form ordinal variables for each – that is, variables with categories for “low”, “middle” and “high”. Table 1 shows how categories for the education and income variables were re-categorised into an ordinal variable.

The four new ordinal variables for each of the re-categorised variables were then used to calculate a single SES variable that assigned an SES score to each student in the database. The SES variable was simply based on the average score of the four ordinal variables and was calculated using the following formula:

$$SES = \frac{\left(\sum_{\text{Father-Mother}} \text{Education} \right) + \left(\sum_{\text{Father-Mother}} \text{Income} \right)}{4}$$

Scores within the calculated SES variable ranged from 1 to 3, where scores ranging between 1 and 1.6666666 were coded to form “Low socio-economic status”, scores between 1.6666667 and 2.3333333 were coded to form “Middle socio-economic status”, and scores between 2.3333334 and 3 were coded to form “High socio-economic status”.

The resulting SES profile of Grade 12 learners in 2005 yielded a

Table 1

Categorization of parental/guardian education and income variables into an ordinal variable.

Source: Cosser (2002); Cosser (2009).

Education	Income	Ordinal Variable	Value (Score)
No formal education	No income	Low	1
Some primary schooling	R 1–R 400		
Grade 7	R 401–R 800		
Some secondary schooling	R 801–R 1 600	Middle	2
Matric/Grade 12	R 1 601–R 3 200		
Technical college	R 3 201–R 6 400		
certificate	R 6 401–R 12 800	High	3
Technikon certificate or diploma	R 12 801–R 25 600		
University certificate or diploma	R 25 601–R 51 200		
Technikon degree	R 51 201–R 102 400		
University degree	R 102 400–204 800		
	R 204 801 or more		

distribution of 71% low SES: 19% middle SES: 10% high SES. However, an analysis of the sample who entered HE in 2006 revealed a distribution far less skewed towards low SES: 51% low SES: 27% middle-SES: 22% high SES. Given that affordability is a key barrier to HE access in South Africa, it is not unexpected that the percentage of high-SES learners should have increased dramatically (more than doubled) from the 2005 figure and that the profile overall should have shifted from low to high SES.

3.5. Methodological limitations of the study

The three main methodological limitations of the study are the following. First, the findings are not generalisable to the entire population of students who entered and progressed through HE between 2006 and 2010. Statistical probability diminishes from the time the horses leave the starting gates. Even were the number of students enrolled in HE in 2010 to have been weighted back to the original sample, the number of students enrolled in HE institutions (1594) was (relative to the baseline survey response profile of 20,659) so small that the picture would have been distorted. Second, disaggregation of the data is clearly less reliable the smaller the data set. So, for example, the results of SES disaggregations involving fewer than a hundred learners need to be treated with caution. And third, the study period – even with the addition of the two years made possible through the linking of learner IDs with unit record data in HEMIS – is short as panel study periods go. A longitudinal study of the kind outlined earlier – the US study begun in 1988 which tracked students over an extended period – is clearly desirable in the South African context.

4. Results

Table 2 indicates the HE pathways of the 2005 Grade 12 cohort of students between 2006 and 2010, showing how many students entered, proceeded through, and exited the HE system.

4.1. Key

1. Pathway codes: 0 = Not enrolled (in that particular year), 1 = First-time entering (institution, or new institution and new programme), 2 = Continuing (in the same programme for which previously registered), 5 = Entering (a programme not previously registered for), 6 = Transferred from a different institution and registered for the same or for a different programme, 7 = Completed
2. The symbol “/” signifies that a student enrolled in and completed a new programme in the course of the same year. Thus, in the table, students who pursued the 1271/70 pathway (combination # 18) enrolled for the first time in 2006, continued in the same programme in 2007, completed the same programme in 2008, enrolled in and completed (1/7) a new (postgraduate) programme in 2009, and did not re-register in 2010.

4.2. Results at the aggregate level

From Table 2 and the Appendix (see footnote 5) we can make the following four observations at the aggregate level.

First, 162 of the 340 pathways (48% of pathways) involved completion, accounting for the pathways of 39% of students. This means the majority of students (61%) had not completed within the five-year period (2006–2010).

Second, of those who completed, most achieved their first qualification in 4 years (40% of those who completed), followed by those who completed in 3 years (30%), then 5 years (27%), then 2 years (3%), and then 1 year (less than 1%). But these figures are merely indicative: they need to be pegged to the type and notional length of programme if they are to be meaningful. Table 3 presents the outcome of a cross-tabulation of SES, year of entry into HE, and notional length of study programme

Table 2

Student pathways through HE, 2006–2010, by SES, in descending order by total.
Source: Author.

Pathway pattern #	Pathway pattern	Students pursuing pathway							
		Low SES		Middle SES		High SES		Total	
		n	%	n	%	n	%	n	%
1	12270	57	7.0	30	7.0	23	6.5	110	6.9
2	10000	54	6.6	34	8.0	14	4.0	102	6.4
3	12222	31	3.8	34	8.0	26	7.3	91	5.7
4	01222	29	3.6	12	2.8	12	3.4	53	3.3
5	12000	30	3.7	17	4.0	5	1.4	52	3.3
6	00001	29	3.6	12	2.8	9	2.5	50	3.1
7	01000	30	3.7	11	2.6	9	2.5	50	3.1
8	12227	21	2.6	16	3.8	13	3.7	50	3.1
9	01227	26	3.2	17	4.0	3	0.8	46	2.9
10	12700	17	2.1	16	3.8	9	2.5	42	2.6
11	12220	18	2.2	9	2.1	9	2.5	36	2.3
12	12200	20	2.5	4	0.9	11	3.1	35	2.2
13	00122	18	2.2	7	1.6	5	1.4	30	1.9
14	00012	15	1.8	9	2.1	1	0.3	25	1.6
15	15222	12	1.5	5	1.2	7	2.0	24	1.5
16	1271/70	10	1.2	6	1.4	6	1.7	22	1.4
17	00100	13	1.6	5	1.2	2	0.6	20	1.3
18	01200	13	1.6	4	0.9	1	0.3	18	1.1
19	15227	12	1.5	0	0.0	4	1.1	16	1.0
20	00522	9	1.1	2	0.5	2	0.6	13	0.8
21	01270	11	1.4	2	0.5	0	0.0	13	0.8
22	1275/70	5	0.6	5	1.2	3	0.8	13	0.8
23	01220	10	1.2	1	0.2	1	0.3	12	0.8
24	01522	8	1.0	4	0.9	0	0.0	12	0.8
25	15270	6	0.7	1	0.2	5	1.4	12	0.8
26	12757	0	0.0	6	1.4	5	1.4	11	0.7
27	12271/7	3	0.4	4	0.9	4	1.1	11	0.7
28	00010	7	0.9	3	0.7	0	0.0	10	0.6
29	05222	4	0.5	3	0.7	3	0.8	10	0.6
30	12271	7	0.9	0	0.0	3	0.8	10	0.6
31	11222	7	0.9	0	0.0	2	0.6	9	0.6
32	12252	4	0.5	3	0.7	2	0.6	9	0.6
33	15220	6	0.7	0	0.0	3	0.8	9	0.6
34	1271/75	5	0.6	2	0.5	2	0.6	9	0.6
35	00120	6	0.7	2	0.5	0	0.0	8	0.5
36	01275	7	0.9	1	0.2	0	0.0	8	0.5
37	12275	3	0.4	3	0.7	2	0.6	8	0.5
38	12752	3	0.4	1	0.2	4	1.1	8	0.5
39	15000	5	0.6	2	0.5	1	0.3	8	0.5
40	12122	3	0.4	2	0.5	2	0.6	7	0.4
41	12276	4	0.5	1	0.2	2	0.6	7	0.4
42	12522	3	0.4	1	0.2	3	0.8	7	0.4
43	12710	2	0.2	2	0.5	3	0.8	7	0.4
44	15700	5	0.6	1	0.2	1	0.3	7	0.4
45	16222	1	0.1	2	0.5	4	1.1	7	0.4
46	00005	4	0.5	2	0.5	0	0.0	6	0.4
47	00127	5	0.6	0	0.0	1	0.3	6	0.4
48	00152	5	0.6	1	0.2	0	0.0	6	0.4
49	01252	1	0.1	3	0.7	2	0.6	6	0.4
50	10012	5	0.6	1	0.2	0	0.0	6	0.4
51	10122	5	0.6	0	0.0	1	0.3	6	0.4
52	11227	1	0.1	1	0.2	4	1.1	6	0.4
Sub-total		615	75.6	310	72.8	234	66.1	1159	72.7
Other pathways ⁷		199	24.4	116	27.2	120	33.9	435	27.3
Total		814	100.0	426	100.0	354	100.0	1594	100.0

to indicate the number of students in the sample who could have completed the study programmes for which they enrolled.

As Table 3 reveals, 92% of students could have completed within the five-year timeframe the study programme for which they had enrolled. The percentages of students within all three SES categories who

⁷ The UK and US data come from the OECD's *Education at a Glance*, where completion rates are defined as "the proportion of new entrants into a specified level of education who graduate with at least a first degree at this level" (OECD, 2013, 69) – hence the comparison with the CHE (2013) completion rate for three- and four-year degrees.

Table 3

Students technically able to complete study programmes within the five-year timeframe, by SES.

Source: Author.

SES	Students able to complete		Students not able to complete		Total	
	n	%	n	%	n	%
Low	732	91.5	68	8.5	800	100.0
Middle	388	93.3	28	6.7	416	100.0
High	324	93.6	22	6.4	346	100.0
Total	1444	92.4	118	7.6	1562	100.0

could have completed, moreover, are very similar. Yet only 39% of students completed – pointing up the high failure and drop-out rates amongst students in the study.

The third point concerns the timing of students' first entry into HE. Of the entire cohort of 1594 students, 66% entered HE for the first time in 2006, 20% entered HE in 2007, 7% in 2008, 3% in 2009, and 4% in 2010. Two-thirds of the 2005 Grade 12 cohort who could be matched to a HE institution via their IDs and whose SES could be calculated from parental education and income information provided therefore proceeded directly from school to HE the next year. Of the 738 students who completed their qualification programme, 82% proceeded straight from school in 2005 into HE in 2006, 16% entered HE in 2007, 2% in 2008, and none in 2009 or 2010. Thus only 18% of students who completed a qualification programme entered HE between 2007 and 2010. Of those who did not graduate in the five years (971 students), 56% entered HE in 2006, 23% in 2007, 10% in 2008, 5% in 2009, and 6% in 2010.

The presentation of these statistics (in the third point) leads inevitably, however, to a tautological conclusion: *the later a student enters HE between two fixed dates, the less likely s/he is to graduate in that time-frame*. If we consider the number of graduates as a proportion of first-time-entering students in each of the five years (2006–2010), the following picture (Table 4) emerges:

While just under half of all students who entered HE in 2006 completed, fewer than a third of students who entered HE in 2007 completed, the percentages of those completing declining – *as one would expect* – steadily from 2006 to 2010. The completion rate of those who entered HE in 2006 or 2007 (1374 students) was 44%. In other words, fewer than half of the students who could have been expected to complete in four or three years – the two periods of time, respectively, in which the highest percentage of students completed – actually did so.

Fourth, the five commonest pathways (Table 2) were as follows:

1. Qualification in four years, with first-time-entry in 2006.
2. First-time-entry in 2006, but with no re-enrolment. This pathway implies student drop-out, though theoretically all students who did not attain a qualification in the five-year period could have re-enrolled in subsequent years and completed (institutional rules permitting).

Table 4

Percentage completion of students in the 2005 Grade 12 cohort who entered HE between 2006 and 2010.

Source: Author.

Year	Students entering (n)	Students completing, 2006–2010 (n)	% completion
2006	1056	513	48.6
2007	318	98	30.8
2008	110	11	10.0
2009	49	1	2.0
2010	61	0	0
Total	1594	623	39.1

3. Five-year enrolment in the same programme, but without completion.
4. Four years of enrolment with first-time-entry in 2007 and non-completion.
5. First-time-entry in 2006, with one year of re-enrolment in 2007 and non-completion. Again, students following this pathway could theoretically have re-enrolled after 2010 and completed (institutional rules permitting).

These pathways account for 26% of all students represented in the data-set. Since the real significance of the findings lies in the analysis of the entire cohort of students' pathways, however, one should not set too much store by the extent of subscription to the five commonest trajectories – except to say that, despite assumptions that the linear trajectory of entering HE straight after school and being retained in the system until qualification completion is the exception rather than the rule, the profile indicates that more students followed this route than any other – however low the completion rate.

Fifth, the incidence of apparent drop-out is worth noting. Of those students who entered HE in 2006, 6% did not re-register between 2007 and 2010. Of those who entered in 2007, 3% did not re-register in 2008, 2009, or 2010. Of those who entered in 2008, 1% did not re-register in 2009 or 2010. And of those who entered in 2009, less than 1% did not re-register in 2010. Theoretically, then, 11% of the total could have dropped out between 2007 and 2010.

This calculation assumes, however, that all these students dropped out rather than stopped out. Stopping out means a student appears to have dropped out but subsequently re-enters HE at a later stage, whether such re-enrolment is planned or not; hence the use of the term “apparent dropout” above. While stopout may be a possibility for students who were not in the system in 2009 or 2010, it seems unlikely for those who left the system after 2006 but before 2008 or after 2007 but before 2009. Nevertheless, the notion of stopout is worth investigating.

Indeed, there appear, from the full data-set (Table 2 including the Appendix), to be many instances of stopout. These are summarised in Table 5.

While 81 students (across 52 pathways) stopped out over the five-year period, however, this number represents only 5% of the total. The percentage of students stopping out who completed is only 7% of those who stopped out and a paltry 0.4% of the total number of students in the response profile (1594); and since only 1% of those who completed did so via a stopping-out pathway, we conclude that students who completed qualifications almost without exception studied uninterruptedly.

4.3. Results at the SES-disaggregated level

Shifting the focus to the SES-disaggregated level, we can make four observations from Table 2. First, the rank order of the top ten pathways pursued by students from different socio-economic backgrounds differs, but only slightly, as Table 6 reveals.

SES is a distinguishing feature, however, among those students who entered HE immediately after school and dropped out after one year (pathway 10000): while 7% of low-SES and 8% of middle-SES students

Table 6

Top ten pathways of students from low, middle and high socio-economic backgrounds. Source: Author.

Pathway #	Low SES		Middle SES		High SES	
	Pathway pattern	%	Pathway pattern	%	Pathway pattern	%
1	12270	7.0	10000	8.0	12222	7.3
2	10000	6.6	12222	8.0	12270	6.5
3	12222	3.8	12270	7.0	10000	4.0
4	12000	3.7	12000	4.0	12227	3.7
5	01000	3.7	01227	4.0	01222	3.4
6	01222	3.6	12227	3.8	12200	3.1
7	00001	3.6	12700	3.8	00001	2.5
8	01227	3.2	01222	2.8	01000	2.5
9	12227	2.6	00001	2.8	12700	2.5
10	12200	2.5	01000	2.6	12220	2.5
Total		40.3		46.8		38.0

pursued this pathway, only 4% of high-SES students did so. Students who stayed one more year before dropping out (pathway 12000) are similarly better represented among low- and middle-SES students (both 4%) than among high-SES students – who do not even feature in the top ten most popular pathways of high-SES students, only 1% of them (see Table 2) having followed this pathway.

Second, completion versus non-completion would appear, from Table 2, not to be a differentiating feature among students from different socio-economic backgrounds; 13% of low-SES students, 19% of middle-SES students, and 13% of high-SES students pursued pathways that culminated in qualification attainment. If we factor the Appendix into the calculation, however, a very different picture emerges: 36% of low-SES, 40% of middle-SES, and 47% of high-SES students followed pathways issuing in qualification completion. In other words, SES is a progressively distinguishing factor in qualification completion as one moves from low- to high-SES.

As we saw earlier, at the aggregate level only 39% of students achieved a qualification over the 2006–2010 period. The corollary of the above SES-disaggregated picture, then, is that of the 61% of students who failed to complete a qualification, nearly two-thirds (64%) of low-SES students, three-fifths (60%) of middle-SES students, and just over half (54%) of high-SES students did not complete a qualification.

Third, the profile of students who were able to switch programmes in the course of their studies (students with a 5 in their pathway pattern) shows that 201 of the 340 (or 59%) of the pathways involved programme transfer (within the same institution) and that 28% of low- and of middle-SES students and 34% of high-SES students switched programmes in the course of their studies. The largest percentage of students, then – at the aggregate level, 29% across the three SES categories – did not switch programmes during their studies. The percentage of programme-switching pathways pursued (59%) does, however, demonstrate student ability to transfer from one course of study to another over the period.

If we differentiate programme-switching pathways on the basis of those leading to qualification attainment versus those that do not, however, we see that while 13% of low-SES students and 14% of middle-SES students who switched programmes at some point in their studies completed a qualification, 21% of high-SES students did so. (The aggregate was 15%.) The ability to switch programmes, indeed, is only important if such switching leads to programme completion; on this measure, only a small percentage of students overall (15%) successfully switched programmes, while only 13% of low-SES students were in this category.

5. Discussion

We can draw three main inferences from the results.

Table 5

Stopout-related pathways of students who were in Grade 12 in 2005 and who entered the HE system between 2006 and 2010.

Source: Author.

Pathway combination	Pathways (n)	Students (n)
Pathways involving stopout of 1 year	40	62
Pathways involving stopout of 2 years	10	16
Pathways involving stopout of 3 years	2	3
Pathways involving stopout followed by completion (immediate or eventual)	5	6

First, the results have shown that only 39% of students in the cohort of 2005 completed a qualification programme within the 2006 to 2010 period – notwithstanding the facts that the vast majority (85%) entered HE in 2006 or 2007 and that the majority of students who completed (76%) did so in three or four years. An overwhelmingly large majority of students (92% on average) could have completed their study programmes within the five-year timeframe. All things being equal, a far larger percentage of students should have completed a qualification programme, therefore, than did.

A comparison with official completion rates reveals that an estimated 44% of students in the South African system who first enrolled in 2000 eventually went on to complete (CHE, 2009). A more recent CHE study (2013), however, calculates the five-year completion rates (that is, graduation in regulation time plus two years for three-year qualifications and plus one year for professional four-year degrees) for all first-time entering students as 38% for all three- and four-year degrees and 35% for all three- and four-year qualifications. The 39% completion rate arrived at in the present study is therefore comparable with the CHE calculations, since it includes all qualifications, not only three- and four-year qualifications.

The CHE figure compares with a projected UK completion rate for the 2000/2001 cohort of 78% (cited in CHE, 2009, 36) and of the 2007/2008 cohort – the completion rate for 2011 – of 72% (OECD, 2013). In the American HE system, by contrast, 52% of the 2000 cohort of students were reported to have completed a four-year qualification within a four-year period. A further 27% persisted beyond the four years for up to a further four years from their original year of commencement (that is, they were enrolled for up to eight years in total), of whom 17% eventually completed – rendering a completion rate of 69% (Pfeffer and Goldrick-Rab, 2011). A later US study, of the 2004 entering cohort, found that 38.9% of students at four-year institutions had completed a degree after four years, a further 17.5% had completed after five years, and a further 4.8% had completed after six years (DeAngelo et al., 2011). A still more recent study (OECD, 2013) showed the US completion rate for 2011 (students who had entered in 2003/2004) to be 53%.

In summary, while the data from the three countries are not perfectly comparable by virtue of methodology and/or data period, the most recently available completion rates are 72% for the UK, 53 cent for the US, and 39% for South Africa.⁸

Second, data from the 2005 cohort of Grade 12 students in the present study revealed that while 102 students pursuing 63 different pathways “stopped out” of the HE system only to return in a subsequent year to continue with or complete their studies, a negligible percentage of these pathways (less than 1%) issued in completion by 2010 – which leads us to conclude that HE completers for the most part study uninterruptedly. A similar trend is reported by Pfeffer and Goldrick-Rab (2011), who showed that since the transition status in any year is likely to be the same as in the preceding year, US students who stop out are progressively less likely to complete. Nearly a third of US students reportedly stop out of HE (Berkner, 2002; Carroll, 1989; McCormick, 2003; Goldrick-Rab, 2006; Goldrick-Rab and Pfeffer, 2009) – though when, why, for how long they do so, and, crucially, whether they complete their study programmes obviously varies. Nor can we generalise from the findings of the present study to say that only 5% of South African students stop out, since we do not know the final destinations of all students in the cohort: a proportion of students who appear to have dropped out may have returned to continue and/or complete their studies after 2010.

Our ignorance about the actual completion rate of a particular cohort of students is, obviously, a function of the number of years

included in the five-year model. Since a number of students in the South African HE system delay entry into HE, it is theoretically possible that a ten-year model might have provided a different completion profile from the five-year one used in Table 2. Given the finding that students who enter HE immediately after school are more likely to complete than are students who delay entry to HE, however, it is highly unlikely that a ten-year profile would have rendered significantly different results overall. Indeed, 892 of the 1910 students in the profile (47%) entered HE in 2006 or 2007 and did not complete a qualification. The completion status of nearly half the cohort, then, is highly unlikely to change should the timeframe in the typology have been extended by five years.

The third inference is that SES is unquestionably a differentiating feature in student progression through HE, student retention within HE, and student completion of a HE programme. Low-SES students are more likely than their high-SES counterparts to drop out of HE both after the first and after the second year of study and are less likely to complete a programme, whether they remain loyal to their programme of first enrolment or switch programmes in the course of their studies.

The South African experience in this regard is far closer to the US and UK than to the Australian experience. The US studies reviewed earlier found large differences in university completion rates (as measured by completion of Bachelor's degrees) according to SES, whether at the aggregate level (Haveman and Smeeding, 2006) or whether completion rates were correlated with students' 8th grade Mathematics test scores (Fox et al., 2005) or with parental education and first-generation student status (Chingos and McPherson, 2011). Indeed, each gradation in SES (from low- to middle- to high-SES) was shown by Adelman (2006) to increase the probability of degree completion by about 6%. Similarly, the UK literature reviewed earlier showed that low-SES students were more likely to drop out of university, less likely to achieve a qualification, and less likely to achieve a first or upper-second class pass than were their high-SES counterparts (Crawford, 2014), even once student characteristics and prior achievement had been controlled for (Powdthavee and Vignoles, 2008).

Why the Australian experience differs from that of the US and UK – HE having been reported in Australia to be a great leveller, students from different socio-economic backgrounds showing little differentiation in terms of retention and completion rates once access to HE has been achieved (QUT Vice-Chancellor, 2004; Marks, 2007, viii) – is a matter for speculation. It may well have to do, however, with Australia's use of a geographical index for SES classification rather than a calculation – as used in the present study, as indeed in American and British studies – based on parental/guardian occupation, income level, and educational attainment. The Australian index may therefore overestimate low-SES participation in Australian HE and correspondingly underestimate the rate of high-SES overrepresentation (Centre for the Study of Higher Education, 2008).

Retention and completion aside, SES is also a distinguishing feature in the timing of entry to and the nature of progression through HE. High-SES students are less likely than their middle- and low-SES counterparts to delay entry into HE (four in five high-SES students proceed directly to HE after school, only three in five low-SES students doing so). This finding bears out the US experience: in a 2007 study, 52% of low-SES students enrolled in a HE institution within two years of leaving high school compared to 83% of high-SES students (Rowan-Kenyon, 2007); and in 2009, 55% of low-SES versus 84% of high-SES school-leavers proceeded directly to HE (Aud et al., 2011). From a progression perspective, students who complete their programmes of study almost without exception study continuously. This finding too is borne out in the literature, Adelman (2006) having found that being enrolled continuously increases the probability of students' earning a Bachelor's degree by 43%.

5.1. Significance of the findings

There are, at face value, immediate implications for HE policy

⁸ Pursued by fewer than 6 students each. A cut-off of 6 students was selected for convenience of reporting (the majority of pathways – 198 of the 340 – were pursued by only 1 student). An Appendix containing the full data-set is available from the author.

arising out of these inferences. Student attrition, whether drop-out or stop-out, should be addressed through interventions that seek to retain students within the system: foundation programmes; extended curricula; and intensive academic support. But while such interventions have been made, however unevenly, in South African HE, and while they may have had some effect in certain institutional contexts, they have not impacted significantly on student progression and completion, as the Council on Higher Education (CHE, 2013) and the findings of the present study have shown. And while some might argue that such retention measures should be increased, cost-benefit analyses need to be conducted to ascertain whether the price of what is essentially remedial intervention to address deficits accumulated over years of schooling does not exceed the graduation and throughput benefits.

Whether in South Africa, the UK or the US, if low SES translates into longer qualification programmes, greater attrition, and poorer outcomes, one must look beyond the HE system for solutions. In South Africa at least, a major problem lies in the paucity of study options in the further education and training (FET) band – that is, between Year 9 and university entry (see Cosser, 2011) – which places inordinate pressure on a university system that cannot meet the demand for HE. The implications of this are not only that additional institutional choices at the FET level need to be made available to school-leavers but that universities need to be more selective in whom they admit. A further implication is that career guidance at school level – especially in the course of Year 9, when learners choose their subjects for the FET phase of their schooling – needs to be focused more than it has been on FET-level institutions (TVET and other colleges) and tailored to the academic and technical capabilities of learners.

But even these measures may not be enough to address the increasing low-SES learner demand for access to HE. Longer-term solutions are located within a broader developmental perspective that addresses learning deficiencies far sooner than in high school, let alone in HE. For example, while the UK government's "widening participation" policy – which seeks to double the proportion of pupils from disadvantaged backgrounds going into HE and to increase by 20% the numbers of students from black and minority ethnic (BME) backgrounds by 2020 (HEFCE, 2015) – may be a noble ideal, policies (such as widening participation) that target, at the admission stage, increased participation of minority groups to enhance social justice may be counterproductive. The HEFCE (2015: n.p.) maintains that:

We continue to emphasise – but with renewed focus – that addressing widening participation relates to the whole 'life-cycle' of a student in HE. This covers pre-entry, through admission, study support and successful completion at undergraduate level, to progression on to further study or employment (emphasis added).

But "the whole 'life-cycle' of a student" misses, through its delimitation of *life-cycle* to *student*, the larger life-cycle of the learner who has not been adequately prepared for entry into HE, not least by dint of socio-economic background. Equity interventions that level the playing field for learners who have been born into poverty and raised in deprivation ought not to be left to universities but introduced at the early childhood development and primary school stages. Early detection may lead to the recommendation of interventions that could limit the need for the costly and ultimately distracting remedial interventions that are made within the HE system itself.

6. Conclusion

On one reading of the findings regarding differential student performance, including those from the South African study reported here, one might conclude that low- and high-SES students are polarized in their HE performance, high-SES students succeeding whilst their low-SES counterparts fail. But success and failure need to be evaluated not only against HE progression and its issuance in completion but in terms of prior academic performance at school – which the present study has not controlled for. It may be, for example, that high-SES students in the

sample performed much better at school than did their low-SES counterparts; or, the corollary, that low-SES students performed, in relation to their academic achievement at school, much better in their progression through HE than their high-SES counterparts. Success and failure, therefore, are relative – and not only in terms of the direct comparison of low- and high-SES students in their progression into and through HE as considered in the present study.

So while it is clear from the evidence presented in this study that SES remained a strong determinant of academic success and that inequalities in access, mobility and throughput were still being reproduced in the second decade of South Africa's transition to democratic rule, the differential behaviour of low- and high-SES students is not so much a matter of polarisation as of degree. On no dimensions are the differences so stark as to suggest diametrically opposed opposites. This phenomenon of a continuum of progression and performance begs further investigation.

So too does the context within which performance is measured. As the analysis of the HEFCE statement about support for the life-cycle of the student revealed, the context for performance measurement may simply be too narrow to yield a deeper understanding of the developmental trajectories of learners. This narrowness suggests the need to broaden the scope of research to track learner progression at least from Grade 8 – as per the 1988 U.S. Department of Education longitudinal study of students (see Fox et al., 2005) – but preferably from pre-school. Given the stark inequalities in South Africa, longitudinal research would enable one to track not only progress through the education system and changes in learner performance over an extended period but possible shifts in SES through its antiphonal interaction with student progression.

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