

Supporting tertiary access for disadvantaged students: Lessons from the Sasol Inzalo Foundation's bursary programme

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Background

The Sasol Inzalo Foundation was established as part of South Africa's single biggest black economic empowerment (BEE) equity transaction. This transaction transferred 10% of Sasol shares into the hands of South Africans from designated groups in September 2008. "Inzalo" means "new birth", "new beginning" or "fresh start". Part of the transaction was the allocation of 1,5% of Sasol's shares to the Sasol Inzalo Foundation, which was set up to focus on skills development and capacity building for South Africa, in the critical areas of mathematics, science and technology.

One of the mandates of the Foundation is to create tertiary opportunities for South African talent from diverse backgrounds in the fields of Science, Technology, Engineering and Mathematics with the dual purpose to create a technical talent pool for the country and empowering South Africa's youth with meaningful livelihoods.

As part of fulfilling this mandate, the Sasol Inzalo Foundation (SaIF) in 2010 started an undergraduate bursary programme for studies towards degrees in science or engineering. Currently the programme has 236 students at nine universities across South Africa; eventually there will be a pipeline of around 350 bursars. The first cohort of bursars has reached their third year at university. Selection criteria for these bursaries were geared toward providing university access to main stream programmes for performing but disadvantaged students; in addition to requiring strong levels of matric performance and considering a means test, an aggregate score was calculated which weighed performance according to how resource-poor the environment was from which the student originated. The profile of the selected student group closely matches the national demographic profile, with a special focus on rural students.

The Foundation partnered with StudieTrust, a national bursary organisation with a track record in this field, to provide comprehensive financial, academic and psycho-social support to the students. In 1974, the founding year of StudieTrust, less than 5% of the black South African population of high school age were actually attending high school and less than 0.2% were in matric, the final school year. The dilemma is that forward strides made in terms of formal access to tertiary institutions are fundamentally undermined by the success rates (of lack thereof) of Black African students. The statistics in this regard are quite sobering. A Council on Higher Education study reported in 2007 that only 50% of all first time students entering university in 2000 had graduated within five years, 12% were still registered after 5 years and 38% had left without graduating. When the statistics were disaggregated into fields of study and race, the report showed that black students had 5 year completion rates for business/management and engineering of 33% and 32% respectively, as compared to 83% and 64% for whites; the picture was substantively similar for the 2001 cohort. Internal tracking of throughput statistics by the

Sasol Inzalo Foundation indicates that the throughput situation has not changed materially since.

Consequently, the Foundation also conducts a research programme tracking the experience and performance of its bursars, with a view to developing a replicable model for tertiary access support. This paper will reflect on some of the lessons learnt in the course of running the Sasol Inzalo Foundation's bursary programme.

Theoretical stance

The theoretical position that influenced the particular approach followed, has affinities with the capabilities approach associated with Amartya Sen and others, and the asset accumulation approach that developed from Sen's work.

Capabilities, according to Sen, are the capacities people must have that enable them to function. Capabilities are distinguished from commodities and characteristics. A bicycle is a commodity and its characteristic is transportation. The capability it offers is the ability to move about. For Sen, poverty is capability deprivation and overcoming poverty would require increased entitlement (Spicker, Leguizamón & Gordon 2006: 26-27). Entitlement is thus something positive for Sen – the exercise of the right to use resources. Poverty is not so much caused by the *lack* of resources, but by the *inability to use* the available resources (Spicker, Leguizamón & Gordon 2006: 67). This view favours the notion of empowerment as a strategy against poverty. Empowerment entails the enhancement of the abilities and capabilities of those who were lacking in power.

An interesting conceptual difference exists between Pualo Friere's notion of empowerment and that of Sen. For Friere, empowerment is a *strategy* in development, while Sen sees empowerment as the *end effect or result* of development. Development leads to increasing the entitlements and capabilities of poor people. The World Bank sides with Sen by defining empowerment as "the expansion of assets and capabilities of poor people to participate in, negotiate with, influence, control, and hold accountable institutions that affect their lives" (quoted in Spicker, Leguizamón & Gordon 2006: 63). Sen's capability approach includes the notion that poverty is lack of freedom. Development is seen as much broader than economic development, but is defined in terms of the level of freedom attained. The term used for this broader concept is "human development." The United Nations Development Programme defines human development as

a process of enlarging people's choices. In principle, these choices can be infinite and can change over time. But in all levels of development, the three essential ones are for people to lead a long and healthy life, to acquire knowledge and to have access to the resources needed for a decent standard of living. If these essential choices are not available, many other opportunities remain inaccessible.

The "other opportunities" include political, economic and social freedom, as well as "opportunities for being creative and productive and enjoying personal self-respect and guaranteed human rights" (quoted in Spicker, Leguizamón & Gordon 2006: 93). Educational attainment forms an important indicator used in the calculation of the Human Development Index (HDI). It is measured by the level of adult literacy (counting two-thirds of the total) added to a combination of primary, secondary and tertiary enrolment ratios. The other indicators are life-expectancy and standard of living.

The asset accumulation approach further developed the ideas of the capabilities approach. The originator of the asset accumulation approach, Caroline Moser, stressed that the inventive solutions of the poor themselves play a crucial part in poverty reduction. The “assets” poor people must accumulate and control in order to become less vulnerable in the face of “shocks” include labour, human capital, housing, land, infrastructure, etc. According to Moser the process by which assets held by individuals and households are transformed into accumulated capital does not occur in a vacuum. Government policy, political institutions and NGOs play important roles in determining how easily households can accumulate assets. The accumulation of one asset often results in the accumulation of others, while the insecurity in one asset can also affect the others (Moser 2007:92).

Institutions also could either undermine or enhance asset accumulation. Laws, norms, and regulatory and legal frameworks all count as institutions, as do the linkages between education and employment. Asset accumulation is affected by opportunities for and constraints of individual and collective agency. The opportunities and constraints relate to the broader political and economic context. A particular *strategy* of asset accumulation is understood as the way in which particular “endowments” are transformed into accumulated assets by individual and collective agency (Moser 2007:94).

First generation asset accumulation (improved basic services, health and education) could be frustrated, for instance, if higher education levels (increased human capital) do not lead to employment and result in negative outcomes. Second generation asset accumulation is therefore designed to strengthen accumulated assets, ensure their further consolidation and prevent erosion (Moser 2007:95)

Educational human capital can be identified as “promotional assets” that actively provide opportunities to move out of poverty in a sustainable way. It presupposes physical capital (land, housing, health, etc.) that can be considered “protective” or “preventative”.

The asset accumulation approach is also referred to as the asset vulnerability approach. “Vulnerability,” according to Moser, is insecurity in the well-being of individuals, households and communities. Resilience and responsiveness to risk are related to assets and control over them. Moser’s research shows that the poor themselves are managing a portfolio of complex assets. Management of assets affects vulnerability in the household (Spicker, Leguizamón & Gordon 2006:12).

Attaining a degree in engineering or the natural sciences would rate as a process of asset accumulation that is believed to have the power to significantly improve the circumstances of individuals and households. The perceived benefits of high levels of tertiary access include

- The individual benefit of an increased likelihood of finding employment that will guarantee a higher earning power, increased robustness and ability to withstand shocks like loss or reduction of income in economic downturns, and improved health behaviours and health.
- The broader benefits to the economy would entail increased human capital, leading to higher total factor productivity, better service delivery (e. g. a professional public service), a stronger national innovation system that will lead to economic growth and eventually increased wealth for all. In contrast to some other countries, South Africa has space in the economy to absorb graduates.

- Socio-economic development benefits include the building of social capital, which supports a healthy civil society, good governance and democracy, thereby creating a conducive environment for wealth creation
- As tertiary institutions are also responsible for training teachers, graduating more and better teachers and school leaders supports improved education and hence a virtuous cycle of poverty alleviation.

The concept of tertiary access

Tertiary access requires an entire chain of events to “go right”. Figure 1 illustrates a whole chain of stages that has to be negotiated successfully for a learner to graduate into the work place:

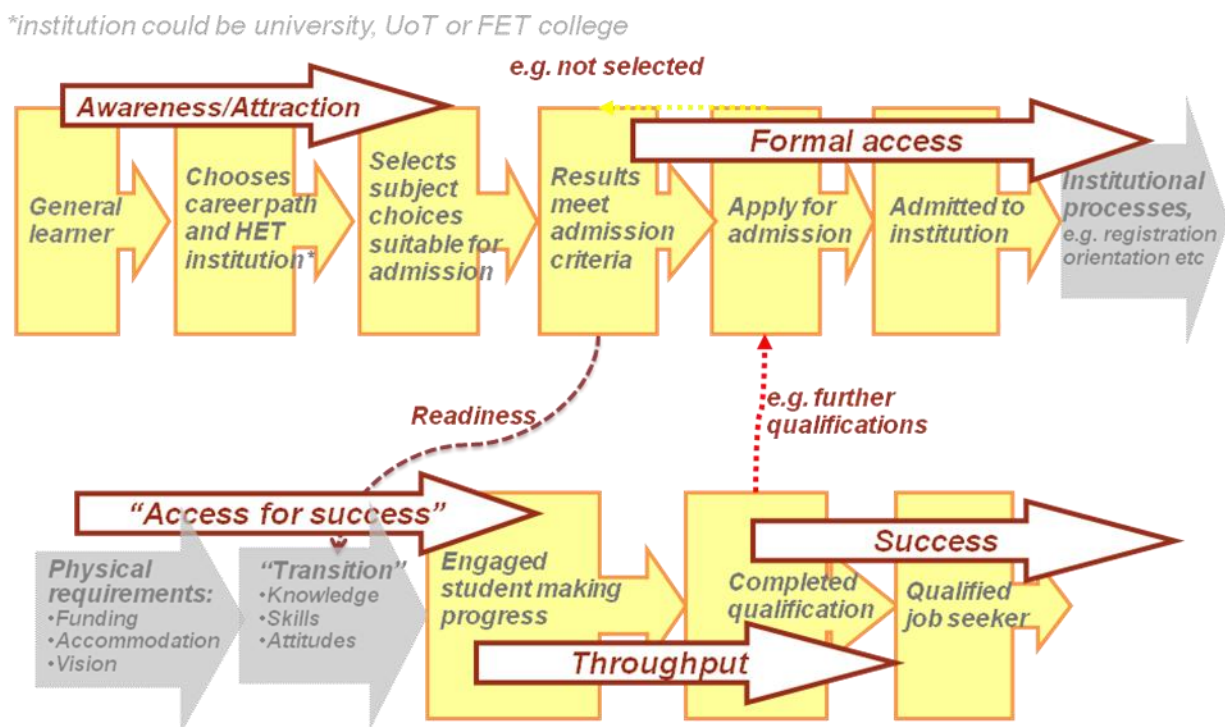


Figure 1: Tertiary access chain

Enabling tertiary access as a strategy of asset accumulation is therefore not merely a matter of providing funding; to deliver new graduates on the scale South Africa needs to make a meaningful impact on poverty requires the whole chain to work together seamlessly and effectively, with no breaks in the chain.

Potential breaks in the chain – vulnerabilities

The transition from each of these stages to the next constitutes a vulnerability – learners are lost from the pipeline at each transition. Examples, familiar to us from news headlines and substantiated by considerable bodies of research, include:

- Learners select or are advised to select subject combinations that do not give them access to university,
- Even with the right subjects their matric performance does not meet admission requirements for the degree programmes in scarce skill areas for which they have the aptitude – they are either not admitted or redirected to different fields of study than they applied for,
- Although Life Orientation is a compulsory matric subject, many learners still do not know when or how to apply for university admission,
- University processes are overrun by applications and late registrations,
- Students do not find suitable accommodation or send home their money and then live on the streets,
- First years struggle to adapt to campus life,
- Dropout rates are high,
- Throughput rates are low and
- Those students who graduate are not guaranteed a job ...

Supporting tertiary access by supporting students through vulnerabilities

Institutions and NGO's in South Africa support tertiary access in a myriad ways. Some examples are indicated in Figure 2

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**institution could be university, UoT or FET college*

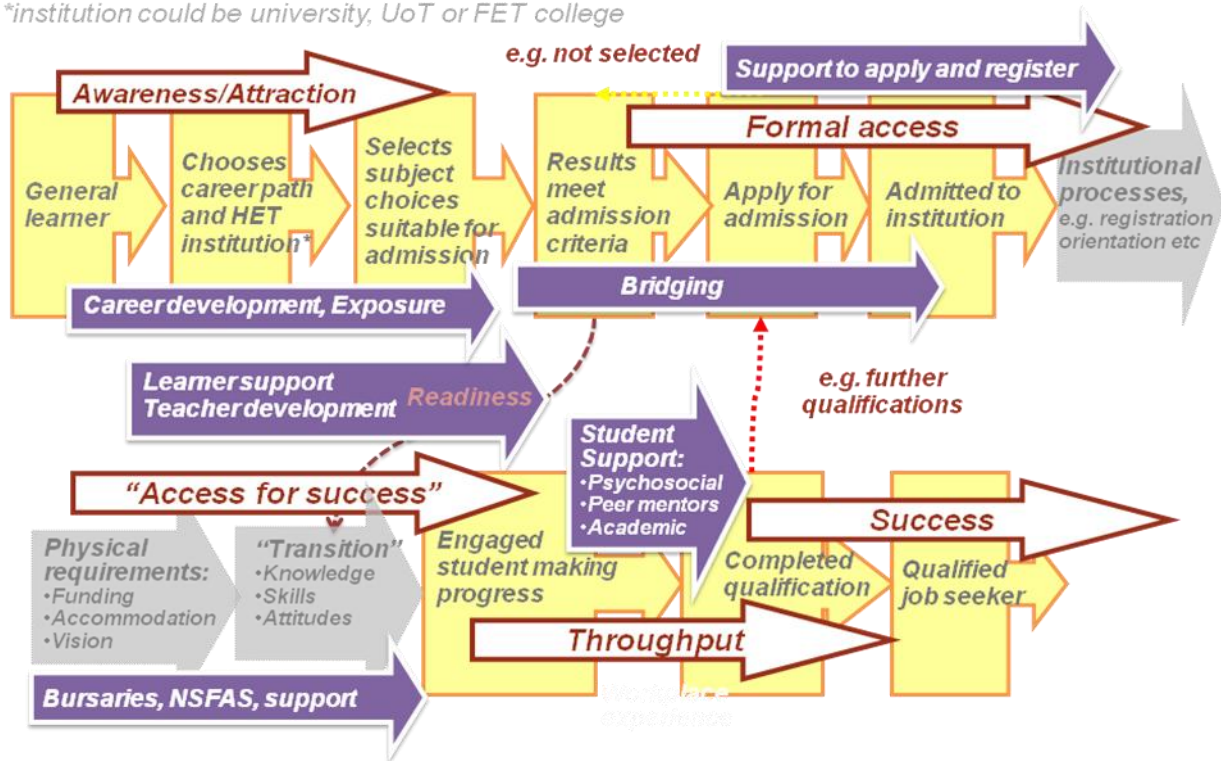


Figure 2: Supporting tertiary access

However, it should be clear from the discussion that supporting students through a part of the

process will come to naught if they fall prey to other vulnerabilities further down the chain....

Universities have instituted various “First year experience” student programmes to support students across the transition from school to university. In 2008 an international conference on “The First Year Experience” was held at Stellenbosch University, in which most of the universities in the country participated. As another example, Dr André van Zyl, responsible for the First Year Experience programme of the Student Development Unit at the University of Johannesburg, recently shared some of their experiences in an internal discussion:

- Around 30% of their first year students are hungry during a normal day at university.
- Many first years view academic success as being related in some way to luck. A starting point of preparing them for success at higher education is to make them grasp that success has everything to do with what you do and how you do it. Unrealistically good matric results cause many students to arrive on campus overly confident. The university experience tends to reduce this over-confidence to a severe lack of confidence. Between these two extremes student support systems must remind students that they do have potential but that this alone will not prevent a bumpy ride ahead.
- Over-confident first years struggle to get to grips with the “surprise of failure” – those with the necessary “grit” are the ones who do not drop out as a result. Dr Van Zyl referred to the work of the psychologist Victor Frankl in this regard: students who can find purpose and meaning in their lives and circumstances are the ones who persevere, and they are not always the ones who look the strongest.
- One major cause of failure at higher education is the lack of step-up when it comes to time actually and effectively spent studying. Time management and effective and appropriate study methods are essential skills to be learned. At this level there is not much room for motivating students. They should by now be self-motivated. The deciding factor will be whether a student takes responsibility for his or her own success.
- When students arrive they are still in the comfort zone of secondary education and the new experience then immediately places them in a panic zone. The goal should be to get them adjusted to living in the “stretch zone”, in-between the extremes. Warning students that they are in for a rough ride does not have to be de-motivating. Most of them will fail their first tests. The important thing is to be there with support when they do. Make sure they understand why failing at this juncture is not unexpected. And show them how to do the step-up needed to start passing.
- According to Dr Van Zyl it is not so much the suffering that goes hand in hand with the surprise of failure that destroys a student’s morale. It is rather the confusion that failure brings about. Being there to give perspective and to offer a story that *includes* the experience of failure, but *does not end* there should be the role of student support programmes.

The Sasol Inzalo Foundation bursary scheme

The partnership between StudieTrust and the Sasol Inzalo Foundation (SaIF) is specifically aimed at the “Access for Success” and “Throughput” portions of the chain in Figures 1 and 2,

i.e. it supports disadvantaged students who qualify for admission and have been admitted to universities to be successful in completing their degrees. As it aims to develop models for how South Africa can increase throughput, it only supports students in main stream courses, not for extended programmes. Students are also only financially supported for the regulation time to complete a degree (see below for further discussion).

Of the first cohort of students, now in their 3rd year, 41% is still on track to complete their studies in regulation time after completing two years, while 40% have fallen behind one year (some had to repeat the first year, some continued to the second year but carried first year subjects, while some fell behind in the second year, in roughly equal proportions). A slightly larger proportion of the second than the first cohort is still on track to complete their studies in regulation time after the first year (67% in the second compared to 60% in the first cohort after the first year). By comparison, Grayson (2011) reported that 17% of black and 38% of white engineering students (excluding the extended programme) of the 2010 cohort at the University of Pretoria were allowed to proceed to the second year.

After two years of study, 13% of the first cohort has been excluded. This compares favourably with national statistics; from the 2000 cohort of students enrolled at universities, 25% left after one year, with a further 9% and 7% dropping out after the second and third years (DoE 2005). Pocock (2012) gives cumulative leaving rates (%) after two years from the engineering faculty of the University of KZN ranging between 28% and 38% during the period 2004 to 2008.

How the Sasol Inzalo Foundation bursary scheme aims to support specific vulnerabilities

Funding support

Studies by the HSRC (e.g. Letseka et al 2009) indicated that the main drop-out reason for South African students is financial difficulty. The SaIF bursary scheme was therefore designed to provide sufficient funding to eliminate funding concerns so that the student can focus on his or her studies. As the bursaries are intended to support disadvantaged students, a means test based on the average household income per person is employed for students to qualify for the bursary.

The ceiling for the means test is set at a family income that would allow the student to qualify for a loan from the National Student Financial Aid Scheme (NSFAS) if their bursary is suspended. This was done to provide a safety net in case a student has to extend their studies by a year. Experience with company bursary schemes, who typically suspend students who fall behind in their studies until they have caught up, has shown that disadvantaged students cannot access bank loans or other funding if they are suspended; such suspensions therefore frequently result in the student dropping out of university all together.

An example of how easily this could happen is presented by student A, who arrived at the StudieTrust offices in search of a study loan. He received a bursary from a major South African financial services company to study Actuarial Science at Wits University. During his second year he failed one minor subject. The strict rules of the company bursary scheme dictated that he should forfeit further bursary funding. This bright young man from the rural areas of the Limpopo Province would have been forced to drop out as he had absolutely no access to further funding. Wits told him that his loan application

was too late (he did not know by the deadline for applications that he would need a loan the next year). He heard about StudieTrust by chance and was fortunate that StudieTrust, a first tier NGO partner of NSFAS, could still administer a loan to the maximum available amount (R54 000 in 2011) – which means that the income of his household was maybe an old age pension and perhaps one child grant - although the loan would have covered at most around 75% of his real study-related expenses. Student A could continue with his third year, and graduated within regulation time (3 years). His company sponsor has now taken him back for his post-graduate studies. This is the kind of student who can still face exclusion for reasons related to poverty. He could have languished in the dusty streets of his home village. It was touch and go ...

In the case of the SaIF bursary, a student who fails a minor will be funded fully for the next year. If a major was failed and this failure would entail that a year be added to the degree programme's minimum or regulation time, funding will continue but the amount originally available for 4 years (in the case of engineering students) would now be spread over 5 years. A NSFAS loan could be arranged to tide such a student over for one year. In 2011, the second year of the existence of the SaIF bursary programme, students who in their first year did badly enough to have added a year to their studies, were suspended for the first semester and therefore had to make use of a NSFAS loan to cover the first semester expenses. However, because the loan application process is time consuming, and not all universities are willing to register students on the strength of a letter from StudieTrust that a loan will be administered, the lack of funds during the first semester still left the student vulnerable for the first part of the year. In 2012 the approach was changed to allow for a bursary to the value of 50% of the full cost to be immediately available, to give the student the chance to continue with studying while the NSFAS loan application is finalized so that the loan funds can be available by the second semester. If a student performs well from this point in time onwards, the remaining 50% of that year's funding is available in the final (extended) year. Lack of performance therefore has a consequence, but not so severe a consequence that bursars cannot continue.

It goes without saying that in some cases the leniency granted will not have the desired effect. But in by far the majority of cases students who struggled in their first year managed to adapt to the new demands and became successful students. The student who returned the best overall first year results in 2011 failed her first year the first time around.

Students who fall behind more than one year are excluded from the programme, but do not have to pay back any of the funding.

In typical cases the SaIF bursary provides accommodation, tuition, a laptop computer, allowances for books and meals as well as limited "pocket money". Where possible, funds are paid directly to institutions; the remaining funds are paid to students in monthly installments, to reduce the risk of them sending large sums of money home and subsequently running out of funds.

Guidelines were developed for each category of funding; however, the guidelines have had to be adapted to cater for the special circumstances of the students in the programme. For instance, in the case of a particularly bright student who lives with his unemployed mother, the policy of paying a smaller amount to a student who studies from home had to be changed. The fact that the mother is unemployed made the son the primary provider. His circumstances as far as the bursary is concerned was changed to that of a student who has to pay rent and lived in a

self-catering set-up – this category qualifies for a larger monthly allowance and the bursary also pays the rent.

Vision support

In the first year of the SaIF bursary programme, a hypothesis that a lack of proper vision created vulnerability for many students was investigated. Many students reported problems such as headaches and not being able to read writing on the board during class. Vision testing for all the students was arranged during July and August; glasses were issued to about half of the tested students.

There was a strong correlation between a student's average score in the first test series and in the June exam of the first year. Students without vision impairment improved their average scores by an average of 4,7 percentage points from the first tests to mid-year; by contrast, students who needed glasses but only discovered this after midyear, lost ground by an average of 2,6 percentage points in the mid-year exam.

Subsequent cohorts of bursars, as well as groups of participants in other SaIF programmes, have all undergone vision testing and been given corrective glasses if needed; the first cohort of bursars has also been retested and new prescriptions issued after two years. In all cases, between 40% and 50% of the group needed glasses. This is an easy to implement, practical intervention that can make a difference if implemented early in the academic year and has now become standard practice in all SaIF programmes.

Supporting the transition from school to university and subsequent transitions

SaIF's initial theoretical model was based on the assumption that success at university would require success in three domains, namely cognitively (e.g. knowledge, conceptual understanding and academic literacy), skills (e.g. language, study methods, approach to learning and time management), and the affective aspects (e.g. identity, agency, social integration and resilience). A research programme was put in place to monitor students' progress in these and other dimensions.

The research poignantly mapped the students' journey. Many students experienced a "Hero to Zero" journey coming into the first year, failing tests for the first time and experiencing an identity crisis, feeling like strangers when they returned home at mid-year (Vosloo et al 2010). One group managed to adapt to many of the aspects of their new world early in the first year and had the highest probability of passing all their subjects at the end of the first year; another group did not adapt in any of the relevant dimensions in the course of the first year and failed outright at the end of it. A third group of students grappled with different approaches to learning and initially struggled, but after midyear turned their performance around, started to engage academically and socially and generally found their feet (Vosloo 2011a).

The research showed that the journey and the typical challenges are different for different students, and that they each use different methods and support mechanisms to pull themselves up when they are ready for positive change. Subsequent research has also shown that some students experience other, similar transitions at the beginning of the second and later years, and that eventual career success in general requires the ability to make transitions into new situations quickly and effectively (Vosloo 2011b)

As mentioned above, many of the bursars managed a turn for the better at the start of the second semester of the first year. However, for some of them the first semester results already forced them to have to extend their studies. It seems a harsh penalty to have to extend your studies by a year because of difficulties in the first semester when experience shows that many students find their feet only in the second semester. It would assist disadvantaged students to succeed in main stream courses if the courses were structured in a way that would allow them to recover from poor mid-year results in the second semester without having to extend their studies, as some universities are starting to do.

SalF and StudieTrust uses a range of mechanisms to support students through these transitions, e.g.

- Students are visited individually twice a year for personal support;
- They have access to the same wellness service that is available to Sasol employees, providing them with a full time anonymous telephonic help line for psychological and other counseling;
- Peer mentoring groups, where senior students mentor a small group of younger students following a structured programme, were introduced;
- A winter seminar focusing on building conceptual understanding and engagement with problem solving takes place in the midyear holidays; there are activities to build “soft skills” in the evenings during the winter seminar.

Initially, the SalF bursary programme relied on the on-campus services for psycho-social support, but it soon transpired that the on-campus services do not have sufficient capacity; in addition, the bursars were found to be reluctant to ask for help, as they have always been seen as the bright kids helping others. Providing an anonymous service has made it easier for them; a number of the bursars have used it very successfully, although not everyone who could have benefited from it actually used it.

Many of the universities have now started to offer peer mentoring on campus or in the hostels; this activity has increased to the level where some of the students are “over-mentored” and are requesting that the programme keeps encouraging social connection through the mentoring system but should cut down on the formal coaching aspects of the programme somewhat.

The residential winter seminar, taught by the Ukuqonda Institute, was originally conducted over two weeks, but has since been shortened to one week per group, with an additional week long intervention before the commencement of the academic programme to which 25 new bursary students with the lowest Maths and Physical Science matric marks are invited. Low is here a relative term, as the entrance criteria are at least 70% for Maths and 65% for Physical Science. The winter seminar programme is differentiated by the year of study, focusing on threshold concepts in the initial years of study and shifting to career orientation in the later years, with technical challenges to be solved in teams, a business game and career development work sessions on offer in the third year.

The problem-based approach used in the seminar’s pedagogy provided a turning point for many students, restoring their self-confidence and resulting in a new approach to their studies. It was

found to contribute not only to skills-building, but to have a positive identity impact. Students who were isolating themselves and spiraling into hopelessness discovered that they could make friends and built up peer support networks during their stay. The timing of the seminar was found to be fortunate – it coincides with the natural reflective pause in the middle of the year, after students have been challenged in one way or another by their first exams and have returned home for the first time, and therefore provides an ideal time to support them in reframing their approach to university when they return after the holidays.

A case in point is Student B, a bright young man who was allocated a Sasol Inzalo Foundation engineering bursary on the basis of a set of excellent matric results, including 76% for Mathematics and Physical Science. When we met this young man during the orientation and peer mentor training workshop in the first university week, he was raring to go, although already somewhat flustered by the complete change of situation. He hails from a household where a single parent aunt is the only caregiver to seven children of which only 3 are her own. The others, including our bursar, are offspring of deceased relatives. Student B found the transition from a very noisy 4-roomed dwelling to a Stellenbosch residence where he had but a single roommate quite unnerving. When we visited him again in April, after the first test series, he told us that he had given up taking work home when he returns on weekends on account of the noise levels, and that his visits were getting less and less frequent. But that was not his main concern. Student B was in the midst of a crisis of identity and the resultant confusion due to a first test result of 28% in Engineering Mathematics. His eventual first semester result for Engineering Maths was 33%. A mere 4 years ago this would have led to his immediate exclusion from further engineering studies at Stellenbosch University. Fortunately this is no longer the case and Student B will be allowed to repeat the course without having to extend his programme. But the confusion could easily have led to him dropping out. With his permission we quote from the email he sent us some time after he received his results:

It has taken some time for to put the words in place to type this email.

I came from high school completely excited and ready to start University but I was not entirely ready for the responsibility and pressures that came with it.

My approach to being in complete control of my own life was wrong. I did not know how to prioritize and I could not manage my time correctly. These were things that I am still learning.

What I also had to learn was to put in effort. When at high school I was driven to achieve, but things happened in my final year and I began to become complacent with my results.

I came with that mind set to university. I nearly lost myself within my decisions that I made. I reached a point where I saw my future disappear. I rekindled my relationship with God.

For the first time in my life I have failed. I failed one of my exams which means that I am in breach of my contract. My percentage is high enough for me to continue with my degree without any extensions. I need to redo one of five

modules because I did not make the correct decisions.

Currently I am fearful for the termination of the bursary because I did not perform to my uttermost.

Which brings me to the next situation. I know that you specifically told me to contact immediately if something was wrong. I apologize for my silence. I am truly sorry for disappointing, with the silence, with the failing of the module as well. I will be looking forward to speaking in person once again.

It was an absolute pleasure to assure this promising young man that his bursary will continue and that we remain confident that he will overcome his confusion and bounce back. The subsequent events are so typical that we can confidently speak of data saturation:

Student B attended the SaIF Bursary Programme Winter Seminar during the June-July university holidays. The daily programme consisted of attempting Maths and Physics problems under the guidance of the staff of the Ukuqonda Institute, guidance that boils down to allowing students the time to complete the problems at their own pace and communicating an attitude that they can do it if they just keep going and use their own resources. During the evenings soft skills learning workshops and events were presented: time management, strength finding, and community building. Student B participated with gusto. When we visited him on campus in the first week of the second semester, he stated that he regained his confidence, a process that started at the Winter Seminar. He could give precise feedback on exactly how long he took to solve each problem (11 hours for the breakthrough problem) and how this experience represented the turn around. He also felt that his newfound confidence was more realistic as it included successfully dealing with failure.

Student B's "case" is typical for the SaIF bursary programme. He is a bright young man from difficult socio-economic circumstances. His matric marks were solid but due to the challenges of his background he only got one A. He was selected for his potential. The university experience included failure early on – from 76% to 28% in less than 2 months. He justifiably feared exclusion from the bursary programme and took the second chance with all his might. As a first generation tertiary education student in his extended family, belonging to the SaIF and StudieTrust community is an important asset that will support his other assets to be less vulnerable.

Trade-offs and dilemmas

Student aspirations

The poverty alleviation literature suggests that stimulating high aspirations is beneficial. However, the students' aspirations have proven to be somewhat of a double-edged sword.

For first generation students, their choice of career path has historically been limited to courses where bursaries are available – in the current situation, mostly for science and engineering studies. Secondly, engineering study is often seen as a "route into middle class" and secure income for their families (e.g. Case 2010). In large companies, the outcome manifests in a large turnover of ex-bursars as soon as they have worked back their bursary obligations.

StodieTrust's interactions with the students during the personal visits, supported by research done at the University of Cape Town (Craig 2011) and others, increasingly points in the direction of students wanting and committing to study engineering with the aim of securing financial security for their families, regardless of their personal interest in the career or work of an engineer. As Craig states:

"The students all necessarily have a core identity in some way connected to studying engineering, yet their envisioned futures are not so much as practising engineers but as people who have escaped poverty by acquiring through hard work a degree with strong potential for getting them a good job.

I consider enrolling for engineering studies for purposes of social mobility and economic upliftment as good a reason as any. Our role as engineering educators, under these circumstances, is to develop an understanding of what engineering is and how the specific subjects we are teaching fit into the structure of the degree programme. In the current educational climate in South Africa, we are fortunate to have the opportunity to contribute to the socio-economic ambitions of some of the top students in the country."

SalF's research (Vosloo et al 2010) highlighted that prospective students are either not well-informed about what their choice of career involves, or do not appreciate the implications of the information provided to them. Many students indicated that they were disappointed that the course was not what they expected. On the other hand, a sizable portion of the group indicated that the experience was better than they had expected. Either way, the expectations formulated prior to university seem to influence their integration significantly. It also impacted on their performance – the group who passed all their subjects at the end of the first year was significantly more likely to have a strong identification with their course of study, while those who failed outright, registered disappointment with their course of study right up to the end of the year.

Both students in the first cohort who left the programme in the first year indicated that they did so because "engineering was not for them". In the SalF bursary scheme students do not have to buy themselves out if they change to a different course, but in most of the company bursary schemes they would be obliged to but could not afford to buy themselves out, which would force them to persist with the ill-fitting course of study due to their financial circumstances.

The consequences of a lack of fit between the student and the course of study reach beyond impact on performance. Some of the collected narratives point out that these students find it hard to admit at home that they are struggling, as they have always been the bright stars and are carrying huge expectations on their shoulders, thus cutting them off from their primary support networks. One of the first SalF bursars attempted (fortunately unsuccessfully) to commit suicide rather than admit that she was not coping with her engineering studies. Another student described how hard it was for him to admit to his friends that he made a wrong choice and that he was changing to a different course.

To illustrate some of the points made above, another case study might illustrate what steps could be institutionalized by bursary programmes to address the vulnerability of choosing the wrong career, or the right one for the wrong reasons:

Student C is the first product of his rural Limpopo high school who was admitted by UCT for a BSc in Quantitative Management. His selection of this particular programme was informed by two factors: he was good in Maths and did not qualify for admission to Actuarial Science, his first choice. He made it to UCT under his own steam and without a cent to his name. When the Financial Aid office discovered that there was no way that he will be able to settle his fees account, they asked all his lecturers to produce reports on his academic ability and performance. The verdict was positive. A NSFAS loan-bursary was arranged for some of his first year costs and he was advised to apply to StudieTrust and other bursary organisations for his second year. It must be said that Student C was ready to go home frustrated by the time the Financial Aid Office threw him a lifeline.

His application for a StudieTrust bursary was successful and from his second year, on the basis of good first year results (in spite of all the financial hardships experienced throughout his first year), he was sponsored by Investec Bank through their CSI bursary programme, administered by StudieTrust. Disaster struck when he failed his second year. The Investec CSI bursary programme assigns company employees as mentors to the participants in the programme. Student C's mentor arranged for him to spend some time during the university holidays at various units of the Bank's Cape Town office. She suspected that his chosen degree programme might not be a good fit. To cut a long story short, Student C discovered his niche after experiencing real life in one of the Bank's units, changed his degree programme accordingly and is now obtaining pleasing results. The bursary programme resolved to continue with his bursary in spite of the fact that he will only graduate in regulation time plus one additional year.

A major consequence of the change of degree and career, based on real-life exposure, is that the main motivator for academic success in Student C's life is no longer the family demands or the shame that failure was threatening back home. The pressure is still there and it is still immense, but it has found an outlet. He now genuinely enjoys what he is studying and as he said: "I am now doing it for myself, not in a selfish way, but I am doing something I love and that makes satisfying all the other obligations so much easier..."

Incidentally, in the SaIF research on first year success (Vosloo et al 2010), one of the research questions asked was for students to indicate whom they would least want to disappoint. Options included parents, bursary providers etc. Students whose selection indicated that they did not want to disappoint themselves, thereby indicating a sense of self-motivation, achieved a June average of 61,2%, significantly higher than those who had different motivations (averages of 53,3% and lower).

As is clear from the case of Student C (and the others), the pressure on most tertiary students from poor backgrounds is immense. At a recent peer mentor training workshop we asked the bursary holders to define their role in life. StudieTrust was interested to explore the most common answer further: "I am a daughter," or a son, brother, sister. We got the same answer on all campuses: a young person would be identified as the brainy one at an early age. The family would identify this potential as a valuable asset in the struggle for better circumstances. At all junctures of the tertiary access chain sacrifices would have been made to protect this vulnerable asset from coming to naught. Then, at last, admission to a scarce skills degree programme would be attained. When a bursary is also won, things are really coming together.

Within 3 or 4 years there would be a stable job and a good salary. Then our bursars experience the after effects of a vulnerability that was presumed to be successfully negotiated – the state of secondary education

When they eventually graduate there will be the temptation of moving too quickly up the “corporate ladder.” Well-qualified Black professionals are in such a demand that promotions might be offered before the professional skills associated with a lower, more practical level are adequately mastered, resulting in work stress. And the pressure to earn more, both from an extended family and from a society where success is measured in material consumption, will be hard to bear.

Balancing different risks

Most company bursary schemes are pre-appointment schemes to enhance employee pipelines, i.e. the bursaries are available for careers provided by the company, and carry an automatic offer of employment and work-back obligation with them. If a student leaves the scheme for any reason, they have to pay back what the company invested in them. The sponsoring companies also offer vacation work to the students, in order to start building a relationship with them as future employees.

The SaIF bursary scheme intends to grow the technically skilled talent pool for South Africa, and is not tied to any particular company. Graduates can choose where they want to work and there is no work-back obligation, but also no assurance of employment. If students leave the scheme, they do not have to repay the funding. Students also have to find their own vacation work.

This sets up an interesting balance of risks. Company bursary schemes are risk-averse, as they are investing in future employees. They require high performance from the student – if a student falls behind, they are suspended from the bursary scheme until they have caught up, or if their performance falters even slightly, excluded altogether. This poses low risk to the company, but high risk to the bursar while studying, especially in the light of the vulnerabilities discussed above. On the other hand, vacation work and eventual employment is guaranteed, resulting in low risk to the bursar who successfully graduates – a very attractive proposition for disadvantaged bursars in the light of the above discussion on aspirations.

The SaIF bursary scheme aims to be more inclusive and therefore takes on more risk than a typical company bursary scheme. It supports the students in the scheme in a variety of ways and carries them through an extra year if they fall behind, resulting in a high retention rate and low risk to any serious student while he or she is studying. However, there is no guarantee of vacation work, and more importantly no guarantee of employment upon graduation, resulting in perceived risk for the student.

As the SaIF bursary scheme’s students progressed through the years, a concern arose about the availability of vacation work for them, as many of them do not have the networks required to find good vacation work opportunities on their own. The programme responded by developing a network of potential vacation work opportunities on behalf of the students for them to tap into, while still leaving the responsibility to find and arrange their vacation work in the hands of the students themselves.

However, as a consequence of the students doing their vacation work at different companies, a few of the (best) SaIF bursars have now been offered company bursaries by the companies

where they did vacation work, posing a dilemma for them: should they sacrifice the security provided by the support of the SaIF programme in exchange for the security of future employment? For the companies offering the students the bursaries it is an excellent deal – they get a low risk future employee while only having to invest in him or her for the final year of study!

The situation poses a risk for SaIF, namely that of losing a number of their best bursars to other (company) schemes before they graduate, impacting negatively on the SaIF programme's performance statistics. On the other hand, if a student leaves the SaIF bursary scheme for a company bursary scheme and guaranteed employment, the programme has safely delivered a competent graduate into employment - albeit before even graduating – thereby fulfilling our mandate. SaIF has therefore taken the decision to count this occurrence as a success, in effect positioning the Foundation to absorb the undergraduate risk on behalf of possible future employers.

Discussion

It bears repeating that providing tertiary access as an asset accumulation strategy is not merely a matter of providing funding; to deliver new technically qualified graduates on the scale South Africa needs to make a meaningful impact on poverty requires the whole tertiary access chain of events to work together seamlessly and effectively, with no breaks in the chain.

The Sasol Inzalo Foundation bursary scheme, in partnership with StudieTrust, aims to develop models for how South Africa can increase throughput of technically qualified graduates.

In the efforts of the SaIF bursary scheme to support students across the vulnerabilities in the tertiary access chain, it is noticeable that the effects of the interventions were never confined to the aspects they were intended to influence. Providing full costs bursaries removed the lack of financial means, but created pressure for students to retain their bursaries. Similarly, the winter seminar was designed to improve conceptual understanding, but contributed to agency, identity formation and self-confidence and helped students realize the possibility and benefits of making friends, thereby resulting in more resolute and robust students.

The narrative data collected also clearly indicated that students responded to different support mechanisms when they were ready for positive change. It would therefore appear that a balanced support programme must offer a palette of support initiatives and expect to find surprising synergistic effects.

The persistence of students in the SaIF bursary scheme is considerably higher than for comparable national data, especially if it is taken into account that these students are all in mainstream, not extended, degree programmes and come for the most part from communities that are more vulnerable to university drop-out. Although the selection process may have succeeded in identifying especially resilient candidates, the research team are gradually coming to the conclusion that the main contribution the SaIF programme makes is to support students to persist when they would have given up or fallen victim to one of the vulnerabilities described above without the support. Students who “jump ship” for company bursary schemes are very reluctant to leave the “StudieTrust family” and often plead to be allowed to stay part of the support programme even after they have moved to the other bursary schemes (not allowed).

The research findings of the SaIF bursary programme demonstrate that science or engineering studies present a multi-dimensional challenge, especially to disadvantaged students, and that success depends on more than academic factors. The asset vulnerability/accumulation approach to understanding poverty and its eradication helped us to identify a chain of vulnerabilities. To address all of them successfully in order to significantly improve the graduation rate in scarce skills, especially of engineering and natural science degree programmes, should be a national priority. Systems to support these students are hugely important in the quest to improve the throughput of technically qualified graduates and alleviate poverty. There is a serious role to play for entities like the Sasol Inzalo Foundation to absorb risk on behalf of future employers and to clarify what can be done to mitigate the drop-out rates.

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References

Case, J 2010. *A challenge to engineering education in South Africa*. Presented at the launch for the Society for Engineering Education of South Africa, Johannesburg, 27 August 2010.

Cobb, P. & Hodge, L.L. 2005. *An interpretive scheme for analyzing identities that students develop in mathematics classrooms*, a report published online at http://www.udel.edu/educ/whitson/897s05/files/Cobb_ID.pdf, most recently accessed February 2011.

Craig, T 2011. *Student Identity and the Need to Make Classroom Mathematics Relevant to Engineering Practice*, Proceedings of the 1st Biennial Conference of the South African Society for Engineering, Stellenbosch, 10-12 August, 2011

Department of Education 2005. *Student enrolment planning in public higher education*. Pretoria: Department of Education

First international Southern African conference on the First Year Experience 2008. Full presentations and webcasts available on <http://academic.sun.ac.za/fyeconference2008/> most recently accessed on 16 August 2012.

Grayson, D. 2011. *Results of the first year of the engineering augmented degree programme at the University of Pretoria*. Proceedings of the 1st Biennial Conference of the South African Society for Engineering, Stellenbosch, 10-12 August, 2011

Letseka, M., Cosser, M., Breier, M. & Visser, M. (eds.) 2009. *Student retention and graduate destination; Higher Education and Labour Market Access and Success*, HSRC press.

Moser, C.O.N. (ed.) 2007. *Reducing Global Poverty. The case for Asset Accumulation*. Washington, DC: Brookings Institution Press.

Pocock, J. 2012. *Leaving rates and reasons for leaving an Engineering faculty in South Africa: a case study*, South African Journal of Science 2012, 108 (3/4).

Scott, I., N. Yeld, and H. Hendry 2007. *A case for improving teaching and learning in South African higher education*. Higher Education Monitor no 6, Council on Higher Education

Spicker, P, Leguizamón, S.A. & Gordon, D. (eds) 2006. *Poverty. An International Glossary*. Second Edition. London; New York: Zed Books.

Van Zyl, A., 2012. *Experiences from the First Year Experience programme at the University of Johannesburg*, Personal communication.

Vosloo, M & Blignaut, S. 2010.. *From hero to zero ... and back? The journey of first year access students in mainstream programmes*. ASSAf "Mind the Gap" forum, October 2010, <http://www.assaf.org.za/stem-mind-the-gap-forum> (visited 25 February 2011).

Vosloo, M. 2011a. *The performance and persistence of engineering students on their journey through first year*, Proceedings of the 1st Biennial Conference of the South African Society for Engineering, Stellenbosch, 10-12 August, 2011

Vosloo, M. 2011b. *High Potential Graduates: a corporate view*, Presented at SETMU: Identifying High Potential Candidates for Higher Education: Transformation or Elitism?, Johannesburg, 7 October 2011