

POST-SCHOOL EDUCATION AND TRAINING SYSTEM

1 Introduction

Post-school education and training (PSET) is critical to South Africa's future socio-economic development. It dramatically improves the employment prospects of young people and raises their incomes from such employment. In addition, broadening the skills base would be socially and economically transformative, and promote economic and employment growth. A primary goal of the PSET system has been to increase access to higher education and skills training. Government has expanded the capacity of the universities and the technical and vocational education and training (TVET) colleges, while also increasing funding for workplace training. University enrolment has grown rapidly, but enrolment at TVET colleges has grown even faster. The main mechanism for increasing access to the PSET system for young people from poor households has been the National Student Financial Aid Scheme (NSFAS), which has grown significantly.

The PSET system comprises two distinct sectors: universities and TVET colleges. The former is relatively well-established, but the latter is new and developing, and its profile has changed considerably (see below). There are currently 26 public universities (11 traditional universities, 6 universities of technology and 9 comprehensive universities) and 50 public TVET colleges operating from more than 260 campuses around the country. The universities provide different educational offerings: traditional universities offer general, formative and professional academic programmes leading to undergraduate, master's and doctoral degrees; universities of technology provide career-focused undergraduate programmes; and comprehensive universities combine elements of both. Together, colleges and universities enrolled about 1.7 million people in 2014, up 27% from 2010. The cost to government was nearly R40 billion, which was supplemented by student fees and 'third-stream' income, from sources such as research or donors.

In addition, the PSET system includes two other sectors: skills training of workers and new entrants to the labour market, and community colleges providing adult basic education and training. Community colleges received about R1.7 billion in funding from the fiscus in 2014/15, while skills training is funded largely through the skills development levy (SDL). The levy amounted to about R13.8 billion in 2014/15 and was channelled to sector education and training authorities (SETAs) and the National Skills Fund (NSF).

1.1 A sector in transition

The above enrolment and expenditure figures reflect neither the extent of the transformation of the PSET system nor the ambition of its goals. The 2013 White Paper on PSET, published by the Department of Higher Education and Training (DHET), targets enrolment growth of nearly 150% for universities and colleges between 2014 and 2030, with even higher targets for community colleges (see Table 1). It also envisages changes to raise both the quality of education and the graduation rate of the PSET sector.

These proposals follow rapid growth between 2010 and 2014, during which TVET enrolments nearly doubled while university enrolment grew by about 9%. Higher enrolment drove growth in expenditure, with public funding of universities rising by nearly 5% a year in real terms and that of colleges by about 10%. Building on the National Development Plan (NDP), the White Paper on the PSET system sets ambitious targets for universities. By 2030 they should:

- Enrol 1.7 million students (an increase of over 70%).

- Raise the number of graduates to 425 000 (an increase of more than 120%).
- Produce 100 doctorates per million people (up from 28 per million).
- Nearly double the proportion of university staff with doctoral qualifications from about 40% to 75%.

Table 1: Summary of targets in the White Paper on Post-School Education and Training

Sector	2010	2014	% change (2010–14)	Target (2030)	% change (2014–30)
TVET	358 393	702 000	96%	2 500 000	256%
University	892 936	969 155	9%	1 600 000	71%
Total enrolments (PSET)	1 251 329	1 671 155	27%	4 100 000	145%
Community colleges	N/A	257 927	N/A	1 000 000	277%

Although the White Paper sets out the challenges facing the PSET system and suggests ways to address these, it neither costs its proposed interventions nor considers the funding options (and their limitations) in any detail. In light of this, an interdepartmental task team commissioned a performance and expenditure review (PER) of the PSET system. The PER aims to estimate the cost of implementing the White Paper proposals, identify existing and potential sources of funding for the system, and calculate any shortfall (or surplus) that may arise. It thus gives policymakers the necessary information on the resource requirements of the PSET system and the trade-offs associated with the different policy choices.

The PER, was conducted by a team led by DNA Economics (Pty) Ltd and Mzabalazo Advisory Services between September 2015 and May 2016. It comprises five reports, which provide:

- A desktop analysis of international practices in the funding of PSET;
- An analysis of the level and composition of expenditure and sources of revenue in the PSET system;
- A detailed costing of the implications of the White Paper on PSET;
- A detailed estimate of the sources of funding for the PSET system;
- An assessment of the options for financing the implementation of the White Paper; and
- A capstone report that pulls together conclusions and implications.

The reports are available at: www.gtac.gov.za/programmes-and-services/public-expenditure-and-policy-analysis.

1.2 The costing model

The PER team constructed a costing model for the PSET system that integrates its various components – universities and colleges, NSFAS, SETAs and the NSF. This very complex model is based on analyses of the cost drivers of each of the system’s many components. Given the extraordinary pressures on the PSET system and government’s commitment to expanding access to tertiary education while keeping the costs to students as low as possible, the model is one of the most important outputs of the PER. It estimates the implications of various policy scenarios for enrolment numbers, the mix of courses offered, the portion of enrolees who cannot afford the fees, the number of students living on campuses, and the like.

Note that the model cannot estimate the costs of policy innovations to increase throughput and graduation rates, even though achieving greater efficiency and effectiveness in the PSET system depends on such innovations. Many proposed innovations have not yet been implemented or have not generated expenditure and performance data. Without such data, the model cannot assess the costs of the proposed innovations. It can, however, test how much of a saving a particular policy innovation that achieved its

goals would generate. This figure could be used in calculating whether such a proposal is likely to meet the basic requirement of having its benefits exceed its costs.

1.3 Contextualising this analysis

Guided by the mandate of the interdepartmental task team, this PER focused on how much the PSET system envisaged by the White Paper would cost the fiscus and whether it could be financed from existing funding flows. In broad terms, without much faster GDP growth, and hence much faster growth in tax and SDL revenues, the gap between the cost of such a system and its likely resources would be significant – as much as 2.5% of expected GDP and over 9% of expected tax revenues, depending on the assumptions.

One reason for this gap is that the White Paper bases some of its targets on NDP goals. However, the NDP envisaged a mutually reinforcing, virtuous cycle of better higher education and training facilitating faster economic growth, which in turn helps finance the expansion of the PSET system. In fact, it envisaged economic growth averaging over 5% a year between 2012 and 2030. If such growth were achieved, or could plausibly be achieved by 2030, expanding the PSET system would be more affordable. Without this growth, however, policymakers' choices are more constrained.

Two other constraints are also important. The first is that while the NDP envisages 25% of young adults being enrolled in the PSET system by 2030, achieving this level of participation would require a significant improvement in the basic education system. The country's schools cannot yet produce sufficient numbers of school-leavers whose results are good enough to justify places in tertiary institutions. In 2015, for example, only 350 000 matriculants achieved results at this level. Unless this number were to increase significantly, it is hard to see how the PSET system could achieve the envisaged enrolment numbers. The second constraint is the limited availability of skilled lecturers and trainers. While an expanded PSET system would produce more graduates with the skills and aptitude to become lecturers and trainers, an overly rapid expansion of the system would soon encounter binding skills constraints in this regard.

These reports, and the elaborate costing models underpinning them, should be seen as providing the tools and platforms needed to calibrate PSET policy and test policymakers' options.

1.4 Outline

The rest of this document is set out as follows: section 2 outlines the structure, performance and challenges of the current PSET system, as well as its sources of financing. Section 3 describes in more detail the resource needs of the TVET colleges and universities, as well the community colleges. Section 4 discusses financing issues, focusing on tax revenues and the DHET proposal to divert funds from workplace training (through SETAs and the NSF) into the PSET system. Section 5 concludes.

2 Expenditure and funding

The PSET system consists of educational institutions – universities, TVET and community colleges – that are largely funded directly from the fiscus through grants from the DHET budget. Any analysis of the PSET system would be incomplete, however, without a discussion of the role and function of three funding agencies – the SETAs, the NSF and the NSFAS. Their mandates, priorities and decision-making processes affect the financing and functioning of universities, TVET colleges and workplace-based training.

As the PSET system forms an integrated whole, policy changes in one area affect other components of the system. Thus if university fees were reduced or their increase capped, for example, funds would have to be found from elsewhere or universities would have to cut spending. If spending cuts were deemed undesirable (because they would hamper access or reduce quality), the need to redirect funds to universities could create challenges elsewhere, either in the PSET system or in the government budget.

2.1 Universities and TVET colleges

As noted, the PSET system comprises 26 universities, 50 TVET colleges, 21 SETAs, the NSF, and a number of community colleges. Table 2 shows expenditure in the system in 2014/15. About 70% of its funding comes from government (mainly taxes and the SDL), while the rest consists largely of university fees and third-stream income from sources such as research commissions, venue rental, donors and investments.

Table 2: Expenditure in the PSET system, 2014/15

Sector	Total spending	Percentage
TVET colleges	R8 501 243	11%
SETAs and NSF	R13 805 833	16%
Universities	R52 860 091	69%
Community colleges	R1 731 890	2%
Other institutions (including DHET)	R426 536	1%
Total	R77 325 593	100%
Total as % of GDP		2.0%

As enrolments into the PSET system, especially TVET colleges, have increased dramatically in recent years, so too have revenues and expenditures, although not necessarily at the same pace. Thus, while the number of enrollees increased by about 9.4% a year between 2010 and 2014, public funding increased by 11.6% a year in nominal terms (5.5% in real terms); this means real spending per enrollee fell. Importantly, both the growth in enrolment and the decline in real spending per enrollee were faster in TVET colleges than in universities, which actually saw a modest increase in real spending (see Table 3).

Table 3: Enrolment and public spending on universities and TVET colleges, 2010/11 to 2014/15

	2010/11	2014/15	Nominal growth	Real growth
Universities (enrolment)	600 002	668 705		2,7%
TVET (enrolment)	358 393	702 383		18,3%
Public funding of universities – subsidies and NSFAS ('000)	R20 860 271	R31 125 034	10,5%	4,7%
Public funding of TVET colleges – subsidies and NSFAS ('000)	R4 269 739	R7 818 661	16,3%	10,2%
Universities (public funding per enrollee)	R34 767	R46 545	7,6%	1,9%
TVET (public funding per enrollee)	R11 914	R11 132	-1,7%	-6,9%

2.2 Sources of funding

Public funding of the PSET system includes direct allocations from the fiscus and indirect allocations from the NSFAS, the SETAs and the NSF (see Figure 1). The five main channels for public funding are:

- Block grants to universities and TVET colleges, over which they mostly have spending autonomy; and
- Earmarked grants to universities and TVET colleges, over they have limited spending autonomy;

- NSFAS funding on the basis of an institution's enrolment of qualifying students;
- Funding from SETAs to universities and TVET colleges in support of students; and
- NFS funding for infrastructure development or training programmes, or allocations to the NSFAS.

Figure 1: The main funding flows in the public PSET system

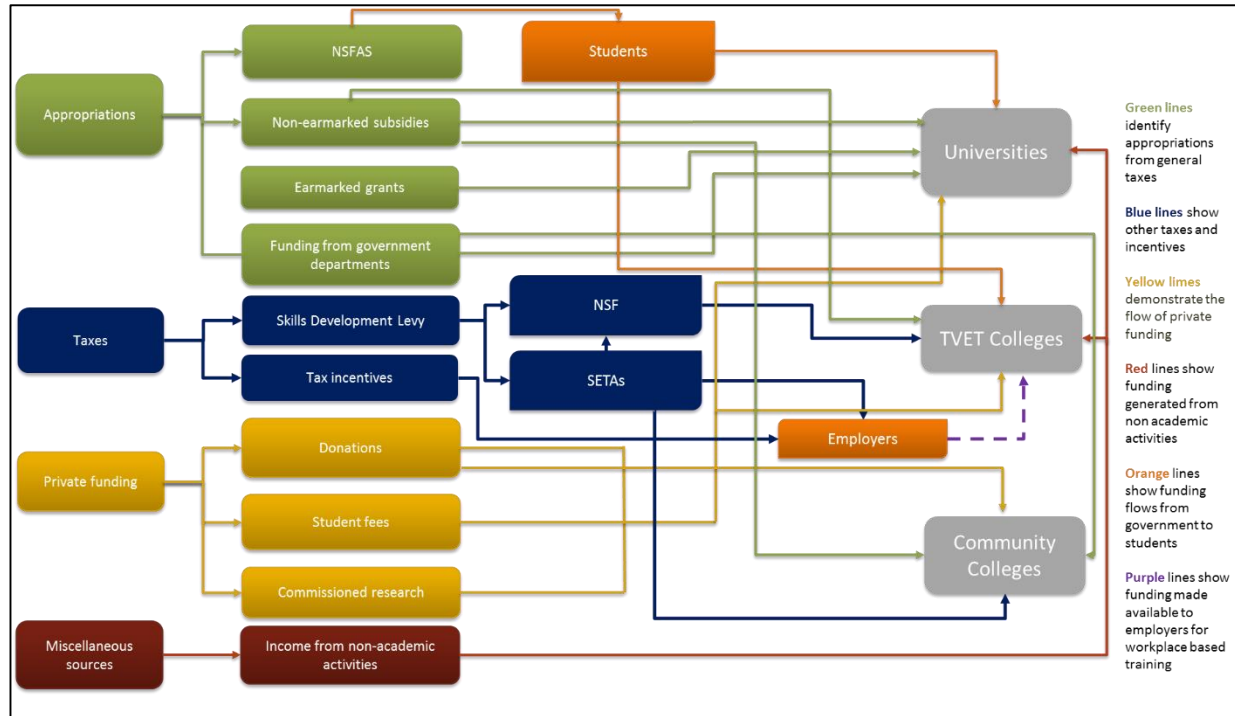


Table 4 shows the funding matrix for the PSET system. The various sources contributed as follows:

- Much of the public funding of the PSET system flows as transfers from the DHET budget to universities, colleges and the NSFAS. In 2014/15, these funds amounted to R37.9 billion, and accounted for 60% of the income of TVET colleges (R5.8 billion). The numbers for universities were R24.2 billion (40%) and for the NSFAS R5.7 billion (66%).
- Excluding NSFAS contributions, tuition fees generated R14.2 billion, of which R13.7 billion accrued to universities (20% of income) and under R500 million accrued to TVET colleges (5%) in 2014/15.
- NSFAS loans and grants to students, financed through allocations from government, contributed just under R7 billion to universities (13% of income) and about R2 billion to TVET colleges (20%).
- Third-stream income amounted to just under R15 billion in 2014/15, of which all but R500 million accrued to universities (27% of income). In the TVET colleges, it accounted for 5% of income.
- In 2014/15, the SDL generated R13.8 billion in revenue, which was divided among the 21 SETAs (which received R11 billion) and the NSF (R2.8 billion). Although it is not the mandate of either the NSF or the SETAs to fund students at public higher education institutions (who are not available for employment), a significant portion of their funds, especially accumulated reserves, has been used to subsidise these sectors (see below).

Table 4: Funding matrix, 2014/15

	Appropriations		Skills development levy		Private funding		Other		Total
	DHET subsidy	Transfer from NSFAS	SETAs allocation	NSF allocation	Fees	Third stream	Investment	Other government departments	
PSET institutions									
TVET colleges	60%	20%	5%	5%	5%	5%			100%
Universities	40%	13%			20%	27%			100%
PSET funding agencies									
SETAs			95%			2%	3%		100%
NSFAS	66%			19%			8%	7%	100%
NSF			27%	63%			10%		100%

In principle, the SDL, a ring-fenced 1% payroll tax paid by employers, is intended to provide resources for training the existing workforce and new entrants into the labour market. In 2014/15, it generated about R14 billion in revenue. About 80% of its revenue is transferred to SETAs, which are responsible for ensuring that employers use the funds to train their workers. The remainder (less some administrative charges) is transferred to the NSF, to be used primarily to finance skills training for work-seekers. Table 5 shows the number of learners funded by all SETAs between 2012/13 and 2014/15. Most of these were learnerships or short-term skills programmes, although many artisan programmes and bursaries were also funded.

Table 5: Number of learners funded by SETAs per learning programme, 2012/13 to 2014/15

Programme	2012/13	2013/14	2014/15
Learnerships	49 709	76 523	77 930
Internships	6 404	7 747	12 006
Artisan development	12 535	18 653	16 119
Bursaries	16 779	18 668	22 307
Skills programmes	84 844	93 875	137 283
Work Integrated Learning: Universities	2 201	3 859	7 590
Work Integrated Learning: TVET colleges	4 310	12 304	12 506
Support to community-based and non-governmental organisations	1 820	2 577	3 467
Adult education and training		15 366	11 393
Support to cooperatives and small businesses	18 693	14 420	11 960

There is general consensus that the SETA system is not working well, and that the funds generated by the SDL are not used effectively to create much-needed skills. The SETAs (and to a lesser extent the NSF) have been unable to spend their funds for some years, allowing large reserves to accumulate. The DHET directed that these reserves be used to fill funding gaps in the PSET system via the NSF. Much of this funding has been used to expand infrastructure at TVET colleges and support NSFAS grants and loans. However, this approach is not sustainable, as the NSF's reserves are drawn down. In response, the DHET has sought to increase the proportion of SDL funds allocated to the NSF (and reduce those allocated to employers through the SETAs); this is being challenged by organised business. The DHET is also trying to incentivise SETAs to use more of their funds for training through TVET colleges and universities, so as to maximise funding for those institutions. Because employers choose which training programmes to use, however, raising the share of SETA-funded training at public sector institutions will require significant

improvement in the quality of their training. As the SDL is intended to be used for workplace training, employers are likely to continue to resist efforts to redirect these funds towards the subsidisation of the public PSET system.

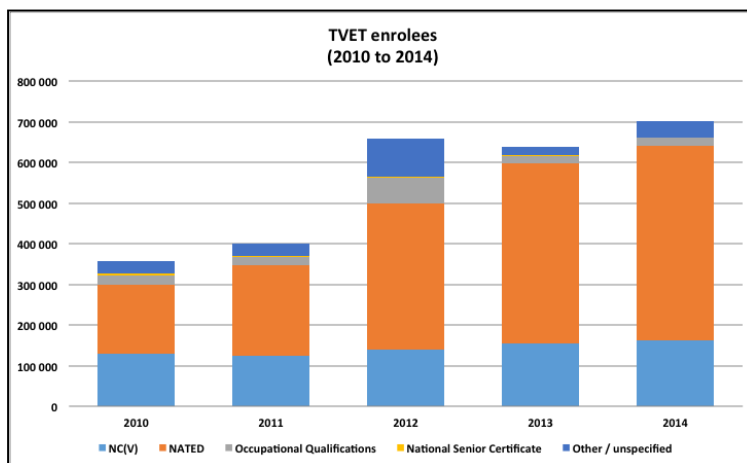
3 Financial performance of the PSET system and future resource needs

Any calculation of the resource needs of the PSET system depends fundamentally on its goals. The White Paper's goals for the PSET system are driven primarily (but not exclusively) by ambitious targets that would see the TVET enrolment increase by more than 250% between 2014 and 2030, and university enrolment by about 70%. This would necessitate a dramatic increase in all the resources of the PSET system – physical infrastructure, teaching and administrative personnel, equipment and consumables. In fact, because the envisaged changes to the TVET system also include significant changes to the mix of courses and the nature of qualifications, the required increase in resources is disproportionately greater. The subsections below assess the two main elements of the PSET system in turn, focusing on cost drivers and challenges, before reviewing the estimated resources needed to achieve the White Paper's goals.

3.1 TVET colleges

TVET colleges cater to two groups of people, the first being learners pursuing vocation-focused schooling rather than a traditional matric; on graduation, they qualify for a National Certificate (Vocational) or NC(V). NC(V) qualifications were introduced only in 2007, but now account for a quarter of all enrollees. The second is those who have completed their schooling and seek a tertiary qualification in a technical or vocational field (National Accredited Technical Education Diploma (NATED) programmes). As noted, the TVET system comprises 50 colleges operating from more than 260 campuses. In 2014, just over 700 000 students were enrolled, almost double the number in 2010 (see Figure 2). The NDP and White Paper envisage 2.5 million enrollees in TVET colleges by 2030.

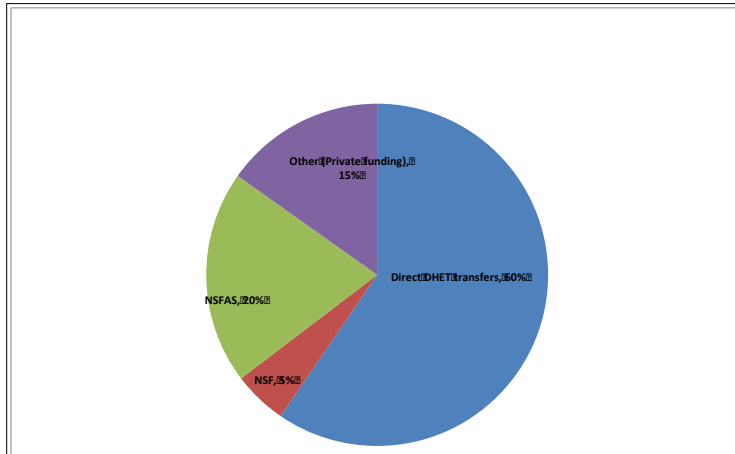
Figure 2: TVET college enrolment, 2010 to 2014



In 2013/14, the funding of TVET colleges amounted to R9.1 billion, of which 85% came from the state through direct transfers from DHET (about 60% of total funding), while bursary funding from the NSFAS (for which about 36% of enrollees qualified) provided a further 20%. The rest came from project funding financed by NSF and SETAs (see Figure 3). Between 2010/11 and 2014/15, the DHET's funding increased

by 47% (from just under R4 billion to R5.8 billion), while the value of NSFAS grants increased by 526% (from R320 million to nearly R2 billion). This implied an increase in total public funding of 83%. However, TVET enrolments increased by 96%, which meant a decline in spending per student in nominal terms.

Figure 3: TVET college funding, 2013/14

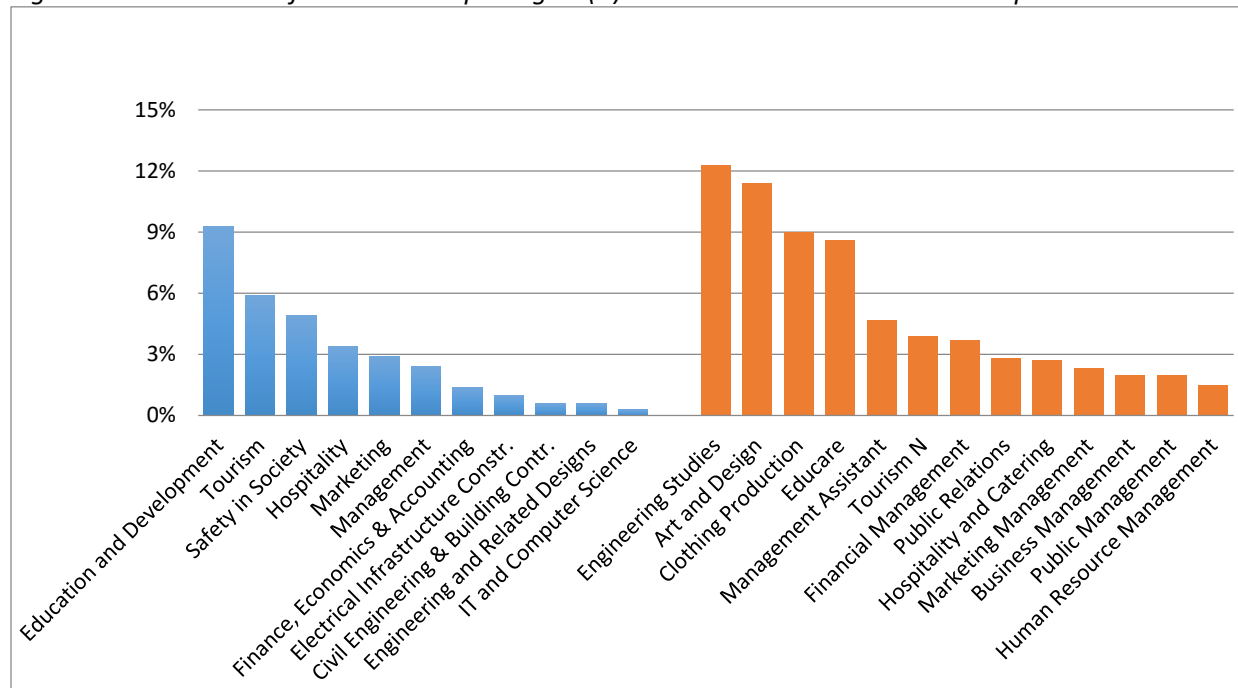


A significant challenge facing the sector is that the funding formulas do not create sufficient incentives for improving efficiency and effectiveness. For TVET colleges, the formula calculates the allocation based on the number of full-time equivalent (FTE) students in NC(V) and NATED programmes, taking into account programme-specific cost factors, the assumed fee level, and an output bonus. The latter is supposed to add a performance-based element, but has never been allocated. Instead, funding has been driven by enrolment numbers and assumptions about costs per student for different programmes. While historical spending norms play a role, and some colleges are allocated budgets that are closer to the funding norm than are others, the formula itself is driven by the number of students per programme. A formula that is driven by enrolments and offers little incentive for colleges to ensure that students graduate obviously creates negative incentives. Ensuring that funding and performance measurement correctly align the incentives of colleges with the country's long-term policy goals should therefore be a key focus area.

3.1.1 Existing performance and challenges

By far the biggest challenge to the TVET sector playing the developmental role envisaged by the NDP is its low throughput rate. While comprehensive information could not be obtained, available data suggests that the average certification rate for NC(V) and various NATED courses is between 30% and 50% per level. Certification rates overstate success, as they do not factor in dropouts during the course. A more realistic estimate is that as few as 2% of students who start NC(V) courses at Level 2 complete the qualification in three years, and only 10% complete their studies in six years. Estimates for the number of students passing in the shortest possible time for other courses and programmes range from about 12% to below 1%. Throughput rates are especially low in more technically demanding programmes, such as engineering and IT-related courses. Although the number of students graduating in the minimum possible time underestimates the total number of students who graduate eventually, the very low throughput rates mean that the costs per graduate are high. Thus, even though spending per learner per year is about R27 000 for NC(V) courses, the cost per graduate is estimated to be over R450 000.

Figure 4: Estimated % of students completing NC(V) and NATED courses in minimum prescribed time



A number of other issues emerge from an analysis of the TVET sector:

- NC(V) programmes do not seem to be as practically and vocationally relevant as intended, with many colleges spending substantially less on the practical aspects of training than was expected when the funding norms were designed. This may affect the employability of graduates.
- While NC(V) programmes were intended to target learners who have completed Grade 9, weak educational outcomes at that level have led colleges to encourage enrolment from students who have completed their schooling. This adds to the inefficiency of the educational system, as some learners are, in effect, repeating the final years of schooling.
- Many NATED curricula are outdated and no longer meet the demands of the workplace, a problem worsened by the fact that most NATED students no longer receive concurrent workplace training.

3.1.2 Resource needs to implement the White Paper

As noted, the White Paper proposes that the TVET sector enrol 2.5 million students by 2030. This would be a near fourfold increase in enrolments, which would require an increase in funding of a similar magnitude. However, as the White Paper also envisages changes in the profile of courses (which would substantially increase the cost per enrollee) and the proportion of students living on campus, the increase in funding required for the full implementation of the White Paper goals would be closer to 12-fold in real terms (see Table 6). Importantly, this finding excludes the costs of infrastructure needed to accommodate these changes. Should all the White Paper's policy goals be implemented, these costs are estimated at nearly R600 billion over 12 years.

The costing model allows the costs of a range of PSET sectors to be calculated, based on different assumptions. Table 6 shows the costs of various scenarios used by the PER team, including the full implementation of the White Paper's goals. It also shows a scenario with less-ambitious assumptions,

which emerged from discussions in the interdepartmental task team. In that scenario, TVET colleges would enrol 950 000 students in 2030 instead of the 2.5 million suggested by the NDP. However, the mix of subjects, along with other policy changes, would result in higher costs per enrollee. This scenario would require about a fivefold increase in real annual spending on TVET colleges by 2030, as well as R140 billion in infrastructure spending between 2014 and 2030.

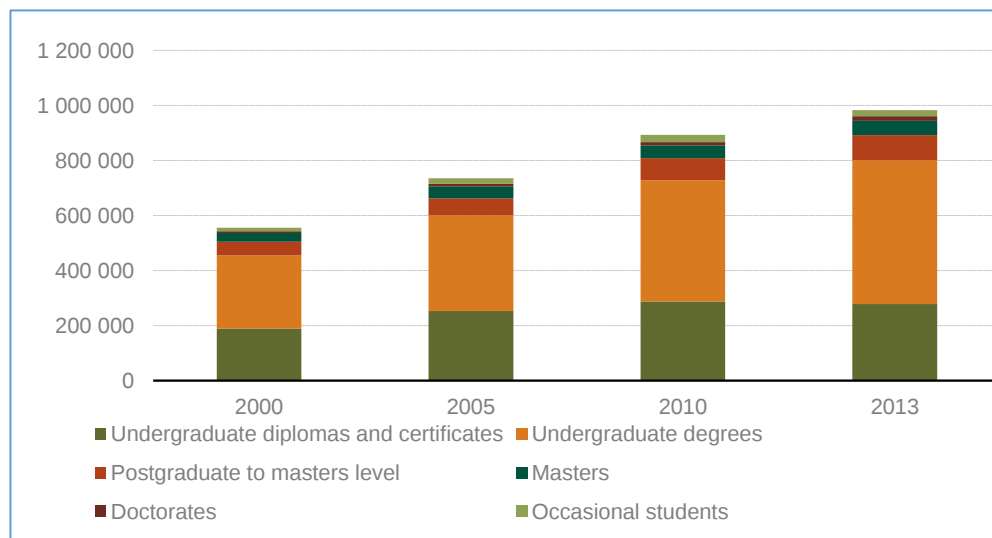
Table 6: Estimated costs, revenue and shortfall under the projected funding growth scenario

Sector	Projected (R million)	2014	2030 (Real)			2030 (Nominal)		
	Item	Current value	Status quo scenario	Full policy scenario	Mixed scenario	Status quo scenario	Full policy scenario	Mixed scenario
TVET	Current costs	R8 726	R27 700	R112 418	R42 035	R70 301	R292 214	R107 943
	Funding and financing	R9 667	R25 576	R23 665	R14 021	R56 035	R60 015	R34 569
	Shortfall (-) or surplus (+)	R941	-R2 125	-R88 753	-R28 015	-R14 266	-R232 199	-R73 373
Universities	Current costs	R52 920	R103 111	R129 800	R96 784	R265 533	R334 264	R249 240
	Funding and financing	R58 854	R93 452	R98 158	R87 744	R218 523	R234 193	R206 814
	Shortfall (-) or surplus (+)	R5 934	-R9 658	-R31 642	-R9 039	-R47 010	-R100 071	-R42 426
Community colleges	Current costs	R1 844	R5 668	R10 221	R6 543	R14 840	R26 761	R17 130
	Funding and financing	R1 844	R7 372	R9 880	R7 349	R2 816	R3 774	R2 807
	Shortfall (-) or surplus (+)	R0	R1 703	-R341	R806	-R12 025	-R22 987	-R14 323
NSFAS	Current costs	R7 453	R18 862	R17 650	R12 174	R49 384	R46 209	R31 874
	Funding and financing	R6 429	R12 020	R12 020	R11 857	R31 469	R31 469	R31 042
	Shortfall (-) or surplus (+)	-R1 024	-R6 843	-R5 630	-R318	-R17 915	-R14 740	-R832
Other institutions (including DHET)	Current costs	R427	R657	R657	R657	R1 719	R1 719	R1 719
	Funding and financing	R427	R657	R657	R657	R1 719	R1 719	R1 719
	Shortfall (-) or surplus (+)	R0	R0	R0	R0	R0	R0	R0
Total	Current costs	R63 917	R137 136	R253 096	R146 018	R352 394	R654 958	R376 031
	Funding and financing	R70 792	R127 056	R132 360	R109 770	R279 093	R299 701	R245 909
	Shortfall (-) or surplus (+)	R5 851	-R16 922	-R126 366	-R36 566	-R91 216	-R369 997	-R130 954
	Costs as % of GDP					2.34%	4.35%	2.50%
	Shortfall as % of 2030 GDP					0.61%	2.46%	0.87%
	Shortfall as % of tax revenue					2.31%	9.37%	3.32%

3.2 Universities

The size of the university sector can be measured through its enrolments. Headcount enrolment includes full-time and part-time contact students, as well as students enrolled in distance education. Between 2000 and 2013, enrolment in universities increased by 77% from 555 000 to over 980 000 (or 4.5% a year). This was largely due to rising enrolment in undergraduate degrees (see Figure 5). Rapid though the growth in enrolments has been, the growth in the number of graduates has been faster: between 2000 and 2013, the number of graduates rose by 5.7% a year from 88 300 to nearly 189 000.

Figure 5: Headcount enrolments by qualification type, 2000 to 2013



Universities obtain income from four sources:

- Grants from government, which comprise four separate 'block grants' for general and operational spending, calculated on the basis of objective criteria for enrolment, graduations and research output; universities also receive 'earmarked grants' for which government specifies the use;
- Student fees, which include residential fees;
- Income from the NSFAS, which provides loans and bursaries to eligible students;
- Third-stream income, from sources such as the private sector, philanthropic donors, the letting out of premises and investment income.

The balance of funding shifted rapidly: in 2000, nearly 50% of universities' income came from government grants, with 22% from student fees, 2% from the NSFAS and 27% from third-stream income. By 2013, the respective numbers were 40%, 22%, 11% and 27%. These numbers highlight the significant shift away from grants, as universities increasingly rely on student fees and the NSFAS. Even excluding the rapid rise in income from fees, university income has grown faster than both inflation and enrolment growth. Real spending per student has increased, as has the real value of public spending per enrollee (see Table 3). Indeed, at nearly 11% a year between 2008/09 and 2015/16, public funding of universities increased faster than spending on most areas of the national budget. Within aggregate spending, the growth in annual spending on block grants (8.7%) was slowest, while growth in NSFAS spending (17.5%) was fastest. There has, however, been a notable shift in the profile of spending, with block grants falling from 77% to 66% of total public allocations to universities and NSFAS funding rising from 9% to 13% (see Table 7).

Note that the mix of funding differs between universities, with traditional universities, particularly the 'top six', attracting considerably more third-stream income than the others. Thus 45% of the University of the Witwatersrand's funding in 2013 was derived from third-stream sources, while universities such as the Tshwane University of Technology or Walter Sisulu University generated less than 10% of their income in this way. Universities' differing capacity to attract third-stream income drives differences in per-student spending, which is considerably higher among traditional universities, especially the 'top six'.

Table 7: Public spending on universities, 2008/09 to 2015/16

R million	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	Average annual growth
Block grants	11 452	12 701	14 533	16 387	17 434	18 439	19 561	20 538	8,7%
Earmarked grants	2 071	2 597	2 984	2 966	3 469	3 950	4 594	5 705	15,6%
NSFAS	1 322	1 445	1 591	2 644	3 378	3 693	3 915	4 095	17,5%
Total	14 845	16 742	19 108	21 997	24 281	26 082	28 070	30 338	10,8%
Percentage share of total spending									
Block grants	77%	76%	76%	74%	72%	71%	70%	68%	
Earmarked grants	14%	16%	16%	13%	14%	15%	16%	19%	
NSFAS	9%	9%	8%	12%	14%	14%	14%	13%	
Total	100%	100%	100%	100%	100%	100%	100%	100%	

The growing importance of student fees (including the NSFAS contribution) reflects a recognition that the bulk of the benefits accruing to society from tertiary education are ‘captured’ by the graduates, since their lifetime earnings are higher. (In contrast, in public basic education, public gains probably exceed private ones.) This implies that PSET students ought to contribute to the costs of their education. The NSFAS is supposed to operate as a deferred payment scheme, in which beneficiaries repay loans over their working lives. However, the NSFAS has struggled to secure adequate repayment levels (see below).

Higher student fees negatively affect households who do not qualify for NSFAS support (because their income exceeds the eligibility limit), but who cannot easily afford the full cost of study. The PER on the NSFAS suggests that in 2015 the average full cost of a year’s study was 423%, 183% and 110% of average household income in the three poorest income quintiles respectively. It also exceeded 50% of the income of households in the second richest quintile. In effect, not only can the majority of households not afford to send a child to university, but the same is also true of many households in which the breadwinner has a secure, reasonably well-paid job, such as nurses, teachers and police officers.

3.2.1 Existing performance and challenges

As noted, university enrolment grew by 4.5% a year between 2000 and 2013, faster than both the economy and the population. Graduation numbers rose even faster, implying that the efficiency and effectiveness of public universities – when measured by graduation rates – have improved. Table 8 shows that a larger proportion of enrolees from 2008 graduated than did enrolees from 2006.

Table 8: University graduation performance, 2006 to 2008

Qualification	2006 cohort	2007 cohort	2008 cohort
360-credit diplomas	46%	47%	50%
3-year degrees	56%	55.9%	59%
4-year degrees	54%	58%	63%

Reasonably high (and rising) average graduation rates mask significant differences among universities, with the universities of Rhodes, Cape Town, Stellenbosch and Wits achieving graduation rates of around 70% after four years and over 80% after six years (see Table 9). These figures are considerably higher than those achieved by the poorest-performing contact universities. (UNISA does even worse in this regard.)

Table 9: Dropout and graduation rates by university, 2005 student cohort

University	2006 % first-year dropouts	2009 % graduates	2013 % graduates	University	2006 % first-year dropouts	2009 % graduates	2013 % graduates
Rhodes	12.5	75.6	83.9	Western Cape	18.3	48.4	58.8
Cape Town	8.6	70.6	86	Fort Hare	17	47.7	60.1
Stellenbosch	12.5	67.3	80.8	Mangosuthu	17	47.5	55.7
KwaZulu-Natal	12.3	65.3	78.6	Free State	15.6	47.3	59.4
North West	12.7	63.4	71.8	Durban Univ. of Tech.	19.8	46.1	60.5
Pretoria	11.3	62.9	78.6	Zululand	23	44.7	50.8
Witwatersrand (Wits)	13.2	60.3	79.5	Venda	27	41.7	51.8
Limpopo*	13.8	56.5	68.6	Tshwane	26.5	37.9	51.3
Central Univ. of Tech.	18.7	55.9	67	Water Sisulu*	23.8	37.2	47.2
Johannesburg	19.6	52.8	64.7	Vaal Univ. of Tech.	21.2	35.9	49.9
Cape Peninsula	21.8	52.5	63.9				
Nelson Mandela	21.3	49.7	61.7	UNISA	44.9	8.7	18.6
				National	25.2	40.7	52.5

A key differentiator between the more successful universities and the less successful ones is the quality of academic staff and, linked to this, expenditure per student. This is both cause and consequence of their capacity to access third-stream income; top universities attract much more of this income per student.

As universities continue to expand enrolment, they will inevitably attract young people whose preparation for university is increasingly inadequate. Apart from the financial challenges associated with expansion, maintaining (and even raising) the system's capacity to generate graduates will be affected by the larger proportion of students whose educational, social and economic backgrounds are less and less conducive to making rapid and successful progress through their degrees.

3.2.2 Resource needs to implement the White Paper

The White Paper envisages enrolment in universities rising from just under 1 million in 2014 to 1.6 million in 2030, a 70% increase. However, as the cost of university education tends to rise faster than inflation, such an increase in enrolment would require a doubling of spending in real terms even before additional policy objectives in the White Paper have been addressed. Fully implementing all the White Paper's goals (lower the lecturer–student ratio, increase the proportion of lecturers with doctoral degrees, and change the mix of programmes) would require a real increase in spending of nearly 130% (see Table 6 above). This finding excludes the costs of university infrastructure; achieving all the White Paper's goals is estimated to require infrastructure spending of around R150 billion between 2014 and 2030.

While the formula driving the allocation of the block grants to universities includes performance-related components (e.g. the number of graduations and the volume of research), planned enrolment numbers continue to play a large role. More importantly, the real value of block grants has not kept pace with the growth in enrolment, and universities have become increasingly dependent on fee income and the NSFAS. The result has been rising average fees, which have affected affordability for students. Given the pressure on government and universities to reduce the growth in the cost of university education, there is an urgent need to address this concern. Ultimately, however, it may be more helpful to consider realistic goals for

the PSET system's production of graduates rather than enrolees, and to structure policy reforms and the funding model accordingly.

4 Financing options

As noted, estimates of the cost of achieving the White Paper's targets by 2030 imply substantial increases in the resourcing of the universities and colleges: in real terms, spending would have to rise by over 300% from about R64 billion in 2014 to more than R250 billion in 2030 (or R650 billion in nominal terms). This would be affordable only if the economy were to grow at a similar pace. Without much faster economic growth, it is hard to see how the PSET system would enrol the number of students and/or achieve the other structural and systemic changes envisaged by the White Paper.

4.1 Estimating the PSET system's resource envelope

The PER uses two different approaches to estimate the public funding available to the PSET system in the medium and long run. The first extrapolates from the rate of growth of tax revenues, which averaged 8.1% (1.6% in real terms) per year over the past few years. The second uses the growth rate achieved since the mid-1990s – just under 3% a year. In both cases, it is assumed that the PSET system will attract the same share of tax revenues as it does now.

Similar methods are used to estimate the rate of growth of the SDL, a portion of which is used in the PSET system. The recent rate of SDL revenue growth, which is driven by above-inflation wage increases, is 12.1% a year in nominal terms (5.6% in real terms). This is higher than the National Treasury's estimated rate of GDP growth of 2.9% a year between 2014 and 2030. Again, the PER estimates the value of the SDL in 2030 using both rates of growth, but how much would be available to the PSET system would depend on how these revenues were allocated (see below).

Regardless of the method used, the result is the same: for the PSET system to achieve the goals of the White Paper by 2030, significant additional resources are required. The PER estimates these as being in the order of R370 billion, or about 2.5% of the GDP expected in 2030 (see Table 6).

4.2 The role of the SDL in funding the PSET system

Clarity is needed on the role of the SDL, which funds both the SETAs and the NSF. SETAs, which historically received 80% of the SDL, operate a levy-grant system in which most of a firm's levy would be refunded if its training programme met statutory requirements. Until recently firms were entitled to receive about 70% of their SDL payments back from SETAs, but the DHET changed the formula in 2012. In terms of the new regulations, much more SDL funding would flow to the NSF and firms would be entitled to only 40% of their contribution. Employers are unhappy with this approach, however, and Business Unity South Africa has taken the DHET to court to have the new regulations rescinded.

The DHET wants to change the formula for allocating the SDL because the NSF has become an increasingly important source of funding for the PSET system. Indeed, as much as 70% of the NSF's disbursements in 2012/13 were used to fill gaps in the funding of the PSET system, principally in the TVET colleges (which received 41% of NSF spending) and the NSFAS (27%). This was possible because the NSF had built up a large reserve over previous years as a result of underspending. As this reserve has diminished, so too has the sustainability of these funding flows to TVET colleges and the NSFAS.

4.3 Funding the NSFAS

The goal of the NSFAS is to make higher education more accessible to young people from poor households. For this reason, it has seen dramatic growth over the past decade. In 2014, the NSFAS disbursed R9 billion, nearly three times as much as the R3.7 billion in 2010 (see Table 10). These loans and grants were made to about 425 000 recipients, twice as many as in 2010.

Table 10: Expenditure on grants and loans by NSFAS, 2010 to 2014

	2010	2011	2012	2013	2014	Growth rate
NSFAS loans	R2 212 514	R3 379 182	R3 732 880	R4 292 911	R4 150 146	23,3%
TVET grants	R317 998	R1 116 591	R1 806 419	R1 933 998	R1 989 711	84,3%
Managed bursaries	R1 147 917	R1 417 303	R2 171 572	R2 474 497	R2 822 614	35,0%
Total	R3 678 429	R5 913 076	R7 710 871	R8 701 406	R8 962 471	34,6%

Since its establishment, the intention of the NSFAS has been to recover a substantial proportion of loans from recipients. Until 2009, repayment rates were around 28% of annual outlays. Recovery rates have fallen substantially since then, to under 4% in 2014. Among the reasons for this is that various policy, legal and managerial decisions have greatly weakened the NSFAS's debt recovery capabilities. These include:

- The National Credit Act, which led to the removal of all the NSFAS's blacklisted borrowers from the databases of credit bureaus in 2007;
- The discontinuation of the (unlawful) authority granted to the NSFAS to compel borrowers' employers to deduct repayments from wages without following due legal process, and the subsequent decision to refrain from using the courts to obtain emolument orders against defaulters; and
- The instruction of the Minister of Higher Education that the NSFAS desist from blacklisting its borrowers.

Addressing some of these policies would allow the NSFAS to increase its contribution to the system.

4.4 Increasing public financing of the PSET sector

As noted, without much faster economic growth, the only way to increase public financing of the PSET sector to the levels required to achieve the goals of the NDP and White Paper would be through reprioritising public spending towards the sector from other sectors or raising taxes.

Significant reprioritisation in favour of the PSET sector has already occurred, with public spending on this sector increasing faster than on all other areas, except debt costs. Further reprioritisation would inevitably mean that other public spending priorities would receive less. Apart from the fact that these programmes pursue important goals, reduced spending in some of these areas (e.g. basic education) would also reduce the effectiveness of higher spending on the PSET system.

It therefore seems that an increase in PSET spending to the level required by the White Paper would have to be financed through higher taxes. The three main sources of tax revenue are corporate income tax, personal income tax and value-added tax, which together accounted for about 80% of revenue in 2011/12. Because corporate income tax revenues are volatile over the business cycle, relying on these to finance PSET is risky. Thus increased spending on PSET would require higher personal income tax and/or value-added tax. Based on calculations provided by the National Treasury, the PER estimated that meeting the funding shortfall for achieving the NDP's goals for the PSET system would require a 4 percentage point

increase in value-added tax or a 4–8 percentage point increase in each of the marginal personal income tax rates (depending on whether taxes on the lowest income tax bracket would be raised).

5 Concluding remarks

The PSET system comprises a complex set of institutions (universities of different kinds, TVET and community colleges, and funding agencies) financed from a variety of sources, both public and private. The scale of the system means that it consumes considerable resources, but because of the skills needs of the economy and the dramatic impact of a tertiary qualification on the probability of employment (and income derived from it), there is significant social, economic and political pressure to expand the system. At the same time, the full cost of post-school education (fees, accommodation, textbooks, transport and living expenses) remains beyond the reach of most households, which puts pressure on government to reduce the cost to students.

The many pressures on the PSET system do not make for simple solutions. It is clear, however, that without rapid economic growth, the resources for expanding the system to the extent proposed by the White Paper would not be available without either significant changes to the budget or significant new taxes. However, unless the educational outcomes generated by schools improved considerably, it is equally doubtful that a sufficient number of appropriately qualified enrolees would be ready to enter tertiary education. These factors would make an overly rapid expansion of the system unwise, especially before the efficiency and effectiveness of spending have improved substantially.

Addressing the legitimate expectations of students from poor households of expanded access to higher education, while also ensuring that the system as a whole operates efficiently and effectively without consuming excessive resources is one of the most profound policy challenges facing government. It is, nevertheless, important to remember that, as a general rule, the impact of higher levels of public spending on PSET is regressive in that, however policy around access is configured, these resources usually benefit members of relatively well-off households.

Policymakers face considerable pressures to design and implement reforms to the PSET system and its financing. As it provides both the first comprehensive review of performance and expenditure of the system and the first costing models for it, this PER is an essential resource in this regard.