

CLOSING THE SKILLS AND TECHNOLOGY GAP IN SOUTH AFRICA

BACKGROUND PAPER 3: THE ROLE OF HIGHER EDUCATION IN CLOSING THE SKILLS GAP IN SOUTH AFRICA¹

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The paper is part of a series of background papers which seeks to identify and analyze key constraints in higher education, skills development, and technology absorption in accelerating labor absorption and shared growth in South Africa. The background papers form part of the 'Closing the Skills and Technology Gaps in South Africa' project which was financed by the Australian Agency for International Development.



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THE ROLE OF HIGHER EDUCATION IN CLOSING THE SKILLS GAP IN SOUTH AFRICA

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I. INTRODUCTION

Higher education has a uniquely important role in resolving the persistent skills shortage in South Africa by producing qualified graduates and postgraduates and by generating research and innovation. Raising education and skills levels are crucial not only for increasing workforce productivity, but also for enhancing the innovative capacity of the economy and facilitating the absorption and diffusion of new technology. The interaction of these factors, along with the quality of education, are what propel economic growth.

Given the demand for highly skilled workers, people with higher education have the lowest unemployment rates. On the demand side, employers in the country consistently identify the lack of skilled workers as one of their greatest concerns; in the manufacturing sector, this shortage persisted even during the recent recession. On the supply side, workers with higher levels of educational attainment in South Africa have lower unemployment rates and experience shorter spells of unemployment than workers with lower levels of education. These effects are particularly striking among university graduates, whose unemployment rate is only one-third that of workers with post-secondary diplomas or certificates (Pauw et al. 2008). Tertiary graduates with degrees in the “hard sciences” or professional qualifications have, moreover, the greatest likelihood of finding employment (Center for Development and Enterprise 2008), whereas university graduates with degrees in the humanities and social sciences are more likely to experience unemployment and longer job searches (Moleke 2010).

While the country’s higher education system leads its African peers in research and postgraduate attainment, it is deeply affected by the same educational inequalities and poor educational performance that characterize the school system.¹ For example, the system’s gross enrolment rate (16 percent) is the highest in Sub-Saharan Africa, but this rate is low both by international standards and in relation to many comparator countries. It is particularly low given the pool of some 700,000 youths with matric who officially qualify for admission to higher education that are part of the 2.8 million young people in the country that are currently “not in employment, education, or training” (the so-called NEETs) (Cloete 2009, 11).²

Despite significant progress in expanding access since 1994, higher education in South Africa remains a “low participation–high attrition” system. Student outcomes are poor overall and highly unequal across both institutional types and racial groups. The participation rate of whites is well over 50 percent compared with 13% for Africans, and white students are almost twice as likely as African students to graduate within a 5-year period.³ By contrast, African students currently comprise almost two-thirds of higher education enrolments, yet only 5 percent of African youth succeed in any form of higher education (Scott, Yeld, and Hendry 2007, 19).

Improving graduation rates will hinge to a very large degree on the ability of the higher education system to increase the numbers of African students who succeed. The aca-

1 According to Stumpf (2010), the South African higher education system produces nearly 64 percent of all African research outputs. The country’s research enjoys significant international visibility in six key fields: genetics and heredity, oncology, psychiatry, respiratory system research, earth sciences and the humanities.

2 The average participation rate in higher education in Sub-Saharan Africa is 6 percent (Stumpf 2010, 34).

3 Stumpf (2010, 34) documents the white participation rate. This rate, however, declined from 64 percent in 2004 to 56 percent in 2008, a trend that requires explanation.

demographic preparedness of a significant proportion of these students, many of whom are the first in their families to pursue post-secondary studies, is poor, a factor that contributes to poor completion and graduation rates. These results have major implications for successful growth in the higher education sector and hence its capacity to close the skills gap.

Given the very high rate of attrition in the sector, the focus must be on improving student performance, without which increased access is likely to prove both ineffective and highly inefficient. Key systemic obstacles must also be addressed in order to improve the outcomes of tertiary education. Specifically, this will require improving the quality of basic and secondary education, reforming the undergraduate curriculum to accommodate the needs of the majority of first-time students, and encouraging an optimal distribution of academic specializations within higher education institutions and an efficient differentiation of the roles and functions of existing tertiary institutions.

II. PARTICIPATION RATES

For a country with significant skills constraints at higher and intermediate levels, South Africa admits a relatively small proportion of its population to higher education.⁴ Its tertiary gross enrolment ratio (GER)⁵ has remained stable at around 16 percent in recent years, yet the GER in countries at similar levels of economic development is at least 20 percent. By way of comparison, the tertiary enrolment rate is nearly 60 percent and higher in most developed countries, while the average in Latin America is 34 percent and in East Asia, 31 percent (UNESCO, 2009).

This low participation rate needs to be understood in the context of a poorly performing school system, where high dropout and attrition rates are compounded by poor academic achievement. Of the students who entered grade 1 in 1995 (the first year of the post-apartheid era), two-thirds dropped out of school before reaching grade 12 (Scott, Yeld, and Hendry 2007, 33). Just over one in five obtained a Senior Certificate, and only 5 percent obtained a Senior Certificate endorsement (which qualifies them for admission to higher education).

Consequently, a large body of young people with school-leaving qualifications or less need alternative post-secondary or post-basic education and training opportunities. A study by the Centre for Higher Education Transformation (2009, 11) provided the following breakdown of the young people known as NEETs:

- 2.8 million of 18–24-year-olds (41.6 percent of the total cohort) were not in education, not employed, and not severely disabled;
- 990,000 of this group qualified for further education and training 700,000 youth were “in the pool” for higher education, against a backdrop of 760,000 enrolled in the higher education system;

4 This and certain subsequent sections draw particularly on two sources of quantitative data and analysis: Stumpf (2010), which was commissioned by the World Bank; and Scott, Yeld, and Hendry (2007), which was published by the (South African) Council on Higher Education. Longitudinal performance data are derived from cohort-tracking studies of the total number of first-time students entering higher education in 2000 and 2001. These are the most recent longitudinal data available from the Department of Higher Education and Training of South Africa. Institutional data and other trend information indicate that performance patterns are robust.

5 The higher education Gross Enrolment Ratio (GER) is the total number of students in higher education (in any age group) in a given year, expressed as a percentage of the 20–24-year-old age cohort.

- 1 million unemployed youth with a qualification of less than grade 10 were in need of training and jobs.

The overall tertiary GER in South Africa masks significant racial inequalities. Participation rates for white students are comparable with developed country figures but, notwithstanding an almost 80 percent increase in African enrolments from 1993 to 1999 (Stumpf, 2010), the 13 percent participation rate of Africans is persistently very low—less than a quarter of the participation rate of whites. Participation rates for coloured students are virtually identical to those of Africans, while the GER for Indian students approaches that of whites (see Table 1).

Table 1: Gross Higher Education Participation Rates by Race, 2004–2008

	2004	2005	2006	2007	2008
African	12%	13%	12%	12%	13%
Coloured	12%	12%	13%	13%	13%
Indian	50%	50%	50%	49%	45%
White	64%	61%	59%	57%	56%

Source: National data for 2000–2008, Higher Education Management Information System, Department of Higher Education and Training (DHET).

The small proportion of African and coloured students entering higher education are in effect a highly select group, largely representing the top decile of their age cohort in terms of past academic performance. Consequently, they must be considered to collectively have strong potential to succeed. The performance of these groups therefore has special significance. However, the gap between the knowledge and competencies that young people—especially African and coloured youth—acquire at school and the demands of conventional higher education presents a barrier to all but the most talented students. For the majority of African students, an additional disadvantage is that English as the dominant language of instruction is not their mother tongue.

III. ENROLMENT PATTERNS

While overall participation rates are comparatively low and racially skewed, enrolment patterns in higher education reveal considerable improvement in the racial profile of the student population, compared to a low base, as well as increased representation of women (see Tables 2 and 3). As noted, African enrolments grew by 80 percent between 1993 and 1999; in more recent years the numbers and proportions of Africans in higher education have continued to grow, albeit more slowly. A slight decline in white and Indian enrolments, and in the proportion of coloured students, can also be seen.

Table 2: Total Enrolment in Public Higher Education Institutions by Race, 2004–2008

	% of total population*	2004	2006	2008
African	79.3%	453,640 (61%)	451,106 (61%)	515,058 (65%)
Coloured	9.0%	46,090 (7%)	48,538 (7%)	51,647 (6%)
Indian	2.6%	54,315 (7%)	54,859 (7%)	52,401 (7%)
White	9.1%	188,687 (25%)	184,667 (25%)	178,140 (22%)
Total	100%	744,489	741,380	797,246

Source: National data for 2000–08, Higher Education Management Information System, DHET.

Note: * See website of the Government of South Africa, 2010 (July), <http://www.info.gov.za/aboutsa/people.htm> (accessed April 20, 2011).

Table 3: Proportional Enrolment in Public Higher Education by Gender, 2004–2008

	2004	2006	2008
Women	54%	55%	56%
Men	46%	45%	44%

Source: See Table 2.

After the major changes of the 1990s, enrolment patterns have largely stabilized, mirroring the GER. On the plus side, the relatively slow change during the 2000s has been in the direction of greater representation of previously disadvantaged populations, with the disturbing exception of coloureds.

However, the shifts in representation by race and gender, while positive, reveal a less sanguine picture when analyzed by type of institution and field of study. This finding suggests that data on progress towards access and equity needs to be disaggregated and carefully analyzed. Similarly, progress needs to be examined against how well the sector is able to produce the range and diversity of skills required for sustained economic growth and development. The following tables provide an overview of enrolment patterns across South Africa's 11 general universities, 6 “comprehensive” universities, and 6 universities of technology.⁶ The distance-education University of South Africa (Unisa), which is classified as a comprehensive university, is a special case – among others also because of its huge enrollment (see Box 1).

Table 4: Proportional Enrolment by Type of Institution, 2004–2008

University type	2004	2006	2008
General	36%	36%	35%
Comprehensive	43%	46%	47%
Technology	21%	18%	18%

Source: See Table 2.

⁶ Following the 2001 National Plan for Higher Education, a government-initiated restructuring led to the reduction, through mergers and institutional incorporation, of 21 universities and 15 technikons (or polytechnics) into 11 general universities, 6 comprehensive universities, 6 universities of technology, and 2 national institutes for higher education. “Comprehensive” universities offer both university qualifications and (“career-focused”) diplomas and certificates formerly offered by the technikons.

Box 1: The Significance of Unisa within South African Higher Education

Unisa is South Africa's only dedicated distance education university. It has been classified as a comprehensive university after it merged with the former Technikon SA (Technisa) in 2004. Other South African universities have distance education programmes, but the great majority of distance education students in South Africa are registered with Unisa, which also caters to students in many other countries in Africa and beyond.

Perhaps the most dominant feature of Unisa is its size. With a headcount of over 260,000 in 2009, its student body represents a formidable proportion of South Africa's total higher education enrolment, as shown in the following table:

Table B.1: Comparison of Enrolments in the Entire Higher Education Sector and Unisa, 2009

	Whole sector	Unisa	% of enrolments in Unisa
First-time entering	164,528	40,884	25%
Total undergraduate	684,419	220,347	32%
Total post-graduate	128,747	29,027	23%
Total	837,779	263,559	31%

Source: Department of Higher Education and Training, HEMIS table 2.7, Unduplicated headcount of enrolled students (<http://www.dhet.gov.za/EducationInstitutions/Universities/tabid/172/Default.aspx>)

Unisa's students are mainly adults, but it has recently admitted increasing numbers of 18–24-year-olds. Black students (i.e., Africans, coloureds, and Indians) make up some 73 percent of its students.

Unisa thus absorbs a large share of students in higher education. If Unisa students were excluded, South Africa's GER in higher education would drop from 16 percent to about 11 percent overall, and from 13 percent to about 9 percent among African and coloured groups.

Since it is accepted that distance education students are predominantly part-time and thus take longer to complete a qualification, Unisa students are not included in most of the cohort-based performance data cited in this paper. However, this does not mean that Unisa student success is unimportant. On the contrary, since Unisa represents a substantial proportion of higher education participation and state subsidy, the performance of its students is critical for skills development.

Little longitudinal information on Unisa student performance is available in the public domain. However, the cohort studies referred to in this paper show that only 14 percent of pre-merger Unisa students graduated in 5 years and 59 percent of its then student body dropped out during that period. The figures for the then-Technisa (which merged with Unisa) were more disturbing: 2 percent graduated within 5 years and 85 percent dropped out.

While it is possible that a number of students who drop out of Unisa will pick up their studies later, the overall situation has important implications for skills development. The university is well aware of this trend and is currently undertaking a major multipronged initiative to improve student success.

Table 5: Proportional Enrolments by Type of Institution and Race, 2008

University type	African	Coloured	Indian	White
General	50%	7%	9%	34%
Comprehensive	67%	5%	7%	21%
Technology	77%	8%	4%	11%

Source: See Table 2.

Table 4 indicates that the share of enrolments in universities of technology has declined somewhat since 2006. While this may be accounted for in part by the merger of some former technikons into the new comprehensive universities, **the skewed ratio of academic and vocational enrolments is a longstanding anomaly in South Africa.** The decline in university of technology enrolments in fact raises the question of the role that this sub-sector plays in providing the technical and career-oriented skills required by the economy—an important dimension of institutional differentiation in the sector.

African students are most heavily concentrated in universities of technology, followed by comprehensive universities, and have the smallest footprint in “traditional” general universities, where they comprise just half of the student population (see Table 5). **In general, Africans are least well-represented in research-oriented universities,** a finding that has implications for the growth of postgraduate studies and research and for the next generation of academics. This under-representation can be partly attributed to the gap between African school-leavers’ levels of achievement and the more demanding entry criteria of the research-orientated universities. Enrolment data indicate that Africans are relatively evenly represented across broad fields of study (see Table 6). Women, on the other hand, are somewhat over-represented in education, humanities, and the social sciences, and under-represented in science, engineering and technology (SET). Further disaggregating the distributions by qualification type would show greater unevenness in representation, with black and women students under-represented in areas such as SET degree programs and postgraduate studies.

Table 6: Proportional Enrolments in Broad Fields of Study, by Race and Gender, 2008

Field of study	African	White	Women	Men
Science, engineering, and technology (SET)	62%	25%	45%	55%
Business and commerce	63%	21%	56%	44%
Education	79%	14%	73%	27%
Other humanities and social sciences	60%	26%	60%	40%

Sources: Council on Higher Education, 2009, “The State of Higher Education in South Africa,” Higher Education Monitor, no. 9, Pretoria, 2009; and UNESCO Institute of Statistics, 2009, Global Education Digest: Comparing Education Statistics Across the World (Montreal: UIS).

The 2001 National Plan for Higher Education proposed tilting the balance of enrolments towards the sciences, engineering, and technology (SET), and to a lesser extent, business and commerce, while reducing the predominance of enrolments in the social sciences and humanities. Enrolment targets over the current decade were set at 30 percent for science, engineering, and technology, 30 percent for business and/or management, and 40 percent for the humanities and social sciences, including education. **Yet the annual enrolment**

growth rate in SET programs is lagging behind average annual enrolment growth rates at the undergraduate level (see Table 7).

Table 7: Proportional Enrolment by Field of Study in Public Universities, 2004–2008

Field of study	2004	2006	2008	Average annual increase (%)
Science, engineering, technology (SET)	27%	29%	28%	4.4%
Business/management	32%	30%	29%	6.7%
Education	15%	13%	16%	7.2%
Other humanities	26%	28%	27%	1.9%

Source: See Table 2

IV. COMPLETION AND GRADUATION RATES

Cohort studies point to alarming underperformance of the higher education system as a whole, with only 30 percent of all first-time entering students—the majority of whom are in three-year programs—graduating within a five-year period (see Table 8).⁷ In contact university programs, half of all students graduate within a five-year period, while in contact “technikon” programs, the figure is only one in three.⁸ Even if one assumes, on the basis of Department of Education estimates, that 70 percent of students still registered after five years will eventually graduate, as will 70 percent of those who change institutions or return to higher education after dropping out, the final overall cohort graduation rate would still be only about 45 percent.⁹

Table 8: First-time Entering Students Who Graduate in 5 Years

Type of institution	Graduation rate
All institutions*	30%
Contact university programs (excl. Unisa)	50%
Contact ‘technikon’ programs	32%

Source: Scott, Yeld, and Hendry 2007, 12. • Note: *This category includes Unisa and students who started in the then-Technikon SA programs. The low completion rates and large enrolments in these distance-education programs bring the sector average down to well below the average for contact institutions.

As noted earlier, a key factor behind the poor success rate in higher education is undoubtedly the quality of schooling.¹⁰ However, the solutions to poor success rates in higher education will have to be found to a large extent within the higher education system itself. This is because substantial, sustained improvements in the basic school system of the order needed to successfully address the challenges of higher education will require considerable time, expertise, and resources.

⁷ See footnote 4 for a note on the limitations of the data.

⁸ In South African higher education parlance, institutions whose programs are offered primarily in face-to-face as opposed to distance education mode are known as ‘contact’ institutions. For convenience, the term “technikon” is used in this paper to refer to the range of vocational, or “career-focused” programs offered formerly by these institutions and now offered by both comprehensive universities and universities of technology.

⁹ Including Unisa students.

¹⁰ The same argument applies with respect to poor performance and extremely poor completion rates in further education and training college programs.

Graduation rates from different types of programs also vary by race and field of study (see Table 9).¹¹ Across the higher education system, the graduation rate even after four years of study is as low as 36 percent for degree programs and 26 percent for vocational programs (Scott, Yeld, and Hendry 2007, 25–26).

Table 9: Percentage of First-Time Students Who Graduate within 5 Years, by Type of Qualification

<i>Subject area</i>	<i>Black</i>	<i>White</i>	<i>All</i>
Professional Bachelor's Degree (4-year programs)*			
Business/Management	33%	83%	60%
Engineering	32%	64%	54%
Languages	26%	65%	42%
Law	21%	48%	31%
General Academic Bachelor's Degree (3-year programs)*			
Business/Management	33%	72%	50%
Life and Physical Sciences	31%	63%	47%
Mathematical Sciences	35%	63%	51%
Languages	32%	68%	47%
Social Sciences	34%	68%	53%
(National) Diploma (3-year program)**			
Business/Management	31%	44%	33%
Computer Science	33%	43%	34%
Engineering	16%	28%	17%
Social Services/Public Administration	29%	23%	29%

Source: Derived from Scott, Yeld, and Hendry 2007, 13, 15–17.

Note: *Percentages refer to first-time entering students, excluding students of Unisa.

**Percentages refer to first-time entering students, excluding distance-education students.

Clearly, few students complete their higher education studies within planned program durations. In key subject areas, well under 30 percent of all students (and less than 15 percent of African students) graduate within the time period formally assigned to different qualification types. Table 10 illustrates this situation for three-year general bachelor's degree programs.

Table 10: First-Time Students Who Graduated from General Academic Bachelor-Degree Programs in Three Years

<i>Subject area</i>	Black	White	All
Business/Management	11%	43%	24%
Life and Physical Sciences	11%	35%	21%
Mathematical Sciences	13%	33%	24%
Social Sciences	14%	43%	29%
Languages	13%	52%	28%

Source: Derived from Scott, Yeld, and Hendry 2007, 25 and 26. • Note: Percentages exclude Unisa students.

11 Since it can be expected that distance-education students will generally take longer to graduate, the majority of undergraduate performance tables in this paper exclude Unisa students.

Comprehensive data on performance by race at the institutional level are not publicly available. However, where such information is known (for example, in the cases of the University of Cape Town and the University of Witwatersrand), differences in graduation rates by race are persistent and substantial, commonly on the order of 20 percentage points between whites and Africans, particularly in science, engineering, and technology and professionally oriented programs.

International comparisons of completion rates confirm alarming under-performance of the South Africa higher education system (Table 11). In four out of ten OECD countries for which cohort studies exist, the completion rates are 70 percent or higher, and the average for both OECD and EU19 countries are 69 percent. In contrast, as shown above, the average completion rate for South Africa is much smaller - 30 percent (the shorter time span at which completion rates for South African students are determined may contribute to that, but it only accounts for a very small share of the difference); the completion rate of South African white students, however, is much more in conformity with the OECD and EU rates.

Table 11: International Comparison of Higher Education Completion Rates

	Tertiary-type A education			
	All	Black	White	Starting study year
South Africa	30			
Business/Management	60	33	83	
Engineering	54	32	64	
Languages	42	26	65	
Law	31	21	48	
OECD countries²				
Canada (Quebec)	75			2000
Denmark	81			1995-96
Finland	72			1995
France	64			1996-2003
Iceland	66			1996-97
Netherlands	71			1997-98
New Zealand	58			1998
Norway	67			1994-95
Sweden	69			1995-96
United States	56			1999
OECD average	69			
EU19 average	69			

Sources: OECD (2009), Education at a Glance 2009: OECD Indicators. See Annex 3 for notes (www.oecd.org/edu/eag2009). South African data from derived from Scott et al. (2007: 13&16).

Notes: The completion rate gives the proportion of entrants who graduated within five years (South Africa) and within eight to ten years (OECD countries singled out in the table) after the year of first enrolment. The year of entrance gives the starting study year for the cohort. The OECD and EU19 averages include also countries that use the cross-section method to estimate completion rates.

The implications of these patterns include:

Increased access alone will not improve equity and graduation rates. For instance, the disparities in completion rates at the tertiary level mean that the absolute number of African graduates remains lower than that of whites in most key degree programs (Scott, Yeld, and Hendry 2007, 17). This result effectively neutralizes the growth in African access and is a severe constraint on graduation rates overall.

Efficient increases in graduation rates must come predominantly from improving the success rates of African and coloured students. It is these groups whose learning needs are least well met by the current system. The small size and high potential of African students entering higher education—insofar as these students largely represent the top decile of their cohort—suggests that the obstacles to improvement are primarily systemic and institutional, not simply a matter of individual ability.

Performance patterns at the undergraduate level limit the size and diversity of the candidate pool for postgraduate study. These patterns contribute to the poor graduation rates and growth prospects for master's and doctoral degree students and research. Less than 5 percent of African youth complete any higher education qualification, a rate that is not sustainable either in terms of economic development or social cohesion. In key subject areas, far less than 30 percent of all students (and less than 15 percent of African students) in contact institutions graduate within planned program durations. The current curriculum duration of three years for core degrees and diplomas and four years for most professional bachelor's degrees is not appropriate for the majority of current students. Moreover, the situation is likely to worsen as participation increases.

V. ADDRESSING THE ARTICULATION GAP

Understanding the challenge

As the previous section made clear, higher education is suffering an “articulation gap,” defined as a mismatch or discontinuity between the learning requirements of higher education programs and the actual knowledge and competencies of first-time entering students.¹² In other words, there is a mismatch between the statutory minimum requirements for admission to higher education and the level of academic preparedness that is needed for succeeding in conventional higher education programs. **The most telling indicator of matriculant under-preparedness is actual performance in higher education.**

This mismatch has a number of unfortunate consequences. School-leavers who meet the minimum statutory requirements have expectations of gaining a place in higher education and gaining a qualification. Unfortunately, those students in the lower half of the spectrum have access to, at best, a very limited range of institutions and programmes, and a very low probability of graduating. At the same time, the costs to higher education of student under-preparedness can be seen in high repetition and drop-out rates, extended completion times, and other inefficiencies. South Africa's low participation rates exacerbate the effects on the economy.

¹² The articulation gap has been identified by the South African Department of Education as a critical systemic fault affecting educational progression to and through higher education (DoE 1997, 2.32).

The articulation gap indicates that the pool of academically prepared candidates for higher education is much smaller than the number of students who meet the statutory requirements for admission. This has important implications for the effectiveness of the pipeline from secondary to higher education, and hence for the possibility of successful and efficient growth.

Given high attrition rates, extended time-to-degree patterns, and low graduation rates, expanding access to higher education without addressing the articulation gap (and thus significantly improving graduation rates) will not efficiently increase graduate outcomes. Rather, existing inefficiencies in the sector are likely to be exacerbated and student attrition, to increase. Despite their under-preparedness, students who succeed in satisfying the minimum statutory requirements for entry to higher education represent roughly the top two deciles of their age cohort. It is this group of students, many of them academically underprepared, who constitute the national pool of candidates for higher education. Growth in higher education graduates therefore depends on the sector's capacity to successfully absorb an increasing proportion of these students.

In this context, graduate outputs, and not just inputs, need to be accorded priority, with the emphasis falling on *successful* participation. The failure to measure and monitor graduate outcomes effectively (as witness the absence of official student cohort data), together with limited institutional accountability for student outcomes, is a critical weakness of higher education planning.

In terms of statutory criteria, there are enough matriculants to allow for some growth in higher education now, particularly in nondegree programs. For example, the total cohort of first-time students entering higher education in 2009 was 164,528 (a number that has grown in subsequent years), of which 91,083 (55 percent) entered degree programs. In comparison, some 126,000 students (24 percent of all candidates) who took the 2010 National Senior Certificate (NSC) examinations obtained "Bachelor passes," that is, they qualified statutorily to enter a degree program. A further 238,000 (44 percent of all candidates) obtained an NSC, qualifying them to enter a certificate or diploma program—over three times the number of students who actually enrolled in such programs in 2009 (70,056) (Department of Basic Education 2011, 44).¹³ Thus the challenge lies not in statutory qualification, but in the extent of the articulation gap between the statutory criteria and the academic preparedness required by higher education.

There is no single solution for addressing the articulation gap between secondary and higher education in South Africa—a combination of approaches and strategies is needed. Among these strategies are: (i) improving the academic preparedness of first-time entering students by raising the quality of school learning outcomes; (ii) providing alternative entry routes into higher education through a college system and/or alternative and "second-chance" entry routes; (iii) expanding private provision of tertiary education and for creating new public institutions, and (iv) improving the effectiveness of teaching and learning in higher education itself, particularly adjusting the curriculum at entry level to the capacities of incoming students. This last process will entail changes in the structure

13 The two figures illustrate the "inverted pyramid" of disproportionate enrolment in degree and diploma programs in the tertiary sector. In terms of statutory criteria, there is much more room for growth in enrolments in nondegree than degree programs. With respect to the remaining 3,389 students belonging to the cohort of first-time students entering higher education in 2009, this group were in fact admitted to "BTEchs," which can be entered only after a vocational diploma.

of provision of higher education and clearer differentiation of the roles of different post-secondary education institutions. The subsections that follow review the various possible strategies noted above, explaining their advantages and disadvantages. Limited resources and capacity in South Africa argue that priority be given to strategies that are focused, grounded in evidence, and implementable.

VI. IMPROVE THE QUALITY OF SCHOOLING, ESPECIALLY IN MATHEMATICS AND SCIENCE

Problems at the school-exit level are indicative of deep-seated failings throughout the school system. While average educational attainment has been rising for several decades and the attainment gap between races declining, the school system has made little progress in cognitive achievement. In fact, international assessments have shown consistently poor performance in reading, mathematics, and science by South African schoolchildren, with the country's national average (302) on the last Progress in International Reading Literacy Study (PIRLS) in 2006 the lowest national average of the 41 participating countries (NCES 2011). The Trends in International Mathematics and Science Study (TIMSS) consistently puts South Africa at or near the bottom of rankings that include other developing countries, which are far less well resourced (Reddy 2003).¹⁴ South Africa was, moreover, recently ranked 137 out of 150 countries in terms of literacy and numeracy achievement in schools (SABC News 2011). Concerns about teacher quality and supply, school management, students' time-on-task, the culture of learning, and other aspects of schooling attest to the complexity and difficulty of school reform.

Data indicate that the current unsatisfactory situation may be worsening. The evidence suggests that the new national secondary curriculum and National Senior Certificate (the latter introduced in 2008), may have led to lower levels of performance in first-year university courses, particularly in mathematics, science, engineering, and technology subjects. Analyses of the cognitive demand, or "challenge level" of school-leaving examinations, coupled with the omission of topics required for higher education study from the "examinable" school syllabus, indicate a **decline in the level of difficulty in key subjects such as mathematics and English as a second language** (Yeld 2011; Scott, Yeld, and Hendry 2007, 35).

Similarly, results of the HESA National Benchmark Tests suggest disturbingly low levels of preparedness in mathematics and academic and quantitative literacy among higher education applicants, as well as among registered students.¹⁵ This assessment is supported by qualitative studies of first-year students' performance in various subjects (see, for example, Slonimsky and Shalem 2005). The critical issue is the quality rather than the number of passes, that is, the underlying knowledge and skills—or academic preparedness—of students entering higher education.

A large proportion of students who obtain a National Senior Certificate (NSC) have very low scores in subjects that have special significance for university study. More detailed

¹⁴ Less well known is the fact that not even South Africa's top-performing schools rank above the international averages (Scott et al., 2007: 34).

¹⁵ HESA (Higher Education South Africa) is a Section 21 company that represents all 23 public universities and universities of technology in South Africa. Its National Benchmark Tests are standardised entry-level assessments of the capabilities needed for succeeding in higher education.

analysis of the performance of the 2010 NSC class (Yeld 2011) indicates the scale of this challenge, as illustrated by the following points:

- The requirements for a NSC pass are very low: three subjects at 40 percent and three at 30 percent.
- Overall performance in key subjects is very poor. The raw (unadjusted) mean score in mathematics was 24 percent; in accounting, 28 percent; and in physical science, 30 percent.
- Large numbers of students are clustered at marginal pass levels (see Table 12).
- The “examinable” syllabus in key subjects such as mathematics and physical science comprises only a subset of the topics in the formal syllabus and the coherence of the examinable syllabus is in doubt.
- The aggregate scores of over half of all NSC candidates are boosted by two subject areas with exceptionally high pass rates. African home languages have pass rates of over 99 percent, with mean scores of about 60 percent or higher. The mean score for mathematical literacy (an alternative to mathematics that was taken by over half of all candidates) was not available, but the pass rate for this subject rate is 86 percent, which indicates a lower challenge level than that which applies to mathematics, which has a pass rate of 47 percent (Department of Basic Education 2011, 56–57).

School performance in key subjects, particularly mathematics and physical science, has a far-reaching impact on higher education access and success. For example, a pass in mathematics is a minimum requirement for many SET, business, and management programs. Assuming a cohort of 200,000 first-time students entering higher education, the target distribution of 30 percent of enrolments in SET programs and 30 percent in business and/or management programs of the Department of Higher Education and Training (DoE 2001) translates into an annual requirement of 120,000 entrants in these specializations. The estimated requirement is reduced to 100,000 to allow for some programs that do not require mathematics. A similar estimate is made for SET programs, on the basis that most of these programs require physical science as well as mathematics. As shown in Table 12, access to and success in key SET and economics and commerce programs is severely limited by poor school performance in mathematics and mathematically-based subjects. In fact, mathematics and physical science had the lowest pass rates on the NSC 2010 exam, at 47.4 percent and 47.8 percent, respectively. Moreover, the generally poor quality of performance in these subjects is indicated by the large proportions of passes at below 40%.

Table 12: NSC Examination 2010 – Number of Matriculants passing Mathematics and Physical Science

	Passed at 30% and above	Passed at 40% and above	Estimated HE requirement
Mathematics	124,749	81,374	100,000
Physical Sciences	98,260	60,917	50,000

Source: Derived from Department of Basic Education 2011, 55–56.

The number of candidates sitting for the NSC exam in mathematics also recently declined, from 290,407 in 2009 to 263,034 in 2010. Despite a somewhat higher pass rate,

the number of passes declined as well, from 133,505 in 2009 to 124,749 in 2010 (Department of Basic Education 2011, 58).

Most commentators agree that substantial improvements in school quality will take a long time to achieve, making it a long-term objective. The South African government has, it is important to note, put in place a medium- to long-term strategy for school improvement (Department of Basic Education, 2010). While this plan is welcomed, positive results on the scale required can be expected only over the longer term. This is especially true in light of the shortage of qualified and competent mathematics and science teachers, together with the persisting effects of apartheid on education, particularly in mathematics and science.

VII. COLLEGE STRATEGY

A complementary approach to addressing the articulation gap between schooling and higher education would interpose a post-school college sector between them. This sector would provide “second-chance” opportunities to premature school-leavers, as well as alternative entry routes into higher education through “bridging” or junior undergraduate programs. The potential role of colleges has been the focus of ongoing debate in South Africa for over two decades. This debate has devoted a good deal of attention to the existing Further Education and Training (FET) colleges sector, together with the possibility of introducing a new system of “community colleges,” receiving a good deal of attention.

This section will review the possibilities and constraints of different options for a college strategy, including associate or junior undergraduate degrees, franchised higher education programs, and second-chance education programs. All of these options have an understandable attraction in the context of South Africa’s poor school quality, low participation rate in higher education, and a burgeoning NEET population. However, none of these potential “solutions” are without complications—even in the host countries in which they were developed. In addition, all of these approaches would confront significant challenges in the South African environment.

From a broad public policy perspective, there is a strong case for providing “second-chance” opportunities to young people who choose or are obliged to leave school without completing grade 12, as well as to matriculants whose school-leaving results are inadequate for entry into higher education. This is especially true in light of the systemic weaknesses of the public school system and the large number of young people who are not in education, employment or training (the NEETs).

In principle, a strong college sector could address the current articulation gap by providing foundational, “bridging,” and/or junior undergraduate programs. The sector would also increase the pool of students completing secondary education. Such bridging programs could work along the lines of the “transfer” programs of American community colleges. From another perspective, colleges could relieve the pressure placed on institutions of higher education from underprepared students, freeing universities to pursue their traditional roles of education and research.

The disadvantage of this strategy is that it could overwhelm the capacity of existing colleges in South Africa, which are struggling to fulfill their core mission of providing

post-school vocational education and training. Over time, however, it appears that colleges could play a vital role in providing “second-chance” opportunities, vocational and occupational training, and access to higher education for talented but underprepared students. Indeed such colleges could be flexible, multi-purpose institutions that meet all of the pressing needs of South African young people.

Another disadvantage of a college strategy is that it could result in a politically unfeasible policy of requiring academically underprepared students to enter university via colleges, rather than directly entering institutions of higher learning. Given the racial and socioeconomic dimensions of educational inequality in the country, it would be socially indefensible to require that under-prepared students who are in or close to the top decile of school-leavers, the majority of whom would be African, follow a circuitous post-school route into an established university.

The challenges of establishing a community college system, either as a wholly new post-school sector or by transforming existing FET colleges, would be considerable. Among the **strategic considerations** of this option are:

- cost and organizational capacity demands of either establishing a new sector or transforming existing FET colleges;
- availability of academic teaching staff, given the current needs of universities;
- the need to offer junior undergraduate courses in an extensive range of disciplines in order to allow for early specialization, which is standard practice in South African degree and diploma programs (in contrast to the practice of two years of general education in American undergraduate programs);
- ensuring quality assurance at a level satisfactory to universities;
- absence of an established accrediting body;
- validity and market value of subdegree qualifications to both students and employers;
- obstacles to the transfer of college students to universities in South Africa (in the established American system, only 25 percent of community college graduates transfer to four-year college and university programs), and
- impact on the resourcing of other parts of the post-school education system, particularly in light of the DHET commitment to re-introducing or re-capitalizing specialist tertiary colleges in such areas as teacher education, agriculture, and nursing.

Colleges and universities have complementary roles to play in closing the skills gap at all relevant levels, along the lines of the DHET’ vision of an integrated but differentiated post-school system (DHET 2011). Colleges today could successfully expand student access to universities of technology and the technical, occupational, and vocational programs of comprehensive universities. Through the development of regional college-university systems, colleges could also, in future, come to play a potentially important role in providing alternative access to university degree programs.

The different subsectors and institutional clusters in the post-school system may become most effective by focusing on the skill levels and areas in which they can be optimally productive. Achieving this goal will require all educational subsectors, including universities, to re-engineer their structures and practices to deal effectively with the realities of a diverse student body in order to improve graduate output. The following text explores the different types of college strategies available to South Africa.

Existing Further Education and Training Colleges

The primary purpose of Further Education and Training (FET) colleges in South Africa is to provide post-school vocational and occupational training, including artisanal training (Department of Education 2008b; DHET 2011, 39). These colleges are expected to make an important contribution to meeting the demand for intermediate skills and widening post-school participation, particularly for young people who do not proceed to higher education and the NEETs. FET colleges are accordingly seen as a vital component of the Technical-Vocational Education and Training (TVET) sector.

The development of a vibrant, responsive, high-quality FET college sector is also aimed at correcting the “inverted pyramid” of post-school education in which current enrolments in higher education considerably exceed those in FET colleges. The 2008 National Plan for FET colleges (Department of Education 2008b) set an ambitious target of increasing college enrolments from 120,000 in 2009 to 1 million by 2014. The long-term goal of DHET is, in fact, for post-school participation to expand to 50 percent of 18–24-year-olds by 2030 (DHET 2011, 29). A significant proportion of this growth—75 percent or more—must be in colleges if the inverted pyramid is to be corrected. The DHET acknowledges that this “will mean a massive expansion of the college system in particular” (DHET 2011, 29).

The 2008 plan to expand FET college enrolments will place a substantial strain on available college capacity and resources. FET colleges already face a major challenge in fulfilling their primary mandate with respect to expanding enrolments and graduation rates in their existing vocational and occupational programs (most of which are at pre-higher education levels). This fact was acknowledged by the DHET in its Revised Strategic Plan for 2010–11 through 2014–15, which observes that the FET colleges sector is the “sub-system that is the most fragile in the complex and incomplete transitions it has experienced in recent years, and in its new location in the post-school education and training system” (DHET 2011, 39).

Community college variants

A comprehensive intermediate college system, similar to the American community college system, is another potential strategy for addressing the articulation gap. Such a system could provide a range of “second-chance” and continuing education opportunities to workers and adults, as well as school-leavers and NEETs, establishing a viable alternative route to higher education through junior undergraduate, “associate” degree or “transfer” programs.

Community colleges represent a strategy for dealing with underprepared students. Interposed between the school system and higher education, these colleges would take responsibility for addressing the deficiencies in secondary education by providing second-chance opportunities for school-leavers who need to complete their schooling or improve their National Senior Certificate (NSC) results. They would also provide students with foundational knowledge, skills, and competencies for successful participation in existing degree and diploma programs.

Two broad approaches might be used to enable FET colleges to broaden access to higher education degree programs in the way that community colleges do in other countries. A few select FET colleges could, under strictly regulated conditions: (i) offer higher cer-

tificate or associate bachelor's programs aimed at providing students admission to mainstream undergraduate degree programs, or (ii) franchise a limited number programs covering junior undergraduate and certificate courses. Although post-Level 4 vocational and occupational programs offered by colleges would make a valuable contribution to filling a gap in intermediate skills provision, articulation and transfer between FET colleges and institutions of higher education are likely to be limited largely to universities of technology and the "technikon" programs of comprehensive universities.

Giving FET colleges the additional mandate of providing foundational programs and/or serving as alternative routes to higher education would, however, further strain their current capacity and resources. The FET sector is already experiencing chronic shortages of qualified and experienced staff and extremely low student success rates, particularly in the new National Curriculum (Vocational).¹⁶ These colleges also suffer from inadequate infrastructure and equipment, poorly developed links with business and industry, limited funding in relation to the scale of current and future needs, and a student intake that is much less prepared academically than the higher education intake.

Associate bachelor degree transfer variant. The American community college system currently offers "transfer programs" to regular (four-year) universities through a two-year associate bachelor's (AB) degree. By providing a solid junior undergraduate education, these colleges not only enable underprepared and nontraditional students to enter higher education, it allows them to do so at the senior undergraduate level with accumulated credits. In South Africa, if FET colleges were to offer higher certificate or associate bachelor's programs, their success would depend on the ability of program graduates to successfully enter university programs and transfer their credits to them.

The experience of existing FET-higher education linkages and earlier experiments in South Africa (e.g., the Khanya and LEAF colleges), suggests that successful student transfers in South Africa are fraught with difficulty, even where articulation and transfer agreements are in place between a college provider and a higher education institution.¹⁷ The reasons for this situation are complex and include differences in institutional practices; climate and culture; higher education perceptions of the quality of college staff; college programs, and student preparedness; curricular differences; student financial aid; and a range of affective and other issues. However these changes are not insurmountable.

Another key consideration is the extent to which receiving institutions in South Africa would be prepared to assume responsibility for students admitted via the college route. Where, as in the Stumpf models, college programs are offered independently of a receiving university and quality is assured independently by the Higher Education Quality Committee (HEQC), the university may have no sense of ownership of the program or its students. Notwithstanding any formal transfer agreements that may be in place, it may thus feel little sense of responsibility either toward the college or the transferring students.

16 DHET has delayed release of the latest NC(V) results, but Business Day (11 February 2011) reports that these had only topped 10 percent once in the previous three years. Chapter 3 of this publication reports that only about 1,200 students successfully completed the third year NC(V) program in 2009.

17 Formal evidence regarding the effectiveness of the LEAF and Khanya College models is not available. However, neither of these colleges was sufficiently successful in transferring students into higher education programs to become sustainable. Khanya closed down, and the LEAF program shrank and was finally absorbed into an FET college before being discontinued. See Stumpf et al. 2009.

The intrinsic value of possible junior undergraduate, associate degree, or transfer programs in South Africa is another important consideration. Not all students who enroll in such programs will necessarily go on to higher education, and it will be important that the college qualifications they obtain have currency in the labour market as well as value, in terms of knowledge, skills and competencies, for the students themselves. Research suggests that the main intermediate qualifications offered by American community colleges, the two-year associate bachelor's (AB) degree, have value where they are vocational qualifications, but in the case of “general” ABs, graduates do not find they make a substantial difference to life-chances although they do lead to employment.¹⁸ In the case of the latter, their value is primarily as a stepping-stone to accessing and succeeding in a recognised four-year bachelor's degree program, hence successful transfer is critical.

In sum, an AB route to university in South Africa would face a number of specific challenges. First, as previously noted, students who enrol in intermediate or community colleges will largely come from disadvantaged and underprepared educational backgrounds, and will need excellent teaching and support.¹⁹ Second, these underprepared and disadvantaged students will likely encounter difficulties in university admission, making it more difficult for them to compete on even terms with more advantaged “traditional” applicants (i.e., qualifying secondary graduates). For those who are admitted, moreover, institutional climate and culture, credit accumulation and transfer arrangements, and student financial aid may impact their ability to succeed. Third, the infrastructure, facilities, and calibre of teaching staff needed to bring such students to a competitive level of preparedness are in scarce supply. Fourth, colleges would need to be able to offer a broad range of undergraduate specializations to enable access into South African degree programs. Finally, in the absence of explicit community college-university articulation agreements, vocational ABs may not be designed to articulate with degree programs, as is true today.²⁰

It is unclear what body would take responsibility for monitoring the quality and standards of higher-education programs offered by colleges. The Higher Education Quality Council (HEQC) is still a considerable way away from being able to shoulder this responsibility for the university sector. Transparent standards and quality assurance would be critical for the credibility of post-secondary college provision and the successful articulation and transfer of students in such programs. In the absence of alternatives, assigning responsibility for direct quality assurance to receiving universities, in the context of specific college-university agreements, might be a viable approach.

Franchise program variant. Colleges could also “franchise” certain programs of higher education institutions, in the tradition of the further education colleges in the United Kingdom. Like associate degree programs, franchise arrangements also enable students to enter higher education through the college system with accumulated credits.

18 For example, OECD research on lifetime earnings (defined as ages 25–64) indicates that AB graduates in the United States (including those with a vocational qualification) had a pre-tax wage premium of 14 percent compared with high-school graduates, whereas the premium for four-year degree graduates was 80 percent (OECD, 2004, 2005, 2006; and Grubb et al. 2006, as cited in Mikhail 2008). The differentials were more marked at an earlier stage of community college development in the 1970s and 1980s, which would be more comparable with the initial stage of any such development in South Africa (see, for example, Adelman 1992).

19 The weak preparedness of incoming students is the main cause of low completion rates in FET colleges. There is a need for enhanced teaching and learning practices in colleges, and an urgent need to develop the teaching expertise of college lecturers.

20 The findings of the recent SANTED project on the relationship between vocational diplomas and degree programs in South Africa's large comprehensive universities—which undertook pioneering work on the knowledge characteristics of various qualification types—indicate similar deep-seated articulation constraints (SANTED 2010, 21–34).

In the South African context, the franchise variant may be preferable on the grounds that higher education institutions must assume ultimate responsibility for the quality of the programs that they franchise. Franchising arrangements have had some success in other contexts, notably in the United Kingdom, but as Stumpf et al. point out (2009, 74), these programs have difficulties of their own. Higher education institutions may see little point in franchise arrangements in circumstances where they regard themselves as better equipped to offer such courses themselves and where the transaction costs of such an arrangement are perceived to be high.

Articulation between FET programs and university of technology diploma programs is highly desirable and could usefully be explored. The modalities for this articulation are not, however, straightforward and would require careful consideration and planning. It should be reiterated here that students entering higher education via the college route are likely to be, on average, less prepared than students entering degree and diploma programmes directly from secondary education.

Second-chance education variant. There is an urgent need to provide second-chance opportunities to young people, whether to help them complete secondary education, improve their National Senior Certificate qualifications, or qualify for admission to higher education. A significant proportion of young people aged 16–18 years drop out of secondary schooling between grades 10 and 12 (OECD 2008, 49–51). Of those who continue through grade 12, only a minority currently qualify for entry to a university degree program.

On the plus side, colleges could play a valuable role as post-school institutions in offering alternatives to ordinary schools at the secondary level. FET or community colleges could also potentially offer “second-chance” general secondary education to adults, and, because of their ethos, to young people who were either not successful in the regular school system or were failed by it.

On the negative side, suitably qualified college staff and appropriate infrastructure are rare. A large proportion of the current complement of college staff, whose backgrounds are in industry and the trades, lack teaching qualifications. Many of these staff would be unable to take on the tasks of either general secondary education or academic development and support for underprepared and disadvantaged students.

Another disadvantage of using colleges to provide second-chance education programs is that it would require considerable resources. Most students of such programs would be from educationally disadvantaged backgrounds, poorly prepared, and thus require highly effective and well-resourced institutions. Unless the second-chance system was educationally better than the majority of secondary schools, its graduates would likely still be underprepared for higher education, even if they met statutory admission requirements.

Regional college-university variant. An alternative approach to a college strategy, one that has the potential to address at least some of the pitfalls identified above, is the development over time of regional college-university systems, along the lines of those in California, Florida, and certain other American states. In such a model, some FET colleges could become constituent colleges of a multi-university system, with common governance, funding, quality assurance, curricular, and credit accumulation and transfer (CAT)

arrangements. In this scenario, junior undergraduate programs, student transfer, and success would be a joint responsibility of the colleges and the wider institutions. The role of colleges in such an institutional configuration would, moreover, be greatly facilitated if potential new junior undergraduate or transfer programs were to be introduced in conjunction with a reform of the current university undergraduate curriculum, as discussed below.

VIII. EXPANSION STRATEGY: EXPANDING PRIVATE HIGHER EDUCATION

Duly accredited, quality-assured private higher education providers could play a valuable role in South Africa. First, institutions whose continued existence depends on the value and relevance of their programs, and hence on their quality of teaching and learning, could provide a competitive benchmark for teaching-and-learning practices in public institutions, including the research universities. Second, private institutions could provide additional higher education places at minimal cost to the state. In Malaysia, the government made a deliberate policy decision to use private sector growth as a key pillar of its expansion strategy following the introduction of a private education sector in 1996 (see Box 2).

The impact of expanding private provision on the public university sector, both positive and negative, needs to be carefully considered by policy makers. For example, in a context of scarce skills and a small, over-stretched academic teaching and research corps, private sector competition for staff could weaken the public higher education sector. Competition for the small pool of well-qualified students could similarly undermine public sector institutions and negatively affect the expansion of public higher education.

Nonetheless, a robust and forward-looking policy framework for private higher education should be developed without delay. This framework is increasingly needed in light of the demand for high-level skills, the imperative of increasing access, the advance of borderless education in the twenty-first century, and major growth in private provision in the rest of Sub-Saharan Africa.

**Box 2: Malaysian Private Sector a Key Pillar in
Higher Education Expansion Strategy**

The Government of Malaysia has identified the need to increase the accessibility of tertiary education and the quality graduates to achieve sustainable economic growth, increased competition, and a well-supported knowledge-based economy.

In 1996, the government facilitated the expansion of the private sector in higher education, making provision for private institutions to offer degree programs either on their own or in conjunction with established foreign universities, without further drain on public funding. These private institutions have had the luxury to use this independence to their advantage. In fact, it became the driving factor behind their growth, which is solely dependent on reputation and their ability to compete for market share. Private institutions also have the freedom to recruit professors from international institutions. Today private institutions account for 40 percent of the total student population enrolled in tertiary education.

The Malaysian Government in 1997 followed the expansion of the private education sector by introducing the National Higher Education Fund Corporation (NHEFC). The NNHEFC is a semi-autonomous body that financially assists students to pay higher tuition fees in private higher education institutions. These loan agreements were later extended to public sector institutions as well. This extension could, however, indicate inappropriate targeting (i.e., with respect to the balance between public and private universities), as well as a mismatch of funds, given that tuition fees in public universities are considerably lower. To maintain the increase in the number of private institutions, it will be important for the government to evaluate why private sector beneficiaries still represent only 32 percent of total beneficiaries of NHEFC assistance.

In 2007, 25 percent of total government expenditure was allocated to education. This investment has paid off: public higher education enrolment increased by nearly 38 percent between 2000 and 2003, and another 20 percent between 2003 and 2005. For private institutions, enrolments increased by 60 percent between 1998 and 2000 and by approximately 19 percent between 2000 and 2005. In 2007, Malaysia had 17 public and 27 private institutions, enabling 30 percent of 18–24-year-olds to obtain higher education. Significant improvements have also been witnessed in the labor force, with the percentage of individuals with a tertiary qualification increasing from 13.9 percent to 17.1 percent in 2003.

In terms of quality, Malaysia is by no means trailing behind. Its academic programs go through a rigorous process of approval, often benchmarked against international standards by the Quality Assurance Division (QAD) and a National Accreditation Board (LAN), which monitor, public and private institutions, respectively. The highly developed university sector also has a strong commitment to equity. Most universities have excellent infrastructure, including sophisticated technology that supports their teaching and research missions.

Source: Regel et al. (2007).

University curriculum reform strategy

Reforming the existing undergraduate curriculum so that it incorporates strong foundational and general education elements is another major strategy for addressing the current mismatch between university learning requirements and the competencies of secondary school graduates. This strategy would not only institute long-term systemic reform in the higher education system, it would afford colleges a useful role in providing junior undergraduate and transfer programs—especially if the design of junior AB programs was built into the design of a new undergraduate curriculum from the outset. Because this strategy is so important, and its potential impact so significant, it is treated at length in a separate section below (see section 3).

Improving the Quality and Relevance of Higher Education

This section addresses the educational process in higher education itself as the key to both successfully widening participation and increasing graduate outcomes. As the DHET Revised Strategic Plan (DHET 2011, 37) observes:

The poor performance of the schooling system is a major systemic constraint to success in the university system. Access to programmes with specialised entry requirements is a major concern to universities, as is the under-preparedness of students and the consequent high drop-out and poor completion rates. This is wasteful of private and institutional resources and energies. This context requires well thought through and coherent institutional responses that increase the internal efficiency of universities and address racial disparities in these efficiencies, rather than ad hoc responses. Not only must graduation rates be improved, but there must be a systemic focus on the production of high quality graduates. We need to identify and produce students who have the potential to become the new generation of academics and researchers.

Curriculum reform, facilitating improvements in teaching and learning, and differentiating the roles of existing higher education institutions are all crucial to improving system performance. As argued earlier, the point of departure must be the majority student population. The following subsections address each of these issues in turn.

Curriculum reform

Reform of the current rigid structure of South African first degrees and diplomas can play a major role in resolving the articulation gap between schooling and higher education. It is a practical avenue through which student attrition can be reduced and graduation rates improved. As noted earlier in this paper, evidence for the misalignment between existing curriculum structures and the academic preparedness of first-time entering students includes the shortage of qualified candidates for admission to many degree programs, especially in SET-related disciplines, a high first-year attrition rate of about 30 percent (Letseka and Maile 2008, 5), and low rates of graduation within mandated time periods. For many students, moreover, early failure results in incoherent curricula and shallow learning or non-completion, all of which negatively affect the pipeline for post-graduate study.

The case for curriculum reform rests on two key propositions. First, the current degree and diploma structure is plainly not working for the majority of students. Second, exist-

ing ‘extended programs’ have indicated the advantages of curriculum reform but their success has been limited. The latter programs, discussed below, are aimed at meeting the needs of academically underprepared or disadvantaged students, but their track record has exposed the limitations of add-on initiatives that fall short of restructuring the mainstream curriculum.

The formal time allocated to core qualifications—three years for a general bachelor’s degree—is a critical constraint for the majority of students. The great majority accordingly do not graduate within the mandated time limit. The constraints of the mainstream curricula have particularly severe consequences for disadvantaged students: there is effectively no “space” for these students to attain the conceptual development, learning approaches, and academic literacies needed for success in advanced study. This is especially true if English, which is the dominant language of instruction, is not their mother tongue. The lack of opportunity for such students to realize their potential is graphically manifested in national performance patterns.

In virtually all respects, African and coloured youth are most negatively affected by systemic obstacles to access and success in higher education. This has major implications for improving graduate outcomes and closing the skills gap, since growth in the number of higher education graduates must come predominantly from these groups. To respond to this problem, the sector has developed various responses over the past three decades that can be broadly characterized as concurrent interventions and extended programs.

Concurrent interventions focus on supporting students in the mainstream curriculum through supplementary tutorials, mentoring schemes, study skills programs, and the like. Such interventions have had limited success, primarily because they operate with flawed assumptions about students’ academic preparedness and prior learning. They also further overload those students who are most in need of support. It should be noted that DHET conditions for “foundational” support grants exclude concurrent academic support for these reasons.

Extended programs are degree or diploma programs of increased duration (usually a year) that incorporate substantial foundational education in addition to regular prescribed coursework. They developed from stand-alone foundational programs into integrated degree and diploma programs that now enjoy formal recognition and funding within the higher education system. Such programs are intended to provide an alternative curriculum structure geared to the needs of underprepared students.

The major advantage of extended programs is that they provide sufficient additional curriculum space to substantively address the articulation gap. Extended programs offer alternative entry-level courses and modules designed to provide sound academic foundations for succeeding in advanced study, as well as interventions that offer social and affective support. The programs specifically address gaps in subject knowledge and inadequate grasp of key concepts; develop academic language skills (for students for whom the language of instruction is not their mother tongue), as well as quantitative, computer, and information literacy; and teach learning approaches appropriate to higher education.

Comprehensive system-wide data on extended program results are not yet available, but it seems clear that they have played a significant role in enabling substantial numbers

of students to enjoy academic success who otherwise would not have gained entry to or would have enjoyed a very low probability of success in higher education. The evidence for this conclusion comes from a wide range of journal articles and institutional case studies (see, for example, Garraway 2010 and Box 3 below). There is also a great deal of anecdotal evidence that many disadvantaged students respond excellently to extended program provision, revealing the academic potential that can be expected from students who are in the top decile of their age-group.

Existing extended programs indicate that systemic responses to underprepared incoming students are more effective than marginal support measures. These programs are appropriately geared to the academic level of incoming students and provide them structured foundational support. As a result, the programs increase the numbers of underprepared students who succeed in higher education and contribute to improved graduation rates. This has been particularly the case in SET, economics, and commerce programs, as outlined in Box 3 below. Plans to improve higher education should capitalize on the merits of this form of intervention.

Yet the fundamental limitation of extended programs is that they assume only a minority—not the vast majority—of incoming students encounter academic, institutional, and other obstacles. One consequence of this assumption is that the key foundational elements of extended programs tend to be “bolted on” to a fixed traditional curriculum structure, rather than integrated into an overall curriculum design that is effectively sequenced and structured. A second consequence is that extended programs may be negatively perceived by both students and staff, as well as under-resourced or marginalized within the given institution.

Box 3: The Contribution of Extended Programs to Access and Success

Government funding support for extended programs began in 2004 and has resulted in almost all higher education institutions offering such programs. These programs are offered in a wide range of specializations, but particularly in science, engineering, and technology (SET). Because the funding policy took some time to become established, sectorwide data on the impact of extended programs on student access and success are not yet available, though the DHET has been systematically gathering such data over the last two years. However, a number of institutions have been offering foundational provision, and variants of extended programs, for over two decades, so considerable experience and information has been acquired at this level.

Extended programs have two interrelated purposes: to provide access, in a responsible way, to talented but disadvantaged students who would not otherwise qualify for entry on the basis of their school-leaving grades and to provide these students, as well as regular-admission students who struggle in standard first-year courses, sound academic foundations that help close the articulation gap and enable them to successfully complete their studies. Because the majority of the student body is affected by educational disadvantage, a longstanding goal of extended programs is that they should pave the way for systemic curriculum reform in higher education.

Access

Government funding has allowed extended programs to be offered to up to 15 percent of the student body (although the need is much greater). Since the primary intention of this funding is to improve student performance (Department of Education 2001*a*), the policy is to use extended programs to support failing mainstream students as well as those admitted under special conditions. However, the great majority of institutions have used extended programs almost exclusively to broaden access. It can be deduced from this trend that about 10 percent of the current student body would not have gained access to higher education without the entry route provided by extended programs. This is a significant percentage in a low-participation environment.

Extended programs have also played a special role in facilitating equity of access in historically white institutions, especially the research universities, because relatively few black students have been competitive on standard entry criteria. This is particularly the case with SET and business and management programs. An example is the extended science program of the University of KwaZulu-Natal (UKZN), where all entering students did not meet regular entry requirements. The program reports that in a recent year, of the approximately 2,000 African students in the Science Faculty, about 1,400 had gained access through an extended program. Without these students, 'the Faculty's proportion of Black African students would have dropped from about 50 percent to about 15 percent (in a province which is 85 percent Black African)' (Garraway 2009, 12). There are many other similar cases among extended programs.

Success

The evidence that curriculum reform designed to address the articulation gap can significantly help underprepared and disadvantaged students succeed does not rely on whether all extended programs are successful, but on whether such provision brings about positive change in performance patterns when offered with a reasonable degree of quality across a range of subject areas. This is because, at present, extended programs are of highly uneven quality across the higher education sector and in many cases, are very inadequately staffed and not integrated into the structures of the host institution, as indicated in (unpublished) reports prepared for DHET.

However, there are many cases where, despite the design difficulties outlined here, the provision of foundational and extended programs has demonstrably made a significant difference to student performance, particularly in SET and business and management programs. Examples of successful extended programs that cover a range of subjects and institutional contexts have been compiled by Garraway (2009); other examples will soon be able to be published, based on DHET analysis of institutional reports.

It is not possible to offer detailed examples here, but the contributions of extended programs to student success can be broadly identified. Since extended program students are, in terms of school-leaving grades, significantly more at risk than mainstream entrants, lower performance levels can be expected among them, despite additional academic support.

particularly in mathematics and physical sciences, extended program attrition rates are often higher than those of black mainstream students in the mainstream degree programs, but in many cases the extended program route produces a substantial proportion—sometimes the majority—of black graduates. To pick up the UKZN example, for the seven entry cohorts through 2002, the graduation rates for the two science foundation/extended programs that were offered were 63 percent and 50 percent, respectively, against a mainstream graduation rate of about 65 percent (Garraway 2009, 17). However, the extended programs' share of African enrolment was about 70 percent in this period, so their contribution to absolute African graduate numbers is significant.

There are also a number of cases in which extended program students outperform their mainstream peers, both in graduation rates and individual subjects. For example, Wits University reports that, for the 14 entry cohorts through 2005, the extended bachelor of science graduation rate was over 50 percent, compared with just under 50 percent for black students in the mainstream program (Garraway 2009, 8). There are many cases of extended program students outperforming mainstream students in individual subject courses with the same final examination, including particularly demanding subjects, such as mathematics, accounting and statistics (Garraway 2009).

The available evidence suggests that structural curriculum reform can positively influence student performance. Students are also increasingly voting with their feet by seeking admission to extended programs even if they qualify for regular entry. (An example of this is the UCT BCom extended program, which could fill its 200 places from students who apply directly to it.) Because of current constraints, however, these programs will not come into their own until they are fully integrated into a flexible curriculum framework and able to reach the large numbers of students who cannot cope with traditional entry-level courses.

Because of limited state funding, extended programs can currently accommodate no more than 15 percent of incoming first-year students. As a result, these programs are not available to the large numbers of entering students who would benefit from them.²¹

A new mainstream curriculum structure would recognize that the majority of incoming students need significant academic support and foundational development. Two groups of students would be likely to benefit in particular from such a curriculum: those (up to 40 percent of incoming students) who currently find themselves academically excluded or who drop out for learning-related reasons and those (perhaps another 20 to 30 percent of incoming students) who do not manage to graduate within the mandated time. For students who are capable of graduating within that time, provisions should be made for their accelerated progression.

The current rigid curriculum framework should be replaced by a flexible one that allows for a range of institutional responses in the context of a diversified higher education system. In institutions serving students who are predominantly from disadvantaged backgrounds, a four-year core curriculum would benefit virtually entire incoming classes. In more selective institutions, accelerated routes would be possible for many students.

A number of factors suggest that curriculum reform is not only necessary but possible. In fact, it is the most pragmatic response to the poor performance in higher education:

- South Africa cannot afford the continued waste—in both human, financial, social, and political terms—implied by the current levels of student attrition.
- The higher education sector has extensive experience of offering extended programs, a body of experience and expertise that exists to support necessary changes.
- The costs of curriculum reform must be considered in light of billions of rands of “lost” investment represented by student failure, extended time-to-degree rates, and the social and economic costs of poor graduation rates.²²
- Evidence shows that for the majority of students, an extended degree or diploma would not increase the time to graduation but, on the contrary, allow for a more meaningful and coherent learning experience and enhance their prospects for success.²³
- The alternatives to structural curriculum reform within higher education are unlikely to be achieved rapidly. One such alternative is to institute major improvements in the quality, effectiveness, and professionalism of mainstream university teaching, a process that will confront competing academic interests and embedded elements of academic culture, status, and reward systems that are influential internationally. Important as it is to pursue this goal, it is unlikely to be achieved rapidly. Moreover, it is unclear how improving instruction would successfully address the diversity of the student body within a uniform curriculum structure. More effective teaching is therefore complementary to, not a substitute for, curriculum reform.

21 This is a direct result of institutions' filling their mainstream places with students who meet the minimum statutory or institutional criteria. These minimum requirements are generally low in relation to the academic demands of the program, with the result that in many programs students are admitted who have little chance of succeeding, as performance patterns confirm. Extended programs are then used to admit students with even lower levels of preparedness. The net result of these practices is a 'worst of both worlds' situation, in which there are high failure rates in both mainstream and extended programs, and in which, as has been shown in section 2, few students graduate in regulation time.

22 Estimates of the direct costs of high student attrition range as high as R4.5 billion per year.

23 The argument for a flexible curriculum seems clear. However, the case for this curriculum will need to be clearly articulated and effectively communicated in both the public and political spheres, as well as in the higher education sector. This case should include a comprehensive analysis of the costs—financial as well human—of the current high wastage and attrition, together with an analysis of the costs and benefits of the proposed reforms.

Improving the effectiveness of teaching and learning

Improving teaching and learning in higher education is a complex issue and much contested within the academic community. There is understandable concern within higher education about the academic preparedness of the current student cohort, and resistance to the idea that higher education should provide ‘remedial’ education. These concerns are also likely to be raised in relation to the curriculum reforms discussed above.

This section focuses on the capacity of the teaching and learning process in higher education to realize the potential of its diverse student body. Building this capacity is a key element of successfully addressing the skills gap. There are a number of factors affecting the effectiveness of teaching and learning in South African higher education, including:²⁴

- Curriculum structure
- Required staff academic qualifications
- Teaching qualifications and expertise of academic staff
- Institutional differentiation and specialization within the academic teaching and research corps
- Supply of academic staff
- Teaching support structures and networks
- Curriculum flexibility

There is anecdotal evidence (e.g., in newspaper articles and institutional forums) that many academics are dissatisfied with their current teaching roles. This dissatisfaction includes resistance to what is seen as “remedial” teaching, as well as the often unfulfilling effort that must be put into teaching large classes with diverse educational and linguistic backgrounds and consequent poor performance.

Difficult teaching conditions are real, counterproductive, and warrant serious attention. The economics of higher education in the South African context makes large class sizes unavoidable at junior undergraduate levels in many subjects. There are productive ways of teaching large classes, particularly with the aid of technology, but the realities of diverse educational backgrounds (as opposed to cultural diversity) are far less tractable.

There is abundant evidence, for example, that the range of student preparedness levels and proficiency in the language of instruction in individual courses is too wide to permit effective teaching and learning. One or other group in a given class will thus be disadvantaged, which contributes substantially to the prevailing differentials in performance.

A flexible curriculum framework would provide courses at different entry levels, allowing for classes to be more homogeneous in the level of student preparedness. Courses could then be designed on the basis of valid assumptions about students’ prior learning and thus on sound psychological learning principles. Flexibility in progression through the curriculum would reinforce this approach.

In terms of staff resistance to “remedial” teaching, the reality is that academic staff are already having to adapt to changing levels of student preparedness. For most academ-

24 The context of teaching and learning is also important, but space precludes more detailed discussion here. The context includes “intangible” elements, such as academic and institutional cultures, student support systems, and academic recognition and reward systems, as well as “tangible” elements, such as classrooms, laboratories, libraries, and ICT. All these elements will require attention within a higher education system that is not only differentiated and diverse, but also highly unequal in resources and infrastructure, among other things.

ics, new first-year classes in an extended curriculum framework would have much the same profile as their current first-year classes. More significantly, the successful outcomes allowed for by structurally accommodating the reality of under-preparedness makes for more rewarding teaching. A certain degree of specialization in academic teaching would also serve to deal more effectively with educational diversity, as discussed below.

Required academic staff qualifications

A consequence of the different histories of South African higher education institutions is a generally low and skewed distribution of academic qualifications among teaching staff. In recent years, however, there has been a concerted drive by many institutions to improve staff qualifications, with generous support complemented by increasingly stringent requirements for academic appointments and promotions. Table 13 indicates a steady increase in the proportion of academic staff with PhDs between 2004 and 2008, with a commensurate decline in the proportion of staff without either a master's or doctoral degree. Improved staff qualifications should contribute to enhancing the quality of scholarship, research, and disciplinary teaching.

Table 13: Permanent Academic Staff of Public Universities, by Qualification, 2004–2008

	2004	2006	2008
Doctoral degree	29%	33%	34%
Master's degree	32%	32%	33%
Other	39%	35%	33%

Source: Department of Higher Education and Training, 2008, national data for 2000–2008, Higher Education Management Information System, DHET, Pretoria.

As expected, these aggregate figures conceal pronounced differences in the qualifications of staff across different institutions. For example, in some general universities the proportion of academic staff with Ph.D.s is 50 percent, while in some universities of technology, by contrast, the proportion is as low as 4–5 percent (Stumpf 2010, 39).

Teaching qualifications of academic staff

Greater responsiveness to the learning needs of students (and the demand for high-level skills) creates a greater need to professionalize university teaching. The low and declining levels of student preparedness present many academic staff with difficult teaching challenges. This applies to staff in historically advantaged institutions, for whom dealing with educational diversity is a relatively new situation (for which they have neither training nor experience), as well as to staff in institutions that have always had a preponderance of disadvantaged students (but who have consistently lacked training, incentives, and systemic support to teach at this level).

Much university teaching is currently based on “craft” rather than systematic knowledge. Effective as it can be, craft knowledge is of limited value in unfamiliar and challenging teaching situations. Teaching expertise (see Kreber 2002) is therefore of increasing importance, not only in enabling higher education to respond to educational disadvantage, but also to a new generation of students with different learning styles and approaches.

The need for teaching expertise will grow with expansion of the higher education system. This expertise will need to be systematically supported by a variety of means, including the professional development of academic staff, training in pedagogical approaches and techniques, formal recognition of teaching achievement as a fundamental aspect of the academic vocation, and dedicated research and development initiatives. The establishment of national networks and associations for the promotion of teaching and learning will also be crucial, as discussed below.

Institutional differentiation and teaching

If South Africa is to move towards productive and efficient institutional diversification in higher education, different approaches to the educational process must be a key element of that differentiation. While the professionalization of university teaching is a global trend, the academic division of labor may differ from institution to institution. This is the case, for example, in differentiated higher education systems such as that of the United States.

In this context, the design and delivery of good-quality teaching to a diverse student body is the central educational challenge. Meeting this challenge requires considerable educational expertise, particularly at the junior undergraduate level. In the historically disadvantaged universities, universities of technology, and certain other higher education institutions, for example, developing the potential of the majority of students requires teaching expertise (ideally based on systematic knowledge of teaching and learning).

In research universities, it is increasingly difficult to see a resolution of the tension between their teaching and research missions that does not involve a specialization in academic roles. Because the government and the academic community have rejected the idea of removing research from certain institutions (Department of Education 2001a), an appropriate balance between disciplinary research expertise and teaching expertise is needed in all institutions. Nonetheless, **those universities that have the major responsibility for educating disadvantaged students must be steered towards developing a strong educational specialization** within a differentiated system in which institutions play different roles and are rewarded for their contribution to meeting national goals.

If teaching missions are to be effectively diversified, unambiguous enabling policies and incentives need to be put in place that prevent “academic drift.” This has not been done previously; the universities of technology are a case in point (Scott 2009). A key consequence of the re-branding of “technikons” as universities of technology has been a movement away from their traditional functions and roles towards those of established universities, which are notionally at a higher level on the academic ladder. Similar to developments in other countries (e.g., in many of the post-1992 universities in the United Kingdom), the universities of technology have begun generously funding staff to improve their academic qualifications and building their research capacity through incentives and changing recruitment criteria. This outcome is contrary to the goals of differentiation and presumably an unintended consequence of institutional reconfiguration in South Africa. A further unintended consequence may be the weakening of these institutions’ teaching mission without their becoming more successful or competitive in research.

This topic is discussed further under *Institutional differentiation, diversification, and academic specialization* below.

Teaching support structures and networks

In addition to institutional policies that recognize and reward teaching, a nationally supported structure is needed to promote teaching excellence and expertise in higher education. Many developed countries have such structures in a variety of forms, for example, the Higher Education Academy in the United Kingdom, similar bodies in Australia and New Zealand, and the prestigious Carnegie Foundation for the Advancement of Teaching in the United States. South Africa has no such body, despite its relatively greater need for educational effectiveness.

Such an organization would support the development of teaching expertise and accredit educational qualifications geared to higher education teaching. It is possible that such a body could be developed as a division of the Council on Higher Education and play a similar role with respect to teaching that the National Research Foundation plays with respect to research. The DHET's planned conversion of teaching development funding into earmarked institutional funding is a positive enabling step. Retaining a small portion of this funding (currently in the region of R400 million annually) could provide the resources for establishing such a national structure.

Supply of academic staff

The ability to attract and retain academic staff, together with the replacement of an aging, predominantly white professoriate and research community, is a matter of growing concern. Higher Education South Africa identified this problem in 2009 as one of the main challenges facing higher education (Stumpf 2010, 39), especially given the long lead times (10 years or more) required to produce a qualified, experienced academic or researcher. The freezing of staff positions at many institutions in the wake of the system-wide restructuring of higher education and the impact of declining state subsidies on staff remuneration both contribute to the present problem. At the same time, the "market value" of many young black graduates has made academia an increasingly unattractive option (Department of Education, 2008a).

For these and other reasons, the racial profile of academic staff has changed only slowly, particularly at the higher levels of professor and associate professor. Africans comprised only 27 percent of academic staff in 2008, while whites comprised almost 60 percent. At senior academic levels, more than 80 percent of professors and associate professors were white in 2007—barely one in ten was African. Women, too, are under-represented, particularly at senior levels: in 2007, women comprised only 20 percent of professors and associate professors.

There are relatively few African role models for African students, which may have some bearing on their readiness to enter the academic profession or pursue postgraduate studies and research careers. Given that staff and student growth will need to come predominantly from this group, the failure to attract and retain black academic staff represents a major constraint on reproducing the professoriate, as well as a wider problem for skills and human resources development.

Growing problems with the supply of academic staff will have far-reaching consequences for class sizes and interactive teaching. At present, the overall student-staff ratio is around

26:1 (Table 14), although the impact of Unisa as an outlier is considerable. Excluding Unisa, the average student-staff ratio is close to 20:1, which is the target ratio established by the National Plan for Higher Education (Stumpf 2010, 41).

Table 14: Student-to-Academic Staff Ratio in Public Universities, 2004–2008

	2004	2006	2008
Total FTE students enrolled	505,249	497,881	538,359
FTE instruction and research staff	20,217	21,333	20,726
Ratio of FTE students to FTE instruction and research staff	25.0 %	23.3 %	26.0%

Source: National data for 2000–08, Higher Education Management Information System, Department of Higher Education and Training. • Note: FTE –full-time equivalent.

At the institutional level, student-staff ratios vary considerably, from as high as 40:1 in some universities of technology and historically disadvantaged institutions to as low as 10:1 in certain residential institutions. This variation has important implications for educational quality in less-resourced institutions, which are generally those that have the bulk of responsibility for educating students most in need of sound teaching.

An additional and potentially substantial challenge is the development of academic and senior administrative staff for the emerging college sector. If colleges are to undertake post-secondary provision, they will compete for the same talent pool as higher education institutions. Even if they do not, FET staffing needs will overlap with those of the universities of technology, where student-staff ratios are generally unfavourable.

The impending escalation of staff recruitment calls for concerted action, beginning with a comprehensive study of the scale and parameters of current and projected future academic staff shortages. This study should focus on scarce skills fields and serve as a basis for developing policy and programs for filling strategically important gaps in the short term, as well as for longer-term measures to substantially enhance the development of a new generation of academic and research staff.

Institutional differentiation, diversification, and academic specialization

The specialization of academic roles both between and within institutions is the key to meeting the diverse and sometimes competing goals of higher education. The demands on the South African higher education system range from “blue sky” research, innovation, and knowledge production to professional and advanced occupational and technical education and training, to degrees and diplomas and good-quality, effective undergraduate teaching. Not all institutions can perform all these functions or roles equally effectively.

Although the principle of institutional differentiation has been accepted by Higher Education South Africa and the Ministry of Higher Education and Training, the DHET’s Revised Strategic Plan 2010/11–2014/15 (DHET 2011) acknowledges that the differentiation debate has not concluded. A HESA (2009) report—“Pathways to a Diverse and Effective South African Higher Education System”—argues in favor of progressive self-differentiation (see Stumpf 2010, 36–7). Following a Ministerial Summit of Higher

Education Stakeholders in 2010, a working group was convened to take the institutional differentiation framework forward (cited in Stumpf 2010, 37).

Formally, South African higher education is already differentiated into three different types of institutions: general universities, comprehensive universities, and universities of technology. However, none of these three categories is homogeneous, and no clear policy framework is in place to define the roles and expected outputs of the different subsectors represented by them.

General universities range from research-intensive institutions to de facto teaching institutions that produce little published research. The comprehensive universities, formed out of amalgamations of former technikons and general academic universities, lack a clear identity and are struggling to define their role. The former technikons, transformed with the stroke of a pen into **universities of technology, include some institutions with virtually no postgraduate enrolment or research base.** Moreover, as Higher Education South Africa has noted, informal historical and geographical categories persist and overlay official institutional classifications.²⁵

Another form of differentiation emerges in practice based on indicators of institutional character, such as enrolment patterns, program mix, student graduation and success rates, academic staff profile, postgraduate and research profile, and funding base. For example, an analysis of a range of institutional input and output variables by the Centre for Higher Education Transformation (CHET 2010a) resulted in a clustering of institutions into three groups.²⁶ **The first group are the leading research institutions, all of them former white universities. The second group is a mix of general and comprehensive universities (but no universities of technology). The final group is comprised of all the universities of technology, plus two comprehensive institutions with low postgraduate and research outputs that can be regarded as historically disadvantaged.**

The cluster approach begins to shift the differentiation debate away from official and historical classifications towards classifications based on observable criteria and clear performance measures. **From a policy perspective, the limitation of the CHET analysis is that it does not address the *desired* character and features of the sector, such as the desired enrolment levels across programs and fields of study, and the differentiated roles of institutions.** Higher education policy and funding should accordingly increasingly be directed towards a desired differentiation of the sector, based on clear social, economic, and developmental objectives that are reflected in clear output and performance measures

Possible models of differentiation

Two broad approaches to institutional differentiation in the higher education system can be distinguished. The first is a formal, “planned” system of differentiation, based on a specific classification of institutions according to their role and function and supported by a differential funding model. The second (HESA) approach is “progressive self-differ-

25 The informal categories include historically disadvantaged institutions (HDIs), historically advantaged institutions (HAIs), rural institutions (the majority of which would also be regarded as HDIs), and research universities (all of which could be regarded as historically advantaged).

26 In contrast with the official classification of higher education institutions, the CHET analysis offers an empirical picture of institutional differentiation. Although the indicators analyzed by CHET are open to debate, they are nonetheless based on objective and measurable criteria.

entiation” that allows and motivates institutions to diversify and differentiate themselves over time

As previously noted, the official classification of higher education institutions into three types (i.e., general, comprehensive, and technology universities) does not provide policy certainty as to the roles and functions of different institutions or subsectors. Nor do these classifications reflect the actual diversity of institutions, both between and within the three categories. It is difficult to see, moreover, how a stricter institutional typology might be imposed, given the relative autonomy of higher education institutions, the difficulties of institutional change, and the political resistance and opposition of the academic community that such an initiative would likely provoke.²⁷ Similarly, a funding model aimed at directing and reinforcing a strict system of differentiation is likely to be robustly contested.

The case for progressive self-differentiation articulated by HESA appears to provide a more plausible and realistic way forward, allowing institutions to build on their existing capabilities while responding creatively to the demands and opportunities of their different contexts. If universities are not to be given assigned roles, but to evolve in response to their environments, then the term “differentiation” itself—which implies enforced and stratified differentiation—may not be helpful. A more accurate and appropriate concept might be a “diversified” rather than “differentiated” system. Consequently, the terms “diversified” and “diversification” are both used for the remainder of this paper.

Identifying and achieving the goals of institutional diversification

Given that self-differentiation can fail to produce desired outcomes and result in academic drift, its effectiveness will depend on the clarity of the national policy goals that underlie it and the extent to which the government is able to incentivize institutions to add value with respect to meeting these goals. From the standpoint of higher education and skills, the key policy goals should unequivocally be increasing successful participation, significantly improving graduation rates, and increasing postgraduate and research outputs.

Ultimately, the efficacy and appropriateness of institutional differentiation and/or self-directed diversification will depend on the extent to which they hinder or facilitate the achievement of key national goals. From this standpoint, neither a laissez-faire approach to institutional diversification nor an approach based on open competition would suffice to meet key public policy goals. Neither these approaches nor the soft-touch steering mechanisms employed to date have resulted in positive diversification of the sector. The steering mechanisms currently in place—planning (including the “program and qualification mix” stipulations applied to individual institutions), quality assurance, and various funding mechanisms (Department of Education 1997a)—have not had the intended consequences. In addition, the funding regime does not adequately support key national goals and desired outcomes.

Fresh approaches should include not only stronger and more clearly focused incentives, but measures to ensure that all institutions have the “tools” they need to contribute sub-

27 Strong resistance of this kind was generated by the last proposal to formally stratify the higher education sector, that is the CHE’s “Towards a New Higher Education Landscape” proposal (CHE 2000), which was subsequently rejected by the Department of Education.

stantially to closing the skills gap. This means flexibility in both policy and funding so as to enable institutions to add value, rather than being subject to the imposition of externally determined differentials. To use the earlier example of the curriculum, a flexible framework would enable different institutions to respond to the actual levels of preparedness of their particular incoming students rather than being forced, as they are now, to try to achieve good-quality outcomes for very different types of students within the same rigid framework.

Institutions may also need to foster a degree of specialization within their academic staff. As argued earlier, contemporary conditions call for specialization of academic roles across universities in order to enable the sector as a whole to fulfill its full range of functions. In the same way, **each institution needs a particular mix of roles—a different distribution of skills in undergraduate teaching, post-graduate work, research and innovation, and/or community engagement—to enable it to develop and successfully implement its mission.** The progressive self-differentiation approach is more amenable to achieving value-added responsiveness than a rigid division between “teaching” and “research” universities. This is important insofar as the country’s development needs call for all higher education institutions to share in the task of widening participation and effective undergraduate teaching.

In addition to an enabling policy framework, incentives need to be created for the process of system diversification so that public policy goals and required system outputs are clearly agreed and supported. A competitively-awarded “innovation and development fund” that would enable institutions to pursue self-directed diversification, and which was linked directly to the achievement of specific system outputs, would be one possible way of incentivising and steering change. Funding windows for a competitive innovation and development fund that fosters self-directed institutional diversification might target funding to:

- Widen successful participation through improved student recruitment, selection and placement;
- Improve the effectiveness of undergraduate teaching;
- Improve student support services;
- Increase graduate and post-graduate outputs, especially in SET and other fields identified as national priorities;
- Support the development of a dedicated strategy for expanding, transforming, and strengthening the academic teaching and research corps;
- Develop research capacity;
- Undertake innovation, technology transfer and adaptation, and technology absorption;
- Commercialize research.

Improving the Quality and Fitness for Purpose of Graduates

Graduate quality and its challenges

While increased graduate outputs in scientific, technical, and professional fields are essential for economic growth and development in South Africa, **the overall quality of graduate outcomes across all fields of study is equally significant.** The concept of quality in higher education includes both cognitive and conceptual dimensions, as well as formal academic or “technical” knowledge. In many professional and vocational fields, it also includes a range of applied skills and competencies. Graduate outcomes also encompass

competencies, attitudes, and dispositions associated with a higher education, particularly a critical perspective, ethics, values, and citizenship. In some systems and disciplines, these graduate attributes have become central to curriculum planning and development, as evidenced by the international growth of the “Graduates for the 21st Century” movement.

Higher education contributes not only discipline-specific, scientific, professional, technical, cultural, and artistic knowledge and skills, but also broad analytic, integrative, and innovative capabilities. The latter are essential for new applications of knowledge, innovations, and technology transfer, as well as social and economic development. In a world in which the future is unpredictable and detailed “manpower” planning is impractical, high-quality graduate outcomes (including rigorous disciplinary or interdisciplinary knowledge) are as important for development as the actual distribution of qualifications and fields of study. Advanced cognitive skills, critical thinking, adaptability, problem solving, and creativity can be generated by sound higher education in any field, provided that it is rigorous and cognitively challenging.

Both resource constraints (e.g., inadequate academic staff qualifications, unsatisfactory faculty-student ratios, inadequate physical resources) **and structural constraints** (e.g., a rigid curriculum framework, institutional inequalities, and the absence of an effective differentiation strategy) **negatively impact graduate quality as well as graduation rates.** The underpreparedness of the majority of first-time students obliges many to resort to strategic or surface learning approaches that do not promote understanding and undermine subject mastery. Among those who do not actually fail, most get by with marginal passes, but are not equipped to proceed to postgraduate studies.

The lack of room for curriculum enhancement in the current degree and diploma programs is a major obstacle to closing the skills gap. In addition to imparting the necessary disciplinary, professional, or technical knowledge base, these curricula need the flexibility to enhance students’ language development (in indigenous languages or the language of instruction), expose them to a range of disciplines, and develop higher-order cognitive skills, such as integrative thinking and problem solving. Curriculum enhancement should thus be a key element of the proposed curriculum reform.

The institutional assets and resources that facilitate high-quality graduates—including the quality of faculty, student preparedness, geographic location, and institutional infrastructure and facilities—are very unevenly distributed across the formal institutional categories and the historical divides. The consequences of these inequalities can be seen in a range of output indicators (CHET 2010a). Partly for these reasons, there are strong perceptions of institutional and racial differentials in graduate quality, as indicated anecdotally by graduate recruitment patterns in the labor market and by formal research on graduate unemployment (Bhorat, Mayet and Visser 2010; Moleke 2005). Such perceptions are anecdotally supported by the underperformance of graduates from historically disadvantaged institutions in postgraduate or even senior undergraduate courses at research universities (for example, the National Astrophysics and Space Science Program at the University of Cape Town).

Despite major differentials in entering students (and in staffing, staff-to-student ratios, and facilities), all institutions are subject to the same curriculum structure and teaching subsidy and expected to achieve the same exit standards (i.e., in terms of the Higher Edu-

cation Qualifications Framework, HEQF). This situation has a number of adverse consequences. For example, the HEQF and the Higher Education Management Information System (HEMIS) allocate a fixed amount of “formal time” to similar qualification types across the higher education sector. This creates a rigid framework for curriculum design, delineated by a fixed number of years. **In effect, an historically disadvantaged institution (HDI) is expected to reach the same exit standards for a bachelor of science degree, for instance, as a research university.**

Given differentials in student preparedness, it would scarcely be possible to reach this goal, even with equivalent resources. Under such circumstances, the HDIs have few options. If they accept the established university exit standard as the benchmark, planning back through the allowed formal time results in entry-level assumptions about student preparedness that are clearly unrealistic and inappropriate. These assumptions in turn exacerbate poor student performance. Alternatively, if the curriculum were designed to align realistically with the preparedness of entry-level students, there would effectively be no chance of attaining the benchmark standard in the allocated time. In practice, a mixture of these options is common. Similarly, the standard input subsidy system rigidly prescribes the number of funded credits, which inhibits the capacity and willingness of higher education institutions to implement extended curricula that would realistically address both the preparedness of incoming students and the need to achieve the benchmark exit standard.

Changing the distribution of specializations among tertiary graduates

The unpredictability of societal and economic change implies that detailed human resources planning is largely impractical, especially given the long lead times in education. It is nevertheless clear that South Africa faces high-level skills constraints in a wide range of SET, managerial, and other disciplines; the country’s research and innovation base is underdeveloped; and the academic teaching and research corps is under strain, particularly in SET fields, in light of the need to widen participation and improve graduation rates.

Enrolment distribution patterns (see Table 7) show that sector enrolments and outputs have been resistant to change, despite the goals established by the 2001 National Plan for Higher Education (Department of Education 2001a).²⁸ The aim of that plan was to expand SET, cap business/management, and reduce humanities enrolments (other than in education programs).

There is also a persistent imbalance between enrolments in “academic” and vocational programs. This imbalance is reflected in the inverted pyramid of enrolments in FETs and higher education institutions, but there is also an imbalance in enrolments among higher education institutions. In particular, a recent decline in university of technology enrolments raises the question of whether this subsector is providing the technical and career-oriented skills that the economy requires. It also indicates deficiencies in current policies relating to institutional differentiation.

Higher education applicant patterns indicate strong student aspirations towards SET, economics, business, and professional qualifications, but these aspirations are not reflected in actual enrolments. Poor schooling performance overall, especially in mathemat-

²⁸ Archer (2011) makes an argument that the government has little or no control in this area because it cannot influence the relevant market forces.

ics and science, is an obvious factor in this regard, even though students entering higher education constitute the top decile of their cohort.

The problem of a very narrow pipeline from secondary education into the program areas targeted in the National Plan for Higher Education is compounded by high failure and attrition rates in undergraduate SET and related programs. Part of the solution to this problem lies in creating more effective pathways into tertiary SET education for students who have good potential in mathematics and science. This involves boosting school-level enrichment programs, developing the capacity of FET colleges as an entry route into higher education, and, in particular, adopting alternative entry levels for higher education SET programs as an integral part of a flexible curriculum framework.

Recognizing and providing incentives for different institutional missions that focus on improving graduate outcomes in SET and other targeted specializations, particularly in relation to students from disadvantaged backgrounds, will also be critical to changing the distribution of graduate outputs.

Improving postgraduate and research achievements

There has been only a slight increase in South Africa's output of scientific publications since 1994. More significantly, its overall share of the global output of such publications declined from a peak of 0.7 percent in 1987 to 0.48 percent in 2003. By contrast, comparator countries such as Brazil, Taiwan, South Korea, and India, which started from a lower base, have overtaken South Africa. Similarly, South Africa's share of registered foreign patents declined from 0.28 percent in 1992 to 0.13 percent in 2007. South Africa's relative position on the World Bank's Knowledge Economy Index has also declined nine places since 1995, to a ranking of 50th out of 140 countries (Kaplan 2008, 100–101). Outputs of research publications show annual average growth of 4.1 percent during the period 2001–2008. Accredited publication units rose from 6,660 in 2004 to 8,086 in 2006, then fell back to 7,697 in 2008 (Stumpf 2010, 50). The distribution of accredited journal publications by field of study (see Table 15), suggests a contribution of around 63 percent by the “hard” sciences and 37 percent by the “soft” sciences.

Table 15: Distribution of Accredited South African Publications by Field of Study

Field	Percentage
Natural sciences and agriculture	36%
Humanities	21%
Health Sciences	20%
Social Sciences (incl. Economics)	16%
Engineering and Applied Sciences	7%

Source: Department of Higher Education and Training, 2008, national data for 2000–08, Higher Education Management Information System, Pretoria.

In simple terms, there is no sign that higher education is beginning to respond at scale to the demands for higher-level skills, graduate and postgraduate outputs, and research. The distribution of outputs is also very skewed: some institutions produce close to 1,000 or more research units per annum and others as few as 20 or less. Similarly, some universi-

ties annually produce upwards of 140 doctoral degrees, while others produce 5 or fewer. **In addition, there are significant concerns about the numbers and profile of active researchers.** Figures for 2006 show that only one in ten academic staff had been rated by the National Research Foundation, of whom only 13 percent were African and 25 percent, women. Nearly 20 percent were over the age of 60 and about 35 percent were between 50 and 60 years old. From this data it can be deduced that the majority of NRF-rated researchers are white, male, and older than 50 (Stumpf 2010, 49).

Closer examination shows that five of the general universities—all of them formerly white, research-intensive institutions—dominate university research production in South Africa. Together, the Universities of Cape Town, Pretoria, Witwatersrand, Kwa-Zulu Natal, and Stellenbosch accounted for nearly 65 percent of all research publication units in 2006–08, while the six universities of technology combined accounted for only 3 percent. The five leading research universities likewise accounted for 57 percent of all doctoral degrees, while the universities of technology accounted for just 3 percent.

Clearly, there is already *de facto* differentiation within the South African higher education system, in this case between the five leading postgraduate and research institutions, on one hand, and the remaining general, comprehensive, and technology universities, on the other. **Institutional diversification—provided it is properly funded and supported—could assist significantly in broadening the research and postgraduate base of the rest of the higher education system,** based on the mission and strategic intent of each institution. Diversification can respond to the demands and opportunities of different institutional environments.

At present, the country's ability to increase its production of research master's and doctoral degrees depends to a very considerable extent on the five leading research universities. These universities are also presently South Africa's most important resource for expanding its output and global share of research publications and patents, ensuring a supply of well-trained new academics and researchers to the higher education system, and producing the high-level skills required by employers and society. From this standpoint, a diversified system must be able to do two things: it must (i) improve the quality of and expand relevant postgraduate and research outputs across the entire higher education system in ways that are compatible with individual institutions; missions; and (ii) secure the role of the leading postgraduate and research institutions as key national resources.

Implications for Higher Education Funding and Policies

Current graduation rates indicate that the existing combination of market forces and state steering mechanisms (including the funding framework) is not meeting national development goals. Put differently, there is an apparent disjuncture between institutional interests and national skills priorities.

It will become increasingly important to ensure that funding progressively supports the realization of key output goals in the sector, in terms of graduate quantity, quality, and the distribution of specializations. Specifically, a balance is needed between input- and output-driven funding, and between rigid standardized approaches and more nuanced funding strategies that allow for flexibility and reward institutional responsiveness to key policy objectives.

The role of financial aid

The National Student Financial Aid Scheme (NSFAS) -- an income-contingent loan scheme backed by the government -- was established in 1999 (NSFAS Act, Act 56 of 1999). The loan amount is intended to contribute to tuition fees, book costs, and lodging. Up to 40% of the loan could be turned into an outright bursary depending on academic achievements. To qualify, students have to prove that their family income is below a certain level (about R120,000 in 2009) and that they have been provisionally accepted at a university. Recognizing that disadvantaged students find it difficult to overcome the articulation gap and succeed at university, NSFAS support is generally not dependent on academic performance. There is, however, a performance incentive in that, under certain conditions, a portion of a NSFAS loan (up to 40 percent) can be converted to a bursary on the basis of academic success. The amount of the actual loan awarded to students has been largely left to individual institutions, although any family contribution is expected to be subtracted from the final loan amount. Repayments on loans commence upon students taking a job (hopefully after they graduate) that pays more than a minimum threshold value – the income-contingency feature of the loan; repayments are handled by the employer.

In 2005-07, 14 - 15 percent of students, approximately 115,000 in 2007, received financial aid (DHET, 2010b), with demand by far exceeding the funding. The number of students receiving financial aid varies, with some institutions having as low as 3 percent of their students receiving the aid, and others as high as 48 percent. Although NSFAS spending is large – in 2009 amounting to 12 percent of higher education budget (see Table 16) – the demand for student financial aid by far outstrips the supply, and very few, if any, students actually receive full funding for their studies. The recovery rate for loans granted since NSFAS's inception up to and including 2009 is 26 percent (R3,2 billion repaid out of a total of R12 billion loaned, DHET 2011b).

Table 16: Spending of National Student Financial Aid Scheme, 2005-11

	2005	2006	2007	2008	2009	2010	2011
	Actual					Projected	
Amount (billions of rand)	0,864	0,926	1,333	1,702	2,145	2,333	2,711
Percent of higher education budget	8,1	7,8	7,3	12,4	12,3	11,8	12,5

Source: DHET (2010b).

Empirical evidence shows that NSFAS has been successful in fulfilling its mandate of increasing participation among the poor, predominantly black population. Indeed, a recent paper by Adrien, Thomas and Melonio (2011) provides evidence that access to South Africa's higher education is constrained by credit availability. Adrien et al. use matched individual data from both a credit institution (Eduloan) and the Department of Education and compare the probability of university enrolment of potential students who obtain a student loan and those who do not obtain it. Based on a regression discontinuity design using the fact that loans are granted according to a credit score threshold, they are able to estimate the causal impact of obtaining a loan on enrolment. They find that the credit constraint is substantial, decreasing the higher education enrolment rate among loan applicants focused by the study by more than 20 percentage points. This paper provides firm evidence that providing student loans via NSFAS is instrumental in securing access

to higher education studies for thousands of disadvantaged young people who otherwise would not have been able to enter higher education and is also vital for reducing inequality and marginalization. For a comparison, see Box 4 for a description of how Colombia has used student aid to increase enrolment.

Indeed, **income contingent loans, such as NSFAS, have increasingly been recognized as an appealing option for financing higher education – and they are an indispensable, crucial mechanism to foster inclusion in the South African context.**²⁹ Such loans are attractive from the equity standpoint, as they improve access to education if students are faced by financial constraints (evidence shows that this is the case for South Africa, see above), both by advancing equality of opportunity and thus improving the chances of talented but poor students, as well as by mobilizing resources and thus removing capacity constraints on public-financed enrollment.

By increasing access, income contingent loans can also improve efficiency of higher education – the argument particularly important in the South African context, provided that access is reasonably matched by success (as this paper has made abundantly clear). Current enrollment in higher education not only militates against upward mobility of poor students in the society – it also prevents large cohorts of talented black students from enrolling. As a much smaller proportion of black students continues with higher education studies, the society foregoes large accumulation of human capital and, as shown elsewhere in this report, foregoes faster economic growth. Moreover, income contingent loans would also attract students who, in the absence of such a scheme, would not enroll in higher education because of the high perceived risk of default on their student loan.³⁰

The recent review of the NSFAS revealed **administrative hurdles in implementing the scheme** (DHET, 2010b). Due to heavy informational requirements, many universities have failed to carry out means tests, provided loans irrespective of students' course of study, their family contribution or their actual costs, resulting in frustration amongst students in higher-cost fields of study – possibly contributing to their worse academic performance.³¹ Moreover, universities have found the management of student debt a task far too onerous to carry through with success and consequently student debt piled up at some institutions.

NSFAS remains a critical element in low income students' ability to access to higher education though its efficiency and impact is weak. The recent NSFAS evaluation (DHET 2010b) has pointed up the shortcomings of the current financial aid system. Only 19% of NSFAS supported students have graduated and “of the 67 percent of NSFAS students who are no longer studying...72 percent have either dropped out or have not completed their studies” (DHET, 2010b). This poor performance suggests the need to reexamine the specific reasons for drop-out and understand why some students succeed while others do not. If the poor performance of the student loan scheme are to be addressed more information on the students, their experience with higher education institutions and the gaps that undermine success is needed to redesign and better target and support loan recipients. NSFAS has shown itself as an important institution, but reforms are needed to make it an effective tool in increasing opportunities for low income students and raising the number of higher education graduates in society.

29 For a review and assessment of income contingent loan schemes in higher education, see Chapman (2006), and for an assessment of its applicability to European transition countries, Vodopivec (2009).

30 Alternative solutions all have significant drawbacks – commercial banks are not willing to lend because investment in education provides poor collateral, and the provision of government guarantee to such loans has created problems of its own which have led to low loan repayment rates.

31 Confirmed in an interview by the Vice Chancellor of the University of Cape Town.

Box VIII: The Colombian Student Loan Agency (ICETEX)

Human capital development is a key priority of the Government of Colombia in its quest to increase technical innovation, foster growth, reduce poverty, and promote equality of opportunity. The success of secondary education coverage in recent years has shifted the government's attention to tertiary education. In a country where more students are enrolled in private institutions than in public ones, there is now a clear focus on improving tertiary access by supporting demand through student loans. The student loan agency ICETEX is thus a key player in the country's financing strategy for tertiary education.

Established in 1951, ICETEX was the first-ever student loan agency in the world. It is a public corporation that provides loans with interest subsidies for low-income students and forgives a quarter of the tuition costs for students from the two lowest socioeconomic strata. In 2003, ICETEX established a new line of credit called ACCES. This mechanism addresses issues of access, equity, and efficiency and was created with the support of the World Bank and the government. ACCES loans have significantly improved access to tertiary education. The new line of credit has also helped improve equity because it targets the lower-income population. Lastly, the efficiency of the tertiary education system has increased, as attested by the marked decrease in dropout rates.

ICETEX has increased its coverage to include over 96 percent of the territory of Colombia. Tertiary education enrollment has grown from 62 percent in 2006 to 69.2 percent in 2010. Enrollment of students whose income is less than twice the minimum salary has increased over a period of four years to reach 50 percent in 2010. Concurrently, the administrative costs of ICETEX declined to 3 percent from 6.1 percent in 2006. Overall, ACCES loans have translated into a 30 percent increase in higher education enrollment and a 13 percent student loan penetration rate (up from 6 percent in 2002). An evaluation of ACCES conducted by the Universidad Nacional de Colombia finds that ACCES borrowers were 30 percent less likely to drop out than similar students without financial aid.

Aware of the fact that low-income students face not only financial difficulties, but are also often hindered by lack of information, motivation, and proper academic preparation at the secondary level, ICETEX has partnered with the government of the Antioquia Department and local universities to help promising high school students from disadvantaged families. The students in this outreach program receive financial incentives in the form of saving loan deposits to encourage them to stay in and graduate from high school. The program operates during the last three years of secondary school. Students are then able to use the deposits toward payment of higher education costs once they graduate and are enrolled in a higher education institution.

In order to keep up with the demand for tertiary education, ICETEX now needs more private investment, with the government planning to build on the success of the ACCES credit line to attract private funding.

Source: World Bank (2008).

It is clearly important for the government to provide financial aid for indigent students. However, academic support and development are also essential for improving student success and graduation rates, including student support and strengthening the teaching

and learning process in higher education. Without such support, the value of student financial aid will not be fully realized and the government's substantial investment in NSFAS will be increasingly difficult to explain.

Implications for the governance and management of the higher education system

Since the Higher Education Act (Department of Education 1997b) gives South African universities a high degree of institutional autonomy, **systemic reforms are dependent not only on regulation but also on incentivizing and steering the institutions through the mechanisms of planning, funding and quality assurance**, as set out in core higher education policy (Department of Education 1997a). The tensions between the state's responsibility to undertake national reforms in the wider public interest, on one hand, and the interests of individual universities as enterprises, on the other, can have far-reaching effects on the system, particularly in relation to institutional accountability for contributing to national development and equity.

However, **reforms of the kind contemplated in this paper can be undertaken by means of changes to policy and regulations without any fundamental legislative change**. The sector can also be incentivized through amendments to the higher education funding framework as well as rewarding value-adding contributions to national output goals within a diversified system, as discussed earlier. This section provides an overview of the main changes that need to be made to existing policies, regulations and frameworks within the higher education management system.

The current Higher Education Qualifications Framework (HEQF)—which is being reviewed in 2011—prescribes a structure of credit requirements for all qualifications. However, it makes no provision for extended curriculum programs, even though the latter are recognized and funded by the government. The HEQF thus makes no allowance for two key elements of a flexible curriculum framework: alternative entry levels and additional foundational course credits for underprepared students.

Altering the HEQF to allow for such flexibility should not be unduly difficult. The framework uses the National Qualifications Framework (NQF)³² credit system, which is based on notional student learning time (1 credit = 10 notional learning hours, with 120 credits being the annual norm for full-time undergraduate study)—a measure of student workload. The necessary flexibility could be achieved by allowing for additional funded credits, up to a maximum of 120 credits at level 5 (higher education entry level) for those students who need additional study, subject to appropriate regulation.

In general, key national higher education goals need to be supported by a funding approach that clearly rewards contributions toward those goals. This approach would contrast with the present funding framework, which incorporates some steering, but essentially supports the status quo.

Reforming higher education has implications for higher education funding, the framework for which is also being reviewed in 2011. First, the HEQF is regulated through aspects of the Higher Education Management Information System (HEMIS) and the higher education

32 The NQF is a comprehensive framework for the amalgamation of all national qualifications, through higher education.

funding framework³³, but on the basis of a different credit system (which is more rigid than that of the HEQF itself). Whereas the HEQF only stipulates minimum or maximum credits for the various levels of a qualification type (leaving it to the institutions to determine credit values for their own programmes within the allowed parameters), HEMIS applies a fixed and strictly regulated system of “formal time” units to each type of qualification (e.g., three years for a general bachelor’s degree). Funding credits for the “teaching input subsidy” for qualifications are then allocated on the basis of these units (with different weightings by subject area). Thus a general bachelor’s degree is limited to three units, and there is no mechanism for an extended program to receive a proportionately greater amount of teaching input subsidy despite the additional teaching-and-learning time it requires.

The rigidity of the current funding system prevents mainstream implementation of a flexible curriculum framework that caters to student diversity. Amendments are thus needed in the funding framework to match the flexibility that needs to be introduced into the HEQF. Consideration should be given to adopting a single credit system, but if this is not practicable, additional formal time could be allocated to extended programs, subject to the same regulation developed for the HEQF. A national competitive innovation and development fund could simultaneously support and create incentives for institutional self-differentiation. The earmarked grants element of the funding framework could be used to create such a fund.

There is presently a major disparity between the teaching input subsidy (a capitation subsidy based on enrollment) and the teaching output subsidy (a subsidy based on graduate output). This system rewards growth in enrolments rather than numbers of graduates, and thus inhibits a shift towards incentivising outputs in higher education. Changing the balance of funding could be achieved by a formal regulation promulgated by the minister of education. However, there is a significant risk in effecting reform in this manner, since no robust national quality assurance system exists to ensure exit standards and quality. It is therefore important that the HEQC give priority to setting and monitoring standards.

A quality assurance (QA) system based on direct evaluation of qualification standards and outcomes is thus needed to shift the emphasis of higher education to outputs and outcomes. South Africa does have a QA system (for which the CHE’s Higher Education Quality Committee (HEQC) has responsibility) that includes a process for accrediting new qualifications and reviewing selected existing qualifications on a national basis from time to time. However, the current system’s institutional audit approach has to date focused primarily on the internal QA systems of higher education institutions, not direct evaluations of qualifications across the sector.

The second institutional audit and/or review cycle of the HEQC is expected to focus on teaching and learning, providing an opportunity to develop a value-added approach to evaluating standards, outputs, and the quality of outcomes. As part of this process, due to commence shortly, the HEQC could play a critical role in operationalizing comparability, rather than uniformity, of qualification standards and outcomes. This is particularly important because comparability of qualifications is central to productive institutional differentiation in the South African context.

33 The aspects of HEMIS and the funding framework referred to here are interconnected, so for convenience the term HEMIS is used to refer to the relevant aspects of the funding framework as well.

South Africa also has a unique opportunity to improve the teaching and learning process when it changes how “teaching development” funding (an element of the funding framework) is used. Formerly part of a block grant for underperforming institutions, this funding is due to become an earmarked grant for which all institutions will be eligible. This more accountable form of funding may, however, require national guidance. If 10 percent of the total annual grant for teaching development (about R420 million in 2011–12) were used to create an effective national structure for promoting teaching expertise (possibly as a Directorate of the CHE), the government could ensure that its investment in teaching is used more effectively to meet key national higher education goals, particularly that of closing the skills gap.

IX. KEY FINDINGS AND RECOMMENDATIONS

This section offers a brief summary of key findings and recommendations aimed at increasing participation, improving graduation rates, and increasing graduate outputs and research in the higher education sector.

Enhance Participation, Performance, and Equity

Only a relatively small proportion of the population of South Africa (16 percent in recent years) is enrolled in higher education. Although significant progress has been made in expanding access since 1994, higher education remains a “low participation–high attrition” system. At the school level, high dropout and attrition rates, compounded by poor academic achievement, mean that a large body of students with school-leaving qualifications are unprepared for higher education. Only 30 percent of all first-time entering students—the majority of whom are in three-year programs—graduate within five years. Overall, student outcomes at the tertiary level are poor and highly unequal across both institutional types and racial groups.

Despite the demand for higher-level skills in the economy and a national plan to tilt the balance of enrolments towards the sciences, engineering, and technology (SET), growth in annual enrolments in SET programs is lagging behind average annual growth in undergraduate enrolments. Moreover, there is an “inverted pyramid” in higher education, with enrolments in universities considerably exceeding those in FET colleges. To address these problems:

- The DHET should explore the development of multiple pathways towards higher education given the heterogeneous student body in South Africa. What is required is an institutional framework which offers more flexible access routes and academic pathways which adapt to differing student needs.
- One option is to utilize regional platforms and be linked to a new, flexible curriculum framework, the development of a credit accumulation and transfer (CAT) system within the multi-institutional framework, and student support and financial aid mechanisms. Within such a framework, some FET colleges could become constituent colleges of a multi- university system where junior undergraduate programs, student transfer, and success would be a joint responsibility of the colleges and the wider institutions.
- The desirability and feasibility of developing a “second-chance” access route to higher education through a college system should be explored as a complementary strategy to mainstream higher education curriculum reform. Second-chance programs could become an additional mission of FET colleges.

- Despite some practical constraints, the community college route could be explored more and perhaps piloted. Such institutions offer flexible training tied to private sector needs, and tailored to the learning needs of participants; remedial work for those whose prior schooling was inadequate; second chances for those who have dropped out; vocational training combined with general education; and university preparation for those not yet ready for university training (and often a cheaper alternative). They thus bring benefits beyond remedial work and university preparation, among others because they by definition are linked in with the community and local private industry, which allows them to flexibly adapt to changing needs.
- A balanced, positive, and forward-looking policy framework should be developed to harness the potential of private higher education.

Address the Articulation Gap

As noted throughout this paper, there is a mismatch between the statutory minimum requirements for admission to higher education and the level of academic preparedness needed for succeeding in South Africa's current higher education programs. Moreover, school-leavers in the lower echelons of those who meet minimum requirements can access only a very limited range of institutions and programs and have a very low probability of graduating. The current programs of the higher education sector are not proving responsive to the educational and learning needs of the student body, a growing majority of which is academically underprepared and disadvantaged. Specifically, the mandated duration of degree and diploma programs is too short to include the extended provision needed by the majority of the student body of most institutions. In order to deal more effectively with underprepared students, the sector needs to:

- Improve the quality of schooling over the long term, particularly in science and mathematics.
- Use existing FET colleges to expand student access to universities of technology and the technical, occupational, and vocational programs of comprehensive universities.
- Consider building a strong college sector over the long term to help address the articulation gap through foundational, "bridging," and/or junior undergraduate programs and "second-chance" programs for students who have not completed secondary education. In the medium term, a few select FET colleges, under strictly regulated conditions, could be allowed to:
 - Offer higher certificate or similar programs aimed at providing students admission to mainstream undergraduate degree programs, and/ or
 - Franchise a limited number of university sub-degree programs.
- Introduce a "flexible curriculum framework" that allows for the incorporation of substantial foundational provision (in addition to currently prescribed coursework) within a coherent curriculum structure, thus affording the majority of students entering higher education programs significantly improved prospects for success.

As part of this framework, enable institutions to draw on additional funded credits for extended programs for the students who need them. For example, an institution primarily serving rural communities could draw on additional funded credits for virtually its entire student body, enabling it to secure the resources needed to deliver the quality education needed by its particular students.

Improve the Quality and Relevance of Higher Education

The current policy assumption of a level playing field is an obstacle to improving the quality and the quantity of higher education graduates. It also constrains the higher education system from effectively closing the skills gap. Curriculum reform, facilitating improvements in teaching and learning, and differentiating the roles of existing higher education institutions are all crucial to improving system performance.

Facilitate institutional differentiation

The current approach to “steering” higher education through funding, formal differentiation, and the approvals process for programs and qualifications has had only a limited effect on changing overall enrolment rates and the distribution of enrolments across disciplines. The official differentiation of the sector, in fact, bears little relationship to the actual diversity of higher education institutions. In response to this situation, the DHET is encouraged to:

- Adopt a “progressive self-differentiation” approach to institutions within the higher education system, allowing institutions to build on their existing capabilities while responding creatively to demands and opportunities.
- Stimulate the process of self-differentiation by introducing a competitively-awarded “innovation and development fund” linked directly to the achievement of specific system outputs, such as:
 - Widening participation through improved student recruitment, selection and placement
 - Improving the effectiveness of undergraduate teaching
 - Increasing graduate and postgraduate outputs
 - Expanding, transforming, and strengthening the academic teaching and research corps
 - Expanding and commercializing research
 - Undertaking innovation and technology transfer, absorption, and adaptation
- Recognize and provide incentives for different institutional missions that focus on improving graduate outcomes in SET and other targeted specializations, particularly that of educating students from disadvantaged backgrounds.
- Support the process of institutional self-differentiation by introducing a flexible curriculum framework and “comparability” of qualifications across institutions and programs.

Improve the teaching and learning process in higher education

There is abundant evidence of major obstacles to effective teaching and learning in South African higher education. In some institutions, the range of student preparedness in individual courses, including proficiency in the language of instruction, is too wide to permit teaching to meet the learning needs of the full class. In others, the very low levels of preparedness of the student body as whole (as well as of proficiency in the language of instruction) mean that traditional teaching approaches have major shortcomings in effectiveness and efficiency.

Overcoming these obstacles is a key element of successfully addressing the skills gap in South Africa. First, a flexible curriculum framework would provide courses at different

entry levels, allowing for classes to be more homogeneous in the level of student preparedness. This change will require teachers who have interest and expertise in developmental entry-level teaching. Second, the challenges posed by student underpreparedness call for improvement in teaching expertise across the sector. In addition to building the teaching capacity of existing and future academic staff, there is an urgent need to replace an ageing, mostly white professoriate and research community and train, recruit, and retain black—and especially African—academics. Recommendations for addressing these challenges include:

- Steer institutional differentiation, and the academic division of labor within individual universities, to enable institutions to focus realistically and systematically on the different tasks of the academic project, including undergraduate teaching, postgraduate teaching and supervision, and research.
- Establish a national structure to promote and develop educational expertise in higher education, as well as improve the teaching qualifications of existing academic staff. As part of its planned conversion of the R400 million teaching development grant into earmarked funding, the DHET should create such a body to actively assist higher education institutions to utilize their share of this funding productively.
- Formally recognize teaching achievement as a fundamental aspect of the academic vocation.
- Introduce a formula-based approach, complemented by substantial earmarked funds, for funding research development, enabling institutions to compete for funding to build their capacity to produce high-level skills and/or research.
- Provide significant, systemic investment to develop new academics, especially black academics. Planning for the provision of an adequate supply of academic staff should begin with a comprehensive analysis of current and future needs. The process should particularly acknowledge and reward the role of the leading research-based institutions in expanding and renewing the academic teaching and research corps.
- Although more controversial, critically review the impacts of existing employment equity policies and practices at all levels of the system to ensure that, so far as possible, the legitimate goals of equity and redress in academic staffing do not conflict with the goals of retaining and reproducing critical teaching and research skills, expertise, and experience.
- Likewise, review the impact of immigration policies on the recruitment of academic talent and expertise in the context of the currently limited pool of South African scholars and academics.

Make Changes to Funding and Governance Arrangements

Funding must progressively support the realization of the key output goals of graduate quantity, quality, and the distribution of specializations. Specifically, a balance is needed between input- and output-driven funding, and between rigid standardized approaches and more nuanced funding strategies that both allow for flexibility and reward institutional responsiveness to policy objectives. Allocation of resources should be based on firm data and research on what strategies are effective in pursuing these objectives. Understanding

the relationship between financial, academic, and other causes of student failure and attrition is particularly critical for making allocations that seek to improve student retention and academic performance.

Evidence shows that participation in higher education is severely constrained by the lack of financial resources. The National Student Financial Aid Scheme (NSFAS)—by far the government’s largest contribution to improving access and performance—helps alleviating this constraint. There are strong equity and efficiency reasons for the income contingent loans such as NSFAS, the reasons especially strong in the case of South Africa given the persistent legacy of apartheid. It is therefore of vital importance to strengthen the scheme financially to provide, in a longer term, a much wider access to NSFAS – the access, as emphasized earlier, that must go hand in hand with the increase in efficiency of system as shown in improved completion rates. Streamlining the scheme to reduce the administrative burden of its implementation should also be considered.

A coherent and comprehensive package of changes should accordingly be introduced into the existing policy, regulatory, and funding frameworks of higher education, including:

- Amend the Higher Education Qualifications Framework to enable a more flexible curriculum structure.
- Amend the HEMIS and the higher education funding framework to enable the development of a flexible funding framework. In addition, a special Innovation and Development Fund is proposed to encourage self-directed institutional diversification.
- Develop a quality assurance framework that recognizes institutional differentiation and diversification, including differences in the student bodies of various institutions and a more flexible, responsive curriculum framework, while ensuring comparable exit standards.
- Improve the design of NSFAS by ensuring that the loan offers adequate support, as appropriate for different fields of study. Moreover, the income contingent nature of the loan introduces fairness in the financing of education (as students themselves bear the costs of the study, as long as their earnings are sufficient), so there is no need to subsidizing such loans, or even converting them to grants, as some recent proposals suggest. Based on the fact that their labor market success rate is higher, the current provisions for preferential financial support for specific areas of study in which skills shortages are evident, should also be retained.
- Introduce active measures, including earmarked funding, to provide higher education institutions support for professionalizing teaching in higher education.
- Use government policy and planning to reward institutions that improve graduation rates and other key outputs. A focus on outputs should ensure that appropriate exit standards are maintained and link growth to steady improvements in these standards. In addition, regular student cohort and graduate destination surveys should be conducted to inform evidence-based policy, planning, and funding of the sector.
- Improve coordination between DHET, other government departments involved in education (including the Departments of Science and Technology, Trade and Industry, and Health), and lower levels of government, including research councils and the national system of innovation.

Learn more about the causes of low academic performance

The range of interventions and support required by a diverse, largely underprepared, and disadvantaged student body needs to be much better understood. Understanding the relationship between financial and academic causes of student failure and attrition is critical for allocation decisions that seek to improve student retention and academic performance. While the issue of the academic under-preparedness of incoming students is undoubtedly one of the main factors,³⁴ the question remains what other factors also contribute to poor performance. This issue is seriously underresearched in South Africa.

Conduct comprehensive research on the relationship between the academic, affective, and financial factors that impact student persistence and success in higher education.

In particular, the effectiveness of NSFAS in achieving both equity and efficiency goals needs to be studied, as are the effects of financial incentives embodied in NSAFS. Furthermore, the effectiveness of other type of support offered to underprepared students, particularly those receiving NSAFS aid, need to be better understood. Conceivably, the contingency of the financial subsidy imbedded in the NSFAS stimulates the recipients to improve their performance, but more research – about the scale of the effect and the desirable level of subsidy – is needed.

34 Administrative data indicate that the academic exclusion rate of black students is several times higher than the rate their of “voluntary” withdrawal from SET programs, particularly engineering and science, supporting the academic unpreparedness argument.

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