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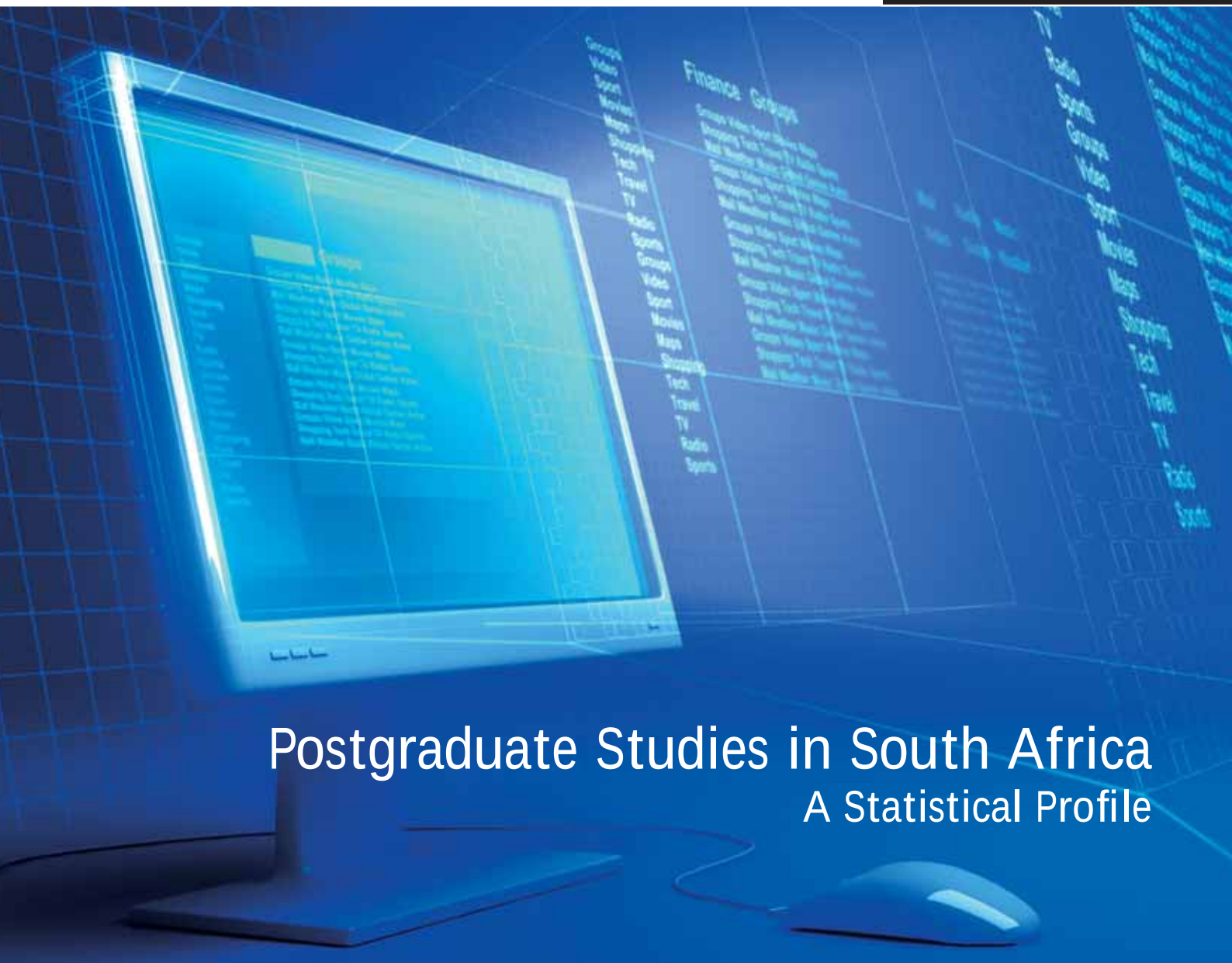


Postgraduate Studies in South Africa

A Statistical Profile

INTRODUCTION

The production of university graduates – and especially postgraduate students – is an essential component of the national system of innovation of modern industrialized societies. Such graduates have acquired the necessary knowledge and skills that underpin the modern knowledge economy and are able to produce new knowledge. In a globalized world their skills are in high demand, whether they are in engineering, ICT, medicine or the social sciences and humanities. It is generally recognized that South Africa does not have sufficient numbers of highly skilled people in most professions, hence the priority given to a host of state department's initiatives. There is an even greater shortage of graduates at postgraduate level and recent initiatives, such as those by the Department of Science and Technology and NRF to accelerate the production of PhDs in the system, target this reality. High international demand for South African graduates, together with the continuing brain drain, provides an urgent imperative to increase the production of postgraduate students in order for the country to remain competitive and to be able to generate knowledge that is responsive to a wide range of societal needs. In this report we present the most salient findings of a comprehensive statistical analysis of the state of PG-studies in South Africa.[1] The results presented here reaffirm the pressing need to prioritise the support and funding of greater numbers of PG students and to ensure that there is a clear, easily-accessible and sought-after transition from undergraduate to postgraduate studies at our higher education institutions.

The report is organized around six main themes:

- Growth in Enrolments and Graduations
- Completion Rates
- Demographics
- Pile-up Effects
- The Burden of Supervision
- Participation Rates

1 This is an abbreviated version of a more detailed and comprehensive report commissioned by the Council on Higher Education and produced by the Centre for Research on Science and Technology at Stellenbosch University. The full report is available on the CHE website.

THE CONTEXT

In order to understand the more recent postgraduate enrolment and graduation trends, some history of the higher education sector in South Africa and general growth trends is required. As Figure 1 shows, the total number of enrolments and graduates almost doubled in the sixteen-year period between 1990 and 2005. However, the growth paths of enrolment and graduation are very different. Enrolments grew steadily between 1990 and 1996, after which they declined for four years, before growing again quite significantly between 2000 and 2004. The decline in 2005 is a potential source of concern. The trend for graduates, however, is much more consistent – although there was a slight "dip" between 1997 and 1999.

Looking more closely at the graduation trends for undergraduate (UG) students, lower postgraduate (Diploma and Honours) and upper postgraduate (Masters and Doctors) students in Figure 2, provides more insight into these overall trends and shows that there was more consistent growth over this period in UG students and upper PG students. The trend line for lower PG students shows a significant decline between 1996 and 2001, which can possibly be explained by the introduction of two-year structured Masters (mostly taught) programmes at many universities during this period. These were viewed as a more attractive option (than a separate Honours and Thesis Masters) to many potential PG students.

Figure 1: Total enrolments and graduates 1990 to 2005

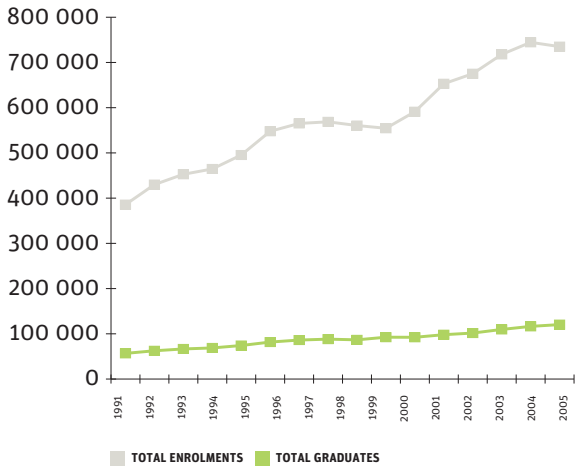
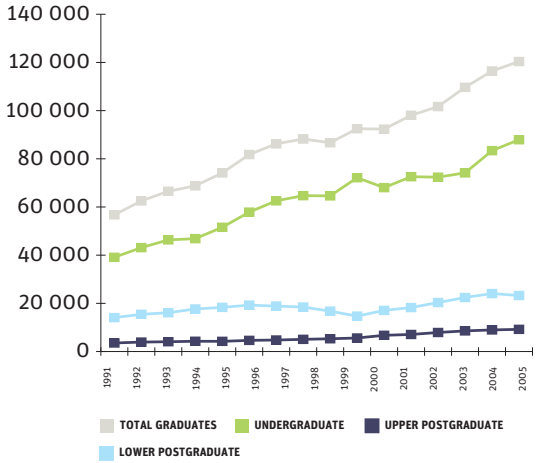


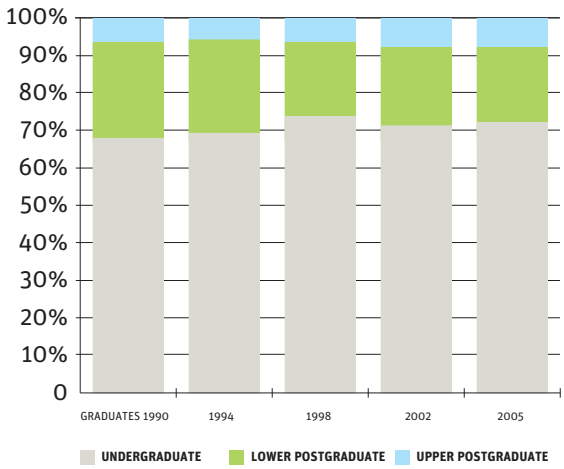
Figure 2: Graduates (UG, Lower PG and Upper PG) 1990 to 2005



It was important to establish what proportion of all graduates over this period were PG graduates, whether this was a significant proportion and whether this had increased since 1990. Figure 3 shows that there was a rather significant change in the structure of graduate output in the country since 1990. In 1990, PG students constituted 31.3% of all graduates. By 2005, this had declined to 26.9%, mainly due to the decline in diploma and Honours graduates (lower PG students) as a proportion of total graduates. In 1990 this category constituted nearly one quarter (24.8%) of all graduates; by 2005 this had declined sharply to less than 20%. Conversely, the share of Masters and Doctoral students over this period increased from 6.3% to 7.7%. Yet, overall the country was producing fewer postgraduates in 2005 than in 1990.

The South African Higher Education system enjoyed substantial growth between 1990 and 2005. Enrolments nearly doubled (with an increase from 385 700 to 715 800) whilst the number of graduates more than doubled (with an increase from 56 744 to 120 385). These figures also show that the ratio of graduates to enrolments improved from 6.8:1 in 1995 to 5.9:1 in 2005. However, the proportion of PG students of the overall number of graduates declined rather significantly from 31.3% to 26.9% over this period, even though the number of Masters and Doctoral enrolments increased during the same period.

Figure 3: PG as share of graduates 1990 to 2005



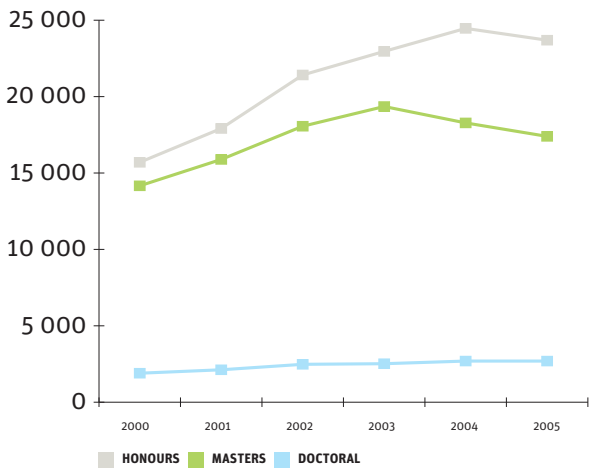
GROWTH IN ENROLMENTS

First Enrolments

In 2005, a total of 54 494 students enrolled for the first time for a postgraduate qualification at South African universities (Figure 4). These enrolments continued to increase steadily between 2000 and 2004 (from 49 391 to 59 857) but then decreased to 54 494 in 2005. At Masters' level, there was a steady increase of first enrolments between 2000 and 2003 (from 14 162 to 19 352), whereafter they declined to 17 398 in 2005. The average annual growth rate in Masters' enrolments for the whole six-year period was 4.4%. In terms of growth per field, the decline in first enrolments from 2003 onwards is mainly due to a decline in enrolments in the Humanities and Social Sciences.

Doctoral first enrolments increased at a steady pace over the six-year period; however, the numbers are relatively small. The overall average annual growth rate was 7.3% for Doctoral first enrolments. In terms of broad fields, the highest growth rate for Doctoral first enrolments was in the Social Sciences (9.9%) and Health Sciences (7.6%). As with Masters' first enrolments, the lowest growth rate for Doctoral first enrolments was in Engineering and Applied Technologies (2.0%).

Figure 4: Headcount of first enrolments by type of postgraduate qualification, 2000 to 2005



ENROLMENTS BY QUALIFICATION AND FIELD

Honours

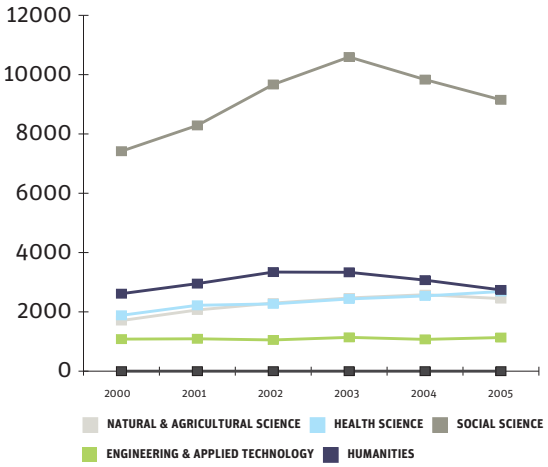
Honours first enrolments increased steadily between 2000 and 2004 but then started to decline after 2004. The overall average growth rate for Honours first enrolments was 9.1% between 2000 and 2005. When looking at trends in Honours first enrolments across the five broad fields, the highest growth rates were in Engineering and Applied Technologies (at 18.1%, although from a very low base) and Social Sciences (10.3%). Natural and Agricultural Sciences showed an increase of almost 6% over the six-year period. However, there was a negative growth rate in Humanities (-1.4%) and almost 0% growth in Health Sciences (-0.2%).

Masters

The decline in first enrolments for Masters' degrees since 2003 was mainly due to declining numbers in Social Sciences and Humanities. In the Humanities there were 2 613 first enrolments in 2000. Enrolments then peaked in 2003 with 3 334, but declined again to 2 740 in 2005 (which is only slightly higher than at the starting point in 2000). Conversely, there was a steady increase in Natural and Agricultural Sciences from 1 707 first enrolments in 2000 to 2 447 in 2005. The highest growth rate for Masters' first enrolments was in Natural and Agricultural Sciences (7.5%) and in Health Sciences (6.6%). Of the remaining fields, the lowest growth rate was in Engineering and Applied Technologies (with 0.8%) and Humanities (1%).

Masters' enrolments: Although first enrolments for Masters' degrees have grown at an average annual rate of 4.4% between 2000 and 2005, this trend reversed, with significant declines since 2003. In fact, whereas first enrolments in 2001 constituted exactly 50% of all total enrolments, this subsequently declined to 43% in 2005. The biggest proportion of this decline is due to decreased numbers of first enrolments in the Social Sciences and Humanities.

Figure 5: Headcount of Masters first enrolments by broad field, 2000 to 2005

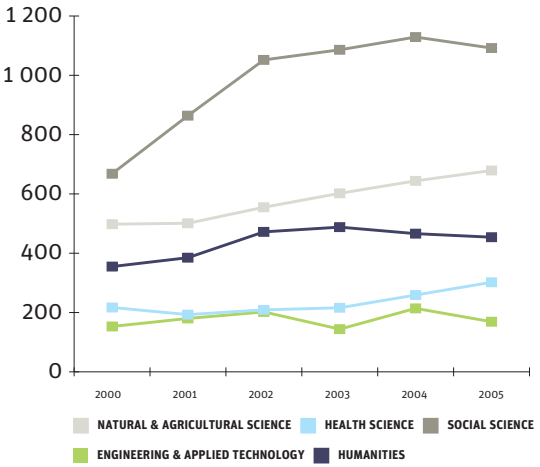


Doctoral

In terms of broad fields, the highest growth rate for Doctoral first enrolments was in the Social Sciences (9.9%) and Health Sciences (7.6%). As with Masters' first enrolments, the lowest growth rate for Doctoral first enrolments was in Engineering and Applied Technologies (2.0%). Although the overall growth of Doctoral first enrolments shows a steady increase over time, Figure 6 shows that there were very small increases in certain fields, such as the Social Sciences (until 2004 then decreasing in 2005) and Humanities (which decreased from 2003 onward).

Doctoral enrolments: The average annual growth rate for students enrolling for Doctoral degrees was 7.3% between 2000 and 2005. However, it is disturbing to note that this growth tailed off for the first time in 2005. In fact, the proportion of first enrolments of total enrolments was lowest in 2005 (29%) and highest in 2001 (33%). The near-zero growth in 2005 is mainly due to fewer first enrolments for doctoral studies in the Humanities and Social Sciences.

Figure 6: Headcount of Doctoral first enrolments by broad field, 2000 to 2005



AVERAGE GROWTH AND AVERAGE GROWTH RATE PER MAIN FIELD

A breakdown by the main scientific field at Honours level shows that the average annual growth rate was highest for Engineering and Social Sciences students. At Masters level we see that the Natural and Agricultural qualifications recorded the highest average annual growth rate of 7%, followed by the Health Sciences (6.6%). The Social Sciences saw the highest average annual growth rate at the Doctoral level (9.9). Across all qualifications levels, the lowest growth rate is in the Humanities.

Table 1: Average annual growth and growth rate of first enrolments by broad field, 2000 to 2005

Broad Field	Honours		Masters		Doctoral	
	Avg. annual growth[2]	Avg. annual growth rate (%)[3]	Avg. annual growth	Avg. annual growth rate (%)	Avg. annual growth	Avg. annual growth rate (%)
Natural & Agricultural Sciences	144	5.7%	155	7.5%	39	7.1%
Engineering & Applied Technologies	76	18.1%	8	0.8%	4	2.0%
Health Sciences	-2	-0.2%	146	6.6%	18	7.6%
Humanities	-19	-1.4%	28	1.0%	22	5.4%
Social Sciences	1 550	10.3%	406	4.8%	84	9.9%
All Fields	1 747	9.1%	704	4.4%	164	7.3%

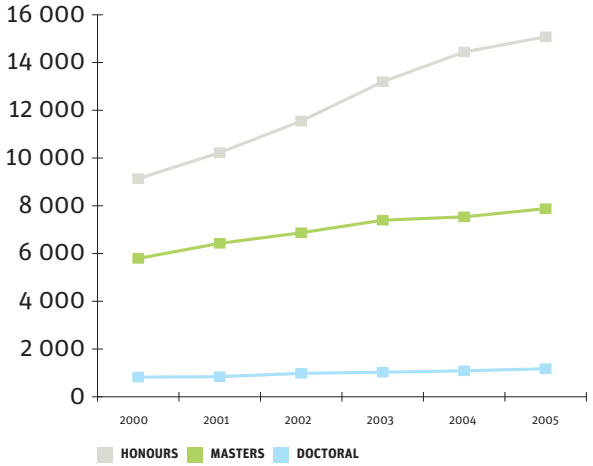
2 Average annual growth is expressed as headcounts. It represents the mean growth (increasing or decreasing) over the years specified. It was estimated by fitting a linear regression trend line to the annual values.

3 Similar to the above, the average annual growth rate was estimated by fitting a linear regression trend line to the annual values but, for this estimate, the values were converted into logarithmic values and the exponents (number of years) of these values were taken.

GROWTH IN GRADUATES

In 2005 a total of 30 803 students graduated with a postgraduate qualification from a South African university. This figure is slightly less than the 31 573 graduates recorded for 2004 but is a significant improvement on the 21 572 headcounts in 1995. In terms of Masters' graduates, there was a steady but small increase between 2000 and 2005, with almost 5 800 students in 2000 and almost 7 900 students in 2005. As far as fields are concerned, the largest average annual growth rate was recorded in the Natural and Agricultural Sciences (9.4%), with the smallest growth rate in the Health Sciences (5.2%). The number of doctoral graduates increased slightly between 2000 and 2005, with 822 graduates in 2000 and 1 176 in 2005. The largest average annual growth rate occurred in Social Sciences (11.6%) with the smallest in Engineering and Applied Technologies (2.6%).

Figure 7: Headcount of graduates by type of postgraduate qualification, 2000 to 2005



Honours

Honours graduates showed a steady increase between 2000 and 2005, from 9 135 in 2000 to 15 077 in 2005. The highest average annual growth rate for Honours graduates was recorded in Engineering and Applied Technologies (28.3%) although from a relatively small base, while there was almost zero growth in the Humanities.

Masters

Masters graduates showed a steady but relatively small increase between 2000 and 2005, with almost 5 800 students in 2000, and almost 7 900 students in 2005. The largest growth rate was recorded in the Natural and Agricultural Sciences (9.4%) and the smallest growth rate was in Health Sciences (5.2%).

Doctoral

The number of Doctoral graduates increased slightly between 2000 and 2005, with 822 graduates in 2000 and 1 176 in 2005. The largest growth rate for Doctoral graduates occurred in Social Sciences (11.6%) and the smallest in Engineering and Applied Technologies (2.6%). In Engineering and Applied Technologies the growth rate per qualification type tends to decline as the qualification becomes more "advanced" (28.3% growth for Honours, 8.2% growth for Masters and 2.6% growth for Doctorates).

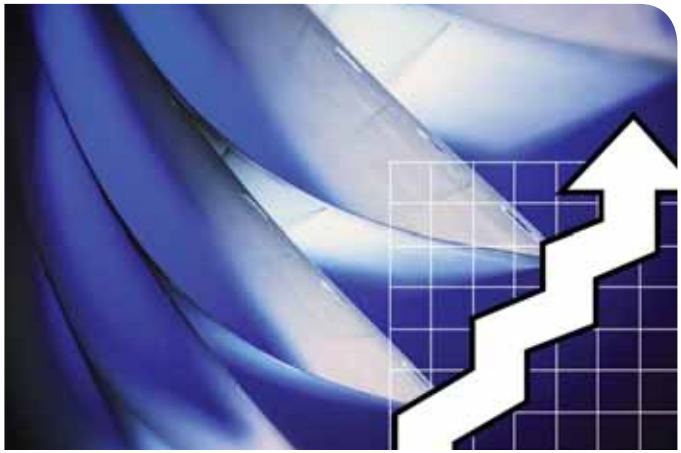
Table 2: Average annual growth and growth rate of graduates by broad field, 2000 to 2005

Broad Field	Honours		Masters		Doctoral	
	Avg. annual growth[4]	Avg. annual growth rate (%)[5]	Avg. annual growth	Avg. annual growth rate (%)	Avg. annual growth	Avg. annual growth rate (%)
Natural & Agricultural Sciences	113	5.8%	83	9.4%	17	6.8%
Engineering & Applied Technologies	70	28.3%	41	8.2%	2	2.6%
Health Sciences	18	4.6%	42	5.2%	11	9.5%
Humanities	-8	-0.7%	94	8.1%	9	4.6%
Social Sciences	1 065	12.9%	55	7.0%	34	11.6%
All fields	1 257	11.1%	408	6.2%	73	7.7%

4 Average annual growth is expressed as headcounts. It represents the mean growth (increasing or decreasing) over the years specified. It was estimated by fitting a linear regression trend line to the annual values.

5 Similar to the above, the average annual growth rate was estimated by fitting a linear regression trend line to the annual values but, for this estimate, the values were converted into logarithmic values and the exponents (number of years) of these values were taken.

PILE-UP EFFECTS



We use the term "pile-up" to refer to the state of affairs where students remain enrolled for their degree much longer than "expected". When the number of "recurring" students becomes too large, this inevitably puts strain on the resources and affects the efficiency of the postgraduate system in general as its leads to increasingly larger numbers of students who need supervision. We constructed two indicators to measure this pile-up effect: *Ongoing enrolments as a percentage of total enrolments* and *Graduates as a percentage of ongoing enrolments.* When there is an increase in the value of the first indicator, it shows that more students are remaining, or "piling up", in the system, while a decrease in the value of the second indicator means the system is producing fewer graduates.

Table 3: Pile-up effects of Masters postgraduate students

MASTERS (Headcounts)	2000	2001	2002	2003	2004	2005
First enrolments (X)	14 162	15 888	18 062	19 352	18 279	17 398
Graduates (Y)	5 795	6 426	6 871	7 396	7 536	7 881
Ongoing enrolments (Neither first enrolment nor graduate) (Z)	9 556	9 642	11 648	13 091	14 671	15 105
Total enrolments (X+Y+Z)	29 513	31 956	36 581	39 839	40 486	40 384
INDICATORS						
Ongoing enrolments as % of total enrolments [Z/(X+Y+Z)]*100	32%	30%	32%	33%	36%	37%
Graduates as % of total enrolments [Y/(X+Y+Z)]*100	20%	20%	19%	19%	19%	20%

Overall, Masters ongoing enrolments as a percentage of total enrolments remained relatively constant between 2000 and 2003 (32% and 33%, respectively), whereafter it increased to 37% in 2005. After 2003, many more such students remained in the system. In terms of graduates as a percentage of ongoing enrolments, the situation has remained relatively stable with graduating students constituting approximately 20% of total

enrolled students in any given year. In terms of gender differences in pile-up, it appears there is a larger increase in the first indicator for women than men (with increases of 9% and 6%, respectively) and, for the second indicator, the decreases are also largest for women (with 13% as opposed to 8% for men). There has also been an increase in the first indicator for first enrolments most notably among the Black African (35% in 2000 and 48% in 2005) and Coloured groups (26% in 2000 and 31% in 2005). However, no significant field differences were recorded for these indicators.

Table 4: Pile-up effects of Doctoral postgraduate students

DOCTORAL (Headcounts)	2000	2001	2002	2003	2004	2005
First enrolments (X)	1 897	2 122	2 480	2 519	2 693	2 692
Graduates (Y)	822	843	981	1 031	1 087	1 176
Ongoing enrolments (Neither first enrolment nor graduate) (Z)	3 236	3 495	4 307	4 829	5 323	5 566
Total enrolments (X+Y+Z)	5 955	6 460	7 768	8 379	9 103	9 434
INDICATORS						
Ongoing enrolments as % of total enrolments [Z/(X+Y+Z)]*100	54%	54%	55%	58%	58%	59%
Graduates as % of total enrolments [Y/(X+Y+Z)]*100	14%	13%	13%	12%	12%	12%

Overall, Doctoral ongoing enrolments as a percentage of total enrolments remained relatively constant between 2000 and 2002, whereafter it increased from 55% to 59% in 2005, resulting in a similar pile-up effect. In terms of Doctoral graduates as a percentage of ongoing enrolments, there has been a steady decline (from 25% in 2000 to 21% in 2005). In terms of gender differences in pile-up, the increase in pile-up for men was once again less than for women (with 3% and 7%, respectively). However, ongoing enrolments as a percentage of total enrolments across all race groups and fields, have increased, except in the Natural and Agricultural Sciences. There has also been a decrease in Doctoral graduates as a percentage of ongoing enrolments across all fields except, once again, in Natural and Agricultural Sciences where it appears the number of graduates are not declining.

There is a significant pile-up effect for both Masters and Doctoral students across most fields between 2000 and 2005. Firstly, the proportion of ongoing enrolments as a share of total enrolments has been increasing for both Masters and Doctoral students. Nearly two out of five (37%) of all enrolled Masters students in the system and three out of five (59%) of all enrolled Doctoral students in 2005 were historical enrolments. Secondly, the proportion of Masters students graduating as a proportion of total enrolments remained the same (1 out of 5), but the situation for Doctoral students has deteriorated from 14% in 2000 to 12% in 2005. The pile-up effect is more prevalent amongst female students, and higher for African and Coloured students at the Master's level. No race differences were found at the Doctoral level.

COMPLETION RATES: TIME TO DEGREE

How long does the average Masters and Doctoral student take to complete his or her degree and has this situation changed between 2000 and 2005? Overall the findings show that the average Master's student takes about three years to graduate, whereas the average Doctoral student takes slightly more than four and a half years. Interestingly, we found no significant changes at either level between 2000 and 2005. There are small differences between fields.

Table 5: Time (in years) to degree completion of Masters and Doctoral students by broad field, 2000 and 2005[6]

Broad Field	Masters				Doctoral			
	2000		2005		2000		2005	
	Mean	N	Mean	N	Mean	N	Mean	N
Natural & Agricultural Sciences	2.9	704	2.9	1 119	4.8	194	4.9	281
Engineering & Applied Technological sciences	2.9	428	3.2	635	5.0	62	4.5	75
Health Sciences	3.6	748	3.5	965	4.8	103	4.5	155
Humanities	2.4	995	2.6	1 408	4.2	140	5.0	224
Social Sciences	3.0	3 020	2.9	3 869	4.4	216	4.6	358
All Fields	3.0	5 795	2.9	7 881	4.6	719	4.7	1 093

6 For Doctoral students, there was an error in the dataset where certain cases were indicated as both first enrolments and graduates. In other words, it was indicated that some Doctoral students took only one year to graduate. These cases have been removed; therefore the numbers of graduates shown here are less than those in the original dataset.

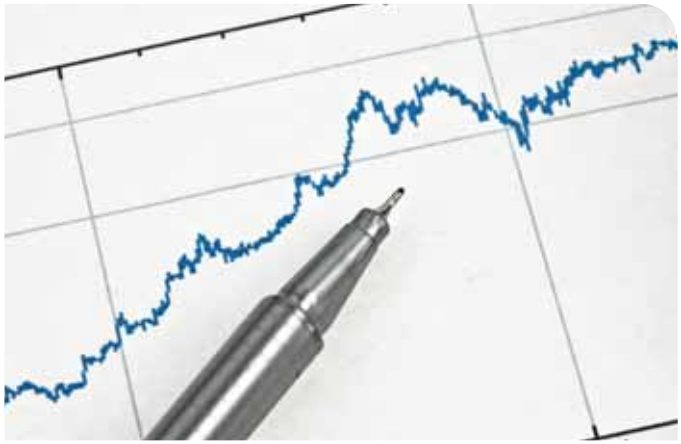
TIME-TO-DEGREE: DEMOGRAPHIC DIFFERENCES

As far as gender is concerned, there were no differences between male and female Master students in 2000 or 2005 in the time taken to graduate. At the Doctoral level, the data show that female students completed their degrees slightly faster in 2000 compared with male students (4.4 years compared to 4.7). However, by 2008, these differences had disappeared with both groups taking equally long (4.7 years). With regard to race, small differences for both qualifications and years were recorded. However, none of these differences suggests any major race effect. Differences in age are strongly correlated with differences in completion rates. Not surprisingly older students take significantly longer to complete their degrees and this effect is more pronounced at the Doctoral level.

Table 6: Time (in years) to degree completion of Masters and Doctoral students by age group, 2000 and 2005

Age Group	Masters				Doctoral			
	2000		2005		2000		2005	
	Mean	N	Mean	N	Mean	N	Mean	N
<30	2.4	1 930	2.4	2 945	3.7	89	3.5	139
30 to 39	3.4	2 053	3.1	3 091	4.5	251	4.7	443
40 to 49	3.3	847	3.4	1 420	5.0	171	4.9	321
50 to 59	3.2	189	3.6	358	5.7	62	5.3	150
60 or older	5.0	28	3.5	42	5.1	15	5.5	40
Total	3.0	5 047	2.9	7 856	4.6	588	4.7	1 093

THE BURDEN OF SUPERVISION



We introduce the term "burden of supervision" to refer to the phenomenon that – due to a number of trends already highlighted in this report – South African academics are increasingly burdened with an unrealistically high load of postgraduate students to supervise. The number of postgraduate students has more than doubled over the past 15 years whilst the number of permanent academics has only increased by 40%. In addition, the pile-up effect of postgraduate students places more demands on the supervisory capacity in the system.

We refer to the *burden of supervisory* as the number of students (Masters and Doctoral) relative to the number of permanent academic staff who are suitably qualified to supervise such students. As Figures 8 and 9 show, the burden of supervision at both levels increased across all fields of science between 2000 and 2005, as the average number of students per supervisor in all fields has increased substantially. At the Masters level, this has increased from 3.8 to 5.2; and at the doctoral level from 1.3 to 2.2.

Figure 8: Burden of supervision by field (Masters)

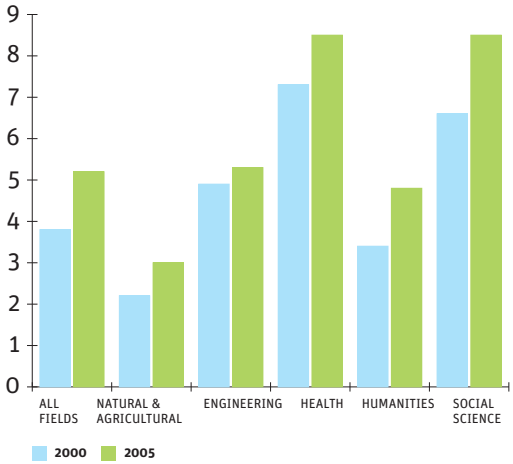
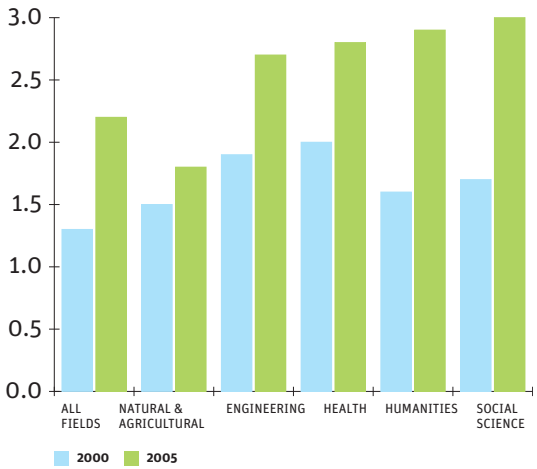


Figure 9: Burden of supervision by field (Doctorate)



DEMOGRAPHICS

GENDER

Female postgraduate enrolments show that female students constitute slightly more than 50% of all Honours enrolments, but less than half at the Masters (46% in 2005) and Doctoral (40% in 2005) levels. As far as graduates by field are concerned, female students show increased representation in most fields (except for the Natural and Agricultural Sciences). Although female graduates constitute significant proportions of the graduates in the Social Sciences, this is the exception. In all other fields and for both Masters and Doctoral degrees, female graduates are vastly in the minority.

Figure 10: Figure 10: Percentage women first enrolments by qualification (2000 – 2005)

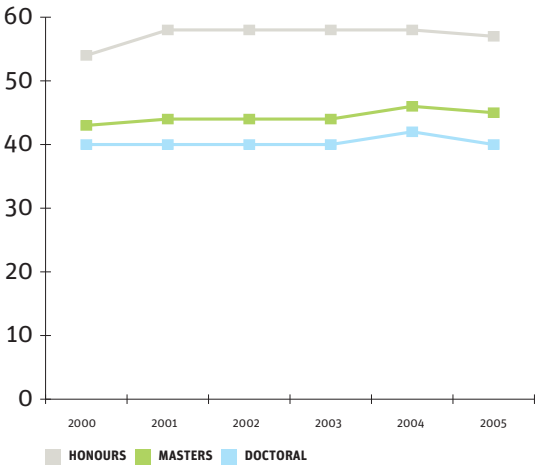


Table 7: Female graduates per qualification, 2000 and 2005

Broad Field	Honours		Masters		Doctoral	
	2000	2005	2000	2005	2000	2005
Natural & Agricultural Sciences	15%	11%	12%	13%	25%	21%
Engineering & Applied Technological Sciences	0%	2%	2%	3%	3%	3%
Health Sciences	4%	3%	17%	16%	19%	18%
Humanities	12%	11%	18%	20%	14%	17%
Social Sciences	68%	78%	51%	48%	37%	41%

RACE

There was a steady increase between 2000 and 2005 in the proportion of Black[7] first enrolments at all levels (Honours: from 47% to 57%; Masters: from 57% to 63% and Doctoral: from 47% to 59%). The proportion of African graduates also increased significantly between 2000 and 2005 at all levels, even though white graduates still constitute the largest single group of graduates at the Masters and Doctoral levels. African Doctoral graduates were increasingly represented in all fields between 2000 and 2005, particularly in the Natural and Agricultural Sciences (34% in 2005), while the share of White Doctoral graduates declined in all fields over the same period.

Figure 11: Percentage Black graduates by qualification (2000 to 2005)

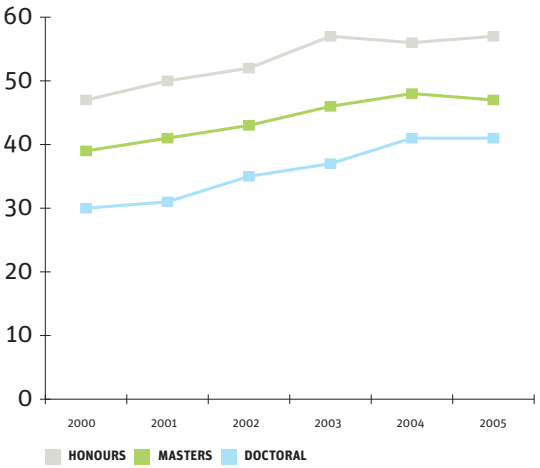


Table 8: Race distribution of graduates per qualification, 2000 and 2005

Race	Honours		Masters		Doctoral	
	2000	2005	2000	2005	2000	2005
Black African	34%	44%	27%	33%	19%	29%
Coloured	5%	5%	5%	6%	5%	6%
Indian	8%	8%	7%	8%	6%	7%
White	53%	43%	61%	52%	70%	59%

7 The word Black is used here as a collective term, referring to Africans, Coloureds and Indians.

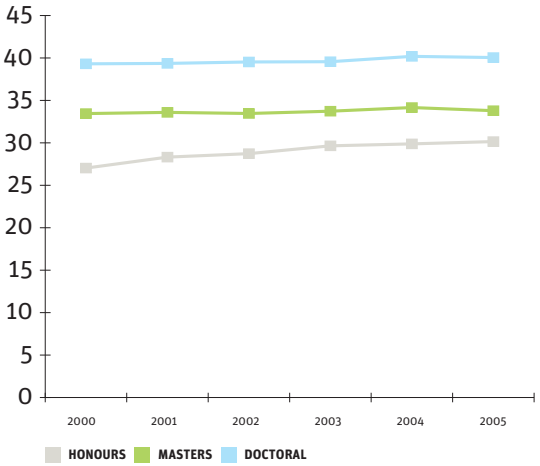
AGE

There was little difference in the age of students for Masters first enrolments in the under-30s between 2000 and 2005 (with 41% and 45%, respectively). However, Doctoral first enrolments under 30 decreased, comprising 28% and 21% respectively in 2000 and 2005.

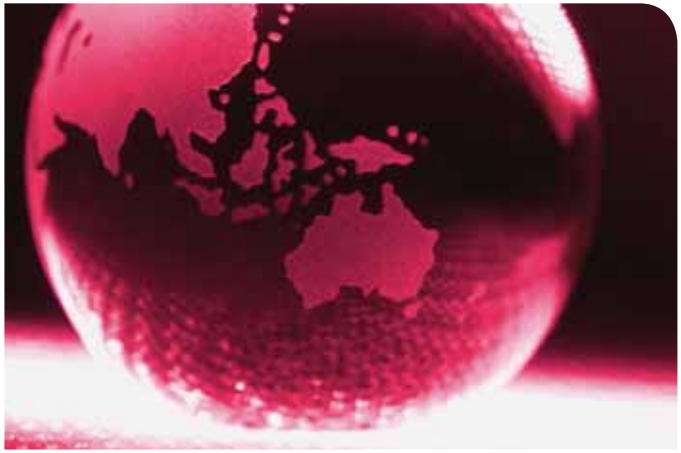
One of the most striking and disturbing findings concerns the changing mean age of postgraduate students in South Africa over the past few years. The mean age of Honours students increased significantly from 27 to 30 by 2005, and most Masters students now graduate at age 34, and most Doctoral students at age 40. There were no significant gender or race differences in these data.

These findings are disturbing for two reasons: First, it means that many Masters and Doctoral students would typically interrupt their studies after having completed their Bachelors and Honours degree to enter the job market and then take up Masters studies later on. This interruption in studies, probably due to lack of financial resources, would invariably impact on their preparedness for advanced studies and might lead them to take longer to complete such studies. Second, and more importantly, it also means that those Doctoral students who enter into a career of academic scholarship or science potentially become productive quite late in their careers. There is a well-established correlation between having a Doctoral degree and publication productivity. Against a background of an ageing academic and scientific cohort, it is imperative that our Doctoral graduates start publishing as early on in their careers as possible!

Figure 12: Mean age at graduation by qualification, 2000 to 2005



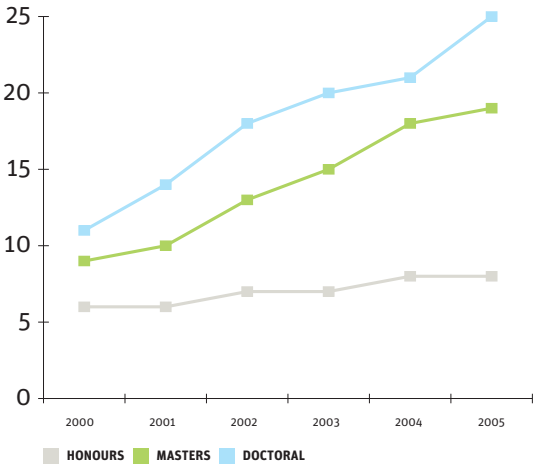
INTERNATIONALISATION OF SOUTH AFRICAN HIGHER EDUCATION



The share of non-South African Masters first enrolments increased from 9% in 2000 to 16% in 2005, with exactly 70% of these being from other African countries of whom approximately half were from SADC countries. The share of non-South African Masters graduates increased by 10% over this six year period, from 9% in 2000 to 19% in 2005.

The share of non-South African Doctoral first enrolments increased from 18% in 2000 to 26% in 2005, the largest share coming from Other African Countries and the SADC. The share of non-South African Doctoral graduates increased by 14% over this six year period, from 9% in 2000 to 25% in 2005, the highest proportion being in the Humanities, with an increase of 19% (from 9% in 2000 to 28% in 2005). The share of Doctoral graduates follows similar patterns to the other qualifications, where the largest share of graduates is from SADC countries (43% in 2000 and 32% in 2005).

Figure 13: Percentage of non-South African graduates per qualification, 2000 to 2005



PARTICIPATION RATES

The participation rate refers to the number of Masters and Doctoral students (in terms of first enrolments and graduates) per 1 000 of the population, specifically those aged between 25 and 34, and 35 and 44 years. In terms of participation, the number of White Masters first enrolments is still substantially higher than that of any other race group in the 25 to 34 year age group, and this has continued to increase over time. Masters first enrolments in the 35 to 44 year age group differ slightly from those in the younger age group, with Indian first enrolments being the highest participation figure in both 2001 and 2005. African first enrolments have the lowest participation rate.

Table 9: Number of Masters and Doctoral Graduates per 1 000 in the 25 to 34 age group and the 35 to 44 age group, 2001 and 2005

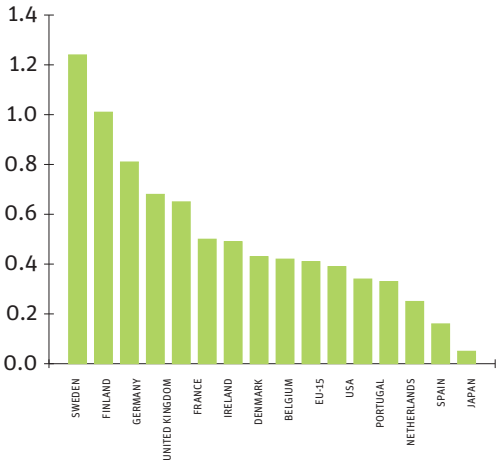
Masters Graduates	25-34 Age Group		Doctoral Graduates	35-44 Age Group	
	2001	2005		2001	2005
Black African	0.32	0.4	Black African	0.05	0.09
Coloured	0.42	0.59	Coloured	0.05	0.11
Indian	2.57	3.43	Indian	0.32	0.49
White	6.71	8.53	White	0.80	1.05
Total	0.88	0.98	Total	0.17	0.23

Source: Calculated by using Mid-year Population Estimates (obtained from Statistics South Africa Website) – only available from 2001 onwards.

There has been an increase in the participation figure of Doctorates between 2001 and 2005 across all race groups (from 0.12 to 0.15). However, White participation rates are significantly higher than any other race group and have increased the most over this five-year period (with an increase from 1.02 in 2001 to 1.43 in 2005). African graduates remain the least in the older age group (with 0.05 in 2001 and 0.09 in 2005), while there are many more White Doctoral graduates than those from any other racial group (with 0.8 in 2001 and 1.05 in 2005).

South Africa has 0.05 Doctoral degrees in Science and Engineering per 1 000 of the population in this age group (25-34). This does not compare favourably with most developed nations in the world.

Figure 14: Doctoral degrees in S&E per 1 000 in the 25-34 age group, 2000



HIGH LEVEL FINDINGS

- The South African Higher Education system enjoyed substantial growth between 1990 and 2005. Enrolments nearly doubled whilst the number of graduates more than doubled (with an increase from 56 744 to 120 385). Over this period the ratio of graduates to enrolments improved from 6.8:1 in 1995 to 5.9:1 in 2005. However, the proportion of PG students of the overall number of graduates declined rather significantly from 31.3% to 26.9% over this period.
- *Masters' enrolments:* Although first enrolments for Masters' degrees have grown at an average annual rate of 4.4% between 2000 and 2005, this trend reversed, with significant declines since 2003. In fact, whereas first enrolments in 2001 constituted exactly 50% of all total enrolments, this subsequently declined to 43% in 2005.
- *Doctoral enrolments:* The average annual growth rate for students enrolling for Doctoral degrees was 7.3% between 2000 and 2005. However, it is disturbing to note that this growth tailed off for the first time in 2005. In fact, the proportion of first enrolments of total enrolments was lowest in 2005 (29%) and highest in 2001 (33%).
- *Masters graduates:* The number of Masters graduates showed a steady but relatively small increase between 2000 and 2005, with almost 5 800 students in 2000, and almost 7 900 students in 2005.
- *Doctoral graduates:* The number of Doctoral graduates increased slightly between 2000 and 2005, with 822 graduates in 2000 and 1 176 in 2005. The largest growth rate for Doctoral graduates occurred in Social Sciences (11.6%) and the smallest in Engineering and Applied Technologies (2.6%).
- *Pile-up effect:* The proportion of ongoing enrolments as a share of total enrolments has been increasing for both Masters and Doctoral students. Nearly two out of five (37%) of all enrolled Masters students in the system and three out of five (59%) of all enrolled Doctoral students in 2005 were historical enrolments. In addition, the proportion of Masters students graduating as a proportion of total enrolments remained the same (1 out of 5), but the situation for Doctoral students has deteriorated from 14% in 2000 to 12% in 2005.
- *The burden of supervision* has increased across all fields of science between 2000 and 2005, as the average number of students per supervisor in all fields has increased substantially. At the Masters level, this has increased from 3.8 to 5.2; and at the doctoral level from 1.3 to 2.2.
- *Age of students at graduation:* The mean age of Honours students at graduation increased significantly from 27 to 30 by 2005, most Masters students now graduate at age 34, and most Doctoral students at age 40.
- *Internationalisation trends:* The share of non-South African Masters first enrolments increased from 9% in 2000 to 16% in 2005, with exactly 70% of these being from other African countries of whom approximately half were from SADC countries. The share of non-South African Doctoral first enrolments increased from 18% in 2000 to 26% in 2005, the largest share coming from Other African Countries and the SADC.
- *Participation rates:* South Africa has 0.05 Doctoral degrees in Science and Engineering per 1 000 of the population in this age group (25-34). This does not compare favourably with most developed nations in the world.

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