

Elusive equity in doctoral education in South Africa

Chaya Herman

Department of Education Management and Policy Studies

University of Pretoria

Chaya.herman@up.ac.za

Abstract

This paper explores the drive to expand the quantity and quality of PhD's in South Africa and the impact this has had on under-represented groups, in particular black South Africans.

Based on both qualitative and quantitative data, the paper argues that while there has been a significant increase in the number of black students in doctoral education, these students are still under-represented compared to their participation in the population and that the increase of black graduates is to a large extent attributed to the intake of doctoral students from other parts of Africa. The relatively low participation of South African black students is attributed to a dysfunctional school system, high drop-out rates, insufficient funding, feelings of alienation and isolation at historically white universities, family commitments and the lure of the labour market. Since the disadvantage to black students affects the majority of the population in South Africa, the paper suggests that the PhD could become a key driver for economic development only if there is a concerted effort to address barriers to black South African students' access to and retention in doctoral programmes.

Keywords

Doctoral education ; South Africa ; Equity ; Diversity ; Higher education

Introduction

It is often argued that national productivity and wealth in the knowledge society will to a large extent depend on the ability to create and apply knowledge. The pursuit of the knowledge economy has therefore become a target for education policy in advanced economies (Warhurst 2008). While different discourses of the knowledge economy have evolved with various implications to education (Välilmaa and Hoffman 2008; Peters 2010) Warhurst (2008) argues that governments tend to follow what he terms "knowledge economy orthodoxy", namely, a single account of the knowledge economy centred on the development

of thinking skills formed through the institutions of higher education. In this conception of the knowledge economy nations have to produce knowledge workers, that is, graduates, in order to achieve a competitive edge. In particular, emphasis has been given to the development of PhD programmes, even though their economic benefit is difficult to quantify (Casey 2009). The inclusion of doctoral education in the Bologna Process, for example, aims to make Europe the most competitive knowledge-based economy by increasing the number of researchers and enhancing research capacity, innovation and economic growth (Bitusikova 2009). It is argued that doctoral education generates economic growth by increasing individual productivity and the productivity of those without a PhD alongside whom they work. It is suggested, at least in the Organisation for Economic Co-operation and Development (OECD) countries, that there is a positive relationship between the time people spend in higher education and a country's performance and productivity (Casey 2009, 222).

At the same time, the national need to achieve a competitive edge in the global economy also exerts pressure on higher education institutions to diversify and to broaden access to under-represented groups. Van Vught (2007) suggests that a diversified higher education system is more able than a homogeneous education system to meet the diverse needs of the labour market. It is also argued that the knowledge and the skills of a diversified student population are essential elements in mobilising the creative capital of the university to meet the challenge of the knowledge economy (Neuman 2002; Enders 2004; ASHE Higher Education Report 2009).

After the transition to democracy, one of the fundamental goals of the higher education transformation in South Africa was to address the legacy of apartheid by broadening access to higher education institutions (HEIs) to under-represented groups, in particular black and female students.¹ At the same time, as South Africa set out to become a global player, education policy had to grapple with a competing imperative of progress towards the research, innovation and economic growth. Subsequently education policies post-1994 demonstrated a tension between the local imperative of equity and redress and the global imperative of competitiveness and economic development and (Kraak 2001; Bundy 2006).

With the basic skills shortage and high illiteracy in post-apartheid South Africa, policy emphasis has been on undergraduate levels and first entrants into higher education.

¹ Black in this paper is used to denote African, Coloured and Indian students.

Doctoral education was initially overlooked by both policy-makers and the research fraternity. It is only since 2006/7 that national policies have begun to view the doctorate as distinct from other postgraduate degrees (Backhouse 2009). It was argued that despite the acknowledged weaknesses of basic and secondary education in South Africa, the country could not wait until the school system was 'fixed'.² In order to achieve global competitiveness it became necessary to make resources available for innovation, research and skill development at postgraduate level. The Department of Science and Technology (DST) and the National Research Foundation (NRF) assigned a specific role to the Ph.D., as a key driver for economic development (National Research Foundation 2007).

This paper explores how, based on current trends, national policy has straddled the inherent tension between its two main developmental missions, that is, economic growth and equality and redress, in the context of doctoral education; and the impact this has had on historically under-represented groups, in particular black South Africans.

The paper consists of four parts. It begins with a brief discussion on the concept of diversity followed by a short overview of higher education in South Africa, thus providing the conceptual and historical contexts for the paper. It goes on to explore how national policies from 1997 to 2010 have responded to global pressures to develop Ph.D., programmes to provide a diverse labour force for the knowledge economy at the same time as they have attempted to achieve the goals of redress and equity. The paper continues with a quantitative analysis of doctoral graduates in the different disciplines and institutions. It disaggregates these graduation rates according to race and gender in order to assess the extent of diversity in doctoral education. The paper concludes by identifying various factors that affect institutional and students' diversity.

The paper draws on document analysis, such as the 1997 White Paper on Higher Education and various policy statements, as well as on a secondary analysis of three studies of doctoral education in South Africa.³

The first of these studies explored the process and outcomes of educating and preparing doctoral students in 16 PhD programmes in a range of disciplines in various South African universities. This was a qualitative study in which the experiences of PhD programme leaders were interrogated in order to identify the overt and covert factors that contributed to the success of their programmes. It also discussed the extent to which these

² Proceedings of ASSAf Panel on the PhD, October 2009. Pretoria

³ These papers were sponsored by the Academy of Science of South Africa (ASSAf).

factors could be replicated as a means of increasing the number of PhD graduates in South Africa (Herman 2009).

The second study explored the experiences of PhD students in higher education institutions in South Africa. This was a web-based survey of 950 PhD students enrolled in the top 12 PhD-producing universities in 2009 (Herman 2009a).

The third study was a statistical profile of doctoral students in South Africa (Centre for Research on Science and Technology 2009).

On diversity

There are various definitions of diversity. Cultural diversity refers to differences in race, ethnicity, language, nationality, religion, etc, among various groups within a community. In South Africa, the word “diversity” is usually associated with racial diversity. This often overshadows other forms of diversity and discrimination. Hassim and Gouws (1999) argue that the prioritisation of racial exclusion as a dominant interest in South Africa has led to a narrow perspective on equality in education by improving access to education to racially based imbalances thus increasing the exclusion of women from higher education. While there is a significant increase in the number female graduates in the last decade, there is a continuing marginalisation of black women as race intersected with gender (Potgieter 2008).

Van Vught (2007), based on a typology adapted from Birnbaum (1983), distinguishes between external diversity, which refers to the differences between higher education institutions, and internal diversity, which refers to the differences within higher education institutions. Some institutions take the form of multiversity; these are institutions of large size and complexity that embrace different purposes, programmes and consistencies. In this sense, internal diversity correlates negatively to external validity (Birnbaum 1983, 38). While diversity refers to a variety of entities at a specific point in time, differentiation is an active process, which increases the diversity of the system (Van Vught 2007, 1).

In Birnbaum’s typology there are a number of types of differences, such as systemic diversity, relating to differences that can be found between institutions; structural diversity, referring to institutional differences of organisational dimensions resulting from historical and legal foundation; programmatic diversity, referring to institutional differences relating to the degree level, degree area, curricula, mission and services; and constituent diversity, relating to differences in student demographics etc.

Especially pertinent to this paper are systemic diversity, programmatic diversity and constituential or student diversity. Systemic diversity is perceived to be desirable under certain conditions (Clarke, Thomas and Wallace 2001; Teichler 2008). However, Singh (2008) makes the point that systemic diversity takes on a different meaning in South Africa in the context of a history of differentiation based on exclusionary ideology. It could also compromise the other goals of national policies, especially those of equity and fair access.

The worldwide growth in the number of doctoral students has been associated with a more diverse student population. Doctoral students are more heterogeneous in terms of social background, age, level of preparation, study mode (part-time or full-time), nationality, work experience, race and gender (Enders 2004; Pearson, Evans and Macauley 2008; Thompson and Walker 2010). The diversity in the student population leads to an increased demand for diverse programmes and different routes to the PhD.

Kehm (2007, 315) maintains that “doctoral degree-holders are regarded as too valuable a resource to leave their education and training in the hands of academics alone” and calls for a national and even a supranational policy to manage doctoral education. Indeed, doctoral education has already become an object of policy debate and reform across the globe (Nerad and Heggelund 2008). More specifically, Neuman (2002) argues that policy has a critical role to play in encouraging diversity in doctoral education. The next section therefore explores the South African policy context with regard to diversity in doctoral education.

Higher education in South Africa in 1994

In order to understand how diversity has played out in the context of doctoral education in South Africa, it is necessary to describe briefly the evolution of the higher education system since the transition to democracy in 1994. At that time, South African higher education consisted of 36 institutions divided along multiple lines:

- A binary system of university and technikons, representing the traditional split between the “mind” and “head” (Bawa 2008).
- Separate universities based on race or ethnicity. This separated the universities into historically white universities (HWUs) and historically black universities (HBUs). While the HBUs had doctoral programmes on their books, these were extremely inefficient and ineffective as regards graduate education (Bawa 2008).
- Separate universities based on medium of instruction (English or Afrikaans).

- Geographical location of urban or rural universities, whereby most of the rural universities were designated for black students (Nkomo and Schoole 2007).

National policies and plans affecting the diversity of the doctoral population

The main policy objectives of the post-Apartheid society were to develop a single, national, integrated and coordinated system of higher education and to redress the race – and, to a lesser extent, the gender – inequalities created by the legacy of the past.

The National Commission on Higher Education (NCHE) was set up in 1995 to advise the government on the reform and restructuring of higher education. It suggested a single coordinated system of higher education encompassing universities, technikons, colleges and private providers, with programme differentiation rather than institutional differentiation. This allowed every HEI to offer postgraduate degrees. The NCHE called for increased access to higher education as a way of easing the tension between the local priorities for equity and the global demands of development. By raising the level of participation and by increasing the proportion of black students at universities, the NCHE hoped to address the economy's need for a highly trained workforce while simultaneously addressing the legacy of apartheid (National Commission on Higher Education 1996 1.2.2). Scant attention, however, was given to postgraduate studies

White Paper 3 on Higher Education (Department of Education 1997) called for the expansion of “enrolments in postgraduate programmes at the masters and doctoral levels, [in order] to address the [high skills levels] necessary for social and economic development and to provide for the needs of the academic labour market” (section 2.24) as well as for the needs of the “general labour markets” (section 4.56). It prioritised “access of black and women students to masters, doctoral and postdoctoral programmes” (Section 2.91). The White Paper raised concerns about “the attrition and ageing of well-qualified academic staff and the emigration of graduate labour,” the “current low levels of enrolment in and graduation from doctoral programmes” and “gross race and gender inequities ... at the postgraduate level.” It encouraged the “mobility of students nationally and internationally to undertake postgraduate studies” as a means of adding to the skills base (Section 4.56).

The delay in implementing the recommendations of the White Paper created a period that was described as a “policy vacuum” (Department of Education 2001a). At the same time, the government's neo-liberal agenda, the competitive market climate, a new common funding

formula and the loosening of the binary distinction between technikons and universities resulted in a “slow, but sure, move towards uniformity, with technikons increasing their degree offerings both at the undergraduate and postgraduate levels” (Department of Education 2001).

In 2000 the Size and Shape task team was asked to review the state of higher education. While the White Paper recommended programmatic diversity, the Size and Shape report recommended a diversified higher education system based on institutional differentiation. It proposed a new three-tiered institutional landscape (Council on Higher Education (CHE) 2000):

1. Institutions which constitute the bedrock of the higher education system, offering quality undergraduate programmes, limited postgraduate programmes up to a taught masters level.
2. Institutions whose orientation and focus is quality undergraduate programmes, comprehensive postgraduate taught and research programmes up to the doctoral level, and extensive research capabilities (basic, applied, strategic and developmental) across a broad range of areas. In these institutions a minimum of 5% of Full Time Equivalent (FTE) students should be at masters and doctoral level.
3. Institutions whose orientation and focus is quality undergraduate programmes, extensive postgraduate taught and research programmes up to the masters level, selective postgraduate taught and research programmes up to the doctoral level, and select areas of research (basic, applied, strategic and developmental). In these institutions a minimum of 10% of FTE students should be at masters and doctoral level.

These recommendations were rejected in the National Policy of Higher Education (NPHE) of 2001 (Department of Education 2001). There was a concern that the separation between teaching universities and universities that can award higher degrees would entrench the apartheid legacy of the knowledge divide and would introduce “an element of rigidity, which will preclude institutions from building on their strengths and responding to social and economic needs, including labour market needs, in a rapidly changing regional, national and global context.” (Section 4.2.1)

One of the aims of the NPHE was the restructuring of the HE system through mergers and incorporations. The rationale for the mergers, *inter alia*, was to achieve economies of scale and to create new institutions with new identities that transcended their racial and ethnic

institutional history (Jansen, et al. 2002). The new HE landscape consisted of 23 institutions, namely 11 traditional universities that focused on research and a mix of discipline-based and professional degree qualifications; six universities of technology that offered a mix of technological, vocational and professional programmes leading to a certificate, diploma or degree; and six comprehensive universities that combined both types of institutions. In Birnbaum's typology, the last of these could be described as multiversity.

In order to encourage productivity in institutions with weak research cultures, such as HBUs or technikons, the NPHE proposed special block grants for research support.

The NPHE continued the binary divide between technikons and universities but allowed each type of institution to offer programmes outside their traditional functions. Universities could offer professional diplomas, and technikons could offer postgraduate degrees. After much pressure from the technikons, their status was changed in 2004 to universities of technology (UoTs). This has reduced institutional diversity and the "academic drift" has undermined programme differentiation.

One of the priorities of the NPHE was to increase postgraduate enrolment and graduation rates since it was observed that "even with the current small enrolments, drop-out rates [were] high and completion rates [were] slow" (Section 5.3). The short-term goals were to grow the efficiency of doctoral outputs from 0.8% of the total annual output of graduates to 1% of the total annual output of graduates. The NPHE also encouraged HEIs to recruit postgraduate students from the rest of Africa and in particular from the Southern African Development Community (SADC) and other developing countries. To ease the process, the NPHE declared that "postgraduate students, irrespective of their countries of origin, would be treated as South African students for subsidy purposes" (Section 5.3). The NPHE also required institutions to increase the access of black, women and disabled students in masters and doctoral programmes, in particular, in business and commerce and science, engineering and technology according to an agreed quota, or to indicate a plan for doing so (Section 5.4.3.2).

After the year 2000 the higher education policies appear to have shifted decisively towards the global. There was a more focused awareness among policy-makers that research and innovation, especially in science and technology, were crucial if South Africa were to be able to position herself as a meaningful player in the global economy. In 2002, the newly established Department of Science and Technology (DST) adopted the National Research and

Development Strategy (NRDS), which was aimed at raising the national investment in research and development (Department of Science and Technology 2002).

The context for the NRDS, as described in the introduction given by the then President of South Africa, Thabo Mbeki, was the need to develop human resources to create wealth in the context of globalisation (Department of Science and Technology 2002). The strategy aimed at increasing the number of people with skills in science, engineering and technology and at redressing the skewed racial and gender profile of this skills base. The NRDS raised concerns about what has been described as “frozen demographics” that is, the context whereby the “human resources for science and technology [were] not being adequately renewed”, and “an overwhelmingly white, male and ageing scientific population [was] not being replaced by younger groupings more representative of [South African] demographics” (p.15). This, coupled with high attrition rates and emigration of academics, resulted in skills shortages and a growing tendency for South Africa companies to source research outside the country.

The NRDS called for direct intervention to address these concerns. There was no discussion of a specific role for the PhD in this agenda, but there was a general call to increase the number of matriculants, in particular blacks and women, with appropriate pass levels in mathematics and science, and to attract these matriculants to involve themselves in postgraduate degrees in science and engineering.

From 2007, the PhD occupied a more prominent position in policy debates. National policy-makers began to view the PhD as a means to develop the necessary high skills levels and to facilitate South Africa’s transformation into a knowledge-based economy.

The National Research Foundation (NRF) was the key institution charged with promoting science:

Responding to challenges facing the South African National System of Innovation (NSI) the NRF identified as a key driver for all its programmes, “the production of *large numbers of high quality* PhDs that are required to provide the bedrock for an innovative and entrepreneurial knowledge society” (National Research Foundation 2007, 8) (emphasis in original).

The NRF sponsors about 25% of all doctoral students. In keeping with national targets of redress and building a more representative research community, the NRF allocated 60% of its total funds to black PhD students, 40% to women, 80% to South African citizens and 20% to

international students (National Research Foundation 2007). However, interviews with NRF officials suggested that the NRF was able to fill only 70-80% of its funding quotas for black South Africans as there were not enough suitable candidates.⁴

The DST's Ten-Year Innovation Plan proposes indicators as a guide for the country research and technology enablers (Department of Science and Technology 2007). The plan made it clear that human capital development, research and knowledge generation are core elements in the transformation to a knowledge-based economy. The plan's target was therefore to increase the number of PhD graduates from a rate of 1,200 a year in 2005 (of whom 561 were in science, engineering and technology (SET)), to 6,000 a year in 2018 (of whom which 3,000 would be in SET). The rationale for this indicator was the low PhD production rate in South Africa (23 PhDs a year per million of the population) in comparison to rate in other developing countries, such as Taiwan, Brazil and India. In order to achieve this increase, the plan recommended different routes for a PhD in addition to the traditional approaches; these included practice-based doctorates and professional doctorates. The plan paid very little attention to diversity issues and redress.

In 2007, the NRF, supported by the DST, launched the South African PhD Project, which sought to increase the numbers and diversity of appropriately skilled PhD graduates and to align the project with the country's National System of Innovation (NSI). The goal of the project goal was to secure the human capital to “. . . position South Africa as a leader in knowledge production in all fields of scientific research, including social science, humanities, law, natural sciences, and engineering and technology.”⁵

Interestingly, at the same time as the DST and the NRF envisaged the PhD as a driver for economic development, the Department of Education issued its Higher Education Qualifications Framework (HEQF), which required qualifications, including doctoral degrees, to be registered (Department of Education 2007). The HEQF viewed the PhD degree as training for academia. According to the HEQF, the graduate is required to “demonstrate high-level research capability and make a significant and original academic contribution at the frontiers of a discipline or field” and “must be able to supervise and evaluate the research of others in the area of specialisation concerned” (Department of Education 2007, 29). The HEQF was the first policy document that tried to answer the question “What is a PhD?”.

⁴ Interview April, 2009.

⁵ *A drive to increase PhD qualifications in South Africa*. NRF Media releases and news, 5 November 2007. http://www.nrf.ac.za/media/2007_11_05.stm

However, it demonstrated the ambivalence among policy-makers with regard to the role of a PhD and the lack of a common agenda.

In 2009, the NRF and the DST commissioned the Academy of Science of South Africa (ASSAf) to conduct a series of studies on the status and place of the doctorate in South Africa. The purpose of these studies was to provide evidence-based advice on how to expand the quality and quantity of PhDs in order for South Africa “to be a serious competitor in the global knowledge economy” (Academy of Science of South Africa 2009). The studies initiated the first national debate on the PhD that has the aim of informing future policy (Herman, 2010).

The policy-makers’ attention to the PhD, coupled with a funding policy that incentivises HEIs to increase their throughput, have heightened the institutional focus on the degree. A question that remains is: “What impact will this have on equity and redress?” Significantly, in the latest NRF Bursary and Scholarship Rules for 2010/11 there is no funding preference to black or female students in the PhD category. The allocation of doctoral bursaries is formally divided between South African (80%), other African (15%) and rest of world (5%) (National Research Foundation 2009). However, it is claimed that the NRF favourably considers applications from black and female students.⁶

In summary, this review of the national policy on higher education identifies two distinct policy positions with regard to the PhD. From 1997 to 2007 there was very little reference to the PhD as a separate degree from a masters and the emphasis was on widening access to postgraduate degrees to under-represented groups, in particular in science and technology. From 2007 the main agenda of the policy was to make the PhD a key driver for economic development and global competitiveness. It is evident that with the growing policy focus on knowledge-based economy, competitiveness, high skills and development, less emphasis has been given to issues of equity and redress, even though this local imperative is still a dominant policy discourse. The next section therefore explores the extent to which doctoral education in South Africa resonates with the policy framework.

Student diversity in doctoral education

Following the surge in tertiary education opportunities coupled with the opening of all the country’s universities to all sections of the population, the annual number of South African

⁶ Private communication with NRF official, 28 March 2010.

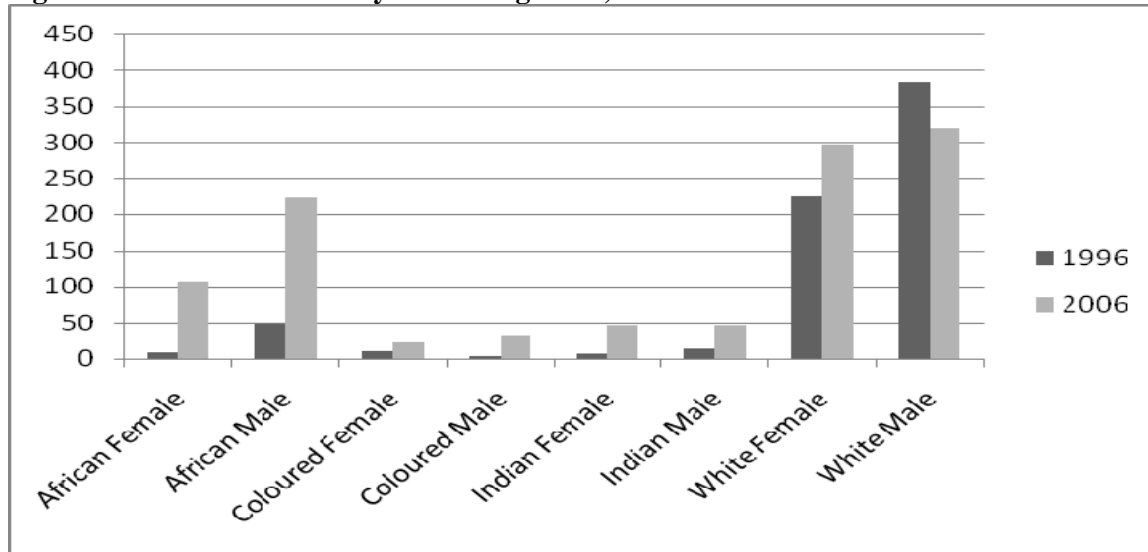
university graduates has doubled since the end of Apartheid in 1994. However, the percentage of doctoral graduates of all university students remained static at 1%, or 4% of all postgraduate students.

In 2007 South Africa produced 1,274 PhD graduates. The highest percentage of graduates was in social sciences (34%), which, with humanities (20%), accounted for more than half of all PhD graduates. Natural and agricultural sciences accounted for 28%, health sciences 10%, and Engineering sciences, materials and technology only 7% - the lowest percentage of graduates.

The number of PhD graduates increased significantly between 1996 (699 graduates) and 2006 (1,100 graduates). Figure 1 presents a comparative analysis between PhD awards in 1996 and 2006 and indicates how far South Africa has moved towards equity goals. While 87% of all doctoral degrees in 1996 were awarded to white students, the profile changed dramatically 10 years later but was still not representative of the total population. For example, 56% of all doctoral graduates in 2006 were still whites (although whites made up only 9.2% of the total population), while the number of African graduates represented 30% of the total (although African made up 79.5% of the total population). The remaining number of graduates included Indians (8%) and Coloureds (5%). There was a slower but still important shift in the percentage of PhDs awarded to women (from 35% of graduates in 1996 to 42% of graduates in 2006), and especially of African women (from 1% to 10% over the same period).

However, the increase in the number of African PhD graduates was attributed largely to an increase in the graduate numbers from SADC and other African countries. Table 1 indicates that, in 2006, 61% of the African male graduates and 48% of the African female graduates were not South Africans. This means that institutions have been achieving their equity quotas partly by recruiting non-South African PhD students. While recruiting international students is a policy priority and can help the country to achieve a competitive edge, the issue here is the lack of redress to historically under-represented groups in South Africa. Furthermore, it is also imperative to acknowledge the risk of a brain drain that denudes other African countries of highly qualified graduates to the benefit of South Africa and its universities (Badat 2008 in MacGregor 2008).

Figure 1 Doctorate awards by race and gender, 1996-2006



Source: 2006 - HEMIS 2006 Table 2.13 for universities; 1996 – Bailey and Cooper (2003)

Table 1 Number of total and non-South African doctoral graduates in 2006 at South African universities by race and gender

Race/Gender	Total	Non-SA	% of non-SA
African women	107	51	48%
African men	224	137	61%
Coloured women	24	1	4%
Coloured men	33	2	6%
Indian women	45	6	13%
Indian men	46	17	37%
White women	298	36	12%
White men	320	55	17%
Unknown	3		

Source: HEMIS 2006 Table 2.13 for universities

It is also evident that the equity targets are not achieved equally across study subjects. The CREST (2009) study shows that while women are well represented in health sciences and social sciences (which includes education), only about a third of the graduates in natural and agricultural sciences and in humanities are women. In fact, there was a decrease in the proportion of female PhDs in the natural and agricultural sciences from 41% in 2000 to 36% in 2007. In engineering sciences, materials and technology, the proportion of women graduates remains extremely low (15% in 2007) (Table 2).

In terms of race, a significant improvement can be observed, with the pool of black graduates increasing in all fields. However, as mentioned earlier, this increase can to a large

extent be attributed to the intake of students from elsewhere in Africa. While 43% of the graduates in natural and agricultural sciences in 2007 were black, only 44% of this number were South African. The same applies in engineering sciences, materials and technology, with 40% of graduates being black, but only 36% of these being South African. On the other hand, however, the percentage of black South African graduates in the humanities and in health and social sciences had reached between 51% and 64% (Table 3).

Table 2 Profiles of doctoral graduates in terms of selected demographic indicators by broad field, 2000 and 2007

Broad field	% Female students		% Black students		% SA students	
	2000	2007	2000	2007	2000	2007
Natural and agricultural sciences	41%	36%	26%	43%	81%	68%
Engineering sciences, materials and technology	17%	15%	16%	40%	91%	70%
Health sciences	59%	62%	31%	39%	87%	76%
Social sciences (including education)	48%	51%	33%	53%	95%	78%
Humanities (including religion)	27%	32%	34%	45%	91%	67%
Total	41%	42%	30%	46%	89%	73%

Source: CREST (2009)

Table 3 Profile of doctoral graduates by race, gender, nationality and broad field, 2007

	Natural and agricultural sciences		Engineering sciences, materials and technology		Health sciences		Social sciences (including education)		Humanities (including religion)	
	% female	% SA	% female	% SA	% female	% SA	% female	% SA	% female	% SA
Black	21%	44%	22%	36%	65%	63%	41%	64%	24%	51%
White	47%	87%	11%	92%	60%	89%	63%	94%	38%	79%
Total	36%	68%	15%	70%	62%	79%	51%	78%	32%	68%

Source: CREST (2009)

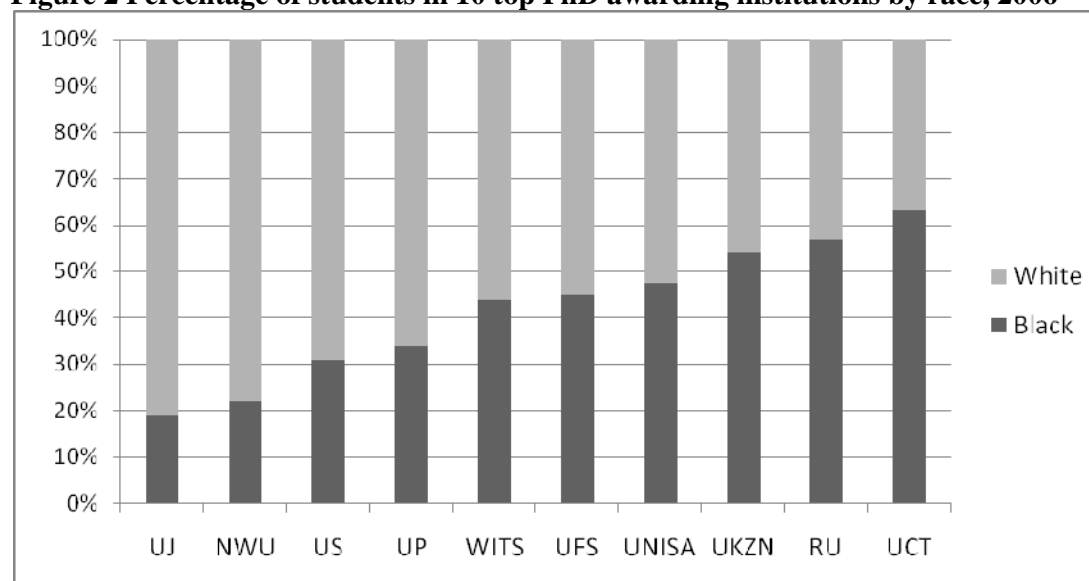
Furthermore, the equity targets are not achieved equally across institutions. It is evident that former Afrikaans-medium universities, namely, University of Johannesburg (UJ), North-West University (NWU), University of Stellenbosch (US) and to a lesser extent University of Pretoria (UP) lag behind their former English-medium counterparts in achieving diversity (Table 4), especially racial diversity (Figure 2).

Table 4 Student percentages in top 10 PhD awarding institutions by gender and race, 2006

HEIs	Former language medium	Male	Female	Black	White
University of Stellenbosch (US)	Afrikaans	66%	34%	31%	69%
North West University (NWU)	Afrikaans	65%	35%	22%	78%
University of the Free State (UFS)	Afrikaans	63%	37%	45%	55%
University of the Witwatersrand (WITS)	English	57%	43%	44%	56%
University of Pretoria (UP)	Afrikaans	56%	44%	34%	66%
University of KwaZulu-Natal (UKZN)	English	56%	44%	54%	46%
Rhodes University (RU)	English	54%	46%	57%	43%
University of Johannesburg (UJ)	Afrikaans	52%	48%	19%	81%
University of South Africa (UNISA)	Distance/English	52%	48%	48%	53%
University of Cape Town (UCT)	English	47%	53%	63%	37%

Source: HEMIS 2006 Table 2.13 for universities

Figure 2 Percentage of students in 10 top PhD awarding institutions by race, 2006



Source: HEMIS 2006 Table 2.13 for universities

These findings are supported by a report commissioned by the NRF which analyses the demographic characteristics of NRF grant-holders in one focus area, that is, Education and Challenges for Change, 2003-2006 (National Research Foundation 2009a). The report reveals that all the available grants were not utilised by members of the previously disadvantaged groups for whom they were meant. Some 45% of the grant-holders were black compared to

55% who were white. The report also indicates that funded programmes benefited more women (68% of grant-holders) than men (32%), especially white women, who accounted for the highest number of researchers of all race and gender categories in 2004 and 2006. The report concluded that while the NRF funding policy has improved gender equity, funding opportunities have remained racially skewed in favour of whites.

Institutional diversity in doctoral education

Table 5 makes it clear that despite policy intentions to abolish the knowledge divide between Historically White Universities (HWUs) and Historically Black Universities (HBUs), and despite the “academic drift” of the Universities of Technologies (UoTs), 90% of all PhDs in 2007 were awarded at HWUs or at the newly established universities that had merged with HWUs.

Table 5 Universities in terms of their share of doctoral graduates, 2007

University	Institution type	2007	
		N	%
University of Pretoria	HWU	170	13%
University of Stellenbosch	HWU	153	12%
University of Cape Town	HWU	142	11%
University of the Witwatersrand	HWU	134	11%
North West University	HWU/MERGED	124	10%
University of Kwa-Zulu Natal	HWU/MERGED	106	8%
University of South Africa	DISTANCE/HWU	78	6%
University of the Free State	HWU	77	6%
University of Johannesburg	HWU/MERGED	75	6%
Rhodes University	HWU	48	4%
University of Western Cape	HBU	41	3%
Nelson Mandela Metropolitan University	HUW/MERGED	35	3%
University of Zululand	HBU	20	2%
University of Limpopo	HBU	17	1%
Tshwane University Technology	UoT	12	1%
Central University of Technology, FS	UoT	11	1%
Cape Peninsula University of Technology	UoT	10	1%
University of Fort Hare	HBU	10	1%
University of Venda	HBU	6	0%
Durban University of Technology	UoT	5	0%
Total		1274	

Source: CREST (2009)

The analysis of the NRF funding for 2003-2006 also reveals that the funding is skewed in favour of academic universities, which received 4.5 times more NRF funding than universities of technology and thus had a much larger slice of the pie (National Research Foundation 2009a, 22). The funding relates to the number of researchers funded by the NRF at each higher education institution.

The NRF report also shows that HBUs have fewer grantees than HWUs – with one exception, namely the University of the Western Cape (UWC). In 2006, for example, HWUs received almost double the number of grants awarded to the HBUs and the merged universities. It is argued that while political pressure and institutional demand encourage universities to widen access to previously under-represented groups, HWUs have established support programmes to facilitate their participation. At the same time, HBUs are widening access to poor and academically weak black students in order to ensure institutional survival (Jansen 2010). This perpetuates the knowledge divide between the HBUs and the HWUs.

It is evident that the UoTs and HBUs are lagging behind the HWUs in terms of the number of researchers they have, as well as the research tradition that they have established and the PhD graduates they produce. This is a clear example of the tension between the democratic discourse of equity and redress and between the discourse of competition and economic development. The policy dilemma is whether South Africa should continue to spread the funding across too many institutions and allow each university to offer a PhD or whether the government should choose a few universities and support them so they become world-class institutions. While this debate takes place in different countries (Kendall 2002), it is, in the South African context, a political decision, as this choice can re-ignite the history of racial discrimination and knowledge divide.

There is a view that if South Africa is to become globally competitive it may be necessary to make this hard decision and allow the previously white universities with strong research traditions to continue to grow and produce “top class” research, with previously black universities reverting to teaching institutions. Such a step would exacerbate inequality and further marginalise black South Africans. The counter-view is that, based on the slow but inevitable transformation of most universities’ demographics in South Africa, all the universities will eventually become black majority universities. Therefore, strategic funding formulae should be considered in order to effect general improvement where it is most needed.

Explaining under-representation of black South African graduates

Two questions remain:

- “Why, in spite of a succession of policy documents that attempt to shift the demographic profile and to abolish the binary divide, does knowledge production at the PhD level remain skewed towards white researchers and historically white universities 16 years after the abolition of apartheid?”
- “Why, importantly, is there a relatively low growth in the number of black South African PhD graduates?”

The next section will explore three main factors that can shed light on black South Africans’ persistent under-representation in doctoral education.

The first factor to be considered is the chronically dysfunctional school system. Less than 50% of those who started in Grade 1 in 1995 completed all 12 years of schooling, and about third of these failed their Grade 12 examinations. Of those who passed, only 16% gained university passes and only 5% or less passed mathematics at the advanced level that would allow them entry into subjects with a high exchange value in the global economy, such as information technology, engineering, natural sciences and medicine. Most of these 5% were white students, with a small percentage of black middle class, leaving most black South African students behind in this critical juncture (Jansen 2010). It is evident that there is initially a small pool of potential black students that can pursue higher degrees in the desired subjects.

The second factor is insufficient funding. The NRF funding of a PhD is simply not enough for full-time studies. In 2009 a PhD bursary was R40,000 a year (or approximately US\$5,000). This was significantly increased in 2010 to R55,000 (approximately \$7,500) which is still not enough to support the average South African doctoral student, who tends to be older than his equivalent in other countries and to have a family to support. This is especially the case for most black South African students, who have family commitments and responsibilities more onerous than those of most white South Africans:

Black South African students, especially women, are coming here, working hard, but going away for the weekend, so are not here for long enough really to get the work done. Asking for more money, getting what everyone else is getting, and when you start to ask questions you learn about their family problems, about students trying to use bursary

money to feed their families and we just don't have money to be able to do that. We're talking about totally different financial needs. (Interview with a PhD programme leader)

Lack of sufficient funding has resulted in many black students working part time, or even full time, while they are studying. Often their studies become secondary to their employment responsibilities (Portnoi 2009).

The third factor is the high drop-out of black South Africans, either for institutional or for individual reasons. While high attrition from doctoral programmes is not unique to black South Africans, there are additional issues that act as barriers to their success:

- It is perceived that some black South African students do not have the skills to do a PhD. This is often blamed on the schooling system in South Africa:

Compared with our own students, students from other African countries have a better background when they come here. We find that right through, they have a better statistical training, they have a better understanding... somehow there is just something lacking; our students have more to catch up than students from elsewhere in Africa. And I found it such a pity, because the potential is there, and it's not the students' fault: it is the schooling, the background. Students from private companies are almost all white and come from better schools, while black South African students usually come from a disadvantaged background... And there is no excuse for it because some of our students from Malawi, who have schools under trees, have a better understanding than students from some of our schools. (Interview with a PhD programme leader)

- There is a view that pursuing an academic career is not particularly attractive for black South Africans. Firstly there are very few academic role models (Jansen 2010). Secondly, the survey shows the almost 50% of black South African PhD students come from homes where neither parents had any schooling and only 16% come from homes where at least one parent has a postgraduate degree and very few with a PhD (Herman 2009a). This means that the overwhelming majority of black students are the first in their families to enrol in a doctoral programme; they have a very poor understanding of the rigours of higher education and the culture of academia. Thirdly, a number of PhD programme leaders commented that considering the background of many black South African a PhD is often not a priority:

There is a sense in many black South Africans asking: "Why a PhD?" Many other African students come to do a PhD, they really want it, but most of our students have to be convinced that a PhD is something worth doing. It does not seem to have a value.

People would point to you and say that you have a PhD, but you are still poor. Maybe this has got to do with our legacy for black people that education is going to free us from poverty. If it doesn't, what is the purpose? (Interview with a PhD programme leader)

- Some students don't finish their degrees because they get job offers from industry. Companies lure promising black South African students into jobs in order to fill their equity quotas, and this often happens when the students' families are pressurising them to earn a decent salary:

Another issue that I come across time and time again, particularly in poorer communities, is that there is a lot of parental pressure for students to get jobs even after BSc or Honours and Masters. Because the investment of the family is quite substantial in getting the student that far, they are expecting a return and they can't wait the entire eight-year period necessary to complete a PhD. (Interview with a PhD programme leader)

- Then there is the impact of institutional culture as well as overt and covert expressions of racism (Portnoi 2009). Soudien (2010) argues that many black students drop out of doctoral programmes because of the discomfort they feel in HWUs. This discomfort manifests itself in feelings of disorientation, dissonance and alienation. Disorientation is felt by black students who struggle to navigate their way through the physical, emotional and administrative space of HWUs. The sense of dissonance emanates from a clash of cultures, as the black students become aware of "how little their own social and cultural universe, in which they might have even held positions of high status, count in the new space of the university" (Soudien 2010, 188). Students who experience dissonance cannot fully engage with an intellectually demanding activity such as doctoral studies. As for alienation, Soudien refers to Thaver's (2006) concept of "at home" and argues that black students who attend HWUs hardly feel "at home" at these institutions. They cannot "identify with the university and what it stands for, they resent what is taught, how it is taught and by whom" (Soudien 2010, 125).

Conclusion – the elusive equity

In this paper I argue that as the policy focus shifts towards the global viewing the PhD as a driver of economic development, less emphasis has been given to issues of equity and redress in doctoral education. While there are parallel policy demands for increased access to

underrepresented group, funding opportunities, and new institutional forms as the result of mergers, the fundamental knowledge divide between various universities remains, and there are also persistent inequalities in the profile of the graduates. Significantly, black South African students are under-represented in subjects that will afford them the opportunity to become players in the global economy.

Scott (2010) points out that in contrast to most developed countries, educational inequalities in South Africa disadvantage the majority of the population and this can have a devastating effect on the country's economic growth. Diversity in doctoral education therefore concerns not only social cohesion and social justice – which are themselves crucial issues – but also the economy.

There is an array of strategies that need to be employed in order to increase the participation of black South Africans in doctoral programmes. These include mobilising funding adequate to meet the particular circumstances of black South Africans; fixing the school system to create a larger pool of potential students; identifying promising students and providing them with mentorship and support from school to doctorate level; reducing the drop-out rate of those who eventually make it into higher education; and, most importantly, changing institutional culture. It is evident that in order to ensure black South Africans' access to and retention in high-level doctoral programmes it is necessary to “entrench diversity as both ideology and practice” in higher education institutions (Salo 2010, 306).

Acknowledgement

I would like to thank Professors Mokubung Nkomo, Johan Beckmann and Chika Schoole for their valuable comments on a draft version of this paper.

References

Academy of Science of South Africa. *The PhD study, The national capacity for the production of highly-trained, top quality postgraduate students, Proposed consensus study*. Unpublished document, 2009.

ASHE Higher Education Report. *The changing landscape and the compelling need for diversity*. Wiley InterScience, 2009, Vol 35(1): 1-26.

Backhouse, Judy P. *Doctoral education in South Africa: Models, pedagogies and student experiences*. Johannesburg: Unpublished PhD thesis, School of Education, University of the Witwatersrand, 2009.

Bailey, T, and D Cooper. “Profile of doctoral awards in South Africa: A case study of the 1996 university cohort.” *Society in Transition* 34, no. 1 (2003): 104-128.

- Bawa, Ahmed. "South Africa." In *Towards a global PhD? Forces & forms in doctoral education worldwide*, by Maresi Nerad and Mimi Heggelund. University of Chicago Press, 2008.
- Birnbaum, Robert. *Maintaining diversity in higher education*. San Francisco: Jossey-Bass Inc., Publishers, 1983.
- Bitusikova, Alexandra. "New challenges in doctoral education in Europe." In *Changing practices of doctoral education*, by David Boud and Alison Lee, 200-210. Routledge, 2009.
- Bundy, Colin. "Global patterns, local options? Changes in Higher Education internationally and some implications for South Africa." *Kagisano*, no. 4 (Winter 2006): 1-20.
- Casey, Bernard H. "The economic contribution of PhDs." *Journal of Higher Education Policy and Management* 31, no. 3 (August 2009): 219-227.
- Centre for Research on Science and Technology. *Doctoral students in South Africa: A statistical profile based on HEMIS data*. A report commissioned by the ASSAf Panel on the PhD, Stellenbosch University: CREST, 2009.
- Clarke, John, Paul Thomas, and Iain Wallace. "How should diversity in the Higher education system be encouraged." Position Paper developed for the Business/Higher Education Round Table Summit Task Force, Australia, 2001.
- Council on Higher Education (CHE). *Towards a new higher education institutional landscape: meeting the equity, quality and social development imperatives of the twenty-first century*. Report of the Size and Shape Task Team, Pretoria: CHE, 2000.
- Department of Education. *Education in South Africa, Achievements since 1994*. Pretoria: DoE, 2001a.
- Department of Education. *Education White Paper 3. A programme for the transformation of higher education*. Pretoria: DoE, 1997.
- Department of Education. *Higher Education Qualification Framework (HEQF)*. Pretoria: DoE, 2007.
- Department of Education. *National plan for higher education*. Pretoria: DoE, 2001.
- Department of Education. *Transformation and restructuring: A new institutional landscape for higher education*. Pretoria: DoE, 2002.
- Department of Science and Technology. *South Africa National Research and Development Strategy (NRDS)*. Pretoria: DST, 2002.
- Department of Science and Technology. *Ten year innovation plan*. Pretoria: DST, 2007.
- Enders, Jürgen. "Research training and careers in transition: A European perspective on the many faces of the PhD." *Studies in Continuing Education* 26, no. 3 (2004): 419-429.
- Hassim, Shireen, and Amanda Gouws. "Gender, citizenship and diversity." In *Diversity and unity: The role of higher education in building democracy*, by M Cross, N Cloete, E Beckham, A Harper, J Indiresan and C Musil, 80-106. Cape Town: Maskew Miller Longman, 1999.
- Herman, Chaya. *Exemplary PhD programmes in South Africa: A qualitative report of constraints and possibilities*. Unpublished report commissioned by the ASSAf Panel on the PhD, 2009.

Herman, Chaya. *Survey of doctoral students in South African universities*. Unpublished report commissioned by the ASSAf Panel on the PhD, 2009a.

Herman, Chaya. *Escalating the production of quality PhDs in South Africa – Pipedream or possibility?* Unpublished paper. HESA Research and innovation conference. 11-12 March 2010. CSIR Conference centre, Pretoria.

Jansen, Jonathan D. “Moving on up? The politics, problems, and prospects of universities as gateways for social mobility in South Africa.” In *The next 25 years: Affirmative action in education in the United States and South Africa*, by David L Featherman, Martin Hall and Marvin Krislov, 129-136. Ann Arbor: University of Michigan, 2010.

Jansen, Jonathan D, Nyiko Bandi, Sibulo Chalufu, Mankolo Lethoko, Chika Schoole, and Venitha Soobrayan. *Mergers in higher education, Lessons learned in transitional contexts*. Pretoria: University of South Africa, 2002.

Kehm, Barbara M. “Quo Vadis doctoral education? New European approaches in the context of global changes.” *European Journal of Education* 42, no. 3 (2007): 308-319.

Kendall, Gavin. “The crisis in doctoral education: a sociological analysis.” *Higher Education Research & Development* 21, no. 2 (2002): 131-141.

Kraak, Andre. “‘Academic drift’ in South African universities of technology: Beneficial or detrimental?” *Perspectives in Education* 24, no. 3 (2006): 135-152.

Kraak, Andre. “Policy ambiguity and slippage: Higher education under the new state, 1994-2001.” In *Policy implementation since 1990*, by Andre Kraak and Michael Young, 85-120. Pretoria: HSRC Publishers, 2001.

Kruss, Glenda. “Employment and employability: Expectations of higher education responsiveness in South Africa.” *Journal of Education Policy* 19, no. 6 (2004): 673-689.

MacGregor, Karen. “South Africa: Challenges of equity, ageing, expansion.” *University World News*. 14 December 2008.

<http://www.universityworldnews.com/article.php?story=20081214092139847>

National Commission on Higher Education. *An overview of a new policy framework for higher education transformation*. Pretoria: NCHE, 1996.

National Research Foundation. *Education research funded by the National Research Foundation- Education and the challenges for change status quo 2003-2006*. Report compiled by Dr Lorna Holtman and researchers from the University of the Western Cape (UWC), Pretoria: NRF, 2009a.

National Research Foundation. *Institutional research development programme, IRDP. Programme Framework (2007-2011)*, NRF: Pretoria, 2007.

National Research Foundation. *NRF bursary & scholarship rules, values and distributions FY: 2010/11*. Pretoria: NRF, 2009.

Neuman, Ruth. “Diversity, doctoral education and policy.” *Higher Education Research & Development* 21, no. 2 (2002): 167-178.

Nkomo, Mokubung, and Chika Schoole. “Rural-based universities in South Africa: Albatrosses or potential nodes for sustainable development?” *International Journal of Sustainability in Higher Education* 8, no. 2 (2007): 234 - 246.

Peters, Michael, A. “Three forms of knowledge economy: Learning, creativity and openness.” *British Journal of Educational Studies* 58, no.1 (2010): 67-88.

- Portnoi, Laura. "To be or not to be an academic: South African graduate students' vocational choices." *International Journal of Educational Development* 29 (2009): 406-414.
- Potgieter, Cheryl. "The intersection of race and gender in higher education." *National Higher Education Conference: Institutional cultures and higher education leadership: "Where are the women?"*. Cape Town: HERS-SA, the Department of Education, The Council on Higher Education (CHE), and Higher Education South Africa (HESA), 2008.
- Salo, Elaine. "Beyond equity committees and statistics." In *The next 25 years: Affirmative action in education in the United States and South Africa*, by David L Featherman, Martin Hall and Marvin Krislov, 297-308. Ann Arbor: University of Michigan, 2010.
- Scott, Ian. "Who is 'Getting through' in South Africa? Graduate output and the reconstruction of the formal curriculum." In *The next 25 years: Affirmative action in education in the United States and South Africa*, by David L Featherman, Martin Hall and Marvin Krislov, 229-236. Ann Arbor: University of Michigan, 2010.
- Singh, Mala. "Valuing differentiation as a qualified good: the case of South African higher education." *Higher Education Policy* 21 (2008): 245-263.
- Soudien, Crain. "Entering the gates of the elect: Obtaining the doctorate in education in South Africa." In, (Eds). *The Routledge doctoral student's companion: Getting to grips with research in education and the social sciences*, by Pat Thomson and Melanie Walker, 116-127. Routledge, 2010a.
- Teichler, Ulrich. "Diversification? Trends and explanations of the shape and size of higher education." *Higher Education* 56 (2008): 349-379.
- Thaver, I. "'At home': Institutional culture and higher education: Some methodological considerations." *Perspectives in Education* 24, no. 1 (2006): 15-26.
- The Republic of South Africa. *South Africa's national research and development strategy*. Pretoria: RSA, 2002.
- Thomson Pat, and Melanie Walker. The changing nature of the doctorate and doctoral students. In, (Eds). *The Routledge doctoral student's companion: Getting to grips with research in education and the social sciences*, by Pat Thomson and Melanie Walker, 9-26. Routledge, 2010.
- Välilä, Jussi and Hoffman David. "knowledge society discourse and higher education." *Higher Education* 56 (2008): 265-285.
- Van Vught, Frans. "Diversity and differentiation in higher education systems." *CHET anniversary conference*. Cape Town, 2007. 1-22.
- Warhurst, Christ. "The knowledge economy, skills and government labour market intervention." *Policy Studies* 29, no. 1 (2008): 71-86.