

# **Expanding doctoral education in South Africa – pipeline or pipedream?**

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## **Abstract**

The purpose of this paper is to discuss both the status of the PhD in South Africa and the feasibility of the country's aspiration to increase by fivefold the production of PhDs by 2025. Based on the first empirical studies on doctoral education in South Africa, it is argued that in order to move towards this target an expanded and coordinated effort is necessary. This includes the removal of barriers that hinder the expansion of the South African higher education system. In particular the paper highlights insufficient funding, policy that stands in the way of expansion, scarcity of students and limited supervisory capacity, lack of recognition in the value of the doctorate and higher learning as well as limited and inadequate partnerships. The main question is whether South Africa can achieve the desired outcome by following international trends or whether the expansion target is merely a pipedream.

Key words: doctoral education, education policy, knowledge economy, South Africa

## **Introduction**

Economic theorists of the knowledge economy argue that knowledge is crucial to national economic growth and increased prosperity (Powell & Snellman, 2004). In this context, doctoral education is geared not only towards academic careers but also towards producing knowledge outside academe. Subsequently, South Africa, in line with global trends, has embarked on initiatives whose aims are to enhance the contribution of doctoral graduates to national economic growth and innovation (Nerad, 2009). The Department of Science and

Technology (DST) and the National Research Foundation (NRF) set a target of a fivefold increase in the annual number of PhD<sup>i</sup> graduates between 2005 and 2025, from 1,200 to 6,000 (NRF, 2007).

The purpose of this paper is to discuss the feasibility of the NRF/DST vision. In the first section of the paper I will explore the international literature in order to identify the structures and strategies that have been put in place around the world in order to expand and diversify doctoral production. This follows with an evaluation of the capacity of the higher education system in South Africa to produce doctoral graduates as well as the likely contribution of South African students studying overseas towards the expansion target. In view of the international literature and the data gleaned from empirical studies on the South African doctorate, I will suggest a number of barriers to expanding the production of PhDs in South Africa.

The main data source for this paper is three studies of doctoral education in South Africa commissioned by the Academy of Science of South Africa (ASSAf). The first of these studies explored the process and outcomes of educating and preparing doctoral students in 16 exemplary PhD programmes in a range of disciplines in various South African universities (Herman, 2009). This qualitative study discussed the extent to which these factors could be replicated as a means of increasing the number of PhD graduates in South Africa.

The second study was a web-based survey of 950 PhD students enrolled in the top 12 PhD-producing universities in 2009 (Herman & Yu, 2009).

The third study is a statistical profile of doctoral students in South Africa (CREST, 2009). These were the first comprehensive studies of the doctorate in South Africa.

## **Expanding doctoral production – International perspective**

The literature indicates that as institutions and countries join the worldwide trend of reforming their knowledge systems and expanding their postgraduate education a few common processes emerge:

- There is a shift away from the traditional PhD model, the apprenticeship model (Ulhøi 2005), towards a more formalised structure of doctoral education and the “American model” of mandatory coursework.
- There is a growing diversity in the models and purposes of the doctorate. Universities seem to offer two types of degrees, namely, the traditional “research doctorate” which serves as a pool of recruitment into the academy, and a “professional doctorate” which is being developed as an upwardly mobile qualification for employed professionals studying part time for their degrees (Kehm 2009, 225). Other types of doctorates include PhD by publication, practice-based doctorates (usually in the performing arts), doctorates in which research work is carried out in cooperation with an enterprise, and fast-track doctorates that allow access to doctoral programmes after the completion of Bachelor’s degrees (Park, 2007; Kehm, 2007). Different models of doctoral programmes have been developed, with special emphasis on interdisciplinary or multidisciplinary models.

European countries have also followed the US lead and are organising doctoral education on the lines of different models of graduate schools.

- There is an increasing importance of networks, alliances and public-private partnerships, as well as the rise of the entrepreneurial university. An example is the emergence of "Triple Helix" relationships involving university, industry and government, in which each of the players has a crucial role in knowledge production (Etzkowitz, 2003).

- There has been an internationalisation of the PhD. The USA and the UK in particular recruit international students from Asia and Eastern Europe in fields where research training at their own national levels is declining (Enders, 2004).
- Universities make efforts to provide international experience to postgraduate students (Nerad, 2009).
- Governments are increasing their control of doctoral education through various funding mechanisms. These include the concentrating of funds on “centres of excellence” and targeted programmes and the use of performance-based funding (Neuman, 2002; Enders, 2004). Funding can be given to institutions or students. Some countries concentrate funding on building a cohort of strong research universities.
- There has been a shift towards formalised supervision arrangements (Park 2007). More students now have more than one supervisor or adviser, while there is often a supervisory committee (Nerad, 2009)

It is not my intention to discuss the advantages and disadvantages of these approaches to PhD education. It is, rather, the extent to which South Africa might be able to expand the number of its PhD graduates by borrowing some of these strategies. The next section therefore evaluates the status of the PhD in South Africa and analyses the barriers to expansion.

### **The current state of the doctorate in South Africa**

With the massification of higher education after the transition to democracy in 1994, the annual number of South African university graduates has doubled, from 699 doctoral awards in 1996 to 1,274 in 2007 – a growth of 82% over a 12-year period. However, while South Africa enjoys an increase at undergraduate level, the percentage of doctoral graduates of all university students remains static at 1%, or 4% of all postgraduate students (CREST, 2009). Furthermore, the institutional division of doctoral production is skewed with a

disproportionate burden on the 10 top universities which were responsible for 87% of all doctoral graduates produced in 2007 (Table 1). These universities are all historically white universities (HWUs) except two newly established universities that have merged with HWUs.

**Table 1 Graduates in public higher education institutions 2007**

UNIVERSITY	Graduates	
	No of PhDs	% of the total
University of Pretoria	170	13%
University of Stellenbosch	153	12%
University of Cape Town	142	11%
University of the Witwatersrand	134	11%
North West University	124	10%
University of Kwa-Zulu Natal	106	8%
University of South Africa	78	6%
University of the Free State	77	6%
University of Johannesburg	75	6%
Rhodes University	48	4%

Source: CREST, 2009, p. 67

With the burden of producing doctoral graduates resting on a small number of institutions, it is unlikely that the universities will have the capacity to meet the expanded doctoral production target on their own. Being aware of the limited capacity, the NRF/DST vision includes seeking international and private collaborations for students to continue their studies in local and possibly overseas universities, including sandwich programmes (NRF, 2009).

Policy-makers have begun to consider the Chinese model of sending large numbers of students to pursue their PhDs in different programmes internationally. Others look nostalgically at the Educational Opportunity Council (EOC) programme that was established during the apartheid regime, whereby the United States Agency for International Development (USAID), among others, provided bursaries for students to study overseas, mostly at undergraduate or Masters level (Reddy et al., 2001).<sup>ii</sup>

There are two important issues that needed to be considered. The first one is whether sending doctoral students overseas will lead to expanding the number of graduates in South

Africa. It seems that currently there are not many South African students pursuing their doctoral studies overseas. In 2007 the NRF provided funds for 49 PhD students to pursue their studies in international universities, mainly in the United Kingdom and United States,<sup>iii</sup> which are the two major destinations for South Africa students.

The second question is whether sending students overseas will contribute to the brain drain. Data from the UK (2007/8) indicate that 245 South African doctoral students were studying in higher education institutions in the UK. However, there was no indication either of the graduation rate or of the number of students who intended to return to South Africa. The data show that 80 students were financing themselves while 30 students had fee waivers from their study institutions.<sup>iv</sup> It is assumed that these students are not bound to come back to South Africa. Graduation rates are available from the US. Table 2 indicates that an average of 50 South African doctoral students a year graduate from American universities. More than half of these intended staying on in the US.

**Table 2 Percentage of South African doctorate recipients graduating from American universities and intending to stay in the United States after doctorate receipt 2000-2006**

	2000	2001	2002	2003	2004	2005	2006	Total
<b>SA Graduates</b>	62	78	43	40	48	52	35	358
<b>% Staying in US</b>	52%	65%	54%	53%	46%	50%	60%	55%

Source: Hoffer, Hess, Welch, & Williams, 2007, p. 96.

While sending students to international destinations might not contribute significantly towards the desired growth target, and may even encourage the brain drain, such students benefit out of proportion to their numbers from exposure to cutting-edge knowledge, to networking and to the global knowledge society. This is especially important for South African students from disadvantaged communities who need to recognise the value of the PhD and of higher learning generally. This was certainly the view of a PhD programme leader in a historically black university, expressed in the following words:

*It is very important to expose them and to get them excited by letting them see the world. This is something that is often underestimated. Students are never the same once they have travelled. And they don't have to go and spend a lot of time: they can spend a few months in a lab somewhere else in the world doing something that supplements what they are doing with us. (Herman, 2009, p. 121)*

While it is important to continue to send students to international destinations despite the possibility of losing some of them to these countries, it may be more beneficial to concentrate on increasing the capacity of the higher education system in South Africa to produce more PhDs. It is suggested in this paper that this may be achieved by removing a number of barriers that hinder the expansion initiative. The following sections highlight some of these barriers:

### **Barrier 1 – Insufficient funding**

Kehm (2009) maintains that the issue of funding requires policies in two aspects, the funding of the institutions to establish and run doctoral programmes and the funding of doctoral students so they are able to devote an appropriate time to their studies. While the NRF has been the main funding source of most of the programmes in South Africa, it is not able to support PhD production adequately.

Herman (2009) argues that the level of funding is unacceptable to many students. With the growth in the number of doctoral graduates the student population has changed in relation to gender, race, age, familial status and educational background. This has implications for funding. In 2009 a PhD bursary was R40,000 a year (or approximately US\$5,000) which is not enough to support the average South African doctoral student, who tends to be older than his or her equivalent in other countries (CREST, 2009) and have a family to support. In 2009 survey, 57% of the students were married or in permanent relationships and 45% of the students had children (Herman & Yu, 2009).

The survey also showed that 65% of the students were working prior to their PhD studies and were earning salaries and that most PhD students continued to work while

studying. This also means that financial constraints limit the amount of time dedicated to the PhD. Supervisors, on the other hand, prefer students to study full time. Since the PhD in South Africa is often viewed as training for an academic career or for scholarship (Herman, 2009), the ideal PhD student is a full-time student on site who is able to engage fully with his or her studies, to attend seminars and conferences, to produce papers and to finish on time.

Some PhD programme leaders, especially in the natural sciences, rely almost entirely on NRF and DST funding. These could be adequate if the programme is run by or includes a number of rated researchers, has a research chair or is able to access a specific grant to secure funds for a number of years. Some programmes use funding from multiple sources. However, the administrative and other effort needed to access funding takes up much valuable time that could be dedicated to supervision and research. There is an advantage for Centres of Excellence or other institutions that have an administrator or secretariat to manage grants and outside funding. Without administrative support, supervisors and heads of programmes spend precious time *“filling in forms and looking around for money”* (Herman, 2009, p. 33). The administrative time involved in securing funds for students and writing reports is particularly vexing in historically black universities that do not have a strong research tradition.

A major problem is the three-year duration of NRF funding. This is often not sufficient for students to complete their PhDs – definitely not in the humanities or social sciences and also sometimes not in the natural sciences. This is often a reason for dropping out or seeking employment before finishing a PhD.

Other concerns are delays in accessing funds and the funding agents’ continuously changing strategies. Some PhD programmes have been established with external funds that have been obtained on the initiative of programme leaders but that are under constant threat as agencies, private donors and industries change their direction and their priorities.

Herman (2009) highlights three ways in which PhD programme leaders operate. Especially in economically unstable times, there are those who prefer the safe funding of the NRF or the DST, however small and bureaucratic this may be. Secondly, there are those similar to the academic entrepreneurs described by Slaughter and Leslie (1997) who look to industry, donor agencies and businesses to secure external funding or projects for their PhD programmes. Finally, there are those who try to find a comfortable balance between the two:

*... because industry or industry-related bodies provide funding for a different type of research. They look for product, patent and processes, and they are not interested in the more fundamental aspects of research. And most academics go into academia because they are interested in some fundamental aspect. I would be unhappy to have a programme that is fully application oriented. And it's not always the best time, economically. (Herman, 2009, p. 35)*

It is indisputable that scaling up the number of PhDs requires high levels of funding. However, what should be the source or sources of additional funding? To what extent will the NRF, as the present major funding source, expand its investment in doctoral education and how will this ensure an increase in the number of quality PhDs? To what extent are academics in South Africa, who tend to view the doctorate as a route to an academic career, ready to make the move and become academic entrepreneurs and what might be the unintended consequences of such a shift? And the main question is clearly articulated by Kehm (2009, p. 234): “Whose responsibility should it be that doctoral students have sufficient financial means to concentrate full time or part time on their studies?”

It is evident that unless the financial needs of the programmes can be met, expanding PhD numbers will not be able to be achieved. Unless more significant funding for doctoral education can be provided, the NRF will have to decide between partial support for a larger number of students or full support for fewer full-time students.

## **Barrier 2 – Existing policy recognises one kind of doctorate**

Any policy on doctoral education needs to answer two main questions, namely, “What is a PhD?” and “What is the purpose of the PhD?”

Scott and Brown (2004) identify three ideal models of doctoral study by the knowledge that is produced. The first model, which they refer to as the pure model, is located within the disciplinary arm of the university. The knowledge is produced within the discipline, it is accredited by the discipline’s criteria and is protected by the discipline. In this model the doctorate is perceived as training for academic career.

The second model has many features of the first but it is beginning to include notions of trans-discipline and looser boundaries between disciplines and between itself and other regulatory bodies and outside agencies. There is acknowledgment that ideas could be better understood from the context of application. Subsequently, new models of PhD were advanced whereby knowledge can be developed at the workplace outside a university.

The third model is the servicing model. This model is described by Scott and Brown as a model whereby the “university and the doctoral student on behalf of the university abandon notions of universal truth, and adopt a more modest role in relation to society as a whole” (2004, p. 21). The student as practitioner is required to make sense of his or her workplace and to develop a new, original and more productive way of working.

The policy context in South Africa supports the pure model. According to the Higher Qualification Framework (HEQF) (DoE, 2007, p.29), the graduate must “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”.

Herman (2009) shows that there is a strong predisposition among PhD programme leaders to view the doctorate in terms of the pure model that is supported by the

policy context in South Africa. At the same time, there is a growing acknowledgment among PhD programmes of the presence of the other two models that try to respond to the needs of business and industry as well as the academy. Subsequently, a number of PhD programmes embody a hybrid version of the three types of models, sometimes in tense association. It seems that the PhD in South Africa is a “jack of all trades” – everything for everybody.

Some academics feel that expanding the PhD would compromise the quality of the degree (Herman, 2009). However, if South Africa were to follow the international trend and introduce different types of doctorates, such as professional doctorates, the number of PhDs could be expanded as a result of this differentiation. This would mean that South Africa might need at least two types of doctorates – one to prepare students for an academic career and one to prepare students for a career in industry or the professions. This has implications for policy. It means that a single-purpose qualification does not fit all.

Recognising diverse models of PhD has implications for doctoral pedagogy. In South Africa only the apprenticeship model of individual mentoring is accredited and funded, whereas in practice different types of programmes have emerged to service different purposes and a diverse student population (Herman, 2009). There is a definite shift towards more structured and formalised programmes, with a number of PhD programmes offering students course work in addition to the traditional individual mentoring (apprenticeship model). There is an increase in project-based PhDs in the social sciences as well as in PhDs by publication. It seems that changing the policy to follow and facilitate these emerging practices would bring doctoral education in South Africa closer to international practices and to its expansion target. Yet as South Africa is following the global trend it should also be aware of its shortcomings as the increased diversity of doctoral programme does not come without criticisms. Kehm (2009) cautions about the quality of the product (thesis), the process, the proliferation of titles, the lack of intellectual depth and the methodological weaknesses of

certain type of doctorates. Some critics argue that professional doctorates fail to deliver on their promises while others argue that these doctorates need to be redefined and re-imagined (Lee, Brennan, & Green, 2009).

### **Barrier 3 – The pool of potential doctoral students is too small**

It is evident that expanding the number of PhDs cannot take place without students. The recruitment, selection and retention of students, especially black<sup>v</sup> South African students, is a burning issue in South Africa (Portnoi, 2009). A major concern is the extent to which South Africa can increase the number of students without compromising the quality of the intake.

The study shows that while some PhD programmes have to turn away students because of the lack of physical lab space or the lack of supervisory capacity, most programmes are struggling to find suitable students (Herman, 2009). It is evident that the more a programme can offer in terms of funding, resources, expertise and the institution's prestige or the reputation of its academics, the more attractive the programme will be to the best students. In this competition, historically white universities have an advantage over historically black universities.

Competition is already rife for quality students and in particular for black quality students, especially (but not exclusively) in science and engineering. Some programme leaders recruit black students from Southern African Development Community (SADC) countries and from elsewhere in Africa in order to comply with the equity targets, as they have found that such students are generally better prepared and more dedicated than their South African counterparts and that they also have fewer family responsibilities.

There is an increasing tendency for PhD programme leaders to begin their recruitment efforts at undergraduate or Honours levels and to “grow their own timber”. The main reason for this practice is to ensure that the PhD student has a solid background knowledge and is

capable of managing higher learning. One way of escalating the number of PhDs could be to highlight this successful practice and to fast-track the process from Honours degree to PhD. This would require the creation of innovative programmes that attract and retain students into Masters and doctoral programmes. It would also require an adjustment to the way universities are funded as such an innovation might mean the loss of the present university subsidy for Masters degrees. It is also important to realise that this practice would limit the pool and the diversity of potential students.

Unquestionably, in order to escalate the number of PhDs it is essential to increase the pool of suitable candidates. This calls for a system-wide effort starting at school level. South Africa has a chronically dysfunctional school system. Fewer than half those 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 15.6% gained university passes and only 5% or less passed mathematics at advanced level – necessary to give them entry into subjects with a high exchange value in the global economy, such as information technology, engineering, natural sciences and medicine. This 5% were mostly white students (Jansen, 2010). It is also of great concern that the percentage of learners obtaining university passes dropped from 18.6% in 2003 to 15.6% in 2007.<sup>vi</sup>

Escalating the number of PhDs would also require achieving a decrease in the drop-out and repetition rates at undergraduate and lower postgraduate levels, coupled with a higher retention of students, especially black students, who are attempting the higher degree in the first place. Although there are no accurate graduation rate figures, the average graduation rate for a PhD in 2007 was calculated as 13%.<sup>vii</sup> This calls for a better understanding of the reasons for drop-outs and for better ways of dealing with the reasons.

#### **Barrier 4 – Limited supervisory capacity**

It is not evident whether the main obstacle to scaling up the number of PhDs in South Africa is the scarcity of students or the dearth of supervisors. While there is a tendency to argue that the “burden” of supervision is growing and is becoming a major constraint on any escalation initiative, CREST (2009) data indicate that doctoral supervisory capacity was faculty specific. Capacity was highest in the natural and agricultural sciences (46% of academic staff with doctorates), following by humanities (35%) and other faculties (less than 30%).

The CREST report assesses supervisory capacity as a ratio between the number of permanent academic staff with PhDs and the number of doctoral students. The norm was approximately two doctoral students to one doctoral staff member at universities and approximately 1.2 doctoral students per doctoral staff member at universities of technology. However, these ratios do not capture the full supervisory load of doctoral staff (CREST, 2009, 13). Also, the same doctoral staff are responsible for supervising Masters students. In 2005 the ratio was 5.2 students per supervisor (CREST, 2009a). Furthermore, since higher education in South Africa has become teaching intensive, the burden of undergraduate teaching is high.

A major concern is the quality of the supervision. A number of PhD programme leaders stress that not enough is being done to ensure that inexperienced supervisors, such as recent PhD graduates, or unsuitable supervisors, such as those without PhDs, should not supervise doctoral students (Herman, 2009). In reality the supervision load is not shared equally among the academics with PhDs. Reputable and experienced supervisors with a good completion record may have 5-10 doctoral students, while others may have 1- 2 students or even none. While the research shows that cohort-based and course-based models can maximise the supervisory capacity, they require funding and energy as well as institutional support and infrastructure (Herman, 2009).

The prevalence of the apprenticeship model of supervision may be a hindrance to escalating the number of PhDs. This is, of course, unless more supervisory positions can be allocated, and unless innovative and effective supervisors are supported by administrative staff, research assistants and, especially, post-doctoral staff (postdocs). For various reasons, many PhD programme leaders struggle to find suitable postdocs and the quality of some of the postdocs, in particular those who graduated from South African universities, is perceived to be too low (Herman, 2009). Nevertheless, the general feeling among the PhD programme leaders has been that by improving the postdoc situation at universities, South Africa could increase its capacity to produce PhDs.

An additional concern is that some supervisors are ageing professors close to retirement. It is perceived that the universities and universities of technology that produce few PhDs themselves absorb senior academics from traditional universities into management and academic positions. Furthermore, an exploratory study of science councils and industries in South Africa reveals that there are many employees with PhDs and research experience whose capacity is not being maximised.<sup>viii</sup> Harnessing these untapped supervisory capacities creatively could support the expansion target.

Supervisory capacity could be enhanced by collaboration between departments or institutions. The survey of doctoral students in South Africa (Herman & Yu, 2009) indicates that 44% of students work with one supervisor and that of the 56% of students who work with more than one supervisor, two-thirds of their co-supervisors are from the same department or the same university. This means that fewer than one in five of the sample had co-supervisors from other universities or from industry or a research council.

Resistance to collaboration comes from different sources. In one instance an attempt by supervisors from different universities to institute joint supervision was obstructed by the universities concerned as this would have affected their subsidy financing arrangements.

Another PhD programme leader reported that the supervisors in his department had resisted any formalised form of joint supervision and that they were opposed to any shift towards a supervisory committee (Herman, 2009).

### **Barrier 5 – No recognition of the value of the doctorate**

It is perceived that the pool of potential PhD students is limited because there is no strong belief in the value of the PhD. The lack of support for doctoral studies is evident in all levels of society. The lack of recognition of the value of an academic career in science adversely affects the recruitment of black South African students, who therefore generally prefer to pursue professional degrees. It is perceived that considering the background of many black South African a PhD is often not a priority:

*There is a sense in which many black South Africans are asking: 'Why a PhD?' There need to be some communication strategies about the PhD, what it is about. 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 its purpose? (Herman, 2009, p. 44)*

Companies lure promising black students into jobs in order to fill their equity quotas, and this happens at the same time as black families are pressurising their student family members to earn decent salaries. This contradicts the motivation to pursue a PhD:

*You have to sit with the students and convince them that it worth doing a higher degree. This takes quite a lot of effort, because you are dealing almost exclusively with black students who are breaking new ground for their families, many of which would like to see the students working and earning salaries. (Herman, 2009, p.120)*

Given South Africa's basic skill shortage and high illiteracy, doctoral education is also not a priority for many policy-makers, industry leaders and others. If expansion of PhD numbers remains a goal, this will not be achieved without strong advocacy for higher

education in general and the PhD in particular. The doctorate should also be a subject for public discussion.

The earlier survey on doctoral education reveals that most students make their decisions on whether or not to study for a PhD during or after their Masters studies (Herman & Yu, 2009). This means that universities should be doing more to market the PhD to the senior undergraduate level onwards. The survey also indicates that students think about the doctorate in terms of personal development rather than in terms of its significance in the knowledge economy. Expansion requires a broader view of the doctorate.

### **Barrier 6 – Limited and inadequate partnerships and collaborations**

Preliminary interviews with major industries in South Africa explored existing collaborations and whether private-public partnerships could play a greater role in the production of PhDs.

Not all major industries share the view that they require knowledge at a PhD level. It is assumed that their motivation to enter into partnerships with universities depends on their investment in Research & Development (R&D) and whether this is developed locally or is imported. (For example, while motor vehicles are built in South Africa, the technology to manufacture them is derived mainly from the manufacturers' offshore partners). However, some major industries provide PhD students with bursaries and scholarships, access to data and facilities, and mentoring. They fund Chairs, Centres of Excellence, and specific PhD programmes.

An example is the sponsorship of Anglo American, Sasol and others, which support lecturers and supplement salaries through the Mine Educational Trust Fund (METF). This fund supports academic mentors who provide doctoral programmes for students who wish to enter the mining industry. At the same time, the capacity of companies to train doctoral

students is limited by the number of their employees with PhDs and the pressure on the time of these employees.

While the “triple helix” links can escalate the production of the PhDs, the industry interviewees raised some concerns, such as the government’s changing rules as far as funding is concerned, the capacity of the universities and the quality of supervision, lack of communication and the absence of formal mechanisms for monitoring and regulating the collaborations. Intellectual property (IP) is an especially thorny issue that has not yet been resolved. For some companies, the new IP bill gives universities some rights over the data, and this may hinder cooperation with other bodies.

Supporting collaborative efforts with the private sector and creating programmes that link universities with industry are essential not only for the expansion of supervisory capacity but also for equipping students with transferable skills and expertise relating to the knowledge economy. However, while there are many examples of such partnerships internationally (Berman, 2008; Thune, 2009), Harman (2009) is cautiously aware that South African problems should be addressed with South African solutions.

### **Discussion – The challenges of escalating the number of quality PhDs**

The first challenge to South Africa is to avoid the “numbers game”. Mouton (2008) shows how funding incentives boosted journal publication, and calls for an approach that looks at policy, regulatory, funding, institutional and capacity dimensions systemically in order to prevent irresponsible massification of the doctoral degree if substantial funding incentives become available. Manuel Castells concedes that the thrust of the South African dilemma is how to balance the need to strengthen the quality of the PhD with the need for rapid expansion in the number of doctoral graduates.<sup>ix</sup>

The second challenge is how best to advocate for public support for and an understanding of the PhD and its role in meeting national development needs. This requires a mind-shift that begins at the institutions themselves, among supervisors, senior undergraduate students, Masters and doctoral students. The main issue in South Africa is how to market the doctorate to a public surrounded by so much illiteracy and when there are major problems with the basic school system.

The third challenge is to eliminate, or at least to minimise, the multiple barriers in the way of any expansion initiatives. Some of these barriers have already been discussed. Individual universities, departments and supervisors in South Africa devise creative ways of dealing with their own problems. Success stories could be shared and reflected upon. At the same time, a competitive market and institutional politics often discourage this practice unless the higher education sector as a whole can be motivated towards a common goal.

The fourth challenge is political. Should all universities continue to offer PhDs or should funds and other resources be better directed at universities, departments and programmes with an existing capacity for such training? While concentration of research capacity could give a country or a region an edge (Marginson, 2009), in the South African context it is a political decision, as it can re-ignite the history of racial discrimination and knowledge divide.

The fifth challenge has to do with policy borrowing. Doctoral education has been scrutinised internationally in the past two decades by countries with highly developed higher education systems as well as by countries with emerging economies and little research tradition. South Africa has much to learn from what Nerad (2009, p.13) terms “converging practices”, that is, practices that have emerged and been tried around the world in the last decade. Yet the solutions have to be sensitive to the local conditions and to the country's political, cultural, institutional and historical context. This paper demonstrated some of the

challenges that South Africa encounters when following international trends. Of particular importance is the context of depleted number of students and the difficulties of recruiting black South African students into doctoral programme. The latter made up 90.8% of the total population and must be the main pipeline for postgraduate degrees.

To achieve the target of a fivefold increase in the number of PhDs in South Africa, a decisive action and a coordinated effort are necessary to match policy with practice and aspiration with reality in order to create a national strategy for producing quality doctoral graduates. Failure to do so will mean that the vision will be no more than a pipedream.

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## Notes

<sup>i</sup> In this paper the terms ‘PhD’ and ‘doctorate’ are used interchangeably.

<sup>ii</sup> Proceedings of ASSAf Panel on the PhD, October 2009. Pretoria

<sup>iii</sup> Data provided by the NRF

<sup>iv</sup> Higher Education Statistics Agency (HESA) Student Record 2007/08

<sup>v</sup> Black in this paper is used to denote African, Coloured and Indian students.

<sup>vi</sup> EMIS, *Report on the Senior Certificate Examination*, Department of Education, Pretoria

<sup>vii</sup> 2007 HEMIS database, October 2008

<sup>viii</sup> Based on unpublished interviews with major industries, international and local foundations, government departments and embassies that were conducted in 2009 ASSAf Panel on the PhD.

<sup>ix</sup> Manuel Castells seminar “Strengthening doctoral scholarship in the Social Sciences” at the Stellenbosch Institute for Advanced Studies (STIAS), 11 August 2009.

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