Research on doctoral education in South Africa against the silhouette of its meteoric rise in international higher education research

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The aim of this article is to survey the international literature on doctoral education from a South African perspective. A colossal amount of published research on doctoral education abroad has accumulated in recent years, dwarfing the minuscule number of publications on doctoral education in South Africa. Three major deficiencies in the corpus of literature internationally on doctoral education are the lack of any empirical validation of the claimed social rates of return to doctoral education, an absence of empirical research on the scholarly contribution/impact of doctoral education, and the inadequacies of the paradigms employed to research doctoral education. This means that the body of literature on doctoral education does not take into account power relations in society and embedded knowledge, as well as the demonstrated stranglehold of these on scholarship. The first two imply that there is a lack of empirical substantiation for claims regarding the indispensable role of doctoral education in accomplishing a knowledge society and the role of doctoral studies in pushing back the frontiers of knowledge. In conclusion recommendations are made as to how South Africa could, given its infancy in this field, seek to build a literature base that consciously addresses the perceived gaps in the international literature in this field.

Keywords: Doctoral education; higher education research; South Africa.

Introduction

The pivotal role assigned to the university in contemporary society (Derrida, 2004; Waghid, 2011) renders doctoral education as the pinnacle of university education a topic of immeasurable importance. This applies to South Africa as much as to any other country in the world, and it would, therefore, be a valuable exercise to determine what could be learned from the international experience with doctoral education. The aim of this article is to survey international literature on doctoral education in order to guide doctoral education locally. The article commences with the role and state of doctoral education internationally and in South Africa. This is followed by a survey of published research on doctoral education in South Africa. The international literature on doctoral education is then surveyed, and synthesised from a South African perspective.

Higher education and doctoral education

Internationally

The present age is described as the age of the knowledge society (World Bank, 2002). The term "knowledge society" refers to a society where the creation and production of new knowledge has become the axial principle of economic and social organisation. In this context doctoral education assumes an incomparably high assigned value. Understandably, doctoral education has risen to prominence in the higher education research agenda internationally. Since the 1990s, nations worldwide have been increasing doctoral degree production and introducing initiatives to reform doctoral programmes (Nerad, 2010:69).

South Africa

The same imperative that exists globally for doctoral education, namely the need to build the human resource base for a knowledge society, is also present in South Africa. Yet doctoral production in South Africa is low, despite a steady growth in recent years. South Africa produced 1 274 doctoral graduates in 2007 (ASSAf, 2010:16). This translates to 26 doctoral graduates per million of total country population, which is low compared not only to advanced countries (United Kingdom: 288, USA: 201), but also to other upper-middle income countries (Brazil: 52; Mexico: 28) (ASSAf, 2010:46). Although a comparison of these figures indicates a clear need to increase doctoral production in South Africa, doctoral education does not constitute a strong focus in higher education research in South Africa (Deacon, Osman & Buchler, 2009:1073). Given the discrepancy between the apparent need to increase doctoral education in South Africa and the paucity of research guiding the exercise to increase doctoral education, a survey of international scholarly literature on the topic assumes particular significance.

Scholarly publications on doctoral education in South Africa: A survey

A survey of scholarly literature on doctoral education in South Africa was conducted by studying all the South African Education journals (*South African Journal of Higher Education*, *South African Journal of Education*, *Perspectives of Education*, *Journal of Education*, *Southern African Journal of Education*, *Journal of Education Studies* and *Education as Change*) as well as a subject search of the catalogues (entering the keywords PhD and doctoral) of the libraries of all South African universities.

The literature search yielded information regarding the volume and frequency of publications on research on doctoral education in South Africa, as well as the themes pertaining to doctoral education upon which these publications focus. The report on these (contained in this section) will then be compared with the international corpus of literature on doctoral education (the report of which appears in the next section of this article).

A striking observation is the dearth of published research on how to increase and equalise access to doctoral education. This is inexplicable in view of the need to increase access (as explained earlier) and to equalise access. The distribution of doctoral graduates of South Africa is unequal along the dimensions of race and gender (CREST, 2009; ASSAf, 2010:129; Herman, 2011a:173-175). For example, 56% of all doctoral graduates in 2006 were Whites, although Whites make up only 9.2% of the total population (Herman, 2011a:172). The Academy of Sciences of South Africa's (ASSAf) report on doctoral education suggests a tenfold strategy to escalate the production of high-quality doctoral graduates in South Africa while simultaneously equalising access to and participation in doctoral education: increasing the enrolment of South Africans in PhD programmes at universities abroad; significantly expanding levels of funding for doctoral studies in South Africa, with a particular focus on shifting the balance of students towards full-time study; creating an overarching national planning strategy for dealing with high-level skills production; strengthening the high school system as the supply base of university students; eliminating bureaucratic, administrative, political, legal and structural barriers to doctoral education; applying strong quality assurance measures in order to prevent irresponsible massification (resulting in compromising quality) of doctoral education; advocating public support for the PhD and doctoral education; targeting specific institutions with capacity; recognising diversity in doctoral programmes and practice, and strengthening relationships between universities and industry (ASSAf, 2010). Not only do issues of access to doctoral education and the need to increase doctoral education receive attention, but the last number of points also clearly emphasise the issues of quality and relevance. Herman (2011b) assesses the feasibility of expanding doctoral education in education in South Africa, and identifies the following barriers: insufficient funding; existing policies recognising only one kind of doctorate (the traditional discipline-based model, preparing for an academic career); the small pool of potential doctoral students; limited supervisory capacity; the lack of due recognition of the value of the doctorate by industry, and limited and inadequate partnerships and collaborations with industry. As far as could be established, no published research on equalising access to doctoral education in South Africa exists.

Similarly, no published research exists on the objectives and desired and official (National Qualifications Framework) outcomes of doctoral education. Much has been published from a national perspective on the process, administration and management of doctoral education. These focus on enrolment numbers and growth, throughput rates and PhD graduates production as per gender, population group, age group, institution and discipline (Watson, 2008; Karlsson, Balfour, Moletsane & Pillay, 2009; ASSAf, 2010). Findings pertaining to enrolment numbers, growth and inequality have been discussed earlier. No research has been published on the administration and management of doctoral education at institutional level.

The largest single set of publications deal with supervision and supervising – deservedly so, as ASSAf (2010:77-79) singles out poor student-supervisor relations as one of the causes of PhD student attrition. Nsimande (2007) urges supervisors to engage in constant self-reflection on their roles as supervisors, in order to distil best practice and thus improve themselves. This challenge is taken up by Olivier (2007), Van Aswegen (2007) and Rochford (2003).

By contrast to the handful of publications representing the experiences of supervisors, the experiences of students have not yet been subjected to much research. Backhouse (2009) has done a qualitative study on doctoral education in four academic units at three historically advantaged universities, exploring how different stakeholders — national and institutional policymakers, academic staff and doctoral people — understand the PhD study; how these understandings influence the practice of doctoral education, and how different practices affect the PhD experience as well as the learning and knowledge produced. Jansen *et al.* (2004) interviewed 24 students during the first phase (guiding students to write a research proposal) of a doctoral programme at the Faculty of Education, University of Pretoria. The interview guided the students to reconstruct and to reflect on their developmental journey: their first ideas about their research idea; the nature of their first research questions; how these changed during the course of the journey, and how these were influenced by their interaction with peers and supervisors. The only research in the quality of doctoral education is the National Research Foundation (NRF) Education study, which concludes from a survey of dissertations that the quality of many is not above suspicion, and much evidence of mediocrity exists (Balfour, Moletsane, Karlsson, Pillay, Rule, Nkambule, Bengesaai, Davey, Lekena, Molefe, Madiya & Goba, 2008:32).

After supervision, the method of doctoral education has drawn most publications. Karlsson *et al.* (2009) did a content analysis of 3 260 postgraduate education dissertations produced in South Africa during the period 1995-2004, and categorised these according to methodologies employed. De Lange, Pillay & Chikoko (2011) report on an interesting cohort model of supervision and support developed at the University of KwaZulu-Natal and its predecessors.

On the content and structure of doctoral education, the NRF education dissertations' study has done a content analysis of themes focused upon by Masters and Doctoral education dissertations (Balfour *et al.*, 2008:23-31). The ASSAf report (2010:64-67) contends that the traditional apprenticeship model that persists in South African universities might serve for training for an academic career, but in so far as doctoral education also provides training for industry and for a profession, programmes should be diversified, and three other models should be considered besides the apprenticeship model:

- cohort based (by contrast to the apprenticeship model, a one-supervisor-to-one-student relationship; the cohort-based model is characterised by a critical mass of supervisors and students working on a project with a fixed time-span);
- coursework based;
- doctorate by publication.

Apart from the ASSAf report and the NRF education study, no research on the content and structure of doctoral programmes has been published in South Africa.

The only publication on doctoral evaluation is Albertyn *et al.*'s (2007) article reporting on a dissertation evaluation instrument (consisting of a set of criteria, together with rating scales for each criterion) which they developed and tested. No research has been published on quality and quality assurance in doctoral

education. Research on the output of doctoral research is limited to the ASSAf report which found that employers note a lack of exposure to international expertise, theories and debates; methodological competence, and "real world" relevance as the salient weaknesses in the skills and abilities of doctoral graduates (ASSAf, 2010:82-86).

The above amounts to a rather thin base of scholarly publications on doctoral education in South Africa.Many critical aspects, such as strategies to increase and equalise enrolments, quality assurance or management at institutional level have not been touched upon at all. Only a single digit number of publications have appeared on other aspects. This constitutes an insufficient corpus of knowledge to inform the urgently needed expansion and reform of doctoral education in South Africa. This begs the next question. Does the international fund of literature on doctoral education offer a resource base to tap in order to benefit from the international experience with doctoral education? After surveying the international literature in the next section, this question will be answered in the conclusion.

International literature survey

An international literature survey of doctoral education was done, using ERIC and Google Scholar, and the keywords "doctoral education", "doctorate" and "PhD". As explained earlier, doctoral education ranks highly on the international higher education research agenda, and there exists a voluminous corpus of publications on the topic. These publications could be divided into four major subthemes:

- Contextual shaping forces of doctoral education.
- Access to doctoral education.
- Process of doctoral education which, in turn, could be subdivided into the objectives and outcomes of doctoral education; administration and management of doctoral education; financing of doctoral education; supervision; student issues; methods, content and programme structure; assessment, and quality control.
- Outcomes of doctoral education from the perspective of both graduates and society.

The literature on each of these subthemes will now be surveyed.

Contextual shaping forces of doctoral education

Any (national or other) education system is the outcome of contextual societal forces. This also applies to doctoral education. The conventional mode of doctoral education, the one-to-one apprenticeship model, was established by the Humboldt University in Germany in the early nineteenth century, out of the contextual exigencies of the time. In as far as it fitted into a system of elitist education and ivory-tower academia, it appears increasingly to be an anachronism in the contemporary university that has fallen behind the demands and challenges of the time. Recently a surfeit of publications has appeared on the theme of the influence of and imperatives set by globalisation to doctoral education (e.g. Nerad & Heggelund (eds), 2008; Martinez, Nerad & Rudd, 2010; Williams, 2005). In the new context, and within the context of the knowledge society taking shape, not only is there the compelling demand to increase doctoral production steeply (Nerad, 2010) and to equalise access to doctoral education (Martinez *et al.*, 2010), but doctoral students educated by means of the conventional method are also found to be wanting in the following respects: they are too narrowly educated and trained; they lack key professional, organisational and managerial skills; they are ill-prepared to teach; they take too long to complete their doctoral studies or do not complete them at all, and they are ill-informed about employment opportunities outside academia (Kehm, 2007:308). In reforming doctoral education (the nature of these reforms will be discussed later), there is once again an international convergence in that the American model (to be explained below) is becoming the international model, as the Humboldt was in the previous two centuries (Nerad, 2010). Knowledge society's and knowledge economy's need for knowledge workers have created a contextual complex shaping doctoral education which is totally different from the context that existed

a few decades ago, when the sole purpose of doctoral education was to prepare for an academic career (Mowbray & Halse, 2010; Marginson, 2010). It spurred new objectives, methods and content of doctoral education, which will be discussed later in this article.

Access

It is clear from enrolment figures cited earlier that there is a worldwide increase in doctoral education and doctoral production. Yet literature on strategies to increase access to doctoral education is sparse. Universal dimensions of educational inequality, namely gender, race, ethnicity, socio-economic status and geography, also pertain to doctoral education. In the USA, for example, while commendably 46% of recipients of doctorates in 2008 were women (for the thirteenth consecutive year this figure was higher than 40%), only 22% of recipients of doctorates in engineering are women (National Science Foundation, 2009:6). Despite these irregularities, and the drive for equality in educational opportunities being a dominant motive for educational reform worldwide, there is no published research on strategies to equalise access to doctoral education, although such strategies may exist in institution-based policy documents.

Process of doctoral education:

Objectives and outcomes of doctoral education

It could be stated that the objective of doctoral education is, as Sprenkle (2010) puts it, to equip students to do original research that pushes back the frontiers of scientific knowledge. Thus, the outcomes of a PhD study then would be, as Walker, Golde, Jones, Bueschel & HutchingsWalker *et al.* (2008:12) put it well:

> *The PhD is, at its heart, a research degree. It signifies that the recipient is able to ask interesting and important questions, formulate appropriate strategies for investigating these questions, conduct investigations with a high degree of competence, analyze and evaluate the results of the investigations, and communicate the results to others to advance the [scientific] field!*

If the above are the intrinsic objectives of doctoral education, which have remained unchanged since the inception of the modem doctorate in the early nineteenth century (Humboldt University, Germany), the external goals have recently changed markedly. In the nascent knowledge society, doctoral education no longer prepares students for academia only, but doctoral education is also increasingly considered for preparing students for leadership positions in government, non-profit organisations, business and industry (Kim & Otts, 2010:1). The one crucial factor that differentiates doctoral level qualifications from the rest is simply that, whereas the lower degrees are essentially about demonstrating the ability to master a body of existing knowledge, the doctoral degree is about the ability to create new knowledge (Jamieson & Naidoo, 2007:364; Leonard, Becker & Coate, 2005).

Administration and management

Reacting to global imperatives (outlined earlier), national, government-driven initiatives include capacity-building (increasing investment) in research and creating hubs of global excellence (Hirasawa, 2009:19). National reports on doctoral production (such as that of the Natural Science Foundation, USA, 2009) devote a large percentage of space to enrolment numbers, student demographics and throughput rates. Attrition rates in doctoral programmes are high. In the USA half of the doctoral students are lost to attrition (Walker *et al.*, 2008). Several publications (Stock, Finegan & Siegfried, 2009; Lott, Gardner & Powen, 2009-2010) have identified risk factors.

On the institutional level initiatives aimed at reforming doctoral education include inter-university partnerships; international collaboration and consortia; transnational universities, and global e-universities (Chen, 2009:54-55). Research by the Council of Graduate Schools in the USA has identified six sets of institutional and programme characteristics as key factors in determining whether a particular student is

likely to complete a PhD programme. These include particular student selection and admission practices; mentoring and advising practices; financial support practices; programme environment practices; research experience practices, and curricular and administrative processes and procedures (Council of Graduate Schools, 2010).

Financing doctoral education

With the retraction of state funding and the introduction of student fees in many parts of Europe, funding for doctoral students is currently a topic of considerable debate in Europe (Kehm, 2007:310) and has also been discussed in publications on doctoral education (e.g. Green & Powell, 2005:121-133). Outside North-America-Western Europe, likewise, the funding of doctoral education is not a research topic. Comparative studies focusing on and comparing levels of funding from state side and from industry/business could not be found.

Supervision

Leggat and Martinez (2010), in their survey of scholarly literature related to PhD supervision in Australasia, identified the following salient themes: elements of supervision; use of information and communication technologies; supervision; warning signs for non-completion of PhD candidates, and evaluation of PhD supervision. Mainhard, Van der Rijst, Van Tartwijk & Wubbels (2009) developed an instrument for measuring a doctoral student's experience of his supervisor. Davidson (2007) makes a case for the development of a pedagogy of supervision, facilitating supervisors to move away from a static or supervisor-determined style of supervision to a repertoire of supervision styles, appropriate for various kinds of students with a diversity of needs.

Students

The largest body of publications is on student-related issues, with the autobiography being a common method. Publications such as Martinez *et al.* (2009), Kiley and Austin (2008) and Anastas and Kuerbs (2009) deal with student a-academic characteristics. Several studies report students' experiences of doctoral education, many of these focusing on the experience of students from marginalised or disadvantaged social categories such as women (Cole & Gunter (eds), 2010), Latino students in the USA (Renaud & Suarez-Renaud, 2008) or international students (Robinson-Pant, 2009). Similarly, several publications deal with students' academic issues (e.g. Kwan, 2009; Wellington, 2010), attrition and retention of doctoral students (Stock *et al*., 2009), as well as socialisation and identity acquisition (Jazvak-Martek, 2009)

Method

The method of doctoral education in many doctoral education programmes has undergone major changes in recent years. Boud and Lee (eds) (2009) give an overview of some of these changes, including the salience of practice (be it the student's professional practice, or practice in industry) and the rise of interdisciplinary doctorates. The employment of new technology, in particular e-learning, for doctoral education has been subjected to research (Beem, 2010; Patti, 2007). Aspects of the method of doctoral education which have received attention include the need for faculty to bring to their students the habits of inquiry and of evidence-based research; turning their students into responsible, active, intentional agents of their learning (Walker *et al.*, 2008); teaching students to review scholarly work (Sullivan, Baruch & Schepmyer, 2010), and the use of reflection in doctoral education (Klenowski & Lunt, 2008). Other publications deal with reforms and innovations in the method of doctoral education, such as using doctoral students as editors of student-run journals as part of their learning experience as doctoral students (Hopwood, 2010) and co-operative or peer learning as method employed in doctoral education (Stracke, 2010). On the supervisor side this trend is complemented by the rise of shared supervision (Kehm, 2007:308). A conspicuous trend, no doubt being given impetus by the ICT revolution and the Bologna-Declaration-Lisbon Goals process of the integration of higher education within the European Union, is the formation of intellectual

communities of doctoral students (Walker *et al.,* 2008) of which EURODOCS (Khem, 2007:312-313) is probably the most salient example.

Content and programme structure

Three interrelated conspicuous trends regarding content and programme structure of doctoral education are the professional doctorate, the American model and the switch to Mode II knowledge. The American model, with its components of coursework followed by a dissertation, housed in a single Graduate school (Nerad, 2010:80) has spread to Europe and beyond (Nerad, 2010:80; Jamieson & Naidoo, 2007:364; Probst & Lepori, 2008), even as far as China (Chen, 2009:52). Central to doctoral reforms is the growth of the professional doctorate, which is proposed as an alternative to conventional PhDs that better prepares graduates for non-academic careers (Servage, 2009). These programmes attempt to integrate theory and practice; students research a problem in their employment practice in commerce, industry, business, government or non-profit organisations. The debates on these programmes and the critics to the emphasis of practice versus research training in doctoral programmes are also reflected in literature (Orr, 2007). The rise of Mode II knowledge has also affected doctoral education programmes, in a shift of dissertation research from basic ("blue sky") research mission-oriented or developmental-research – i.e. research aimed at surmounting an obstacle or effecting development in industry, business or public service (Probst & Lepori, 2008; Hirasawa, 2010:21); and the rise of interdisciplinary research within doctoral education (Gnares, 2010). The value of communities of practice in doctoral education, i.e. a group of doctoral students forming a working team or group, interacting with one another, has also received attention in scholarly literature on doctoral education (Schacham & Od-Cohen, 2009).

Assessment

Based upon two empirical studies on what examiners are seeking, one done in the USA and one in Australia, Hollbrook (2007) drafted an inventory of what constitutes an acceptable level of doctoral scholarship. Yet Kiley (2009) demonstrates that in Australia there is far from consensus on this; in fact it varies considerably from examiner to examiner, between universities and across disciplinary fields. Kiley (2009) also makes a case that the conventional method of doctoral examination – developed in a context different from the current one – has become outdated. One of the main suggestions of Kiley, to supplement summative assessment with substantive formative assessment, is the topic of a case study of a model where such reform was effected by Crossouard (2008). In order to improve doctoral students' capacity to do research those students in research-centred universities in China are required to publish a number of articles (usually 2) in leading journals in their fields before thesis defence (Chen, 2009:53). Wasley (2008) reports favourably on the trend at some USA universities of portfolios replacing the qualifying examination as admission to thesis writing.

Quality

Literature on the quality of doctoral education is sparse (Taylor, 2008:1). Yet recently concern has been raised on the quality of doctorate education (Chen, 2009:48; Hoyle & Torres, 2008; Ghezi, 2008; Kehm, 2007:315, 316). Although Bourke (2007), examining 2121 examiners' reports on 804 dissertations in Australia, could compile a set of 10 practical measures of dissertation quality, and although qualification frameworks, such as the Qualifications Framework for the European Higher Education Area have facilitated the setting of benchmarks for doctoral programmes, defining (let alone realising) quality in doctoral programmes remains an elusive concept – Orzoff, Peinovich & Riedel (2008) call doctoral programmes the "Wild west of outcomes assessment". Despite large projects in the European Union (such as the League of European Research Universities' "Statement on Doctoral Training" and the Bologna Process) (Kehm, 2007; Taylor, 2008) standards of quality in doctoral education remain unspecified.

Output

Economic contribution

The argument is that the production of PhDs generates benefits for wider society: the production process helps generate knowledge from which all can benefit, and the skills developed in doctoral education could be put to the benefit of society (Casey, 2009:226). Although this argument is appealing, attempts to find empirical validation for the economic or societal return of doctoral education are an exercise ending in frustration (Casey, 2009:226).

Careers of doctorates: What do PhD graduates do after graduation?

Individual rates of return of the doctorate have been calculated, although figures are by no means impressive. In the United Kingdom (UK), for example, it has been calculated that having a PhD raises men's earnings by 31% and that of women by 60%, over a person who had the basic qualification to attend university (two A levels) but chose not to (for a masters degree the earnings premia are 29% for men and 55% for women, i.e. a doctorate makes a further 2% difference in the earnings of men, and 5% in that of women) (Casey, 2009:220). Despite the whole movement of rethinking the objectives and structuring of doctoral education to prepare for careers outside academe, higher education remains the main destination of PhD graduates. In the UK, four in ten PhDs are employed in education (primary through tertiary) (Casey, 2009:221) and in the USA, 51% of doctorate graduates are employed in higher education (National Science Foundation, 2009:19). In the absence of empirical evidence on the social return of doctoral education, it is difficult to take issue with Jamieson and Nardwa's (2007:363) statement that the doctoral degree is a "positional goal", i.e. its value is determined by how many people possess the qualification, or with Servage's (2009) contention that the surge in the number of professional doctorates could be explained better by credentialism than by human capital theory.

Publishing and research development after completion of the doctorate

Low publication rates from doctoral degrees have been noted as a problem in the quality of doctoral education for preparing students to participate in research cultures (Lee & Kamler, 2008). Lee & Kamler (2008) contend that issues of writing and publication need to be systematically addressed within doctoral pedagogy. One pedagogy is the use of writing groups for and beyond the period of the doctorate (Atchinson, 2009; Sacham & Od-Cohen, 2009).

Discussion

At first sight, in terms of the number and the rate of production, the international corpus of literature cuts an impressive figure. A closer look, however, reveals that it does not live up to this promise. While the recent surge in doctoral enrolments and the societal and educational contextual factors at the basis of this growth are well covered, as are changes in the content and method of doctoral education, the absence of any data concerning social rates of return means that the contention of the role of the doctorate in sustaining the knowledge society – which forms the basis of the contemporary unprecedented expansion of doctoral education worldwide – cannot at this stage be empirically validated, as the value added to society by the doctorate has not been measured. The total output of research in doctoral education in South Africa is small. Both the colossal international fund and the minuscule South African body of published research suffer from major inadequacies. The first is the lacunas of research on the social return of doctoral education. Secondly, all research on doctoral education, in South Africa and internationally, takes place in what Paulston (1977) terms equilibrium paradigms, i.e. system theory, human capitalism, modernisation theory and structural functionalism. Equilibrium paradigms all consider society to consist of a number of subsystems (such as the economic system, the social system, the political system, the education system, etc.). Each of these systems and each institution in society performs a function, and fulfils its role in

keeping society functioning. Society is a harmonious, well-functioning entity. Hence there is no critical questioning of society and its structures, features and power relations. This notwithstanding a whole set of rival paradigms in the social-scientific literature of education which have shown, since the early 1970s, how inadequate the equilibrium paradigms are in explaining education and education-society interrelationships; let alone in fulfilling an ameliorative function with regard to education and society. These paradigms not in the equilibrium camp include theories of socio-economic reproduction (Bowles & Gintis, 1976); cultural reproduction (Bourdieu & Passeron, 1977), cultural history (Popkewitz, Franklin & Pereyra (eds), 2001) and critical theory (Giroux, 1983; Weiler, 1984). To be sure, some of the scholars on doctoral education, such as Servage (2009), Lee, Brennan & Green (2009), Drake and Heath (2008) and Archbald (2008) criticise the tradition of investigating doctoral education from equilibrium paradigms, and ask for an employment of, for example, critical theory, and for a factoring-in of power relations in society, of the hierarchy of values in society and for the role of the neo-liberal economic order in shaping doctoral education; but none goes over into an actual investigation and analysis of these.

Socio-political contexts and embedded knowledge have a powerful influence on education systems curricula and knowledge regimes right up to university level (Jansen, 2009:175-186). Yet the investigation and revelation of these relationships do not form part of the research agenda of research on doctoral education.

Besides the claim of its indispensable role in realising a knowledge society, the other related premise upon which the contemporary expansion of and investment in doctoral education is based,

is the actual war machine on the front, pushing back the frontier of knowledge. Yet this literature survey could not find empirical support to back this claim – despite the fact that it could easily be done by an impact study of doctoral theses using Google-scholar. As explained earlier, concern has been expressed about the low rates at which doctoral research is converted into publications in scholarly journals. What is also disturbing from the survey presented in this article is the dominance (at least in the English literature) of North America, Western Europe and Australia in research on doctoral education. This is part of a general pattern in the educational sciences of the extra-Western experience not being reflected in scholarly literature and theory construction. As this can easily give rise to parochial theory (pretending to be universally valid) and to a neglect of the interest and needs of the Global South, this feature of the corpus of social science literature has been rightfully regularly criticised, for example by Biraimah (2011) or by UNESCO's seminal report on the global higher education revolution (Altbach, Reisberg & Rumbley, 2009: 32). In this regard the UNESCO report even cautions that such a lopsided production of scholarly knowledge lays the global scientific project open to the criticism that it functions to entrench northern hemispheric hegemony (Altbach *et al*., 2009: 32).

The above survey presented a wide-angled lens view of the state of publications on doctoral education. There is a need for zooming in, exploring each of the facets, where need be (i.e. the many places where literature is sparse or non-existent) by research. From that exercise and follow-up research both the nascent South African corpus and the colossal international body of scholarly literature can be placed upon a secure basis, forming a scaffold for guiding and reforming doctoral education worldwide.

References

Academy of Science of South Africa (ASSAf) 2010. *The PHD study: An evidence-based study on how to meet the demands for high-level skills in an emerging economy*. Pretoria: Academy of Science of South Africa.

Albertyn RM, Kapp CA & Frick BL 2007. Taking the sting out of evaluation: Rating scales for thesis evaluation. *South African Journal of Higher Education* **21(8)**: 1207-1221.

Altbach PG, Reisberg L & Rumbley LE 2009. *Trends in global higher education: Tracking an academic revolution*. Paris: UNESCO.

Anastas JW & Kuerbis AN 2009. Doctoral education in social work: What we know and what we need to know. *Social Work* **54(1)**:71-81.

Archbald D 2008. Research versus problem solving for the education leadership. Doctoral thesis: Implications for form and function. *Educational Administration Quarterly* **44(5)**:7-4-739.

Backhouse JP 2009. Doctoral education in South Africa: Models, pedagogies and student experiences. Unpublished doctoral dissertation, University of the Witwatersrand.

Balfour R, Moletsane L, Karlsson J, Pillay G, Rule I, Nkambule T, Bengesaai A, Davey B, Lekena L, Molefe S, Madiya N & Goba B 2008. Project postgraduate educational research in education: National issues, friends and reflections (1995-2004) 4th Progress Report (Unpublished).

Beem K 2010. Online doctorates for administrators. *School Administrator* **67(8)**:10-16.

Biraimah K 2011. Enhancing research agendas in emerging nations: A Kenyan example. In N Popov, C Wolhuter, B Leutwyler, M Mihova & J Ogunleye (eds), *Comparative education, teacher education, education policy, social inclusion, history of education*, *Volume 9*. Sofia: Bureau for Educational Services: 295-300.

Boud D & Lee A (eds) 2009. *Changing practices of doctoral education.* Oxford: Routledge.

Bourdieu P & Passeron JG 1977. *Reproduction in education, society and culture.* London: Sage.

Bourke S 2007. PhD thesis quality: The view of examiners. *South African Journal of Higher Education* **21(8)**:1042-1953.

Bowles S & Gintis HA 1976. *Schooling in capitalist America: Education and reform contradictions in economic life.* New York: Basic.

Casey BH 2009. The economic contribution of PhDs. *Journal of Higher Education Policy and Management* **31(3)**:219-227.

Centre for Research on Science and Technology (CREST) 2009. *Postgraduate studies in South Africa: A statistical profile.* Report commissioned by the Council on Higher Education. Pretoria: Council on Higher Education.

Chen X 2009. Recent reform in university education and its implications for student development in China. In Research Institute for Higher Education, Hiroshima University. *Producing qualified graduates and assuring education quality in the knowledge-based society: Roles and issues of graduate education.* Hiroshima: Research Institute for Higher Education, Hiroshima University: 45-58.

Council of Graduate Schools (USA) 2010. PhD completion and attrition: Policies and practices to promote student success. Retrieved on 17 December 2010 from http://www.phdcompletion.org/information/publications.asp.

Crossouard B 2008. Developing alternative models of doctoral supervision with online formative assessment. *Studies in Continuing Assessment* **30(1)**:51-47.

Davidson RM 2007. Valuing employability: Supervision training and the generic or transferable skills agenda. *South African Journal of Higher Education* **21(8):**1184-1193.

Deacon R, Osman R & Buchler M 2009. Education scholarship in higher education in South Africa, 1995-2006. *South African Journal of Higher Education* **23(6)**:1072-1085.

De Lange N, Pillay G & Chikoko V 2011. Doctoral learning: A case for a cohort model of supervision and support. *South African Journal of Education* **31(1)**:15-30.

Derrida J 2004. *Eyes of the university: Right to philosophy, 2*. Stanford: Stanford University Press.

Drake P & Heath L 2008. Researching in schools and universities: Insiders and professional doctorates. *Higher Education Review* **41(1)**:21-35.

Giroux H 1983. *Theory and resistance in education: A pedagogy for the opposition.* New York: Bergin and Garvey.

Green H & Powell S 2005. *Doctoral study in contemporary higher education*. Maidenhead: McGraw Hill.

Herman C 2011a. Elusive equity in doctoral education in South Africa. *Journal of Education and Work* **24(1)**:163-184.

Herman C 2011b. Expanding doctoral education in South Africa: Pipeline or pipe dream? *Higher Education Research and Development* **30(4)**:505-517.

Hopwood N 2010. Doctoral students as journal editors: Non-formal learning through academic work. *Higher Education Research and Development* **29(3)**:319-331.

Hoyle JR & Torres MS 2008. Students' reflections on the relevance and quality of highly ranked doctoral programs in educational administration: Beacons of leadership preparation? *AASA Journal of Scholarship and Practice* **5(2)**:5-13.

Jansen J, Herman C & Pillay V 2004. Research learning. *Journal of Education* **34**:79-101.

Jansen JD 2009. *Knowledge in the Blood: Confronting race and the Apartheid past.* Cape Town: UCT Press.

Jazvak-Martek M 2009. Oscillating role identities: The academic experiences of education doctoral students. *Innovations in Education and Teaching International* **46(3)**:253-264.

Karlsson J, Balfour R, Moletsane R & Pillay G 2009. Researching postgraduate educational research in South Africa. *South African Journal of Higher Education* **23(6)**:1086-1100.

Kehm BM 2007. Quo vadis doctoral education? New European approaches in the context of global changes. *European Journal of Education* **42(3)**:307-319.

Kiley M 2009. Rethinking the Australian doctoral examination process. *Australian Universities' Review* **51(2)**: 32-41.

Kiley M & Austin A 2008. Australian postgraduate research students still prefer to "stay at home": Reasons and implications. *Journal of Higher Education Policy and Management* **30(4)**:351-362.

Klenowski V & Lunt I 2008. Enhancing learning at doctoral level through the use of reflection? *Assessment and Evaluation in Higher Education* **33(2)**:203-217.

Kwan BSC 2009. Reading in preparation for writing a PhD thesis: Case studies of experiences. *Journal of English for Academic Purposes* **8(3)**:180-191.

Lee A & Kamler B 2008. Bringing pedagogy to doctoral publishing. *Teaching in Higher Education* **13(5)**:511-523.

Lee A, Brennan M & Green B 2009. Re-imagining doctoral education: Professional doctorates and beyond. *Higher Education Research and Development* **28(3)**:275-287.

Leggat PA & Martinez K 2010. Exploring emerging issues in research higher degree supervision of professional doctorate students in the Health Sciences. *Advances in Health Sciences Education* **15(4)**:601-608.

Leonard D, Becker R & Coate K 2005. To prove myself at the highest level: The benefits of doctoral study. *Higher Education Research and Development* **24(2)**:135-149.

Lott JL, Gardner S & Powen DA 2009-2010. Doctoral student attrition in the STEM fields: An exploratory event history analysis. *Journal of College Student Retention: Research, Theory and Practice* **11(2)**:247-266.

Mainhard T, Van der Rijst R, Van Tartwijk J & Wubbels T 2009. A model for the supervisor-doctoral student relationship. *Higher Education* **58**:359-373.

Marginson SM 2010. Global movements in research labour and doctoral students: Strategic implications for national systems and universities. In Research Institute for Higher Education, Hiroshima University. *Producing qualified graduates and assuring education quality in the knowledge-based society: Roles and issues of graduate education*. Hiroshima: Research Institute for Higher Education, Hiroshima University: 1-15.

Martinez GA, Nerad M & Rudd E 2010. Global perspectives on advocating for change in doctoral education. *Learning and Teaching: The International Journal of Higher Education in the Social Sciences* **3(1)**:92-103.

Mowbray S & Halse C 2010. The purpose of the PhD: Theorising the skills acquired by students. *Higher Education Research and Development* **29(6)**:653-664.

National Science Foundation (United States of America) 2009. *Doctorate recipients from U.S. universities summary report 2007-2008.* Arlington, VA: National Science Foundation.

Nerad M 2010. Increase in PhD production and reform of doctoral education worldwide. *Higher Education Forum (Japan)* **7**:69-84.

Nerad M & Heggelund M (eds) 2008. *Towards a global PhD? Forces and forms in doctoral education worldwide.* Seattle, WA: University of Washington Press.

Nsimande R 2007. Using "cunere" to re-conceptualise and understand best practices for effective research supervision. *South African Journal of Higher Education* **21(8)**:1117-1125.

Olivier MAJ 2007. Postgraduate supervision: For better or for worse? *South African Journal of Higher Education* **21(8)**:1126-1141.

Orzoff JH, Peinovich PE & Riedel E 2008. Graduate programs: The Wild West of outcomes assessment. *Assessment Update: Progress, Trends and Practices in Higher Education* **20(3)**:1-16.

Patti G 2007. The online doctorate: Flexible but credible. *School Administrator* **64(7):**30-35.

Paulston RG 1977. Social and educational change: Conceptual frameworks. *Comparative Education Review* **21(2/3)**:370-395.

Popkewitz TS, Franklin BM & Pereyra MA (eds) 2001. *Cultural history of education: Critical essays on knowledge and schooling.* London: Routledge Falmer.

Probst C & Lepori B 2008. What is a doctorate? Changing meanings and practices in communication sciences in Switzerland. *European Journal of Education* **43(4)**:477-494.

Renaud EA & Suarez-Renaud G 2008. Modern-day Latino professors used C.H.I.L.E. to succeed in graduate school: Five strategies from the front lines. *International Journal of Progressive Education* **4(2): 1-29**.

Robinson-Pant A 2009. Changing academies: Exploring international PhD students' perspectives on "host" and "home" universities. *Higher Education Research and Development* **28(4)**:417-429.

Rochford K 2003. Hundred per cent successful throughput rates of master's and doctoral research students. *South African Journal of Higher Education* **17(3)**:217-225.

Servage L 2009. Alternative and professional doctoral programs: What is driving the demand? *Studies in Higher Education* **34(7)**:765-779.

Sprenkle DH 2010. The present and future of MFT doctoral education in research-focused universities. *Journal of Marital and Family Therapy* **36(3)**:270-281.

Stock WA, Finegan TA & Siegfried JJ 2009. Can you earn a PhD in economics in five years? *Economics of Education Review* **28**:523-537.

Stracke E 2010. Undertaking the journey together: Peer learning for a successful and enjoyable PhD experience. *Journal of University Teaching and Learning Practice* 7(1). Retrieved on 5 December 2010 from http://ro.uow.edu.au/jutlp.

Sullivan SE, Baruch Y & Schepmyer H 2010. The why, what, and how of reviewer education: A human capital approach. *Journal of Management Education* **34(3)**:393-429.

Taylor J 2008. Quality and standards: The challenge of the professional doctorate. *Higher Education in Europe* **33(1)**:65-86.

Van Aswegen ES 2007. Postgraduate supervision: The role of the (language) editor: *Sed quis custodiet yisos costodes?* (Juvenile, Satire, 6, 346-348). *South African Journal of Higher Education* **21(8)**:1142-1154.

Waghid Y 2011. The decline of the university in South Africa: Reconstituting the place of reason in the university. In R Barnett (ed), *The future university: Ideas and possibilities*. London: Routledge.

Walker G, Golde CM, Jones L, Bueschel AC & Hutchings P 2008. *The formation of scholars: Rethinking doctoral education for the twenty-first century.* San Francisco: Jossey-Bass.

Wasley P 2008. Portfolios are replacing qualifying exams as a step on the road to dissertations. *Chronicle of Higher Education* **54(44)**:A8.

Watson P 2008. Measuring postgraduate cohort throughput: A case study. *South African Journal of Higher Education* **22(3)**:725-739.

Weiler H 1984. The political economy of education and development. *Prospects* **14**:467-477.

Wellington J 2010. More than a matter of cognition: An explanation of affective writing problems of postgraduate students and their possible solutions. *Teaching in Higher Education* **15(2)**:135-150.

Williams G 2005. Doctoral education in Canada, 1900-2005. A report from the Canadian Association for Graduate Studies. Retrieved on 13 August 2011 from http://ogpr.educ.ubc.ca/Doctoral%20ed/alpha%20bibliography.htm

World Bank 2002. *Constructing knowledge societies: New challenges for tertiary education.* Washington DC: The World Bank.