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Are South African doctoral qualifications educating the thinkers we need?

Significance:

The recently completed national review of the doctoral qualifications offered by South African higher education institutions has provided important insights into the national landscape of doctoral education, and raised many questions. One key question is whether our doctoral qualifications educate our students to be the broad and critical thinkers needed to address current and future scientific and societal challenges. In the South African higher education context, we must ask ourselves whether we are providing the academic and intellectual depth required to enable our doctoral graduates to achieve the graduate attributes that we express as our national aspirations, and we need to consider new approaches to doctoral education.

Introduction

The *Doctoral Degrees National Report*[1] of the Council on Higher Education (CHE) was published in June 2022, following an intensive process of reporting and review. All South African universities and private higher education institutions which offer doctoral degree qualifications were required to undertake a Self-Evaluation Review, based on the National Standard for Doctoral Qualifications established by the CHE in 2018.[2] Individual Review Panels then reviewed the Self-Evaluation Reviews, conducted site visits to the institutions, and provided feedback to the CHE. The comprehensive National Report was compiled from the Review Panel reports and additional information provided by the CHE.

This is the first time a national review of an entire qualification type has been conducted (although previous national reviews have been conducted on the disciplinary programmes MBA, Education, Social Work, and LLB). The outcomes of this review are of tremendous significance for higher education institutions and broader society. In this Commentary, we highlight some issues that emerged from the review. The Commentary raises important questions about the extent to which we are successfully preparing our doctoral graduates as critical thinkers, equipped for future roles, and contributing effectively to addressing local, national and global scientific and societal challenges, as they are identified in the graduate attributes set out in the Qualification Standard, and we suggest some new approaches to doctoral education for consideration.

The purpose of a doctoral degree

The national Qualification Standard[2] states that the purpose of the doctoral qualification is to 'develop the highest level of holistic and systematic understanding of scholarship in, and stewardship of, a field of study through an original contribution that advances the frontiers of knowledge'. These expectations are the essence of doctoral study, emphasising high-level intellectual thinking, and distinguishing it from master's-level training programmes.

Further to the statement of purpose, the Standard sets out graduate attributes that would demonstrate the achievement, by the doctoral student, of required levels of knowledge and proficiency. These attributes resonate with global trends, in specifying outcomes that all doctoral graduates should have attained on completion of the qualification, in preparation for ongoing contribution to a research community. We note that the national review of doctoral qualifications was not intended to include a review of the Standard itself, but rather, to use it as a benchmark. In a separate article[3], we have explored in more depth the concept of graduate attributes, and the effectiveness of institutional practices in developing an understanding, among academics and students, of their significance.

The attributes are broadly categorised as 'Knowledge and Skills Attributes'. Knowledge Attributes include:

> broad, well-informed, and current knowledge of the field or discipline; insight into the interconnectedness of the topic of research with other cognate fields; ethical awareness; originality; and capacity for reflection, critical thinking and problem solving.

These relate to the expected original contribution, and its integration into existing literature and academic debate. The doctoral graduate should demonstrate:

> specialised, in-depth knowledge within a specific area of research, and awareness of the significance of their work in the field of research. The notion of originality itself requires the doctoral graduate to be a 'well-informed expert'.

Skills Attributes relate to the selection and application of appropriate research approaches and methods to answer research questions, the ability to work independently, to substantiate and defend findings and conclusions, to reflect critically on the research process, and to demonstrate critical and analytical thinking, and intellectual competence, in problem solving in diverse contexts. Furthermore, graduates should demonstrate:

> *an advanced level of communicative competence, through capacity for extended, sustained and rigorous academic writing, including relevant digital literacy skills appropriate for doctoral research, and the ability to relate individual research with reference to, and critical analysis of, associated research produced by scholars in the relevant intellectual and knowledge domain.*[2]

Such skills should encompass communication with both expert and non-expert audiences.

It is expected (by the CHE in the first instance) that institutions should take this expression of the purpose of the doctoral degree into account in planning doctoral programmes, and make this the foundation for the provision of doctoral education. The graduate attributes express the expectation that our doctoral graduates will have developed into broad and critical thinkers, implying that our doctoral programmes should be structured and implemented in ways that support such development.

The National Report considered several aspects of doctoral education that would influence the intellectual development of doctoral students as well-informed experts and critical thinkers. Some key findings and questions are summarised here.

Awareness of graduate attributes

A first, and critical, aspect of directing the structuring and implementation of doctoral programmes is clear awareness of the graduate attributes, by students, supervisors, academics and university leaders. The question we must ask is: are academic role players paying enough attention to the desired attributes and their attainment by doctoral graduates?

The Report demonstrated a surprising lack of awareness, or depth of understanding, among many academic role players, of the attributes that a doctoral graduate should attain, and especially those specific to a doctoral qualification, as opposed to generic graduate attributes. Of even greater concern, supervisors and doctoral students, in many cases, were uninformed about the Standard, and therefore had paid little or no focused attention to the graduate attributes. It was clear that students, particularly, had insufficient awareness or understanding of the developmental progression required, in realising these attributes.

Preparedness of candidates

Many factors influence the successful achievement of the doctoral qualification. Key initial steps include the process of selection of the candidate, the progression from admission to acceptance of the research proposal, and initiation of the research project. A common comment in the reviews was that our students are not well-prepared for doctoral study, and we must ask whether our institutions are providing appropriate support, to address this challenge.

The Review found that there is wide variation, among institutions, in the level of preparedness expected of doctoral candidates, at the time of their selection and admission. There is also wide variation in the provision of pre-registration measures used to assess the readiness of a candidate to engage with learning at doctoral level, and programmes to assist them in preparing for the doctoral study. There are significant variations in processes for supporting the student in the preparation and acceptance of the research proposal, a key milestone at the start of any doctoral study. In some instances, doctoral candidates are registered (or pre-registered) and provided with strong academic support in preparing their research plans; in others, prospective candidates are expected to write and submit a proposal with minimal or no support, before they are admitted. Such inconsistencies inevitably mean that many students are intellectually ill-prepared to begin doctoral studies, which may then hinder their academic development.

Supervisory support

Throughout a doctoral study, the supervisory support provided to a doctoral candidate is a pre-eminent, and critical factor. The progress of the doctoral candidate is influenced strongly by the way in which the supervisory process is conducted, and the extent to which the student's intellectual development is prioritised in supervisory guidance and supporting interactions.

The Report highlights serious concerns expressed by institutions, regarding insufficient numbers of adequately qualified supervisors in the sector, and a national emphasis on increasing numbers of doctoral graduates. These, combined, create pressure on individuals and institutions, compromising their capacity to provide high-quality supervision.

This pressure can potentially lead to conflict for supervisors, in terms of prioritising either the completion of an acceptable thesis or the development of the student, which may take more time than the national expectation of 3 years. In addition, some students may see a doctoral degree simply as a way to gain better employment in due course, as opposed to being motivated towards developing themselves intellectually. Thus, the motivation of the student for undertaking a doctoral study should be part of the admission process, and awareness of this should be part of supervisor induction.

There is clearly a need for additional supervisory capacity across the national system. While it is recognised that programmes for training supervisors are in place in some institutions, we should be asking why these are generally not mandatory, and why there is usually no certification of the training. This leads us to question how we ensure the quality, and depth, of the supervision provided to our doctoral students. In the rapidly changing national and global contexts, and with current inter-disciplinary approaches, the attitudes of institutions and supervisors should be focused on innovation and renewal, rather than remediation. Furthermore, there is much advantage in ensuring the transfer of experience from the old to the new, at institutional as well as individual level.

In all South African universities, the one-on-one supervisor-student model is the most common (despite international trends towards alternative supervision models). The student-supervisor relationship is therefore the primary source of guidance for the student, and the intellectual development of the doctoral candidate is highly dependent on the availability of a supervisor with relevant qualifications, wisdom, and experience. The National Report makes recommendations for adoption of alternative models such as cohort supervision or supervisory panels, and some newer, alternative approaches are discussed later in this article, which would promote greater depth and diversity in supervision practices.

Where a student does have more than one supervisor, the addition of co-supervision may provide a constructive route to stronger support, but there were also reports of conflicting views or approaches between supervisors, creating difficulties and negatively influencing students' progress. This influence is even more evident for a doctoral student undertaking interdisciplinary studies, where allocation of supervisory responsibility between supervisors from different disciplinary fields may lead to differing (and even competing) styles of support and guidance for the doctoral students.

Ethical awareness

The Standard requires that doctoral graduates demonstrate ethical awareness, and indeed, the requirement for understanding of professional conduct and research integrity is a fundamental aspect of any research programme. There are well-established national and international frameworks of definitions and regulations to guide ethical research conduct.

Disturbingly, the Report reveals that while most institutions have established processes for ethics approvals, few provide training programmes which cover more than the process of obtaining ethics approval. Even in these processes, there were reports of lack of clarity and consistency, and many bottlenecks reported. Of additional concern were reports that across some institutions, in fields of human and animal research, students' understanding of the regulations, and compliance, were inadequate.

How are we educating our doctoral students to grapple with issues of ethics and research integrity? Very few institutions or individuals reported focusing on in-depth consideration of ethical issues, as for example the philosophy of ethical research, fundamental ethical principles, and associated responsibilities related to the research itself, including benefit to communities, in research involving human subjects. A broad interpretation of ethical accountability would seek to reconcile private good with public good and the benefit to humankind, whether local, national or global.

Assessment of graduate attributes

Further to describing the graduate attributes, the Standard requires a description of systems for monitoring and assessing the progression towards their attainment, which is key to judging the attainment of knowledge and skills attributes by doctoral graduates. Few Self-Evaluation Reviews provided evidence of assessment beyond the examination of the thesis. We need to debate whether this is enough.

From the Report, the majority of universities clearly consider that successful examination of the thesis demonstrates attainment of at least some of the graduate attributes, as, for example, broad and expert knowledge, original contribution to the field, research methodology, reflection, rigorous academic writing, and critical and analytical thinking. The assumption is that doctoral graduates whose theses are accepted, and who have achieved a body of research which constitutes a contribution to knowledge, have developed the expected intellectual thinking skills – an assumption which may not be justified without clear evidence of intellectual depth.

Related to this, the successful publication of peer-reviewed articles emanating from the doctoral research and other research outputs such as patents, is regarded as evidence of original and innovative thinking contributing to the body of knowledge, and of development of an effective researcher with disciplinary and professional impact. The majority of universities expect the doctoral graduate to have published their results in peer-reviewed journals, and this undoubtedly demonstrates that the research has yielded useful research data, but not necessarily intellectual depth.

Many doctoral students are (or perceive that they are) expected, by supervisors and research leaders, to prioritise the generation of data and publication of the results, over the development of in-depth thinking about their subject area. The national and institutional systems of performance management, and incentivising of publication, drive this behaviour in a way that can lead to doctoral graduates who are highly skilled technically, but are not equipped with critical thinking ability.

It is clear from the information in the Report that not all universities have sufficiently developed strategies and mechanisms to purposefully build the graduate attributes into their doctoral qualifications, and to assess them. Critical and analytical thinking and problem-solving skills are not easily measured, or assessed, directly. Many universities indicated difficulty in identifying ways to verify doctoral graduates' ability to conduct research-related critical and analytical thinking.

If we wish to assure ourselves that our graduates are critical thinkers, our universities need to develop this capacity. We perhaps also need to consider methods of assessment, and a move beyond the conventional thesis examination and oral presentation to a requirement for active engagement with assessors and peers.

Recognised challenges

A number of challenges exist for universities in the provision of doctoral training, in addition to those described above. The South African university sector is highly diverse, and the Report recognises the importance of context, for different institutions. Historical changes, including mergers, restructuring, and realignment of qualifications, have led to an uneven doctoral education terrain. There are wide differences in numbers of students, academic workloads, expectations of research productivity, supervisory capacity, and institutional culture. Within this context, many institutions have been unable to create effective systems for high-level doctoral education, and doctoral students' experiences are highly variable across the sector.

Related to this, while some universities have well-established infrastructure, a few do not have adequate infrastructure to support doctoral education, and the cost of establishing adequate infrastructure is prohibitive. Some of these institutions are reliant on collaboration and partnerships to support the research needs of their doctoral students. This may not be altogether disadvantageous, as it can provide students with broader learning opportunities, and access to a more research-rich environment. However, it does not solve the problem of institutional capacity where the research-rich environment needs to be established in the longer term.

An overarching challenge, recognised widely, is the availability of funding for doctoral student bursaries. With insufficient funding, and a challenging socio-economic situation, many doctoral students are working part-time, which, while providing experience and exposure, may limit their capacity to engage adequately with the intellectual development expected of them. Related, limited availability of funds for mobility constrains the opportunities for broadening thinking through experiences in other countries or institutions.

Interventions to support intellectual development

Recognising the need for academic support for doctoral students' development, many institutions offer training and capacity-building programmes but, again, this is highly variable across the sector. Many universities offer research methodology training, writing skills development, etc., and host workshops, seminars and colloquia, and there are examples of excellent support programmes.

Writing Centres, dedicated to assisting postgraduate students, were mentioned in several reports, established to specifically develop competence in academic writing and communication, including relevant digital literacy skills appropriate for doctoral research. Writing Centres typically have consultants with language skills, but it is important that the staff need to have postgraduate education experience themselves, and they need to work in collaboration with supervisors, while not replacing the supervisors' role.

Some universities have Postgraduate Centres (or equivalent) where staff are dedicated to supporting postgraduate progress, with academic, disciplinary, and intellectual input. Others reported establishing Communities of Practice among doctoral students, and these can provide for peer support and intellectual discussion.

However, in most cases, these academic support activities are voluntary and participation in the programmes is inconsistent. Systems are required to monitor and evaluate the impact of academic support interventions, and these are not in place in all institutions. In particular, there is a need to identify specific activities that students should undertake, to assess their progress towards the graduate attributes, and to demonstrate attainment of the attributes on graduation. Such systems could be developed nationally, for the benefit of all institutions.

Mentoring programmes for doctoral students were not widely reported. Mentorship, where experienced individuals (who are academically qualified but not supervisors) offer the student advice, informal support, and wisdom, could provide additional guidance for doctoral students to develop intellectual depth.

A few universities reported exploring new approaches to supervision, including cohort models, supervisory panels, and interdisciplinary supervision teams. This is generally viewed as a valuable approach, especially where the doctoral studies are in inter-/multi-/transdisciplinary knowledge areas. Few reported developing approaches such as doctoral training centres[4], where structured doctoral education is being conducted collaboratively between institutions, and participants have opportunities to engage with, and learn from, a range of different stakeholders.

New approaches

Given the considerations described above, it is time to ask ourselves how we could improve the doctoral education we offer, to assure the academic and intellectual development of our doctoral students. One approach is to revise our programmes, and focus more deliberately on critical thinking.

In 2018, an article in *Nature* outlined a (then) new programme at Johns Hopkins University, intended to reform the training of doctoral students, to 'put the philosophy back into the Doctorate of Philosophy'[5]. The programme was designed to develop students' critical thinking abilities, and to improve their capacity to recognise rigour and to understand scientific integrity and

social responsibility aspects of research. The key point was that doctoral programmes tend to train students to be technically skilled, but not broad critical thinkers. Furthermore, students focusing on productivity would not, generally, consider the social impacts of their research or societal needs for research that leads to a better world. While it is acknowledged that the article[5] was written in the context of medical training, it may be argued that the same is true of doctoral programmes in many different disciplines. These concerns closely match those outlined in the present article, regarding the South African context.

The proposed solution[5] was based on the implementation of curriculated doctoral programmes with coursework modules incorporated, and the debate over the inclusion of modules aimed at developing the critical thinking, integrity and social responsibility aspects of the doctoral education. We, in South Africa, need to ask ourselves how we could incorporate learning to develop critical thinking, integrity and social responsibility in our doctoral programmes.

Perhaps what is needed, initially, is a revision of the academic activities in which our doctoral students are engaged, and the introduction of high-level curriculated doctoral modules to enable development of those broad and critical thinking abilities that we seek.

In South Africa, the PhD qualification explicitly excludes credit-bearing coursework modules, with the exception of the professional doctorate, over which there is some current debate. Currently, credit-bearing coursework and work-integrated learning are allowed in the professional doctorate, and the debate is around the challenge of ensuring quality and academic rigour in such doctoral-level coursework. The addition of curriculated training modules in general doctoral degree programmes may be a complex issue under the current national qualification framework, with respect to practical issues (such as impact on time required for completion of the programme) and the need to change the Higher Education Qualifications Sub-Framework regulations for doctoral qualifications. Nevertheless, there is an urgent need for alternative approaches to developing academic environments and processes that will impart and facilitate the development of 'thinking' capacity in doctoral students in South Africa.

Conclusion

We must debate whether South African institutions are doing enough to make doctoral programmes intellectually, academically, and philosophically directed, and whether there are sufficiently intensive opportunities for our doctoral candidates to engage in academic conversation and debate, and scholarly activities that add intellectual depth, and develop high-level critical thinking.

The National Review has shown that such activities are not central to many of the doctoral programmes offered at our universities. The result is that we have little certainty that our doctoral graduates do emerge as the broad and critical thinkers that we expect.

The National Report concludes with a set of recommendations, including that our institutions should:

- deliberately pursue awareness and integration of the graduate attributes in every doctoral programme;
- identify and clearly state assessment criteria and assessment tasks that doctoral students should complete in order to determine if the graduate attributes have been attained;
- consider fostering attributes such as critical citizenry and consciousness of social responsibility, with the notion of 'engaged research' and the doctoral qualification being seen as a 'public good'; and
- ensure that doctoral studies reflect global/international and regional benchmarks.

Engagement with the National Report, and its recommendations, should, at least, stimulate debate and discussion on how best to ensure that our doctoral education programmes achieve their purpose.

References

1. Council on Higher Education (CHE). Doctoral degrees national report. Pretoria: CHE; 2022. Available from: https://www.che.ac.za/sites/default/files/inline-files/CHE%20Doctoral%20Degrees%20National%20Reporte_0.pdf
2. Council on Higher Education (CHE). Higher Education Qualifications Sub-Framework: Qualification standard for doctoral degrees. Pretoria: CHE; 2018. Available from: https://nr-online-1.che.ac.za/html_documents/3.Doctoral%20Degrees%20Qualification%20Standard_Version%201.0_%20%20HEQC%20Approved%208%20November%202018%20(002).pdf
3. Faller F, Burton S, Kaniki A, Leitch A, Ntshoe I. Achieving doctorateness: Is South African higher education succeeding with graduate attributes? [submitted manuscript]; 2022.
4. Explore the different models of centres of excellence in doctoral training. Vitae News. 2012. Available from: https://www.vitae.ac.uk/news/vitae-news-2010-2015/explore-the-different-models-of-centres-of-excellence-in-doctoral-training
5. Bosch G. Train PhD students to be thinkers not just specialists. Nature. 2018;554:277. https://doi.org/10.1038/d41586-018-01853-1