Quality assurance of doctoral thesis assessment at South African universities: A systematic literature review

M. Ramchander
Department of Operations and Quality Management
Durban University of Technology
Durban, South Africa
https://orcid.org/0000-0002-3827-2349

M. M. Nadar
Department of Operations and Quality Management
Durban University of Technology
Durban, South Africa
https://orcid.org/0000-0001-9993-8805

ABSTRACT

In South Africa, the assessment of doctoral theses should follow structured processes that ensure fair, consistent, and rigorous evaluation of research outputs. The quality and integrity of doctoral thesis assessment processes depend on robust assessment systems, appropriate examiner selection, and the consistent application of assessment criteria across universities. The objective of the study was to ascertain the challenges faced by both universities and students regarding the quality of doctoral thesis assessments. The appointment of suitable examiners and the production of examiners' reports are among the most critical aspects of assessment. The assessment process comprises written reports from examiners who are supposed to assess the thesis on institutionally set criteria. However, the literature reveals notable variation in assessment criteria across institutions. Such discrepancies pose a significant barrier to maintaining assessment quality. More specifically, any variance in how examiners apply criteria can lead to inconsistent evaluation outcomes. The examination process can become very protracted by delaying final decisions, often resulting in delayed graduation. The PRISMA methodology was used to execute a systematic literature review. Three library databases were used to identify 71 articles, where the advanced search function was used to deploy keywords employing Boolean operators. The inclusion criteria were journal articles published from 2019 to 2024. After screening the abstracts of all the articles, 21 articles were found to be relevant to this study. Using thematic analysis, the research findings were teased out to provide a clear understanding of the quality of assessments and the challenges they pose. The key findings included a lack of standardisation of assessment criteria across institutions, inconsistencies in examiner reports for the same thesis, and inconsistent application of set criteria, including institutional criteria independent of the examiners and subjective criteria dependent on the examiners. This study recommends establishing a community of practice of examiners within faculties, in which appointed examiners are inducted and offered the opportunity to discuss and develop a shared understanding of the assessment framework for doctoral examination, including the interpretation of criteria and expectations.

Keywords: doctoral thesis assessment, assessment quality, examiners' reports.

INTRODUCTION

As the highest academic qualification, the doctorate signifies a candidate's ability to conduct independent and original research. Given South Africa's ambition to increase the number of doctoral graduates from around 3000 to 5000 annually by 2030, the quality of doctoral assessments should be a focal point of academic discourse, centred on the quality and consistency of doctoral thesis assessments. Institutional responses to ramp up doctoral production have raised concerns about the quality of doctoral qualifications in South Africa (Ramlall, Singaram and Sommerville 2020, 130). The study aimed to identify the key quality challenges arising from the examination of doctoral theses. To identify the challenges, a systematic literature review was conducted to explore previous studies on doctoral thesis examination at South African universities and at universities abroad for benchmarking purposes. By synthesising the findings of relevant studies, recommendations were made to enhance the quality of doctoral thesis examinations.

Hodgson (2020,51) is of the view that the examination of a doctoral thesis is a crucial milestone in a student's demanding journey, where their research thinking and writing are assessed by experts and writing the doctoral thesis can be one of the most challenging aspects due to the complex mix of practical, intellectual and emotional struggles and transformations unique to doctoral experience. Poole (2015, 1518) suggests that common characteristics of doctoral quality include the student's ability to engage with the discipline's literature, to use its theoretical foundations to create new knowledge, and to theorise research findings in a meaningful and creative manner, while adhering to research ethics and principles. Hence, doctoral students must ensure that their work makes a significant and meaningful contribution to the field in which it is conducted, advancing knowledge, addressing key gaps, pushing the boundaries of existing research, and maintaining the highest standards of quality (van Schalkwyk et al. 2020, 1).

The significance of doctoral studies has expanded beyond academia (Byram and Stoicheva 2020, 1–2). Doctoral education has become a priority in many countries, driven by the goal of increasing the number of doctoral graduates to establish nations as knowledge societies and economies, or to gain a competitive edge in the global knowledge economy (Bao Kehm and Ma 2018, 1). McKenna (2019, 1) asserts that globally, the demand for doctoral education has surged, driven by a correlation between a country's economic stability and the number of individuals with doctoral qualifications. Higher Education institutions (HEIs) have focused on massification, prompting concerns from government, industry and society about the quality and

inadequacy of HEIs in preparing students for professional practice (Halibas et al. 2020, 917). Temoso and Myeki (2022, 207) express that South African universities are under increasing pressure to enhance their outputs with fewer resources while also addressing institutional and structural inequalities to improve doctoral graduation rates. Faller et al. (2023, 94) argue that although the goal of increasing the number of South African doctorate graduates from 54 to 100 per million citizens in 20 years is admirable, there are concerns that prioritising quantitative targets may undermine the safeguarding or improvement of quality. Yudkevich, Altbach and de Wit (2020, 14) argue that as universities globalise the quality of doctoral education must adapt to meet the evolving demands of changing labour markets and the global revolution in knowledge production with critics highlighting issues such as outdated models, long completion times, high dropout rates, limited interdisciplinarity and internationality, inadequate skills for a diverse labor market, declining quality and ineffective assessment practices due to budget cuts.

While the quality discourse on doctoral education focuses on the quality of doctorates, emphasising global competitiveness, international mobility, the knowledge economy, and high-level research skills, raising questions about quality assurance in terms of both processes and outcomes is imperative (Du Preez and Simmonds 2016, 342). Therefore, the quality of a doctoral study demands that students produce a substantial and original contribution to their field underpinned by thorough research and validated through rigorous assessments, ensuring both academic integrity and practical relevance.

South African universities operate within a regulatory framework that seeks to balance institutional autonomy with national quality assurance mechanisms. According to the Council on Higher Education (2022, 1), a national review of doctoral qualifications in South Africa, conducted jointly with the National Research Foundation (NRF), focused on the following key areas.

- The NRF, as part of its Human Capital Development (HCD) mandate, funds doctoral studies but requires assurance of their quality across public and private universities.
- While increasing the number of doctoral graduates is important, the primary focus is on maintaining high-quality standards.
- Quality assurance impacts international comparability research output and national capacity to address global and local challenges in a knowledge-driven economy.

Achieving a doctoral degree is recognised as a significant academic milestone certifying researchers' ability to conduct independent research, with the thesis undergoing rigorous

examination and, in some cases, a defence, prompting universities to prioritise quality and maintain high standards due to the high stakes involved (Chetcuti, Cacciottolo and Vella 2022b, 1358). The South African Qualification Standard for doctoral degrees emphasises the graduate's attributes, assessing both the completion of an acceptable thesis and the impact of their scholarship in advancing a field, to produce a researcher capable of contributing to an established research community (Faller et al. 2023, 94).

Concerns persist regarding variability in assessment criteria, examiner reliability, the role of external examiners and the extent to which doctoral assessments effectively measure research competence. Council of Higher Education. (2022, 7) explain that the Doctoral Standard of the CHE mandates that institutions establish assessment policies with criteria:

- For selecting examiners who ensure expertise in the research area, independence, integrity, fairness, reliability and rigour in the examination process.
- For coordinating and approving examiners' reports and responsibility for awarding the degree.
- For conducting oral examinations when included in the final assessment process.
- For provisions and procedures for appealing examination decisions.

According to Starfield et al. (2017, 3), examiners evaluate the doctoral thesis independently, responding to questions such as:

- Does the thesis present a well-organised and comprehensive investigation of the selected topic?
- Does the thesis address the topic with adequate scope and depth to fulfil the doctorate requirements?
- Does the thesis offer an original contribution to knowledge in the field and include material suitable for publication in a relevant academic journal?
- Does the thesis adhere to internationally recognised standards for research conduct and presentation in the field?
- Does the thesis show a deep understanding of the relevant literature in both the subject and broader field, along with the candidate's ability to critically analyse and evaluate that literature?
- Does the thesis demonstrate a strong command of the appropriate methodology and/or theoretical framework?

Hodgson (2020,54) further highlights the following expectations of a doctoral thesis:

- A comprehensive understanding and critical engagement with the literature demonstrating a clear connection between the literature, research findings and a consistent disciplinary perspective.
- A deep understanding and application of theory and method showcasing the ability to generate original insights and contribute meaningfully to their field.
- A coherent development of a compelling argument.
- An original contribution to knowledge and consistent use of theory and method.
- the ability to synthesise information, which may include evidence of published work in reputable journals.
- A critical self-reflection and assessment of the student's own work.

The examination process also involves an element of subjectivity, with examiners potentially serving as gatekeepers to their academic community, sometimes displaying bias towards candidates who share their ideologies, and the roles of examiners have been scrutinised for their impact on the content and purpose of the examination report (Ramlall et al. 2020, 132). Sharmini and Kumar (2018, 673) similarly note that examiners assess the thesis based on institutional criteria and their professional judgment to evaluate the quality of scholarship and act as "gatekeepers" to ensure the candidate meets acceptable standards.

Guerin and Aitchison (2021, 629) and Wilkins, Hazzam, and Lean (2021, 1) contend that the ability to articulate and defend research findings is essential in the thesis, and publishing therefrom is a moral responsibility.

OBJECTIVE

The objective of this study was to examine the quality challenges arising from doctoral thesis examinations at South African universities.

METHOD

This study employed a Systematic Literature Review (SLR) approach guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework. Andreini and Bettinelli (2017, 2) define an SLR as a reliable and scientific overview of existing research on a topic, aimed at identifying, appraising, and synthesising relevant studies through a transparent and replicable process, with clearly defined protocols for literature search, inclusion and exclusion criteria, and analytical methods to ensure an audit trail. More specifically, according to Kraus, Breier, and Dasí-Rodríguez (2020), the SLR seeks to answer a specific

research question. This study addresses the question, "What are the key factors influencing the quality of doctoral assessments?"

Keywords essential to addressing the research objective and question were combined using Boolean operators such as "AND" and "OR" to refine or expand search results, as detailed in Table 1.

Table 1: Search strategy

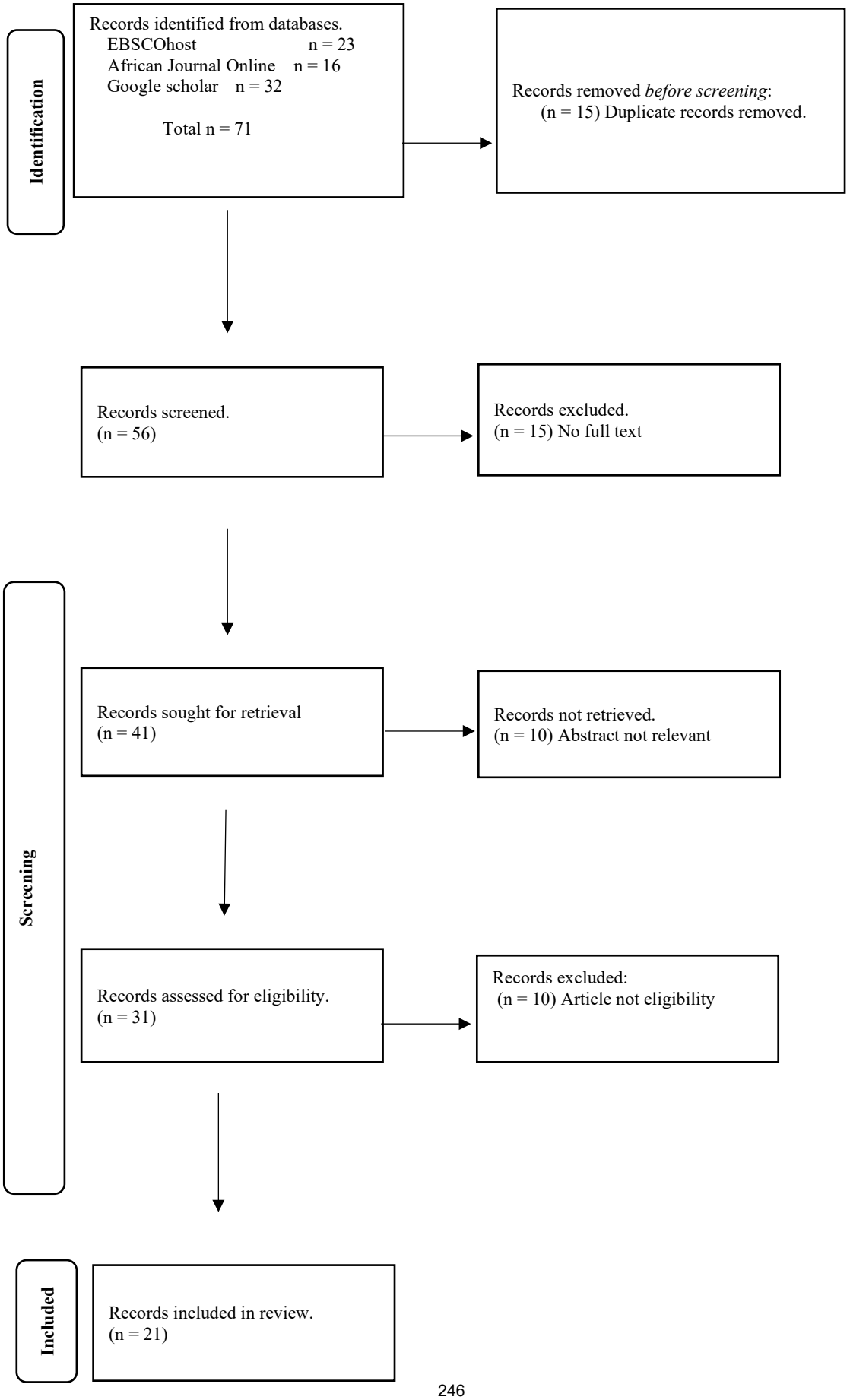
"Quality" OR "standard"
AND
"Postgraduate" OR "Masters" OR "Doctoral"
AND
"Assessment" OR "Examination"
AND
"thesis" OR "dissertation"

Source, Researchers' own construction

The EBSCOhost, African Journal Online, and Google Scholar databases were searched for relevant articles. The inclusion criteria were Year of publication (2019–2024); Language (English); Article type (Journal full text).

DATA COLLECTION

Figure 1 depicts the SLR identification, screening, and inclusion phases for transparency and reproducibility. Seventy-one records were identified in the three databases.



Figure, 1: PRISMA flow chart
Source, Adapted from Page et al. (2020)

A detailed protocol outlining the inclusion and exclusion criteria, data extraction procedure, and evaluation guidelines was established to ensure consistency and minimise subjectivity throughout the review process. The review involved searching three key databases relevant to the study, yielding 71 records. After removing 15 duplicates, 15 articles were excluded due to the absence of full text, 10 were excluded because their abstracts were not relevant, and 10 were excluded based on eligibility criteria, resulting in 21 articles being included in the final systematic literature review through the selection process. Each article was carefully evaluated for its relevance, quality, and contribution to the research topic. These articles covered a range of perspectives, methodologies and findings, ensuring a comprehensive analysis of the subject matter. The inclusion of these articles was based on criteria such as publication date, full text availability, impact within the field, and methodological rigor, allowing for a well-rounded and insightful examination of the literature.

The literature from the 21 articles was first imported into NVivo version 12 and organised into nodes for efficient management. The data was then coded by linking relevant sections to the appropriate nodes. Through this coding process, themes emerged that were further explored using NVivo's query and visualisation tools, including text searches and word-frequency queries. Finally, the identified themes were extracted and reported with a visual bubble chart and a word cloud used to present the findings. By synthesising and critically assessing a wide range of studies, important insights into the current state of research in this field were obtained. Inter-rater/coder reliability in the SLR process was maintained by having two researchers independently code the data with regular checks for consistency and agreement throughout the analysis. Trustworthiness was ensured by clearly formulating the research question(s), defining inclusion and exclusion criteria, selecting databases and keywords, and establishing methods for data extraction and synthesis, all of which promoted consistency and minimised research bias.

RESULTS

Figure 2 presents a cloud diagram that visually represents text data, with word sizes varying by frequency, offering an intuitive overview of prominent terms. Larger fonts indicate higher frequency. This tool is useful for identifying key themes and focus areas by emphasising the prominence of specific words within a text or dataset.



Figure 2: Word cloud
Source, NVivo software version 12 construct

The word cloud was created by analysing word frequencies in the literature using the Microsoft Word cloud add-in. The predominant words arising from the SLR were doctoral research, quality assessment, examiner, examination, qualification, and thesis standard. These keywords helped formulate the themes. In qualitative studies, the results sections are often structured around themes to aggregate and compare findings from individual studies.

Figure 3 highlights the key themes identified in the systematic literature review.

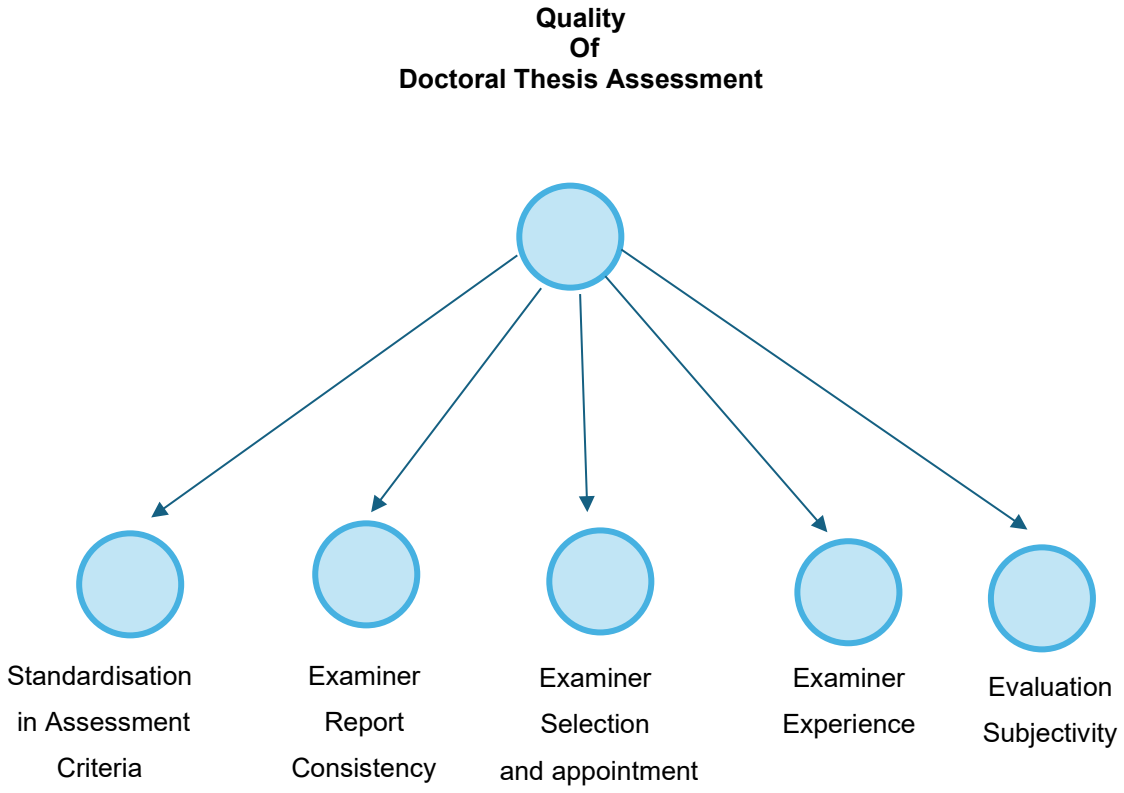


Figure 3: Key themes identified in the systematic literature review
Source, Author's own construction

Figure 3 illustrates the five key themes extracted from NVivo version 12, identified through a systematic coding process and further analysed using query and visualisation tools to capture the most significant patterns and insights from the data.

The themes extracted from the SLR are further explained in the data extraction matrix depicted in Table 2.

Table 2: Data Extraction matrix

Theme 1, Standardisation in Assessment Criteria		
Findings	Context of the study	Authors
Differences in the structure, length, focus, and emphasis of reports (significance and methodology), as well as inconsistencies in examiners' feedback and ratings for the same thesis, reveal a lack of standardisation in the doctoral examination process.	South Africa Qualitative document analysis of 54 examiner reports on 18 doctorate theses at a South African University.	(Ramlall et al. 2020, 142)
Higher education institutions can contribute to standardisation by implementing structured programs, such as workshops, conferences, seminars, and communities of practice, that provide doctoral students with opportunities to present their research, receive feedback, and engage in scholarly discourse.	South Africa: The article was based on the South African Higher Education Council's report.	(Tshuma and Bitzer 2023, 719).
Challenges in appointing examiners; vague criteria for ancillary requirements (oral defence) to the thesis; discrepancies in the quality of examiner reports and examiner recommendations; and discrepancies in the category chosen by the examiner to indicate the final decision regarding the choice of categories, regarding the nature of corrections or a re-examination result in delays.	South Africa: A qualitative study was undertaken at six South African universities to gather data from a purposeful sample of expert informants and relevant documents.	(Schulze and Lemmer, 2019)
The standardisation of assessment criteria across institutions is crucial to ensuring consistency, fairness, and the reliability of evaluation outcomes, ultimately strengthening the integrity of the doctoral education process.	Portugal: A systematic literature review to understand transformations in doctoral education, including how it is conceptualised.	(Cardoso et al. 2022, 891)
Varying guidelines are used to assess PhD theses. Still, there is no comprehensive or standardised framework to evaluate the contribution of each criterion, ensuring the quality and fulfilment of doctoral research.	India. The study explored the increasing approval rates of PhD theses across.	(Ganguly 2020, 87)
The standardisation of assessment criteria is essential to mitigate the impact of contextual factors, ensuring consistent and equitable evaluation across different institutions and maintaining the quality and credibility of doctoral assessments.	Malta, Analysis of 38 examiner reports for doctoral thesis during the years 2017-18	(Chetcuti Cacciottolo and Vella 2022, 1358).
Promoting a standardised research culture requires institutions to provide resources, training programs, and structured opportunities for collaboration and early publishing. Recognising and rewarding student-faculty contributions further supports the development of a cohesive academic environment.	Netherlands, Australia, UK, Denmark, Singapore, Malaysia, USA, Canada. The study explored the attitudes, perceptions, opinions, and experiences of 54 academic staff responsible for teaching on doctoral programmes.	(Wilkins et al. 2021, 9).
Failure to uphold rigorous, standardised doctoral assessments can undermine the value of the PhD, devaluing high-quality research and hindering the future training of scholars and scientists. The findings indicate that the PhD degree is under pressure in terms of its quality and rigor.	UK, Review of mainstream academic literature on doctoral degrees from the point of view of the origin and development of contemporary PhD.	(Alexander and Davis 2019, 6)

Theme 2, Examiner Report Consistency		
Findings	Context of the study	Authors
The assessment reports revealed variability in examiners' report structures, a focus on literature review and analysis over methodology in feedback, and general adherence to institutional guidelines, despite differing interpretations, underscoring the complexities of the assessment process.	Ghana, The study was based on a review of 34 thesis examiners' reports on 19 theses at the Department of English at the University of Cape Coast.	(Afful 2020, 118)
Many institutions have established structures to support doctoral studies, such as graduate schools' doctoral colleges, doctoral research schools, doctoral training centers, and industry partnerships. These efforts aim to enhance the consistency of examiner reports, ensuring more standardised assessments. As suggested, "In these ways, doctoral education has increasingly become structured at both the program and institutional levels."	The article provides a general analysis of factors that provide an overall framework for the international discussion of changes in doctoral education, drawing on a sample of case studies from across the globe.	(Taylor 2023, 610)
To enhance report consistency, assessments should not only measure research quality and writing but also support students' development as researchers. Providing structured, constructive feedback and regular progress monitoring can create a more uniform approach to evaluation while better preparing students for academic publishing and future scholarly contributions. Standardised assessment criteria and well-defined examiner expectations can contribute to a more transparent and equitable evaluation process.	Netherlands, Australia, UK, Denmark, Singapore, Malaysia, USA, Canada. The study explored the attitudes, perceptions, opinions, and experiences of 54 academic staff who are responsible for teaching on doctoral programmes.	(Wilkins et al. 2021,12)
Theme 3, Examiner Selection and Appointment Processes		
Findings	Context of the study	Authors
The CHE qualification standard for doctoral students mandates that institutions establish policies for examiner selection, ensuring expertise in the topic, independence, integrity, fairness, reliability, and rigor in the examination process, as well as clear criteria for the number and selection of internal and external examiners.	South Africa, The National Review Report synthesises findings from 28 institutional reports to provide a comprehensive overview of doctoral studies and qualifications.	(Leitch et al. 2022, 53).
Theme 4, Examiner's Experience		
Findings	Context of the study	Authors
Although universities have established criteria for doctoral assessments, the lack of clarity on how examiners interpret these criteria, coupled with the absence of training or guidance for providing feedback, highlights the challenges stemming from examiners varied scholarly understanding and experience.	Malta: The study analysed the consistency, quality, and interpretation of the examiner reports for 12 doctoral theses presented at the Faculty of Arts, University of Malta, in 2017 and 2018, involving 50 reports from 21 internal and 21 external examiners.	(Chetcuti Cacciottolo and Vella 2022, 2).

Theme 5, Evaluation Subjectivity		
Findings	Context of the study	Authors
A key role of a PhD examiner is to assess both the potential of the researcher and the quality of the research, with criteria provided by universities that can often be open to interpretation, leading to significant variations in the assessment of doctoral theses due to differences in personal judgment, disciplinary expectations, and interpretation of the criteria.	Australia. The study was based on 142 PhD examiners' written reports on 50 PhD theses submitted to a university in New Zealand.	(Starfield et al. 2017, 1)
The doctoral defence is an oral examination of the thesis in which the candidate is evaluated not only on their research contributions, defence skills, and field knowledge, but also on their personal abilities and capacity to navigate the defence dynamics, aiming to reduce subjectivity in the evaluation process.	The Netherlands, the article evaluates the defence format used in 26 countries, 24 of which use an oral format.	(Lantsoght 2023, 343)
	New Zealand. This study was conducted at a research-intensive university in New Zealand, where the oral examination for a PhD was made mandatory.	(Kumar Sanderson and Kaur 2021, 1080)
The quality of doctoral education is essential, as low standards can hinder knowledge creation and dissemination within the university. Without ensuring academic integrity and minimising evaluation subjectivity at the doctoral level, the quality of education at lower levels is also compromised.	South Africa: The article reviews the quality of doctorate qualifications in South Africa.	(McKenna 2019, 1)
Students must actively engage in learning, cultivate self-regulation, embrace intellectual humility, build their research identity, seek feedback, collaborate within academic networks and adopt a lifelong learning mindset to navigate the complexities of doctoral research and achieve professional growth. Students must be aware of the potential subjectivity in the examination and evaluation process, which may be influenced by personal biases, varying interpretations of criteria, and examiners' individual perspectives.	South Africa: The article was based on theoretical perspectives exploring learning and development in doctoral studies.	(Albertyn 2022, 623)

Source: Author's own construction

DISCUSSION AND RECOMMENDATIONS

This systematic literature review examined challenges associated with doctoral dissertation assessment and their implications for quality education in South African HEIs. The findings indicate that inconsistencies in doctoral assessment practices may undermine the quality, credibility, fairness, and comparability of doctoral qualifications across institutions. Given the strategic role of doctoral education in developing research capacity, innovation, and academic excellence in South Africa, ensuring rigorous and equitable assessment processes is fundamental to maintaining quality higher education.

Lack of Standardisation in Doctoral Assessment

The systematic literature review found that doctoral assessment practices are not consistently standardised across institutions. Variations in assessment frameworks, criteria, and evaluation procedures create differences in how doctoral dissertations are judged. Within the South African higher education context, such inconsistencies may affect the comparability of doctoral qualifications and raise concerns regarding the maintenance of national quality standards.

Doctoral dissertation assessment is a critical quality assurance mechanism because it determines whether candidates have demonstrated the advanced research competencies required at doctoral level. Where assessment criteria are inconsistently applied, the reliability and validity of assessment outcomes may be compromised. The findings therefore suggest a need for greater alignment of assessment frameworks and evaluation criteria across South African HEIs to strengthen the quality and credibility of doctoral qualifications.

Inconsistent Examiner Reports

The systematic literature review identified significant variation in examiner reports, with differences in expectations, interpretations of assessment criteria, and evaluation standards. In the South African context, inconsistent examiner reports may result in unequal treatment of doctoral candidates and uncertainty regarding the standards expected for successful completion of a doctorate.

Consistency in examiner reporting is essential for quality education because it contributes to fairness, transparency, and reliability in assessment practices. When examiners apply divergent standards, assessment outcomes may depend more on individual interpretation than on the quality of the dissertation itself. Strengthening assessment guidelines and clarifying examiner expectations could enhance consistency and improve confidence in doctoral assessment outcomes.

Bias in Examiner Selection and Appointment Processes

The systematic literature findings revealed concerns regarding potential bias in examiner selection and appointment processes. Factors such as professional networks, institutional affiliations, and disciplinary relationships may influence examiner selection, potentially affecting the objectivity of doctoral evaluations.

From a quality assurance perspective, transparent and equitable examiner appointment processes are necessary to maintain the integrity of doctoral assessment. South African HEIs are increasingly expected to demonstrate accountability, fairness, and adherence to ethical assessment practices. Addressing potential bias in examiner selection would strengthen

confidence in doctoral examination processes and contribute to the broader goal of quality higher education.

Variation in Examiner Experience

The systematic literature review found considerable variation in examiner experience and expertise. While experienced examiners may possess a strong understanding of doctoral standards and disciplinary expectations, less experienced examiners may apply criteria inconsistently or struggle to evaluate complex research contributions.

The quality of doctoral assessment is closely linked to examiner competence. In South African HEIs, examiner training and mentorship may therefore play an important role in promoting consistency and enhancing assessment quality. Developing examiner capacity can contribute to more reliable assessment outcomes and support the production of high-quality doctoral graduates capable of contributing to national research and development priorities.

Subjectivity in Doctoral Evaluation

Subjectivity emerged as a recurring concern across the reviewed studies. Although some degree of academic judgement is inherent in doctoral assessment, excessive subjectivity may compromise fairness and consistency. Differences in disciplinary perspectives, personal preferences, and interpretations of quality can influence assessment decisions.

In the South African higher education sector, reducing unnecessary subjectivity is important for strengthening the credibility of doctoral qualifications. Structured assessment criteria, examiner training, and supplementary assessment mechanisms, such as oral examinations or defence processes, may enhance transparency and reduce variability in assessment outcomes. By promoting more objective evaluation practices, institutions can strengthen the quality assurance function of doctoral assessment and ensure that doctoral graduates meet nationally recognised standards of scholarly achievement.

Implications for Quality Higher Education in South Africa

Collectively, the systematic literature review findings demonstrate that doctoral dissertation assessment is not merely an administrative process but a critical component of quality assurance in higher education. Effective doctoral assessment contributes to the credibility of qualifications, the development of research excellence, and public confidence in the higher education system. Conversely, inconsistencies in assessment practices may undermine the quality and reputation of doctoral education.

Strengthening standardisation, examiner selection procedures, examiner development, and assessment transparency can therefore contribute significantly to enhancing the quality of doctoral education in South African HEIs. Such improvements align with national objectives of producing high-quality doctoral graduates who can contribute meaningfully to research, innovation, and socio-economic development.

LIMITATIONS AND FUTURE RESEARCH

A limitation of this study is that it relied exclusively on published literature and did not incorporate primary qualitative data from doctoral students, supervisors, or examiners. As a result, the findings may not fully capture the lived experiences of stakeholders involved in doctoral assessment processes. Future research should therefore investigate the perspectives of doctoral candidates, supervisors, and examiners within South African HEIs. Such studies could provide deeper insight into assessment challenges and identify practical strategies for strengthening quality assurance in doctoral education.

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