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No Doctoral Studies Without Hurdles: A Review on Pathways to Prevent Dropouts

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Abstract: In traditional academia, doctoral studies typically require a minimum of three to six years of full-time study, depending on the country and institution. However, the scientific community's expectations for timely doctoral program completion are often unmet. Many students who enter a doctoral programme either drop out or fail to complete it within the expected timeframe. Extensive literature exists documenting the challenges faced by early career researchers, yet there is limited research on how to address the existing and perceived barriers that hinder doctoral study retention. To address these issues and other obstacles, it is essential to investigate the root causes of students dropping out of their studies. Therefore, this study aims to propose strategies for overcoming these barriers by providing a comprehensive overview of the necessary actions and approaches. The methodology employed a thorough review of internationally recognised peer-reviewed articles sourced from the SCOPUS multidisciplinary database. A total of 24 articles relevant to the topic were selected. The primary finding of this study is that doctoral students encounter various financial, academic, and social challenges, which require innovative solutions to enhance the timely completion of their studies.

Keywords: Completion, challenges, doctoral studies, dropout, retention, success.

1. Introduction

Doctoral education is crucial in a world where science and innovation are key drivers of economic growth and livelihoods for many people globally (Corcelles et al., 2019). It is also important because it contributes to a country's knowledge economy and development aspirations. Despite the valuable benefits of a PhD, there is a rapid increase in the dropout rates of doctoral students worldwide (Hardre et al., 2019). However, several governments today are reluctant to acknowledge the multiple and complex challenges faced by PhD students (Sverdlik et al., 2018; Bahnson., 2023). This bottleneck indicates the urgent need to rethink how we support PhD students around the world (Swartz et al. 2019; Corcelles et al., 2019).

More importantly, securing and retaining skilled employees is critical because their knowledge, skills, and experience are crucial for delivering an organisation's services successfully. However, achieving these and other organisational goals depends on society's willingness to support the cohort of doctoral scholars. This narrative has attracted the attention of scholars such as Skakni (2018), Bahnson et al. (2023), and van Rooij et al. (2021), who argue that academia urgently needs to address the issue of student dropout rates. This assertion is supported by Cloete et al. (2015), who report that in South Africa (SA), for example, it takes almost five years, on average, to complete a doctoral programme. Extreme cases have been reported in the United Kingdom (UK), where some doctoral students take 25 years to complete their studies (Liu et al., 2019). This statement implies that our PhD

students often take longer to complete their studies than necessary. This is one of the bottlenecks that universities must address in order to reduce the ever-increasing dropout rates and ensure that students complete their studies within the standard 3-4 year period in the case of SA and some European countries (Waight & Giordano, 2018; Liu et al., 2019). This is crucial, as most dropouts are highly dependent on government and donor-funded social programmes (Alves et al., 2023; Waight & Giordano, 2018). Addressing this problem requires a better understanding of the causes of high dropout rates and the development of innovative strategies to reverse this trend.

Previous research on doctoral dropout suggests global rates of 40-60%, with significant variation between countries and regions (Gittings et al., 2018; Mirick & Wladkowski, 2019). For instance, the reported dropout rate for PhD students in the UK is 19.5%, with a completion rate below 50% (Mathies & Cantwell, 2022). In South Africa, the dropout rate is 22% in the first year of the study (van Rooij et al., 2021) and slightly below 50% in the later stages of the research (Cloete et al., 2015). Surprisingly, annual data on PhD admissions and awards in India indicate a possible decline in the dropout rate from 53% in 2011-2012 to 37% in 2015-2016 (Bahnson et al., 2023). Despite questionable research infrastructure, a lack of trained faculty members in many institutions, and the rise of predatory journals (Hardre et al., 2019), the number of PhD candidates in India has quadrupled in the last decade. However, the dropout rate remains high due to the challenges associated with pursuing a PhD, such as the time and skills required (e.g., creativity, intellectual tenacity, and analytical ability). Furthermore, employment opportunities and job satisfaction may also influence graduates and negatively impact the dropout rate, which has been decreasing over the years.

As a result, various initiatives have been launched in recent decades to scrutinise and reform doctoral education in order to reduce dropout rates. Examples of such initiatives include the Woodrow Wilson National Fellowship Foundation's Responsive PhD Initiative and the Carnegie Initiative on the Doctorate in North America (Sverdlik et al., 2018). The literature demonstrates that both the number of dropouts and the time required to complete a degree have increased significantly over time (Beasy et al., 2021). Consequently, several countries are failing to meet their annual targets for the number of doctorates produced. South Africa, for instance, currently has a graduation rate of 40%, which is projected to reach 70% of all graduates by 2030 (Breitenbach, 2019). However, setting goals for doctoral students can pose challenges by potentially stifling creativity and innovation, as universities may prioritise meeting targets rather than ensuring the quality of work produced.

While these targets are a step in the right direction, one of the ongoing challenges is the strain on existing support systems, leading some students to seek additional mentorship from sources outside their institutions (Waight & Giordano, 2018). Given the alarming dropout trends and their adverse consequences, it is imperative for academics, policymakers, and other relevant stakeholders worldwide to take decisive action to address this situation.

Various theoretical models and frameworks have been used to explain the doctoral dropout rate. One seminal example is Tinto's model of student integration, which addresses the underlying problems of dropout (Litalien & Guay, 2015; Mirick & Wladkowski, 2019). This model suggests that students often drop out due to a lack of social integration systems, which hinders their ability to adapt quickly (Beasy et al., 2021). As a result, the academic and social integration of doctoral students (DSs) plays a critical role in predicting successful completion. Academic mediation theory is another relevant model that sheds light on dropouts. Cloete et al. (2015) demonstrated a linear relationship between academic performance and dropout rates, with poor academic performance leading to higher dropout rates and vice versa. Additionally, other factors such as deviant affiliation, personal deviance, family socialisation, and structural pressures have been used to explain high dropout rates in higher education more broadly (Mathies & Cantwell, 2022). These theories provide valuable insights that can guide curriculum developers in designing effective support systems for doctoral studies. Therefore, this study aimed to propose strategies for overcoming doctoral student dropout

and addressing challenges that hinder their timely completion, as well as their acquisition of expected knowledge and skills.

1.1 Findings from the cross-national literature

Doctoral students face various challenges, including academic demands and financial constraints (Beasy et al., 2021; Bekova, 2021), as well as social challenges. These students must learn to effectively manage their doctoral studies and navigate relationships with their study supervisors (Hardre et al., 2019; Holmes & Rockinson-Szapkiw, 2020). Additionally, difficulties in adjusting to university cultures can pose a problem, as universities must cater to the diverse needs of different doctoral students (Bahnson., 2023; Holmes & Rockinson-Szapkiw, 2020). In the UK, 16.2% of students dropped out of their doctoral programs early, while 3.3% dropped out in the final stages (Mathies & Cantwell, 2022). Therefore, the focus should not be on whether the issues leading to doctoral students' dropouts are known but on how to prevent them from discontinuing their doctoral studies. Another important question is what kind of support can be provided to minimise the risk of dropout among doctoral students.

Given the increasing number of doctoral dropouts and the lack of adequate strategies to reduce dropout rates or their reduced effectiveness, there is an urgent need to deepen understanding of preventive measures to decrease dropout rates in doctoral studies. This review examines the common challenges faced by doctoral students and identifies ways to promote their progression, success, wellbeing, retention, and completion. This is relevant to higher education institutions, the nation, doctoral students, and their supervisors. It sets the stage for further research, policy influence, and practices that foster the timely attainment of doctoral degrees. The methodology of this study will be discussed in the following section, followed by the critical findings, their interpretation, the study's conclusions, and recommendations for policy and practice.

2. Materials and Methods

The present study followed a systematic review of scientific articles for which no ethical review was required. The systematic approach was chosen because it allows researchers to gain useful insights and provide a detailed summary of peer-reviewed research in response to a research question (Brunton et al., 2020). An extensive search of global databases was conducted in SCOPUS via the search engines Bing and Google. These electronic databases were specifically selected and preferred because they promote multidisciplinary studies and provide full texts on publications in scientific journals with leading citation indices (Pranckute, 2021). This broad search approach was chosen to maximise the likelihood of capturing a representative sample of relevant publications (Creswell et al., 2018). The screening of articles is illustrated in Figure 1.
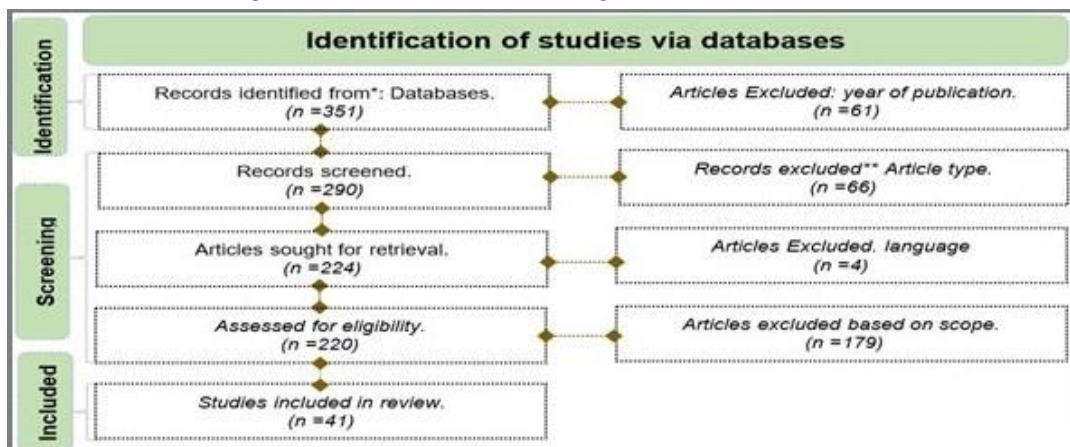

Figure 1: The inclusion and exclusion of articles using the PRISMA approach

The systematic review approach outlined two main steps for searching and obtaining valuable data (Kraus et al., 2020): a) article search and screening, and b) data collection and analysis. As shown in Table 1, the search initially had a broad scope, and then the identified articles were narrowed down by combining the first set of keywords with the second set of search terms using Boolean operators (Trakulsunti et al., 2022). The search was further refined by limiting the publication date to ensure the selection of recent papers. Consequently, articles that were 1) published before 2013, 2) written in languages other than English, 3) classified as grey literature, or 4) available only as book chapters or published dissertations were excluded.

Table 1: The Boolean operators used to retrieve articles

TITLE-ABS-KEY ("phd OR doctoral AND retention AND dropouts AND completion AND students AND degree AND attrition")	351
TITLE-ABS-KEY ("phd OR doctoral AND retention AND dropouts AND completion AND students AND degree AND attrition AND PUBYEAR > 2012 AND PUBYEAR < 2024")	290
TITLE-ABS-KEY phd OR doctoral AND retention AND dropouts AND completion AND students AND degree AND attrition AND PUBYEAR > 2012 AND PUBYEAR < 2024 AND (LIMIT-TO (DOCTYPE, "ar"))	224
TITLE-ABS-KEY phd OR doctoral AND retention AND dropouts AND completion AND students AND degree AND attrition AND PUBYEAR > 2012 AND PUBYEAR < 2024 AND (LIMIT-TO (DOCTYPE, "ar")) AND (LIMIT-TO (SRCTYPE, "j")) AND (LIMIT-TO (LANGUAGE, "English"))	220
Final sample (after screened based on scope)	24

Two forms of deduplication were used in this review to exclude overlapping publications. In the first form, identical data sources were removed from the five selected databases (Creswell et al., 2018). In the second form, multiple articles published based on the same data set were removed (McKeown & Mir, 2020). Additionally, Zotero bibliographic management software was used to detect duplicates, and the remaining articles were manually screened as electronic deduplication was deemed insufficient (McKeown & Mir, 2020). The multistep screening process eliminated all irrelevant articles and narrowed down the sample (Table 1). The final selection includes articles that were classified as reviews or empirical articles that served to summarise emerging issues from original research and literature-based studies of doctoral student dropout. The overall process of extracting and screening journal articles from each selected electronic database resulted in a total of 24 articles selected for the current study (Table 1). The distribution of these articles is shown in Figure 2 below.
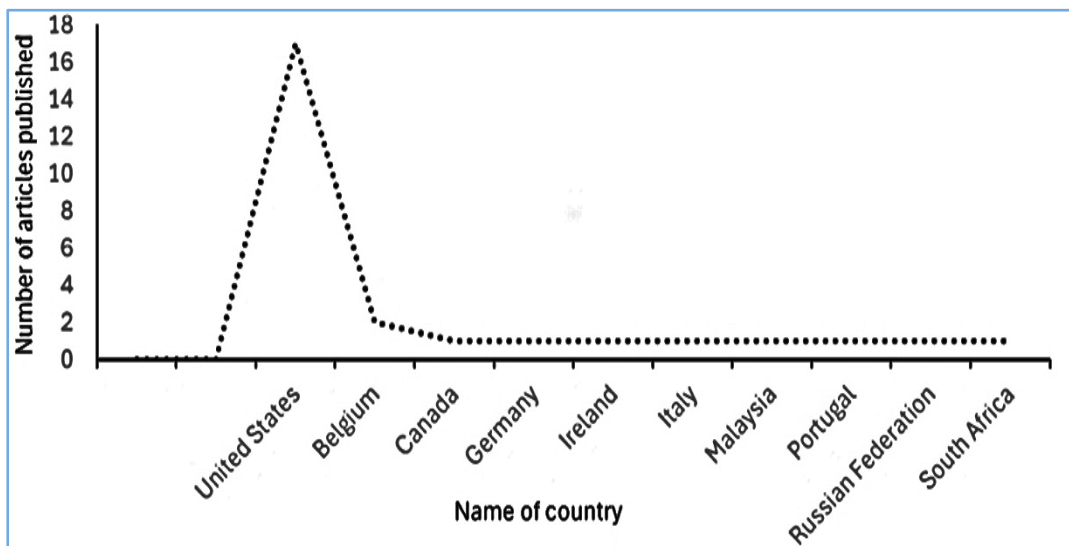

Figure 2: Distribution of articles extracted from Scopus (2012-2023) across various countries.

The distribution of relevant articles on doctoral dropout across countries, published from 2012 to 2023 and extracted from Scopus (Figure 2), demonstrates a significant concentration of research

output in the United States, with 17 articles. However, the disparity between the United States and other countries raises questions about the global perspective in this area of research. This skewed distribution indicates the necessity for broader international collaboration and attention to promote a more comprehensive understanding of the phenomenon of doctoral dropout, moving beyond a predominantly US-centred view.

2.1 Data querying and analysis

The work of Friese (2014) was utilised to create a framework for collecting and analysing qualitative data from the selected articles. This involved using ATLAS.ti22 word cloud, data retrieval, and the auto-coding tool to identify data segments that mentioned critical concepts of interest (Kalpokas & Radivojevic, 2022). In this study, we employed the ATLAS ti.22 software to capture the main ideas in the literature and generate summarised results from the systematically reviewed literature (Smit & Scherman, 2021). During this phase, three essential steps were taken to search for and obtain valuable data. The first step involved loading the relevant articles into the software for analysis after creating search codes such as '*academic challenges*,' '*financial challenges*,' '*social responsibility*,' '*health and wellness challenges*,' and '*causes of school dropout*' using the Open Code Tool (Adelowotan, 2021). In the second phase, all irrelevant codes and dead ends were eliminated, and similar codes were grouped into higher-level codes (Adelowotan, 2021; Smit & Scherman, 2021). The developed codes were continuously revised to avoid duplicating codes and citations. In the final step, we conducted selective coding, which enabled us to develop themes, theoretical concepts, and relationships between themes (Adelowotan, 2021; Kalpokas & Radivojevic, 2022).

3. Presentation and Discussion of Findings

The present study identified several factors that promote or hinder the timely completion of a doctoral degree. The results shed light on common challenges faced by doctoral students, as well as delays or discouragements that undermine the successful and timely completion of their studies.

3.1 Lack of social interaction with peers and academics

It is important to consider the assumptions of Rio Tinto's model for doctoral studies as a solitary exercise. The model is based on the idea that students should approach their studies with a sense of autonomy and self-motivation (Litalien & Guay, 2015). This means that while they are guided and supported by supervisors and other experts, the actual process of researching and writing the dissertation is largely independent. However, due to a lack of interaction, some students suffer from depression and anxiety. Researchers have reported depression and anxiety in students in several countries and disciplines, including counselling, medicine, law, and psychology (Bahnson et al., 2023). Some students also commit suicide. Doctoral students with mental health issues are likely to drop out of PhD programmes (Stubb et al., 2012). Recent studies have, therefore, shown that social interactions are of great importance, as they can either promote, stimulate, or hinder the completion of a PhD. These claims are supported by Sala-Bubaré and Castelló (2017), who found that the lack of adequate social interaction between doctoral supervisors and DSs is one of the main obstacles that needs to be addressed. In addition to social engagement between supervisors and DSs, the interaction between students within a faculty also contributes to students' ability to complete their studies by building confidence in their research and professional oral communication skills and sharing knowledge and experiences (Alves et al., 2023; Sala-Bubaré et al., 2017; Diem & Wolter, 2019). This is supported by Liu et al. (2019), who state that good student-supervisor interaction assists students in achieving self-stress management and research self-efficacy. The latter refers to an individual's confidence in completing various aspects of the scientific research process (Liu et al., 2019). Engagement with faculty and peers helps underprivileged first-year students by providing them with space to interact with their privileged peers, other senior students, and their respective supervisors. Additionally, such interaction is key for developing positive psychological attributes and problem-solving, decision-making, communication and interpersonal skills, teamwork, time

management, and organisational skills, which are key to doctoral graduates and the employment environment.

3.2 Availability of Internet and other library resources

The Internet offers excellent opportunities to improve the quality of education (Tomlinson et al., 2019). Despite the potential risks associated with Internet misuse (Bernardo et al., 2020), the positive benefits of Internet access cannot be denied. A comprehensive synthesis of the literature highlights the impact of Internet access on social and academic engagement. For example, the Internet not only bridges communication but also the spatial gap between doctoral students (DSs) and their supervisors and colleagues (Elliota & Kobayashi, 2019; Fook, 2023). This is because Internet access helps students receive timely information and communicate their needs, expectations, and other academic challenges. Scholars such as Pyhältö (2022) reached a similar conclusion, lamenting that slow and erratic internet connections can contribute to students falling behind academically.

Aristovnik et al. (2020) also add that lack of access to an uninterrupted internet connection is critical for students pursuing higher education, particularly in Asia and Africa. The COVID-19 lockdown exacerbates this issue through working from home, which further deepens the problem with internet access and widens the interaction gap between the student and the supervisor, resulting in a loss of sense of belonging and causing academic stress (Pyhältö et al., 2023). Although this is the case, several universities in developing countries have financial difficulties subscribing to some of the most important journals and publications (Pyhältö et al., 2023). This situation makes it difficult for doctoral students to keep abreast of the latest developments in their field and may cause them to miss important findings that could impact their work.

Despite several attempts to make learning materials available in electronic and print formats through open-source journals (Alves et al., 2023; Pyhältö et al., 2023), some students are excluded from using the internet due to a lack of technical skills (Breitenbach, 2019) and lack of access to the internet and necessary gadgets (Waight & Giordano, 2018). Higher education policies should, therefore, ensure that students have the necessary skills to effectively use Internet resources and that reliable access is provided. In addition, empowering academics would help ensure they can effectively teach and guide their students while enhancing the skills and learning competencies students need to complete a doctoral degree.

3.3 Self-evaluation capacity and academic abilities

Findings on self-assessment ability (SeC) suggest a positive relationship between SeC and doctoral degree completion (Fook, 2023). This finding supports the assumptions of the Tinto model that students should be able to set the agenda and timeline for their work while relying on their initiative and creativity to develop their research (Litalien & Guay, 2015). Similarly, through literature study, it emerged that SeC encourages students to constructively reflect on mistakes and make proactive efforts to correct them. However, evidence from the literature suggests that students lack the reflective and self-monitoring skills necessary to take control of their learning and willingly accept responsibility for their academic work. This observation is supported by researchers such as Smith and García (2018), who reported that self-evaluation helps students gain insights by accepting what they know rather than what they think they know. A survey by Rockinson-Szapkiw (2019) found that doctoral students are more likely to drop out if they fail or are unable to meet the demands of their courses, leading them to choose to drop out. The question is how to teach them effective reflection skills so they can successfully complete their studies. This requires special training and systematic mentoring rather than leaving students to aimlessly drift in the dark until they give up.

3.4 Availability of financial support

Considering that the Gross Domestic Product (GDP) per capita for higher education or doctoral support is not a fixed figure and varies across countries (Breitenbach, 2019; Waight & Giordano, 2018), the lack of adequate financial support has also been cited as a barrier to doctoral studies in countries with lower levels of doctoral support (Prieto, 2022). Countries with higher GDP per capita are expected to allocate more resources to higher education and doctoral support (Sverdlik et al., 2018). Research consistently shows that insufficient financial support to cover research-related costs, tuition, living expenses, and attendance at indexed conferences and academic workshops is considered one of the biggest challenges that prevent doctoral students from completing their studies (Pyhältö et al., 2023; Van Rooij et al., 2021). Another challenge is that financial support is increasingly in the form of loans rather than grants and scholarships (Waight & Giordano, 2018). In the United States, for example, 70% of university graduates used loans to cover some or all of their expenses in 2018 (Sverdlik et al., 2018; Waight & Giordano, 2018). Although loans could be reused to support more students and theoretically have more impact, many students do not qualify for loans (Hardre et al., 2019). This means that funding is ultimately inaccessible, even when funders repeatedly emphasise that they are willing to help. This poses significant challenges for disadvantaged students, as they are technically excluded from most forms of loan-based funding.

While there are now more funding opportunities for doctoral students in Africa, these opportunities are only available on a competitive basis (Bekova, 2021; Breitenbach, 2019). For example, Mobility for Breeders in African countries such as the Republic of Benin, Nigeria, South Africa, Namibia, and Ethiopia; the Open Society Initiative for West Africa in West Africa, and the National Research Fund (NRF) in South Africa offer doctoral fellowships that are subject to strict requirements (Bahnson et al., 2023; Schalkwyk et al., 2021). Thus, several underprivileged PhD students are excluded because they do not meet the eligibility criteria. In some cases, applicants meet the criteria, but funds are insufficient to distribute to all qualifying applicants. Therefore, further efforts must first be made to design interventions for financially vulnerable students and plan timelines for completion; such targeted opportunities would benefit both students and institutions.

3.5 Pathways for reducing dropouts for doctoral students

Highly skilled professionals are extremely important for collectively addressing development challenges and achieving Sustainable Development Goals. In this context, reducing and preventing dropouts helps universities in both the Global South and the North to fulfil their role as key drivers of sustainable development. As such, this study proposes several options that can guide key stakeholders to reduce the identified potential causes of school dropout (Figure 3). The first step is to make sure DSs know what resources are available to them, including academic, financial, and emotional support. It is also important to foster a good relationship between students and their supervisors. Therefore, universities need to foster collaboration between supervisors and co-supervisors by networking and information-sharing platforms between students and supervisors. Collaboration between supervisors will help them provide consistent feedback to their students.

The study also suggests that all roles need to be clarified so that students know what is expected of them and what the deadlines are for each stage of the doctoral process, such as presentations, dissertations/thesis, and oral defence (Figure 3). Only if they know their schedule will they be able to meet the deadlines. To achieve this, tools such as the Gantt chart are very useful in helping students plan their work easily (Figure 3). It is also important to foster a sense of community among graduate students by creating platforms where graduate students can discuss their research projects. These platforms provide students with opportunities to receive peer evaluations and share their challenges. In addition, flexible learning options such as evening or weekend classes accommodate students' schedules.
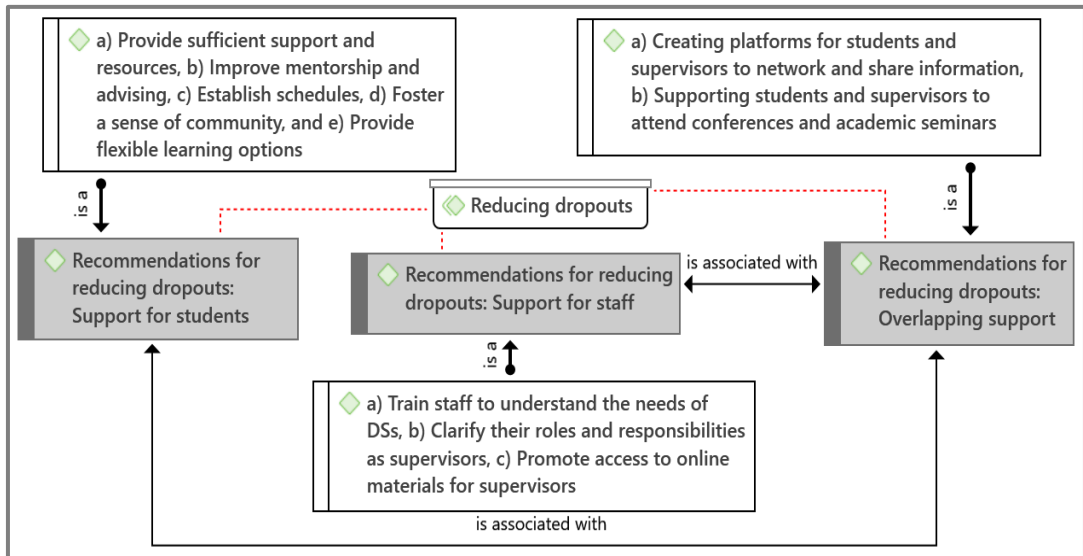
Figure 3: Propositions for reducing the number of dropouts

Given the greater emphasis on improving social relationships between academic staff and students and the greater demand for academic support (Figure 3), higher education institutions need to foster a sense of community in a knowledge economy. Thus, to successfully produce this cohort of academics, we need to rethink how DSs can be supported, both inside and outside the classroom, not only to complete their studies successfully but also in a timely manner.

Providing doctoral students with various learning options is crucial for several reasons. Firstly, doctoral studies are often intense and demanding, requiring a high level of motivation and engagement. By identifying students who may be at risk and understanding the specific learning needs of each individual, institutions can intervene early and provide appropriate support mechanisms. This not only enhances the academic experience but also contributes to the overall success and wellbeing of doctoral candidates. Additionally, offering different learning options acknowledges the diverse backgrounds, learning styles, and preferences of doctoral students. Some may thrive in traditional lecture-based settings, while others may prefer experiential learning, collaborative projects, or independent research. In some cases, it can be extremely beneficial to utilise the resources of international universities to supplement supervision capabilities in the Global South. This can, for example, expose students to different academic cultures and provide additional support mechanisms for student success. By catering to these differences, institutions foster an inclusive learning environment where every student can excel.

The leadership style of the supervisor plays a crucial role in the mental health of graduate students, as some doctoral students who withdraw from the doctoral programme report inadequate supervision (Figure 3), highlighting the importance of good supervision in completing the doctoral programme (Liu et al., 2019, Fook., 2023). A weak relationship with a mentor is a common characteristic among graduate students who experience anxiety and/or depression. Research self-efficacy is vital for perseverance when students face difficulties during their PhD journey, and it can also predict their research interests and knowledge. Therefore, a positive relationship exists between high research self-efficacy and a high completion rate of studies, future research engagement, and research productivity. Consequently, we recommend promoting student-supervisor interaction and mentoring. While timely completion of studies is encouraged, institutions should also support students who are struggling due to family and personal problems, as some may drop out due to pressure and ill health (Bahnson et al., 2023). Therefore, establishing social support programmes and allowing students to extend or reregister would be helpful**.**

4. Conclusion

This study highlights the increasing importance of doctoral studies in universities and identifies the challenges faced by doctoral students. It also suggests strategies to prevent and reduce the dropout rate among DSs. There are several reasons why students do not complete their doctoral studies, including inadequate financial support, strained relationships with mentors, academic incompetence, poor Internet access, and lack of library resources. Consequently, this study proposes ways in which graduate education can support students both inside and outside the classroom by proposing interventions to reduce dropout rates. Given the high dropout rate among DSs, the study's findings suggest that certain variables influence DSs' decisions to complete or drop out, such as the type of training they receive, financial and academic support, social interactions, and the availability of resources like the Internet. A comprehensive mix of in-campus and out-of-campus support is needed to promote graduation and reduce dropouts. For example, universities need to break down the barriers that separate students' in-campus and out-of-campus learning. Therefore, the findings of this study are a valuable source of information for educators, researchers, administrators, and other relevant stakeholders to understand trends in the administration of doctoral degree programs and reduce dropouts in order to meet individual and national targets.

5. Declarations

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