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Analyzing the Doctoral Candidates' Level of Efforts to 'Leapfrog' Their Dissertation Accomplishment Needs

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Abstract. Completing a doctoral program is a significant challenge faced by many doctoral candidates worldwide. This multi-case study explores the level of effort demonstrated by doctoral candidates in overcoming challenges to complete their dissertations as one of the scientific writing works, which must be accomplished to achieve their doctoral degrees. The six doctoral candidates who were in process of finishing their dissertations, were involved in this study. In this case, three persons studied at an Indonesian state university while the three others studied at overseas universities. One of the six doctoral candidates is Malaysian while the five others are Indonesian. In-depth observations during their dissertation writing process were conducted to gather the data purposively. The gathered data were analyzed descriptively using member checking. This study revealed three key aspects of doctoral success. First, intrinsic motivation and strong intrinsic motivation (67%-87%) among five participants supported sustained effort, while low intrinsic motivation (37%) hindered progress. Second, concerning goals and study periods, clear goals and shorter timelines (e.g., four years) facilitated completion, whereas low goal focus and extended periods (over seven years) impeded progress. Third, concerning strategies for success, effective practices included goal-setting, persistence, and community engagement. Resilience was evident in some participants despite extended timelines, while lack of intervention strategies contributed to failure. These findings offer valuable insights for improving doctoral education practices. However, future studies are recommended to involve more participants and employ other scoring-rubrics to measure doctoral candidates level of effort.

Keywords: Doctoral candidates; doctoral student; leapfrogging; level of effort; member-checking

1. Introduction

Achieving a doctoral degree, especially for lecturers, is often demanded by higher education institutions worldwide to increase their accreditation, including in Indonesia. Many lecturers have struggled to obtain such a degree. Previous

findings have revealed many issues with completing a doctoral degree. Wahidah et al. (2023) revealed that many doctoral candidates (DCs) failed to complete writing their dissertation, while Indrayadi (2023) affirmed the difficulties encountered by doctoral students (DSs) in preparing and publishing their work in reputable international journals.

In Canada and the United States of America, doctoral attrition rates range from 40% to 60%, with motivation identified as a key factor in PhD completion. Many students abandon their study after an average of two years. Identified motivation seems to play a particularly distinctive role in the definition of the two most desirable profiles. Thus, nurturing and supporting the type of behavioral regulation may result in significant benefits for various educational outcomes, including long-term persistence and research productivity (Litalien, 2024).

In the realm of higher education, the ability to effectively read and write in a scientific context is paramount for DSs, including DCs (Crawford, 2020; Suman, 2024). These skills not only serve as the foundation for successful dissertation completion but also play a crucial role in shaping the future of academic discourse. The integration of reading and writing in academic settings is well-documented; however, many DSs struggle to master these interconnected skills, often resulting in challenges during their research journey. Integrating reading and writing skills is not an easy task for either DSs or DCs.

Previous studies suggest that many lecturers (including DSs and DCs) struggle to publish acceptable articles due to a lack of institutional support, such as training in scientific writing for reputable international journals. This support is essential for helping lecturers develop the habit of writing manuscripts that follow the format, content, and language procedure (Hermayawati, 2023). Additionally, heavy administrative workloads leave lecturers with little time to produce quality manuscripts. Since the number of published manuscripts contributes to both national and global institutional accreditation, future studies could explore how institutional support impacts lecturers' ability to write for reputable international journal publications.

Previous findings primarily emphasize the dissertation writing process, publication requirements, and institutional support. In contrast, this study has focused on the level of effort (LoE), as LoE may influence the speed ('leapfrogging') at which DCs complete their dissertation writing. To fill in such a gap, this study analyzed how DCs engage in leapfrogging to fulfil their scientific reading and writing needs. Through a qualitative case study involving six DCs from various universities in Indonesia and Malaysia, we sought to uncover the patterns and strategies employed by successful students in this process. By examining the experiences of these students, this research contributes to a deeper understanding of the reading-writing nexus in doctoral education and offer insights into pedagogical practices that can support other DCs in overcoming their academic challenges.

2. Literature Review

This section reviews the basic theories which support the current study, related to research issues, as follows: (1) doctoral education and academic skill development; (2) academic reading-writing integration; (3) leapfrogging strategy in skill development; (4) institutional support and writing programs; (5) scientific writing for research publication; (6) time management and workload in doctoral studies; and (7) LoE. By reviewing these areas, the study gives comprehensive foundation for understanding the reading and writing needs of DCs and how they can leapfrog these challenges effectively.

2.1 Doctoral Education and Academic Skill Development

Doctoral education involves DSs and DCs as its students. To make this study clear, it is necessary to differentiate the terms DS and DC. A DS is someone who is enrolled in a doctoral program at a university. This involves completing a specific number of credits and coursework, as well as passing various exams. Once a student passes the qualifying exams and finishes the required coursework, they become a DC (Crawford, 2020; Suman, 2024). At this stage, they move away from the structured schedule of classes and exams and start working independently on their dissertation, which focuses on their unique interests.

Doctoral candidates collaborate closely with advisors from their dissertation committee, who provide support and feedback during the writing process. Unlike students who mainly learn from existing knowledge, DCs conduct their original research and write about it. They demonstrate their understanding of the subject and how their work contributes to the field or addresses real-world issues. Both DS and DC continually face significant challenges in research writing (Ali et al., 2022; Sitompul & Anditasari, 2022). Furthermore, this study will use the term "Doctoral Candidate (DC)" because it involved DCs as participants, not DSs. Their challenges are particularly in connection to their reading and writing abilities, because these interconnected abilities require a high level of focus.

2.2 Academic Reading-Writing Integration

Integrating reading-writing particularly for a dissertation completion requires the following skills:

(1) Critical analysis, that is the ability to evaluate and interpret texts effectively to draw meaningful insights;
(2) Synthesizing information by combining ideas from multiple sources to create cohesive arguments or narratives;
(3) Academic writing proficiency by adhering to complex academic standards, including proper structuring, referencing, and argumentation;
(4) Time management by balancing extensive reading with the writing process under restrictive deadlines; and
(5) Attention to detail by ensuring accuracy in the citation, language use, and logical flow in writing while thoroughly understanding source materials (Fairbanks, 2024).

Those five skills require sustained effort and practice, making the integration process particularly demanding for DCs to face when dissertation writing process is a challenge to complete. Such an effort, of course, needs leapfrogging to achieve

the targeted graduation on time, which may not exceed four years of the defined study period.

2.3 Leapfrogging Strategy in Skill Development

As stated by Oxford University Press (2024), the term 'leapfrogging' literally refers to the act of jumping over others who are bent down, similar to how a frog leaps. In a broader sense, it implies that an individual or group surpasses or outpaces others to achieve a leading or dominant position. Leapfrogging is often generally described as the ability to jump ahead or make rapid progress in a nonlinear way (Glockmann et al., 2021; Ndlovu & Newman, 2020; Yap et al., 2022). In the educational concept, it is the idea that education innovations can rapidly accelerate progress in teaching and learning. The concept of leapfrogging emerges as a potential strategy for addressing the scientific reading-writing needs of DSs.

Yap et al. (2022) asserted that transformative leapfrogging can occur when a country or region acts as a testing ground for alternative socio-technical configurations, allowing for the experimentation and expansion of radical alternatives within its local industry. The mechanisms behind leapfrog development are complex. It can be phrased as a 'result of optimal inter-temporal decision-making by developers who choose the timing, type, and location of development' (Zhang et al., 2017). In this context, leapfrogging refers to the ability of the DC to strategically navigate and utilize existing literature to enhance their understanding, framing, and articulation of their research. By effectively leveraging prior research, students can bypass traditional learning hurdles, thereby accelerating their academic progress and improving the quality of their scientific writing.

As the demand for high-quality research increases, it is crucial to explore innovative ways to help DCs develop the skills they need. However, many DCs do not realize that to complete their dissertations and graduate on time, they must significantly enhance their reading and writing abilities. This study highlights the importance of these skills in the doctoral journey and introduces leapfrogging as a strategy for achieving academic success.

2.4 Institutional Support and Writing Programs

Many DCs are commonly involved in supportive roles, such as researcher educators, academic literacy advisors, or academic developers, in addition to serving as supervisors for those candidates (Aitchison, 2022). The completion and final examination stages are the last steps in a doctoral program and represent the culmination of a candidate's research efforts (Crawford, 2020; Suman, 2024). Completion means writing and submitting a doctoral thesis, while final examination refers to the viva voce, delivered oral performance.

Over time, doctoral programs have changed and now come in various formats. In addition to traditional research-only degrees, there are also professional, practice-based, and new route programs that include some taught elements alongside research. All programs require a significant thesis or a practice-based project that addresses a unique research question. Viva voce procedures, or oral exams, differ around the world. They can be either private or public and may be formal or

ceremonial. Candidates face various practical and emotional challenges as they work to earn their doctoral degree during this crucial stage. These challenges provide valuable insights for supervisors to better support their postgraduate students during this important time (Suman, 2024).

Doctoral programs ideally take three to six years to complete, but funding may only be provided for the first three years. This can pressure DCs to submit lower-quality work due to financial constraints. Financial support often only provides for the data collection phase of their studies and is inadequate during the writing phase, forcing candidates to take part-time jobs, which adds more time pressure and stress related to thesis writing. Additionally, in some countries, candidates must not only pass their thesis and viva but also publish several peer-reviewed articles to earn their doctoral degree. This requirement creates extra stress, as candidates have to write in two different styles—one for publication and another for their thesis—often leading to both being of lower quality and delaying completion (Wang et al., 2019; Wyllie, 2021). Doctoral identity development is shaped by institutional views of the doctoral process and reinforces the power structures surrounding DSs (Bloomberg, 2022).

2.5 Scientific Writing for Research Publication

Scientific writing for research publication faces several challenges, including lack of recognition, inadequate rewards, limited resources, insufficient funding, unsupported academic environment, and poor English skills. Many lecturers struggle with productivity in writing textbooks, conducting research, and publishing articles due to limited institutional support, few research grants, and time constraints (Hermayawati, 2023; Yulianti et al., 2020). While internal motivation is crucial for starting to write, external support is also important for those who are already motivated (Misdalina et al., 2020). Additionally, many lecturers have low motivation to publish, which can hinder their progress in writing dissertations. Improving writing skills often requires extensive reading, especially of scientific literature.

2.6 Time Management and Workload in Doctoral Studies

Managing the demands of a doctoral program can be overwhelming. Ichorbio (2023) offered 10 time-management strategies:

(1) Prioritize tasks using tools such as the Eisenhower Matrix;
(2) Plan flexible schedules;
(3) Break large tasks into manageable steps, and work in focused intervals with the Pomodoro Technique;
(4) Minimize distractions;
(5) Use productivity apps;
(6) Learn to say no to non-essential commitments;
(7) Prioritize self-care through healthy habits;
(8) Collaborate with peers and delegate tasks;
(9) Regularly review; and
(10) Adjust strategies to stay motivated and productive while maintaining balance.

The "Pomodoro Technique" is a time management method that can help someone to stay focused and to manage time effectively. By adopting such strategies, DCs can balance the demands of a doctoral program while staying productive and maintaining well-being (Ichorbio, 2023; Nagy, 2016).

2.7 Level of Effort (LoE)

In this study a LoE was benefited as an instrument to gather data. A LoE is actually a project management term that can mean two different things such as the total amount of work, time, or resources necessary to deliver the project's deliverable (Clickup, 2024; Hytham, 2024; Indeed, 2023; Scott, 2024). In this study, LoE was employed to differentiate participants' level in their struggle to leapfrog their success and to evaluate the efforts needed to achieve the participants' learning objectives by highlighting their efforts in the three aspects, namely goals focus, internal motivation, and study periods.

According to the "goals focus (GF)" framework, Indeed (2024) identifies three sub-goals: outcome goals (OG), performance goals (PG1), and process goals (PG2). Outcome goals refer to the ultimate achievement, such as earning a doctorate or PhD, which can be influenced by external factors such as the economy, health, institutional support, and intrinsic motivation. Performance goals track progress towards these outcome goals and are largely within an individual's control, though factors like skills and finances may still impact progress. Process goals involve the daily actions that help individuals develop the habits and skills necessary to achieve their performance and outcome goals.

2.8 Research Objectives

Referring to the aforementioned issues, the current study generally analyzed the DCs' LoE to leapfrog their dissertation accomplishment needs. This study specifically focused on describing the following terms:

(1) The DCs' LoE to expedite their dissertation completion;
(2) The specific challenges (SC) faced by the DCs in enhancing their scientific reading and writing skills; and
(3) The initiatives taken by the DCs to leapfrog targeted interventions that address academic and dissertation accomplishment demands.

By highlighting the DCs' LoE to leapfrog their dissertation accomplishment needs, the current study presents the findings that were not previously investigated.

3. Research Method

This study utilized a qualitative research approach with a multi-site case study design, involving six DCs from domestic and overseas universities. A multi-site case study is a research design which facilitates the comprehension of a particular phenomenon within its contextual framework, thereby enhancing the complexity of the phenomenon (Yin, 2018). In this research, the complexity phenomenon occurred in the six involved participants who underwent different experiences in their ongoing process to accomplish their dissertations in the different sites, within the different study periods. In this case, the multi-site case study approach was employed to capture the complexity of the phenomenon experienced by

participants across different locations. The results of this study were not intended to be generalized.

Three of the DCs were enrolled at an Indonesian state university located in east Java Indonesia, while the other three attended state universities overseas, namely at a university in Taiwan, Malaysia and the United States of America. To protect their privacy, the names of the universities and participants are not disclosed; instead, they are referred to as P1, P2, and P3, for those at the Indonesian university, and P4, P5, and P6, for those at the foreign institutions. P1, P2, and P3 recently completed their doctoral degrees in four to six years, whereas the other three are currently still working toward their degrees abroad, with their study duration exceeding seven years. The six participants were purposely involved as the research participants by the reasons that they had the same issues in accomplishing dissertations but with different LoE.

The data were compiled by conducting in-depth observations of the six participants' LoE during their struggle to accomplish their dissertations. Since this study involved a small size of participants, the data were collected using an in-depth observation approach to create explanatory frameworks derived from the objective analysis of documented data. An observation approach requires a researcher to spend time with small groups of individuals to gain a deep understanding of their social context, making its application challenging in large organizations (Cacciattolo, 2015).

The gathered data were first coded to analyze using member-checking for finding its validation. Member checking, often referred to as participant or respondent validation, is a method used to enhance the credibility of research results. It is widely employed in qualitative research to ensure validity (Creswell, 2018), including multi-site case-study. The followings are stages in conducting participants' validation.

> 1) Preparing the Findings for Feedback ==>2) Engaging Participants==>3) Sharing the Findings ==>4) Collecting Feedback ==>5) Analyzing Feedback ==>6) Reporting Member Checking Results.

In this study, coding was conducted through several stages: (1) organizing the collected data, (2) assigning initial codes based on the LoE, (3) engaging participants, (4) incorporating their feedback, and (5) finalizing the codes. The purpose of coding was to address the three defined research objectives outlined earlier. The data were categorized into three types of initial codes: DCs' LoE, which included their GF, intrinsic motivation, study duration, and initiatives to leapfrog targeted aspects of dissertation completion. These initial codes were reviewed and validated by the DCs, who served as research participants, before being finalized as the study's findings.

The member-checking process followed a systematic sequence to ensure the accuracy and credibility of the findings. The data were first organized and summarized for feedback. Participants were then informed and engaged in the process. The findings were shared, allowing participants to review and provide feedback on their accuracy and relevance. This feedback was analyzed to address

discrepancies and refine the findings. Finally, the results, incorporating participants' input, were reported to enhance the study's validity.

4. Results

This section presents the answers to the aforementioned three research questions, which were as follows:

(1) The efforts of the DCs' LoE to expedite their dissertation completion;
(2) The specific challenges faced by the DCs in enhancing their scientific reading and writing skills; and
(3) The initiatives taken by the DCs to leapfrog targeted interventions that address academic and dissertation accomplishment demands.

4.1 The efforts of the DCs LoE to expedite their dissertation completion

The efforts of the DCs LoE to expedite their dissertation completion are illustrated in Table 1. Table 1 shows the six participants' aspects of LoE in their efforts to accelerate their dissertations accomplishment namely: GF, internal motivation (IM) and the study periods (SP). The GF highlights outcome goals (OG), performance goals (PG1), and process goals (PG2). Table 1 presents the results of participants' GF as follows: P1 achieved a GF score of 11, P2 and P3 achieved a similar GF score of 14, P4 and P5 achieved a similar GF score of 9, and P6 achieved a GF score of 4.

Table 1: Goals focus of participants' level of effort (LoE)

Participants & Study Periods	University	Goals focus Level of Effort (LoE)				
		OG	PG1	PG2	Total GF	Percentage (%)
P1 (6 years)	Domestics university	4	4	3	11	73
P2 (4 years)		5	5	4	14	93
P3 (4 years)		5	5	4	14	93
P4 (>7 years)	Overseas university 1	3	3	3	9	60
P5 (>7 years)	Overseas university 2	3	3	3	9	60
P6 (>7 years)	Overseas university 3	1	1	2	4	27

Note of LoE level:
1=20-39% (Unsatisfactory); 2=40-59% (Fair); 3=60-79% (Good); 4=80-89% (Very good); 5=90-100% (Outstanding)
OG (outcome goals), PG1 (performance goals), PG2 (process goals)

Referring to Table 1, the GF LoE of P1 is 73% (which means good goals), P2 and P3 are 93% for each (outstanding), P4 and P5 are 60% for each (which means good goals), while P6 is 27% (which means unsatisfactory goals).

Table 2 presents the internal motivation in the LoE. The intrinsic motivation inventory includes six main sub-scales: interest/enjoyment, perceived competence, effort, value/usefulness, pressure/tension, and perceived choice (CSDT, 2024). P1 achieved an IM score of 24, P2 and P3 achieved an IM score of

26 and 25 for each, and P4, P5 and P6 achieved IM scores of 22, 20 and 11 for each. It means that each participant has their own IM effort. Referring to the total of the IM of LoE, it is found that P1, P2, P3, P4 and P5 have IM that stretches from 67% to 87%, which means they had "good", and "very good" IM in their doctoral degree accomplishment, while the other participant (P6) shows to have 37% which means they have relatively low intrinsic motivation.

Table 2: Intrinsic motivation in the level of effort (LoE)

Participants	Internal/Intrinsic motivation Level of Effort (LoE)							
	Interest	Perceived Competence	Effort	Usefulness	Pressure	Perceived Choice	Total IM	Percentage (%)
P1	4	4	4	4	4	4	24	80
P2	5	4	5	4	4	4	26	87
P3	5	4	4	4	4	4	25	83
P4	4	3	4	4	3	4	22	73
P5	3	3	4	3	3	4	20	67
P6	2	2	1	2	1	3	11	37

Note: 1=20-39% (Unsatisfactory); 2=40-59% (Fair); 3=60-79% (Good); 4=80-89% (Very good); 5=90-100% (Outstanding)

Table 3 presents the participants' effort levels in completing their final work. Of the six participants, two participants, P2 and P3 (33%), graduated on time, completing their doctoral degrees within four years. Another participant (P1) finished in six years. The two other participants are still working toward completion despite having taken more than seven years. The final participant (P6), who remains in the research proposal stage, appears to be struggling or stuck.

Table 3: The LoE of the participant's dissertation completion

Participants	Level of Effort (LoE)			
	Goals focus	Intrinsic motivation	Study period (Year)	Doctoral Degree Accomplishment
P1	Good	Very good	6	Done
P2	Outstanding	Very good	4	Done
P3	Outstanding	Very good	4	Done
P4	Good	Good	>7	In process
P5	Good	Good	>7	In process
P6	Unsatisfactory	Unsatisfactory	> 7	Stuck

4.2 The specific challenges faced by the DCs in enhancing their scientific reading and writing skills

Table 4 outlines the challenges faced by the six participants across the five aspects used to evaluate their reading and writing competencies. These aspects were critical analysis, synthesizing information, writing proficiency, time management in reading and writing, and citation accuracy. Each aspect was scored on a scale of 1 to 5, with the following categories: Score 1 (Unsatisfactory) with a percentage

between 20–39%; Score 2 (Fair) with a percentage between 40–59%; Score 3 (Good) with a percentage between 60–79%; Score 4 (Very Good) with a percentage between 80–89%; Score 5 (Outstanding) with a percentage between 90–100%. The table highlights the specific difficulties encountered by the participants within these categories.

Table 4: The specific challenges faced by the DCs in enhancing their scientific reading and writing skills

Participants	Participant's Specific Challenges						
	CA	SI	WP	RWTM	AC	Total Score	Percentage (%)
P1	3	3	3	3	4	16/25	64
P2	4	4	3	4	4	19/25	76
P3	4	4	3	4	4	19/25	76
P4	3	3	2	3	3	14/25	56
P5	3	3	2	3	3	12/25	48
P6	2	2	1	1	1	7/25	28

Note: CA=critical analysis, SI=synthesizing information, WP=writing proficiency, RWTM=reading-writing time management, AC=accuracy in citation.

Table 4 reveals the six participants' SC with total scores based on the aforementioned defined aspects. The results show that P1 underwent 64% which includes "good" SC; P2 and P3 had 76% of SC for each, which means "good" SP; P4 and P5 had 56% and 48% that include "fair" SC; while P6 had 28% that includes "unsatisfactory" SC.

4.3 The initiatives taken by the DCs to leapfrog targeted interventions that address academic and dissertation accomplishment demands

To effectively leapfrog the targeted academic and dissertation accomplishment demands, the participants engaged in various activities grouped into three key initiatives, each focusing on distinct intervention improvements, such as: (1) behavioral adjustments; (2) enhanced diligence; and (3) increased engagement. These initiatives highlighted a strategic approach to addressing academic and dissertation challenges through focused behavioral, diligence, and engagement improvements. Table 5 presents the results of in-depth observations of the investigated participants.

Table 5: DCs' initiatives to leapfrog targeted interventions that address academic and dissertation accomplishment demands

Aspects for Intervention Improvement	Participants	P1	P2	P3	P4	P5	P6
	Behavioral Adjustments	**Yes (√) /No (X)**					
	Adopting proactive habits, such as setting clear goals and maintaining consistent schedules for academic tasks.	√	√	√	√	√	X
	Developing resilience and adaptability to manage challenges during their dissertation process.	√	√	√	√	√	X
	Enhanced Diligence	**P1**	**P2**	**P3**	**P4**	**P5**	**P6**
	Demonstrating sustained effort in research activities, including thorough literature reviews and detailed data analysis.	√	√	√	√	√	X
	Maintaining persistence in revising and refining their academic work based on feedback.	√	√	√	√	√	X
	Increased Engagement	**P1**	**P2**	**P3**	**P4**	**P5**	**P6**
	Actively participating in academic communities through seminars, workshops, and collaborative projects.	√	√	√	√	√	X
	Building stronger connections with mentors, peers, and institutional support systems to foster collaborative learning and shared accountability.	√	√	√	√	√	X

5. Discussion

This current study analyzed the leapfrogging experiences of DCs concerning their scientific reading and writing needs. Concerning completing their doctoral programs, this study particularly highlighted the description of the following aspects: (1) the efforts of the DCs LoE to expedite their dissertation completion; (2) the SC faced by the DCs in enhancing their scientific reading and writing skills; and (3) the initiatives taken by the DCs to leapfrog targeted interventions that address academic and dissertation accomplishment demands. The study reveals three answers to the defined research questions regarding the following aspects.

First, regarding the efforts of the DCs LoE to expedite their dissertation completion, the findings indicate that participants 1, 2, 3, 4, and 5 demonstrated IM levels ranging from 67% to 87%, signifying "good" to "very good" levels of motivation in pursuing their doctoral degrees. In contrast, P6 exhibited a significantly lower intrinsic motivation level of 37% (unsatisfactory), highlighting a relatively weak commitment compared to the other participants. This disparity suggests that intrinsic or internal motivation can play a crucial role in sustaining effort and progress during the doctoral journey (Chen & Zhao, 2024). This means that only one per six persons (6%) has unsatisfying IM.

Such a finding is strengthened by previous findings that to succeed in the doctoral degree needs not only IM but also two other aspects, namely "goals focus (GF)" and "study period (SP)" (Clickup, 2024; Hytham, 2024; Indeed, 2023; Scott, 2024). The current study reveals the GF LoE of P1 is 73% (which means good goals), P2 and P3 are 93% for each (outstanding), P4 and P5 are 60% for each (which also includes relatively good goals), while P6 is 27% (which means unsatisfactory goals). In this case, P2 and P3 have outstanding GF levels; P1, P4 and P5 relatively have similar GF levels; while P6 has an unsatisfying GF level.

Regarding the "study period (SP)", only P2 and P3 achieved their doctoral degree faster than the others. They graduated within four years SP with "outstanding" IM, and "good" GF with relatively "on time" SP. The doctoral degree is then followed by P1, who reached the "good" in IM and GF but with six years SP. Among the three other participants, P4 and P5 also have "good" both in IM and GF but with the SP exceeding seven years. It is considered better when compared with achievement of P6, which has "unsatisfactory" levels of both IM and GF levels, including the SP which also exceeds seven years.

Previous studies by Bloomberg (2022), Wang et al. (2019), and Wyllie (2021) emphasize the aforementioned findings by highlighting that doctoral programs usually take three to six years to finish and funding is typically only available for the first three years. This can pressure candidates to produce lower-quality work due to financial stress. Support often only covers data collection, forcing candidates to take part-time jobs during the writing phase, which adds to their stress. In some countries, including Indonesia, candidates must publish several peer-reviewed articles to earn their degree, requiring them to write in two different styles, which can lead to lower quality and delays. Additionally, institutional views on the doctoral process influence candidates' identities and reinforce existing power dynamics.

Second, the DCs face SC in enhancing their scientific reading and writing skills. The analysis highlights the SC faced by the DCs in improving their scientific reading and writing skills to accomplish their dissertations. The results reveal that P1 achieved 64%, indicating "good" SC; P2 and P3 each scored 76%, also reflecting "good" SC. However, P4 and P5 scored 56% and 48%, respectively, falling into the "fair" category for SC, while P6, with a score of 28%, was categorized as having "unsatisfactory" SC. These results underscore varying levels of difficulty among the participants in addressing their scientific skill development, particularly in the DCs' reading and writing skills. An in-depth observation of P6 revealed that she progressed very slowly in the dissertation writing process. This was evident from the fact that completing the introduction section alone took her several months, including the time spent finding references. Furthermore, she has been working on her dissertation for over seven years, highlighting significant delays in her progress.

Scientific writing for research publication and dissertation completion faces challenges such as lack of recognition, inadequate rewards, limited resources, insufficient funding, and poor English skills. Many lecturers struggle to write

textbooks, conduct research, and publish due to limited support, few grants, and time constraints (Hermayawati, 2023; Yulianti et al., 2020). Low motivation to publish can hinder their progress on dissertations, and improving writing skills often requires extensive reading of scientific literature. While internal motivation is crucial for starting, external support can further motivate DCs who are already engaged (Misdalina et al., 2020). Without adequate support, high IM becomes essential for DCs to achieve their goals. Thus, high IM becomes a pivotal challenge for the DCs as a leapfrogging their final reading and writing task to gain a doctoral degree.

Third, concerning the DCs' initiatives to leapfrog interventions for academic and dissertation success, it is revealed that there are three core areas of interventions, namely "behavioral adjustments", "enhanced diligence", and "increased engagement". Winthrop and Barton (2017) affirmed that the education innovation community has strong examples of leapfrogging, showing that breaking from traditional paradigms is possible. These interventions represent a targeted approach to overcoming challenges, aiming to improve focus, persistence, and active involvement in the dissertation accomplishment process. The three aspects benefited to leapfrog interventions for academic and dissertation success are: (1) behavioral adjustment by adopting proactive habits (such as setting clear goals and maintaining consistent schedules for academic tasks) and developing resilience and adaptability to manage challenges during their dissertation process; (2) enhanced diligence by demonstrating sustained effort in research activities (including thorough literature reviews and detailed data analysis) and maintaining persistence in revising and refining their academic work based on feedback; (3) increased engagement by actively participating in academic communities through seminars, workshops, and collaborative projects and building stronger connections with mentors, peers, and institutional support systems to foster collaborative learning and shared accountability.

Related to three initiatives stated, the data show that five out of the six participants actively implemented the identified interventions to leapfrog their dissertation challenges. In contrast, P6 did not engage in similar efforts. Interestingly, despite having study periods exceeding seven years, P4 and P5 continued striving to complete their dissertations, reflecting their resilience and commitment. However, P6 attributed her prolonged delays to being overwhelmed by institutional work responsibilities, denying any major personal challenges during her more than seven years of attempting to write her research proposal. This highlights the importance of balancing professional obligations with academic demands to ensure progress in doctoral studies.

Managing the demands of a doctoral program can be overwhelming. Ichorbio (2023) offered ten time-management strategies: prioritizing tasks, planning flexible schedules, breaking large tasks into manageable steps, minimizing distractions, using productivity apps, refusing non-essential commitments, prioritizing self-care through healthy habits, collaborating with peers and delegate tasks, regularly reviewing, and adjusting strategies to stay motivated and productive while maintaining balance. By adopting such strategies, the DCs can

balance the demands of a doctoral program while staying productive and maintaining well-being (Ichorbio, 2023; Nagy, 2016).

However, all of those suggested strategies are not easily conducted by doctoral program students without having the key success of doctoral degree achievement such as high internal motivation (HIM), supporting atmosphere and setting, and financial support from any relevant parties. Nevertheless, the main key factor is on HIM, since it can enable anyone to achieve their goals, including facing any challenges. It is implied that the success of the doctoral degree actually depends on the candidates themselves.

These findings highlight the role of intrinsic or internal motivation, external support, and time-management strategies in overcoming doctoral program challenges. Success ultimately hinges on candidates' commitment and ability to balance academic and personal demands. Future research with larger samples is needed to deepen understanding of these dynamics.

6. Conclusion

This study explored the LoE demonstrated by DCs in overcoming challenges to complete their dissertations. Using a qualitative with multi-site case study design, six DCs from Indonesian, Malaysian, and international universities were examined. The findings addressed three key aspects. First, IM is crucial for sustaining effort. The five participants showed "good" to "very good" IM (67%-87%), while one (P6) displayed an unsatisfactory level (37%), highlighting the critical role of strong IM in doctoral success. Second, GF and SP, with clear goals and shorter study periods (e.g., 4 years for P2 and P3) were linked to timely dissertation completion. Lower GF levels and extended study periods (over seven years for P6) hindered progress. Third, initiatives for dissertation success were that successful participants used strategies such as setting goals, maintaining persistence, and engaging in academic communities. Despite longer timelines, P4 and P5 showed resilience, while P6, overwhelmed by work, failed to employ these interventions effectively. The study clarified patterns and strategies that support DCs in overcoming academic challenges, offering insights to enhance doctoral education practices.

Although this study offers a potential foundation for future research, further investigation is needed to examine the impact of DCs' LoE on the speed of completing their dissertations.

7. References

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