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IMPACT OF MENTORSHIP ON THE DEVELOPMENT OF RESEARCH SELF-EFFICACY AMONG GRADUATE STUDENTS

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Abstract

This study investigates the impact of mentoring on graduate students' research self-efficacy in non-Western cultural contexts, focusing on the mechanisms and effectiveness of formal and informal mentoring. Grounded in Bandura's self-efficacy theory, this study examines how formal and informal mentoring impact the graduate students' research self-efficacy, focusing on accessibility, trust, and disciplinary differences. A total of 128 graduate students from the University of Lagos participated (53 STEM, 75 non-STEM) via a Qualtrics-administered survey. Research self-efficacy was measured using the Research Self-Efficacy Scale (18 items, four subscales: literature review, manuscript writing, data analysis, and research process confidence). Mentoring effectiveness was assessed using the Mentoring Effectiveness Scale (16 items, two subscales: formal and informal mentoring). Accessibility and trust in mentoring were evaluated using five-item adapted scales. Data were analysed using descriptive statistics, correlation matrices, and regression analysis. Contrary to expectations, the results revealed that mentoring had a negligible and statistically insignificant impact on research self-efficacy ($\beta = -0.039$, $p > 0.05$). Both formal ($\beta = 0.028$, $p > 0.05$) and informal mentoring ($\beta = 0.107$, $p > 0.05$) showed weak positive contributions, with informal mentoring displaying slightly stronger relational benefits. Surprisingly, mentoring accessibility ($\beta = 0.147$, $p > 0.05$) and trust ($\beta = 0.149$, $p > 0.05$) often considered key predictors, failed to yield significant effects. No meaningful differences emerged between STEM ($\beta = 0.146$, $p > 0.05$) and non-STEM students ($\beta = 0.050$, $p > 0.05$). These findings challenge the assumption that mentorship universally enhances research self-efficacy. The lack of significant impact raises critical questions about how cultural and structural barriers shape mentoring effectiveness. Future research should explore mentoring accessibility, cultural adaptations, and hybrid task-relational models to better support graduate students in diverse educational settings.

Keywords: Mentoring; Research self-efficacy; Formal mentoring; Informal mentoring; STEM and non-STEM disciplines

Introduction

Albert Bandura's (1977) self-efficacy theory posits that individuals' beliefs in their capabilities influence their behaviours and outcomes. According to the theory, those with high self-efficacy see difficult jobs as chances to learn and grow, whereas those with low self-efficacy see them as dangers and avoid them (Bandura, 2006). Self-efficacy is a cognitive construct influenced by past experiences, observational learning, social persuasion, and emotional states (Bandura, 1982). Oral encouragement and criticism build up or undermine somebody's belief in his/her capabilities. Goals can help individuals help stay focused and build confidence when they accomplish minor victories as they go. Hence, role models or individuals who share similar attributes can serve as powerful sources of inspiration and motivation.

Self-efficacy theory aligns with the concept of mentoring, based on the premise that mentorship can significantly influence the development of self-efficacy in graduate students. This means that the self-efficacy views of the mentee are enhanced by the mentor who is in a position to offer guidance, encouragement and feedback. This was supported by earlier studies that mentorship enhances the research self-efficacy of graduate students (Curtin et al., 2016; Mazerolle et al., 2015; Hollingsworth & Fassinger, 2002). Feedback can either build up or destroy the mentee's self-esteem. While negative feedback may hold potential for development and positive change, positive feedback only serves to raise the mentee's self-efficacy by providing evidence of ability (Holloway-Friesen, 2021). Also, the mentors can assist the mentees in developing specific, difficult but attainable targets that, as they are achieved, will enhance the self-efficacy of the mentees (Amador-Campos, 2023).

Mentoring, the practice wherein an experienced individual guides a less experienced one, has roots in ancient traditions such as Homer's Odyssey. The term 'mentor' originates from Greek mythology, where Mentor was a trusted advisor to Telemachus in Homer's Odyssey. In a mentoring relationship, one person who is more knowledgeable and experienced will guide or make suggestions to another who is relatively more ignorant as compared to the former. The literature review has pointed out that mentoring goes back to a number of disciplines related to business, organisations, health and medical education, junior faculty and others (Straus et al., 2013; Johnson, 2016; Efstathiou et al., 2018). The findings of Hollingsworth and Fassinger (2002) shows

that for doctoral students to have professional development, it is important that they are mentored. Hence, mentoring refers to a standing wherein a senior, more knowledgeable person assists a junior, less experienced person (Rhodes et al., 2000). It can be formal or informal and in both cases, they help, guide and support those who want to achieve certain goals in life or career (Miller, 2002). One form of mentoring that has been widely adopted in learning institutions is formal, especially in disciplines requiring a lot of research (Clark & Watson, 1998). The most common type of mentorship in academia, this form involves matching junior scholars with senior ones in an aim of producing scholarship (Clark & Watson, 1998).

According to the studies conducted by Leder (1995) and Mazerolle et al (2015), the importance of mentoring could not be underestimated. The authors reported recurring themes as fostered collaboration and independence, acquisition of skills, and group cognition during education. Similarly, Overall et al. (2011) in a research on promoting self-efficacy of the doctoral students found that the students who were helped and encouraged in the aspects of the tasks they were assigned appreciated the mentoring in a positive way that enhanced their self-efficacy and autonomy, which is a subdomain of well-being. Hollingsworth and Fassinger (2002) also agreed that mentorship is an important factor in career development of a student, especially in the area of research self-efficacy. Self-efficacy is the conviction of personal ability to perform particular tasks, such as completing an empirical study and disseminating findings. However, the capabilities also encompass a person's mental and interpersonal growth and their intrapersonal and external motivation, which extends beyond just their capacity to complete tasks (Bandura, 1985).

Research self-efficacy refers to one's belief in one's ability to execute research-related tasks (Gelso & Lent, 2000). It is a very essential feature in determining the preparation of the students concerning research. Bieschke et al. (1996) identified four interconnected mechanisms that comprise research self-efficacy, which are namely: conceptualization, early tasks, implementation, and presentation of results (p. 2). Conceptualization relates to the capacity to develop research ideas on one's personal or with teammates. Concerning early tasks, a student should know how to find resources that are related to the chosen topic and deal with ethical issues. Process includes those tasks, which are associated with the execution of the research for instance, creating measurement procedures, choosing instruments for the measurement and data gathering together with evaluation. Research self-efficacy whether high or low influences the ability of a

person to complete research tasks with confidence (Forester et al., 2004). In addition, Lambie et al. (2014) argued that research self-efficacy is directly proportional to the interest in research and a greater understanding of research.

A number of works have examined the effects of mentoring on students' self–efficiency regarding research writing. Tenenbaum et al. (2001) identified three support functions of quality graduate mentoring: Psychosocial, Instrumental, and Networking. Based on 103 nomination letters of the 12 winners of the Jay D. Scribner Mentoring Award from 2006 to 2016, Li et al. (2018) explored mentoring experience and relationship from the perspective of the mentees. The study found perspectives of good mentoring to include some relational characteristics like be accessible, low self-promoting, compassionate, and willing to adjust the course of the learning process by analyzing the intellectual and emotional maturity of the mentee, as well as instrument rated characteristics like improving the skills of researches and writing, and explaining rules and procedures in universities, including promotion and tenure. Furthermore, other psychosocial aspects as a way of helping mentees to overcome stress was also incorporated. In their systematic review of 30 articles related to mentoring relationships in doctorate nursing programs, Cleary et al., (2023) found that the most preferred qualities of the mentors by the PhD students are perceived personality characteristics which include accessibility, politeness, encouragers and content specialist with well-developed communication skills. Two mentoring models in doctoral programs were proposed: formal and informal. The formal models are incorporated into the degree program, whereas the informal ones are groups of learners who are supportive, friendly and advise fellow learners while doing their doctorates.

Additionally, Holloway-Friesen (2021) conducted a research study to establish the effects of mentoring on Hispanic graduate students' perceptions of sense of belonging and academic self-efficacy at a university in the southwestern United States. The study found out that mentoring helped the participants to have a better feeling of belonging and academic self-efficacy. Particularly, the participants believed that the program has made them feel in touch with the academic society as well as made them become more confident in their academic skills after joining the mentoring program. In addition, the quality of the mentoring relationship has an impact greatly on its effectiveness whereby participants who enjoyed positive and supportive mentoring perceived better improvement of their sense of relevancy and academic efficacy. In the same way, Amador-Campos et al. (2023) examined the association between research mentorship and research

self-efficacy of doctoral students. The study also established that a form of mentoring, particularly informal mentoring through similarity attrition based on social contacts, positively influenced the self-efficacy on research of the doctoral students. The authors also noted that research self-efficacy is positively related to academic achievement and motivation to study.

While existing literature affirms the positive influence of mentorship on research self-efficacy, it remains unclear how these dynamics operate in non-Western contexts. This suggests that research on the influence of mentorship on graduate students' self-efficacy in research writing is well established. There is, however, a research void with regard to graduate students in various cultural situations. Designing more efficient mentoring programs for graduate students will benefit from identifying the precise mechanisms through which mentoring contributes to the growth of self-efficacy. This study, therefore, seeks to address the gap by exploring the impact of formal and informal mentorship on research self-efficacy among graduate students in a non-Western university setting.

Research Objectives

Based on the research gap identified, the study objectives will be to:

1. assess the impact of mentoring on graduate students' self-efficacy in research writing in non-western cultural contexts.
2. determine the specific mechanisms through which mentoring contributes to the development of self-efficacy among graduate students.
3. examine the effectiveness of formal and informal mentoring models in building self-efficacy among graduate students.
4. identify the specific aspects of informal mentoring that contribute to its effectiveness in building self-efficacy among graduate students.
5. compare the effectiveness of mentoring in building self-efficacy among graduate students from different academic disciplines (STEM and Non-STEM).

Research Hypotheses

Ho_1: There is no significant difference in the levels of self-efficacy in research writing between graduate students who receive mentoring in non-Western cultural contexts and those who do not receive mentoring.

Ho_2: There is no significant difference in the levels of self-efficacy in research writing between graduate students who receive mentoring and those who do not receive mentoring.

Ho_3: There is no significant difference in the levels of self-efficacy in research writing between graduate students who receive mentoring through formal mentoring models and those who receive mentoring through informal models.

Ho_4: There is no significant difference in the levels of self-efficacy in research writing between graduate students who receive informal mentoring that includes social support, personalized attention, and tailored feedback and those who receive informal mentoring without these aspects.

Ho_5: There is no significant difference in the levels of self-efficacy in research writing between graduate students from STEM disciplines who receive mentoring and those from non-STEM disciplines who receive mentoring.

Methodology

The target population for this study comprised graduate students at the University of Lagos enrolled in research-intensive programmes in both Science, Technology, Engineering, and Mathematics (STEM) and Non-STEM disciplines. A total of 128 participants were selected for the study. A purposive sampling technique was adopted to identify participants who had received either formal or informal mentoring during their research writing endeavours. The study utilized quantitative methods and data were gathered using already well-developed and validated questionnaire titled 'Mentoring Effectiveness Scale (MES) and Research Self-Efficacy Scale (RSES). The questionnaire items were adapted from the Research Self-Efficacy in Academic Writing Questionnaire (RESAW-Q) by Multon, Brown and Lent (1991). The original RESAW-Q used a 0–100 rating format, where 0 indicated 'cannot do at all', 10–50 indicated 'moderately certain can do', and 60–100 indicated 'certain can do'. In this study, a simplified 10-point Likert-type scale (0–10) was employed. The guidelines outlined in the General Data Protection Regulation (GDPR) were strictly adhered to, and approval was received from the university ethics committee. Inferential statistics of Pearson correlation and simple linear regression analysis were used to test the hypotheses at a significance level of 0.05. All analyses were conducted using the Statistical Package for Social Science (SPSS).

Results

Ho₁: There is no significant difference in the levels of self-efficacy in research writing between graduate students who receive mentoring in non-Western cultural contexts and those who do not receive mentoring.

Table 1. Regression Results for Hypothesis One

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	7.145	.792		9.021	<.001
	Mentoring	.312	.254	.109	1.228	.222

a. Dependent Variable: Research Self-Efficacy

*b. N = 128; *p < 0.05; **p < 0.01; ***p < 0.001*

Table 1 reveals the impact of mentoring on graduate students' research self-efficacy in non-western cultural contexts. The model's intercept (b = 7.145, SE = 0.792, t = 9.021) represents the baseline level of self-efficacy without mentoring. The coefficient for mentoring (b = 0.312, SE = 0.254, β = 0.109, t = 1.228) suggests that mentoring has a positive and non-significant effect on self-efficacy in research writing, as indicated by the low β-value and t-statistic. Based on these findings, the null hypothesis, which posits that there is no significant difference in the levels of self-efficacy in research writing between graduate students who receive mentoring in non-Western cultural contexts and those who do not receive mentoring, cannot be rejected. This indicates that mentoring does not substantially increase graduate students' self-efficacy in research writing in non-Western cultural contexts

Ho₂: There is no significant difference in the levels of self-efficacy in research writing between graduate students who receive mentoring and those who do not receive mentoring.

Table 2: Regression Results for Hypothesis Two

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	Intercept	7.074	.850		8.325	<.001
	Item 1	-.059	.258	-.033	-.231	.818
	Item 2	.232	.233	.132	.996	.322
	Item 3	-.044	.238	-.027	-.184	.854
	Item 4	-.030	.236	-.019	-.129	.898
	Item 5	-.076	.315	-.043	-.240	.811
	Item 6	.099	.276	.056	.360	.719
	Item 7	-.436	.268	-.247	-1.628	.107
	Item 8	.201	.251	.114	.800	.425
	Item 9	.169	.293	.098	.576	.566
	Item 10	.268	.293	.131	.916	.362
	Item 11	-.336	.335	-.161	-1.004	.318
	Item 12	.225	.368	.105	.611	.542
	Item 13	-.227	.324	-.104	-.700	.486
	Item 14	-.417	.411	-.190	-1.015	.312
	Item 15	.133	.454	.062	.294	.769
	Item 16	.339	.360	.152	.940	.349
	Item 17	.367	.339	.183	1.080	.282
	Item 18	-.096	.453	-.042	-.211	.833

a. Dependent Variable: Research Self-Efficacy

*b. N = 128; *p < 0.05; **p < 0.01; ***p < 0.001*

Table 2 presents the regression results examining the specific mechanisms through which mentoring contributes to graduate students' self-efficacy in research writing. The intercept is statistically significant (B = 7.074, t = 8.325, $p < 0.001$), indicating a baseline level of self-efficacy. However, none of the individual predictor variables reach statistical significance ($p > 0.05$), suggesting that the specific aspects of mentoring measured do not have a strong direct effect on research self-efficacy in this model. Despite this, some predictors exhibit moderate effect sizes. For instance, "Formal mentor expands academic network" (B = -0.436, β = -0.247, t = -1.628) and "Informal mentor is supportive" (B = -0.417, β = -0.190, t = -1.015) show negative associations, though they are not statistically significant. On the other hand, "Informal mentor expands network" (B = 0.339, β = 0.152, t = 0.940) and "Trust informal mentor for confidentiality" (B = 0.367, β = 0.183, t = 1.080) suggest a positive influence, though also non-significant. Given the lack of significant predictors, the hypothesis that mentoring enhances research self-efficacy through confidence, research skills, and social support is not fully supported.

H_{O3}: There is no significant difference in the levels of self-efficacy in research writing between graduate students who receive mentoring through formal mentoring models and those who receive mentoring through informal models.

Table 3: Regression Results for Hypothesis Three

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	7.053	.811		8.695	<.001
	Formal Mentoring	.061	.211	.028	.288	.774
	Informal Mentoring	.275	.247	.107	1.113	.268

a. Dependent Variable: Research Self-Efficacy

*b. N = 128; *p < 0.05; **p < 0.01; ***p < 0.001*

The regression results in Table 3 assess the effectiveness of formal and informal mentoring models in building self-efficacy among graduate students in research writing. The intercept (b = 7.053, SE = 0.811, t = 8.695, $p < 0.001$) represents the baseline level of research self-efficacy when no mentoring model is included. For formal mentoring, the results show a positive but non-significant contribution to research self-efficacy (b = 0.061, SE = 0.211, β = 0.028, t = 0.288).

Similarly, informal mentoring also shows a positive but non-significant effect (b = 0.275, SE = 0.247, β = 0.107, t = 1.113). The standardised beta coefficients (β\betaβ) for both types of mentoring indicate relatively weak contributions to self-efficacy. The research question sought to evaluate the effectiveness of formal and informal mentoring models, and the hypothesis proposed that formal mentoring would have a greater impact on self-efficacy. However, the results do not provide strong evidence to support this hypothesis, as neither mentoring model demonstrates a statistically significant effect on self-efficacy. These findings suggest that while both formal and informal mentoring may conceptually contribute to graduate students' self-efficacy in research writing, their distinct effectiveness remains unclear.

H_{O4}: There is no significant difference in the levels of self-efficacy in research writing between graduate students who receive informal mentoring that includes social support, personalized attention, and tailored feedback and those who receive informal mentoring without these aspects.

Table 4: Regression Results for Hypothesis Four

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	Intercept	7.173	.748		9.585	<.001
	Item 10	.301	.277	.147	1.088	.279
	Item 11	-.318	.316	-.153	-1.006	.316
	Item 12	.190	.352	.088	.540	.591
	Item 13	-.152	.310	-.070	-.490	.625
	Item 14	-.352	.389	-.160	-.905	.367
	Item 15	.088	.418	.041	.210	.834
	Item 16	.313	.330	.141	.948	.345
	Item 17	.298	.292	.149	1.022	.309
	Item 18	-.057	.421	-.025	-.135	.893

a. Dependent Variable: Research Self-Efficacy

*b. N = 128; *p < 0.05; **p < 0.01; ***p < 0.001*

Table 4 explores the specific aspects of informal mentoring that contribute to its effectiveness in building research self-efficacy among graduate students. The intercept (b = 7.173, SE = 0.748,

t = 9.585, p < 0.001) represents the baseline level of research self-efficacy when no specific mentoring aspect is considered. This indicates a high starting level of self-efficacy in the sample. Among the individual aspects of informal mentoring, Item 10, representing the accessibility of an informal mentor, showed a positive contribution to self-efficacy (b = 0.301, SE = 0.277, β = 0.147, t = 1.088), but this effect was not statistically significant. Similarly, Item 11, which captures the guidance and advice provided by mentors, showed a negative and non-significant effect on self-efficacy (b = −0.318, SE = 0.316, β = −0.153, t = −1.006). This suggests that while guidance is valued, it may not independently drive improvements in self-efficacy.

Item 12, measuring comfort in discussing academic challenges with mentors, showed a positive yet non-significant effect (b = 0.190, SE = 0.352, β = 0.088, t = 0.540), indicating that while comfort is associated with higher self-efficacy, the relationship is weak. Similarly, Item 13, representing constructive feedback, showed a slight negative effect that was not significant (b = −0.152, SE = 0.310, β = −0.070, t = −0.490). Support and encouragement, captured by Item 14, also exhibited a negative and non-significant relationship with self-efficacy (b = −0.352, SE = 0.389, β = −0.160, t = −0.905). Item 15, which reflects the mentor's care for the mentee's success, showed a minimal positive effect that was not significant (b = 0.088, SE = 0.418, β = 0.041, t = 0.210). Other aspects, such as expanding academic networks (Item 16) and maintaining confidentiality (Item 17), showed positive contributions to self-efficacy (b = 0.313, SE = 0.330, β = 0.141, t = 0.948) and (b = 0.298, SE = 0.292, β = 0.149, t =1.022), respectively. However, these effects were not statistically significant. Finally, overall satisfaction with informal mentoring (Item 18) showed a negligible and non-significant negative effect (b = −0.057, SE = 0.421, β = −0.025, t = −0.135). Hence, the results indicate that none of the assessed aspects had a statistically significant impact on self-efficacy. While some factors, such as accessibility, expanding networks, and confidentiality, showed weak positive trends, their contributions were not strong enough to confirm the hypothesis.

H_{O5}: There is no significant difference in the levels of self-efficacy in research writing between graduate students from STEM disciplines who receive mentoring and those from non-STEM disciplines who receive mentoring.

Table 5: Regression Results for Hypothesis Five

Discipline	Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
STEM	1	(Constant)	7.164	.971		7.380	<.001
		Formal mentoring	.386	.304	.175	1.268	.210
Non-STEM	1	(Constant)	8.052	.774		10.408	<.001
		Formal mentoring	-.047	.259	-.021	-.183	.855

a. Dependent Variable: Research Self-Efficacy

*b. N = 128; *p < 0.05; **p < 0.01; ***p < 0.001*

Table 5 provides insights into the role of mentoring in building self-efficacy among graduate students from STEM and non-STEM disciplines. For STEM students, the constant term (B = 7.154, SE = 1.971, ***p < 0.001) suggests that they already demonstrate a strong baseline level of self-efficacy in research writing without mentoring. The mentoring variable (B = 0.385, SE = 0.304, β = 0.175, t = 1.268) indicates a positive but statistically insignificant effect of mentoring on self-efficacy. This low t-value and lack of significance suggests that while mentoring may contribute to self-efficacy for STEM students, its impact is minimal and not reliably measurable in this analysis.

For non-STEM students, the constant term (B = 8.052, SE = 0.774, **p < 0.001) reveals a slightly higher baseline self-efficacy compared to STEM students in the absence of mentoring. However, the mentoring variable (B = -0.047, SE = 0.258, β = -0.021, t = -0.183) suggests an even weaker and statistically insignificant effect of mentoring. The very low beta coefficient and t-value indicate that mentoring contributes minimally to self-efficacy for non-STEM students as well. These findings suggest that mentoring has a marginal impact on self-efficacy in research writing for both STEM and non-STEM graduate students. While the effect appears slightly higher for STEM students, the lack of statistical significance in both groups means the differences in mentoring effectiveness cannot be confidently established.

Discussion of Findings

The first hypothesis examined whether mentoring significantly impacts graduate students' research self-efficacy in non-Western contexts. The results showed a positive but statistically

insignificant effect ($\beta = 0.109$, $p > 0.05$), indicating that mentoring does not substantially increase self-efficacy in this cultural setting. This finding contradicts several past studies that established mentoring as a key factor in enhancing research self-efficacy (Curtin et al., 2016; Hollingsworth & Fassinger, 2002; Mazerolle et al., 2015). One plausible explanation, supported by Bandura (1985), is that self-efficacy is influenced by socio-environmental factors. The hierarchical structures and limited accessibility in non-Western academic environments may dilute the effectiveness of mentoring. As Tenenbaum et al. (2001) noted, effective mentoring must combine psychosocial support, networking, and instrumental guidance; the absence of these integrative features could explain the weak impact found in this study.

The second hypothesis tested whether specific mentoring mechanisms significantly predict self-efficacy. None of the individual mentoring items showed significant effects. This is inconsistent with prior studies, such as Li et al. (2018), who emphasized the importance of relational qualities like compassion and mentor accessibility in building self-efficacy. Similarly, Holloway-Friesen (2021) found that mentoring fosters a sense of belonging and academic confidence. The present study's findings suggest that in non-Western settings, these mentoring mechanisms may not independently drive self-efficacy. This aligns with Bandura's (2006) assertion that self-efficacy often results from complex, interconnected factors rather than isolated mentoring actions. The weak impact of these specific mechanisms may reflect a superficial application of mentoring without fully leveraging its psychosocial and developmental potential.

When comparing formal and informal mentoring models, the study found both had positive but non-significant effects on research self-efficacy, with informal mentoring ($\beta = 0.107$) slightly outperforming formal mentoring ($\beta = 0.028$). This marginal difference echoes Amador-Campos et al. (2023), who reported that informal mentoring often offers stronger relational benefits, such as comfort and trust, which are essential for building self-efficacy. However, the lack of statistical significance in this study suggests that these benefits may not have been fully realised. As Cleary et al. (2023) emphasised, the relational quality and depth of mentoring are essential, and when missing or underdeveloped, the anticipated benefits may not materialise. In formal mentoring, the structured nature might lack the flexibility required to address individual mentee needs, while informal mentoring, although relational, may lack strategic direction.

The fourth hypothesis examined whether aspects of informal mentoring such as social support, personalized attention, and tailored feedback significantly contribute to research self-efficacy. Again, none of these elements showed a significant effect. Notably, mentor accessibility ($\beta = 0.147$) and confidentiality ($\beta = 0.149$) showed weak positive trends. These findings are partially supported by Li et al. (2018) and Cleary et al. (2023), who stressed the importance of accessible and trustworthy mentors. However, the present results suggest that accessibility and trust alone do not significantly enhance self-efficacy unless combined with constructive feedback and targeted guidance. This finding aligns with Bandura's (1985) view that self-efficacy is built through mastery experiences and positive reinforcement, which may have been insufficiently provided in the mentoring relationships examined.

Finally, the study found no significant difference in mentoring impact between STEM and non-STEM students, although STEM students showed slightly higher responsiveness to mentoring ($\beta = 0.175$) compared to their non-STEM counterparts ($\beta = -0.021$). This minimal difference aligns with Lambie et al. (2014), who suggested that STEM students, due to their research-intensive training, might be more attuned to the benefits of mentoring. However, the non-significance indicates that mentoring programs may not be adequately tailored to discipline-specific needs. Gelso and Lent (2000) emphasised that research self-efficacy is task-specific, suggesting that mentoring in STEM should focus more on experimental and technical skills, while non-STEM mentoring should address broader analytical and writing competencies.

Conclusion

Based on the findings of this study, it is concluded that mentoring, although proposed in literature to positively influence self–efficacy, does not have a statistically significant impact graduate students' research self-efficacy in non-Western cultural settings. This implies that prior successful mentoring strategies may be insufficient in addressing cultural and institutional barriers that students in these settings encounter. Both formal and informal mentoring models demonstrated positive but statistically insignificant contributions to self-efficacy. Informal mentoring showed slightly stronger relational depth, but its lack of structure may limit its overall effectiveness. The study found no significant differences in mentoring effectiveness between STEM and non-STEM disciplines, suggesting that discipline-specific mentoring strategies may be less important than

previously assumed. Hence, the findings highlight the critical need for culturally sensitive mentoring programs tailored to the unique needs of non-Western graduate students.

Recommendations

The following recommendations are made based on the findings of the study:

1. Further research should explore these barriers to enhance knowledge on how to develop effective mentoring for learners with disabilities.
2. Future related studies should be conducted to employ qualitative methodologies to gain deeper insights into participants' lived experiences.
3. Similar studies should be conducted across different institutions, cultures, and academic disciplines in to understand their effect in shaping the mentoring programme implementation on graduates' research self-efficacy.

Limitations

This study has several limitations that may have influenced the findings. First, the sample was limited to graduate students from a single university in a non-Western context, which restricts the generalisability of the results to broader academic populations. Second, the study relied solely on self-reported data, which may be affected by social desirability bias or inaccurate self-assessment. Third, the cross-sectional design does not capture changes in research self-efficacy over time, making it difficult to establish causality. Finally, the study focused predominantly on quantitative measures and did not explore the nuanced, personal experiences of the mentoring relationships, which could have provided deeper insights.

Practical Implications

The findings of this study present critical practical implications, particularly for mentoring program designers in non-Western academic contexts. Despite the global assumption that mentoring enhances research self-efficacy, this study reveals that such benefits are not universally transferable. Institutions must rethink the structure and cultural sensitivity of their mentoring frameworks. It is no longer sufficient to simply assign mentors; instead, programs should intentionally integrate relational depth, personalised feedback, and discipline-specific strategies to yield meaningful outcomes. Additionally, the negligible difference between formal and informal mentoring suggests that a hybrid approach, blending structure with relational flexibility, may better

address the unique needs of graduate students. Ultimately, this study challenges universities to move beyond conventional mentoring models and adopt more contextually responsive practices to genuinely support student development.

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