The capital for students’ academic success in a PhD journey: the HERO within

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Abstract

Purpose – This study aimed to examine the influence of psychological capital on the students’ academic success in a PhD journey in Tanzania.

Design/methodology/approach – A cross-sectional survey design was used and data were collected through structured questionnaires from 200 PhD students in Tanzania. Confirmatory factor analysis was used to test the measurement model. The hypotheses were empirically tested using structural equation modeling (SEM).

Findings – The findings affirm that psychological capital in terms of hope, self-efficacy, resilience and optimism are significant predictors of students’ academic success in a PhD journey.

Originality/value – To the best of the authors’ knowledge, this paper is among the first to comprehensively examine the influence of psychological capital on students’ academic success in PhD studies. Previous studies have primarily focused on the undergraduate level. Additionally, this study extends the applicability of conservation of resource (COR) theory to the context of PhD students, demonstrating that psychological capital serves as a crucial resource for them to achieve success in their PhD studies.

Keywords Psychological capital, Academic success, PhD journey, Tanzania

Paper type Research paper

1. Introduction

Universities offer a variety of programs, among them being the PhD, which is the highest degree program. PhD is considered the most valuable scholarly level since it is commissioned to produce new knowledge and interpretations (Ndayambaje, 2018; Ahmed et al., 2017). Academic success in a PhD journey refers to the positive outcomes and achievements of students actively pursuing a PhD degree (Schneider et al., 2020). This success encompasses several key facets, including maintaining high academic performance, successfully progressing through the program, adhering to the prescribed schedule of PhD studies and overall satisfaction with the PhD journey.

Despite increased enrollment in PhD programs, dropout rates and delays are concerning (van Rooij et al., 2021; Igumbor et al., 2022). For example, in Australia, most of PhD students are reported to complete their studies beyond the expected time (Torka, 2020). Likewise, a research conducted by Ganesha and Aithal (2022) in India highlights that only half of the PhD students managed to finish their studies over the past decade. Moreover, Waswa et al. (2020), reported that in Kenya, PhD students tend to have protracted completion times, whereas in Uganda’s Makerere University, 48.6% of students extend their candidature and 36.4% drop out of their studies (Wamala et al., 2012). Furthermore, in Tanzania, the research such as that by Mkhai (2023), Amani et al. (2022) and Magali (2019) reveals that over 50% of PhD students conclude their studies beyond the expected time.

A PhD is demanding, research-driven, with high expectations (van Rooij et al., 2021, Sibomana, 2021; Ahmed et al., 2017). Based on that, PhD students are prone to stress, anxiety and potential burnout due to rigorous demands (Pyhältö et al., 2012). Siltanen et al. (2019) argued that, pursuing a PhD necessitates inner drive. Thus, PhD studies require high levels of personal drive.
and internally controlled sense of competitiveness. According to Luthans and Youssef-Morgan (2017), pursuing goals that require high levels of personal drive, needs one to have hope, efficacy, resilience and optimism (HERO). Psychological capital generates power to support the quest of multiple pathways toward the goal (H), creates confidence in ones abilities to achieve challenging goals (E), provides ability to adapt and recover from setbacks (R) and creates high expectations of success (O) (Luthans and Youssef-Morgan, 2017).

Despite the acknowledged significance of psychological capital in various contexts, limited research has explored its influence on academic success during the PhD journey. While prior studies have linked psychological capital to academic performance in undergraduate education (Chaffin et al., 2023; Saman and Wirawan, 2021; Sánchez-Cardona et al., 2021; Slätten et al., 2021; Martínez et al., 2019; Ortega-Maldonado and Salanova, 2018), the distinctive nature of PhD programs in terms of academic demands, motivation, stress and pressure sets them apart (van Rooij et al., 2021; Sibomana, 2021). PhD pursuits involve intensive research and higher intrinsic motivation, necessitating a robust psychological capital to manage stress and pressure, unlike undergraduate studies. Therefore, the ways through which psychological capital influences success may differ between these two academic levels.

Thus, this study aimed at examining the influence of psychological capital (hope, efficacy, resilience and optimism) on students’ academic success in PhD studies. By so doing, this study contributes to the body of knowledge on how psychological capital shapes academic achievement in PhD studies, elucidating the roles played by hope, self-efficacy, resilience and optimism. Universities can leverage these findings to design targeted support initiatives and interventions that nurture and bolster these psychological capital facets among PhD students, potentially leading to enhanced academic performance.

2. Literature review and hypotheses development
2.1 The conservation of resource (COR) theory
According to the COR theory, psychological capital is a personal resource and the accumulation of such resource can enhance life well-being. Based on that, and in the context of this study, psychological capital is an individual resource, and its accumulation positively influence academic success among students pursuing a PhD. Psychological capital is an internal resource that derives individuals towards success from within (Holmgreen et al., 2017). Lech et al. (2018) opined that students who possess a strong psychological capital have inner strengths and positive mindsets that can be valuable in their pursuit of PhD studies. Likewise, students with high psychological capital are more likely to gain academic resources (Carmona-Halty et al., 2021). For example, they may have a higher self-efficacy, which can lead to greater confidence in their research abilities and a higher likelihood of seeking out and utilizing academic support resources. Moreover, since PhD studies are demanding and stressful (Bran et al., 2023), psychological capital can serve as a buffer against such situations. When students face setbacks, challenges or stress, their psychological capital can help them cope, recover and maintain their well-being.

The COR theory emphasizes that individuals use their existing psychological capital as resources to stay away from negative effects of stressful situations (Fatima et al., 2018). In this sense, psychological capital helps people to deal with difficult tasks and situations; thus, explains why some people succeed in tough tasks and situations than others. In the context of this study, hope, self-efficacy, resilience and optimism (HERO) among PhD students are considered components of psychological capital, a resource that can significantly influence their academic success. Therefore, COR theory is relevant to this study because the accumulation of HERO among PhD students can enhance their confidence, determination and ability to navigate the challenges of their PhD journey, ultimately contributing to their academic success. Consequently, the COR theory provides valuable insights into the role of psychological capital as a resource in the context of achieving success in PhD studies.
2.2 Hope and students’ academic success in a PhD journey
Hope is a set of cognitions which involves thinking about a goal along with motivation towards the goal and the way of achieving the goal (Michałowska et al., 2022). It gives an individual a purpose to pursue a goal as well as a drive and pathways of attaining it. As established by Cui et al. (2022) and Michałowska et al. (2022), hopeful individuals are better equipped to effectively manage stress. This is particularly relevant in the context of PhD studies, which are well-documented to be stressful due to their high demands and pressures, as noted by Bran et al. (2023). The presence of hope enables students to employ constructive coping strategies, maintaining a sense of balance and well-being even in the face of these challenges. This, in turn, helps reduce the negative impact of stress on their academic performance, ultimately contributing to improved academic outcomes. In addition, hope involves having clear goals and believing that one can find pathways to achieve those goals (Gallagher et al., 2017). In the context of PhD studies, this means that hopeful students are more likely to set clear research goals and believe in their ability to navigate the complex path to completing their studies. This innate motivation serves as a driving force, compelling them to diligently and persistently work toward their objectives, ultimately enhancing success in their PhD journey. Basing on this, the following hypothesis is formulated:

\textit{H1. Hope positively influences students’ academic success in their PhD Journey.}

2.3 Self-efficacy and students’ academic success in a PhD journey
Self-efficacy refers to the belief in one’s ability to organize and perform courses of action (Bandura, 1997). Individuals with high self-efficacy approach tasks with greater readiness and persist in the face of challenges, enabling them to surmount personal and situational barriers (Kang et al., 2021). These tendencies, enhance personal accomplishments and decrease vulnerability (De Ridder et al., 2012). Komarraju and Nadler (2013) argued that self-efficacious students tend to approach academic tasks with confidence and a belief in their ability to execute them effectively. In the context of PhD journey, this confidence can lead to efficient research processes, better organization and a higher likelihood of producing quality work. In addition, self-efficacious individuals view challenges and setbacks as opportunities for growth rather than as insurmountable obstacles (Kang et al., 2021). In PhD studies, where research hurdles and academic setbacks are common, high self-efficacy can serve as a protective factor, enabling students to bounce back, adapt and persevere, ultimately leading to academic success in their doctoral journey (Ndiango et al., 2023). It is thus worth to hypothesize that:

\textit{H2. Self-efficacy positively influences students’ academic success in their PhD journey.}

2.4 Resilience and students’ academic success in a PhD journey
Resilience is defined as the ability to recover from disadvantaged circumstances (Saman and Wirawan, 2021). This indicates that a resilient person may experience stress, emotional upheaval and suffering, however, shows the ability to work through emotional pain and suffering (Zulu and Munro, 2017). Resilient students maintain control over their studies and achieve success despite the presence of stressful events, challenging conditions and unfavorable circumstances (Cambri, 2021). Additionally, resilient make students able to respond to challenges, be flexible and find ways to be out of the hard situation in order to perform better (Cambri, 2021). Moreover, resilient students are more likely to persist in their academic pursuits (Zulu and Munro, 2017). This persistence can be critical during the challenging phases of PhD studies, such as the thesis writing process or when experiments do not yield the expected results. Furthermore, a study by Ahmed et al. (2017), revealed that students with high resilience develop their engagement which in turn help them to improve their performance and end results. Therefore, it is worth to hypothesize that:
H3. Resilience positively influences students’ academic success in their PhD journey.

2.5 Optimism and students’ academic success in a PhD journey
Optimism expresses an individual overall belief of experiencing more positive things than negative ones in the future (Nwanzu and Babalola, 2019). Optimistic students tend to maintain a positive outlook, even when faced with challenges and setbacks in their PhD studies (Icekson et al., 2020). This positive attitude can help them approach their research and coursework with enthusiasm, resilience and a solution-oriented mindset. Hoy et al. (2006) opined that optimism improve the ability of individuals to endure difficult situation and solve problems which may affect students’ academic achievement. Moreover, optimism is often associated with high levels of motivation (Gibbons, 2023). Thus, optimistic PhD students tend to be intrinsically motivated to pursue their research interests and academic goals (Galimberti, 2023). This internal motivation can fuel their passion for their work and drive them to put in the necessary effort required for academic success. Therefore, it is worth to hypothesize that:

H4. Optimism positively influences students’ academic success in their PhD journey.

3. Methodology
3.1 Research design and study areas
This study employed a cross-sectional research design, where, data were collected at one point in time. The rationale for choosing this design is that the study aimed to collect data about a phenomenon under study in its current state, rather than focusing on tracking changes over time (Saunders et al., 2019). The study involved registered PhD students who had been enrolled in their PhD programs for at least one year prior to the data collection period. The rationale for including individuals who are currently pursuing their PhDs is to capture the current state of the phenomenon under investigation. This enables to provide practical recommendations and interventions to support those currently in the process of obtaining their PhDs. Conversely, conducting research on individuals who have already completed their PhDs may necessitate more resources and time, including the task of tracking down and contacting past graduates. Using current students is a more practical and accessible approach. These students were drawn from three public universities in Tanzania: the University of Dar es Salaam (UDSM), the University of Dodoma (UDOM) and the Nelson Mandela African Institution of Science and Technology (NM-AIST). The decision to use PhD students who have been registered for at least one year is based on the argument made by Ayala and Manzano (2018) that students who have been registered for at least a year are likely to have settled into their PhD programs and have a more stable academic status. As a result, they were capable of providing relevant and adequate information pertaining to the variables of this study. In addition, the selection of these three universities for the study was driven by their status as the most prominent and well-established institutions in Tanzania, with a significant population of PhD students.

3.2 Data collection and sample size
Between September and November 2022, data were collected from 200 PhD students at three universities through an online questionnaire distributed via WhatsApp using Google Forms, following the administration of 240 questionnaires. This resulted in an effective response rate of 83.33%. The study employed convenience sampling, distributing the questionnaire to PhD students through WhatsApp and Google Forms. This approach was chosen due to the diverse locations of PhD students across the country and the flexibility of thesis-based
programs, which do not require physical presence at universities (Vasantha and Harinarayana, 2016). Contacting them through WhatsApp using Google Forms provided a convenient and efficient means of data collection. A structured questionnaire was employed for data collection due to its capacity to encompass a broad scope and yield substantial information within a short timeframe (Saunders et al., 2019). Prior to distributing the survey instrument to potential respondents, it underwent a pre-testing phase with 15 PhD students. Subsequently, revisions were made based on their feedback, ensuring that the content and design were made clear and understandable for the respondents.

3.3 Measurement of variables
This study employed the compound psycap scale (CPC-12), developed by Timo et al. (2016), to assess the psychological capital of PhD students in universities. The scale comprises four dimensions: hope, efficacy, resilience and optimism, with each subscale measured using three items adapted from Dudasova et al. (2021) as indicated in Appendix. Responses were recorded on a five-point Likert scale, ranging from ‘strongly agree’ (5) to ‘strongly disagree’ (1). To measure PhD students’ academic success, this study employed three items namely satisfaction, intention to quit and progress based on the approach adopted from van Rooij et al. (2021). PhD students’ academic success was assessed using a five-point Likert scale, with responses ranging from ‘strongly agree’ (5) to ‘strongly disagree’ (1).

3.4 Reliability and validity results
Cronbach’s alpha (α) and composite reliability (CR) were used to test internal consistency of the data. All variables had Cronbach’s alpha coefficients greater than 0.7, indicating that internal consistency reliability was attained (Hair et al., 2010). Additionally, the values of CR for all variables were greater than the threshold of 0.70, indicating the achievement of internal consistency (Hair et al., 2010). Moreover, the discriminant validity was assessed using the Fornell-Larcker criterion, which compares the square root of the average variance extracted (AVE) to the correlation of latent constructs to determine validity (Ringo et al., 2023). Since the values of the square roots of AVE as indicated in Table 1 were greater than the corresponding inter-correlations, discriminant validity was achieved (Fornell and Larcker, 1981). Similarly, Table 1 results show that the AVE values for all variables were above the recommended threshold value of 0.5, suggesting that convergent validity was attained (Hair et al., 2010).

4. Results and discussion
4.1 Demographic characteristics of PhD students
In this study, 28.5% of PhD students are female, whereas 71.5% are male, indicating a clear predominance of male students in PhD programs. Regarding age distribution as indicated in Table 2, 46% of PhD students are aged 40 or older, followed by those in the 36 to 40 age group (35%). This suggests that a significant portion of PhD students are relatively older, likely pursuing their doctorates after accumulating substantial work experience. Additionally, Table 2 results indicate that the majority of PhD students (89%) are enrolled in full-time doctoral studies, while 11% are pursuing their degrees part-time. This suggests that most PhD students are fully dedicated to their academic pursuits. Finally, Table 2 results show that 90 (45%) of PhD students are from UDSM, 65 (32.5%) from UDOM and 45 (22.5%) from NM-AIST.

4.2 Model measurements results
Model fit indices were analyzed to assess the suitability of the model for the collected data. The results indicate a good fit, with a Chi-square minimum value to degrees of freedom...
(CMIN/DF) ratio of 1.580 (CMIN of 126.384 and DF of 80), which is below the acceptable threshold of 3, suggesting excellent fit (Hooper et al., 2008). Additional model fit indices examined are comparative fit index (CFI) = 0.978, incremental fit index (IFI) = 0.978, Tucker--
Lewis index (TLI) = 0.971, Parsimony normed fit index (PNFI) = 0.718, goodness of fit index (GFI) = 0.943, adjusted goodness of fit index (AGFI) = 0.914, standardized root mean square residual (SRMR) = 0.041 and root mean square error of approximation (RMSEA) = 0.047. All the values of fit indices fall within the permitted range, indicating that the model fits the data accurately (Hooper et al., 2008; Hu and Bentler, 1999) (see Table 3).

4.3 Common method bias
Harman’s single-factor test was applied to determine the existence of a common method bias. Unrotated factor analysis was conducted to see whether a single factor could account for the majority of the variance. According to the test results, about 29.592% of the variance can be attributed to a single factor. As the value was less than 50%, common method variance was not a cause for worry in this study (Podsakoff et al., 2003).

4.4 Testing of hypotheses and discussion
In this study, SEM was employed to test the four hypotheses. The study examined the influence of psychological capital on PhD students’ academic success. All the hypotheses are supported by the data collected. In H1, it was hypothesized that hope (HP) significantly and positively influences PhD students’ academic success. As shown in Table 4, the results support this hypothesis, indicating a significant positive influence of HP on PhD students’ academic success (β = 0.151, p < 0.05). Likewise, in H2, it was hypothesized that self-efficacy (SS) significantly and positively influences PhD students’ academic success. The results in Table 4 confirm this hypothesis, revealing a significant positive influence of SS on PhD students’ academic success (β = 0.353, p < 0.001). Also, in H3, it was hypothesized that resilience (RE) significantly and positively influences PhD students’ academic success. The results in Table 4 confirm this hypothesis, revealing a significant positive influence of RE on PhD students’ academic success (β = 0.216, p < 0.001). Furthermore, in H4, it was hypothesized that optimism (OPT) significantly and positively influences PhD students’

<table>
<thead>
<tr>
<th>Construct</th>
<th>SE</th>
<th>OPT</th>
<th>HP</th>
<th>RE</th>
<th>SS</th>
</tr>
</thead>
<tbody>
<tr>
<td>SE</td>
<td>0.799</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OPT</td>
<td>0.178</td>
<td>0.819</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HP</td>
<td>0.445</td>
<td>0.301</td>
<td>0.822</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RE</td>
<td>0.287</td>
<td>0.117</td>
<td>0.280</td>
<td>0.816</td>
<td></td>
</tr>
<tr>
<td>SS</td>
<td>0.473</td>
<td>0.322</td>
<td>0.374</td>
<td>0.345</td>
<td>0.868</td>
</tr>
</tbody>
</table>

**Source(s):** Survey data (2022)

**Table 3. Results for discriminant validity**

<table>
<thead>
<tr>
<th>Regressed variables</th>
<th>Standardized Estimate</th>
<th>Unstandardized Estimate</th>
<th>SE</th>
<th>CR</th>
<th>P-Value</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS ← HP</td>
<td>0.151</td>
<td>0.184</td>
<td>0.078</td>
<td>2.364</td>
<td>0.018</td>
<td>Accept</td>
</tr>
<tr>
<td>SS ← SE</td>
<td>0.353</td>
<td>0.424</td>
<td>0.081</td>
<td>5.245</td>
<td>***</td>
<td>Accept</td>
</tr>
<tr>
<td>SS ← RE</td>
<td>0.216</td>
<td>0.238</td>
<td>0.071</td>
<td>3.355</td>
<td>***</td>
<td>Accept</td>
</tr>
<tr>
<td>SS ← OPT</td>
<td>0.228</td>
<td>0.289</td>
<td>0.080</td>
<td>3.633</td>
<td>***</td>
<td>Accept</td>
</tr>
</tbody>
</table>

**Note(s):** ***p < 0.001**

**Source(s):** Survey data (2022)

**Table 4. Regression results**
academic success. The findings in Table 4 support this hypothesis, indicating a significant positive influence of OPT on PhD students’ academic success ($\beta = 0.228, p < 0.001$).

In H1, the results of this study indicate that an increase in hope by one unit corresponds to an improvement of 0.151 in students’ academic success in the PhD journey. This implies that higher levels of hope are associated with better academic performance in the PhD journey. When students have more hope, they tend to achieve higher levels of success in their studies. PhD studies are often long and challenging and students may encounter setbacks and obstacles. However, individuals with high levels of hope tend to set clear and achievable goals and believe in their ability to overcome difficulties. This optimism and determination can drive them to persist in their studies, even when faced with complex research problems or demanding workloads. This finding supports the COR theory which is based on the assumption that, psychological capital is a resource which derives individuals towards success from within. Likewise, the finding is in line with the studies by Kibby (2015), Marques et al. (2017), Hansen et al. (2014) and Gallagher et al. (2017) who found that hope positively influences academic success of undergraduate students.

In H2, the results of this study indicate that an increase in self-efficacy by one unit corresponds to an improvement of 0.353 in students’ academic success in the PhD journey. This finding implies that higher levels of self-efficacy are associated with better academic performance in the PhD journey. When students have greater self-efficacy, they tend to achieve higher levels of success in their studies. PhD students with strong belief in their ability to succeed in their studies can be successful in their PhD journey. This finding support the COR theory which assumes that psychological capital as a resource brings about sense of capability that increases individual’s effort and persistence to overcome barriers of performance (De Ridder et al., 2012). Similarly, the findings correspond to the studies by Kang et al. (2021), and Broadbent (2016) who found that, self-efficacy brings about academic engagement among undergraduate students, thus it helps students to effectively deal stress caused by with their studies.

In H3, the results of this study indicate that an increase in resilience by one unit corresponds to an improvement of 0.216 in students’ academic success in the PhD journey. This finding implies that higher levels of resilience are associated with better academic performance in the PhD journey. When students possess greater resilience, they tend to achieve higher levels of success in their studies. This finding aligns with the results of a study by Cambri (2021), which demonstrated that resilience enables students to respond to challenges, remain flexible and find effective ways to navigate difficult situations, ultimately leading to improved performance. It also corroborates with the study by Ahmed et al. (2017), which indicated that students with high levels of resilience tend to enhance their engagement, subsequently resulting in improved academic performance in undergraduate studies.

In H4, the results of this study indicate that an increase in optimism by one unit corresponds to an improvement of 0.228 in students’ academic success in the PhD journey. This finding implies that higher levels of optimism are associated with better academic performance in the PhD journey. When students possess greater optimism, they tend to achieve higher levels of success in their studies. This result can be explained by the fact that optimistic PhD students tend to see the positive side of situations, which, in turn, contributes to their success in their studies. Additionally, optimistic PhD students often hold high expectations which motivates them to persist until things turn out positively. They also have strong beliefs in their capabilities and the ability to succeed in their PhD journey. These findings align with the COR theory, which suggests that inner resources such as optimism play a significant role in a PhD student’s success. The finding is consistent with the study by Icekson et al. (2020) which has shown that optimism is positively linked to academic performance in undergraduate studies. Therefore, optimism is identified as one of the psychological capital factors contributing to the academic success of PhD students, as demonstrated in the current study.
5. Conclusion, implications and future research

5.1 Conclusion
The primary objective of this study was to examine the role of psychological capital in influencing the academic success of PhD students in their studies. The study employed the COR theory to explain this relationship. While existing literature has provided evidence of the influence of psychological capital on academic achievements in higher education, its contribution specifically within the context of PhD studies has been underexplored. Therefore, this study aimed to address this gap. Based on the findings, the study concludes that psychological capital (including hope, efficacy, resilience and optimism) plays a significant role in determining success in a PhD journey. These findings suggest that higher levels of psychological capital are associated with greater success in the PhD journey.

5.2 Theoretical implications
This study examined the influence of psychological capital on students’ academic success in their PhD journey. Given the limited empirical evidence on this relationship within the context of PhD studies, our study contributes valuable empirical insights to the fields of higher education, education management and psychology. In addition, this study extends the applicability of the COR to the context of PhD students by demonstrating that psychological capital, encompassing hope, efficacy, resilience and optimism, serves as a crucial resource for PhD students in achieving success in their PhD studies. Therefore, the study findings highlight the significance of enhancing psychological capital for PhD students to succeed in their studies.

5.3 Practical implications
The findings of this study have practical implications for university management and PhD students. First and foremost, the findings confirm that psychological capital plays a crucial role in predicting success in PhD studies. Therefore, universities and academic institutions should design educational interventions and programs aimed at enhancing students’ psychological capital. This might include workshops, seminars or courses focused on developing hope, self-efficacy, resilience and optimism, which are key components of psychological capital. Likewise, universities should organize and support regular training and workshops not only in key research skills but also in coping strategies and stress management to enhance PhD students’ psychological capital. Additionally, universities may consider establishing peer support networks or mentorship programs where PhD students can connect with others to receive emotional support, advice and guidance. Furthermore, the findings of this study highlight the importance for PhD students to actively cultivate their psychological capital. They can engage in activities and practices known to promote hope, self-efficacy, resilience and optimism, such as setting achievable goals, seeking mentorship, practicing self-care and maintaining a positive outlook. Additionally, participating in social and academic networks can provide valuable sources of encouragement, emotional support and opportunities for social comparison, all of which can contribute to the enhancement of their psychological capital.

5.4 Limitations and areas for future research
This study was conducted within a specific country context, namely Tanzania. Consequently, there may be concerns about the generalizability of the findings to PhD students in other nations. The unique educational systems, cultural contexts and institutional practices in different nations can significantly influence the experiences and outcomes of PhD students. To address this limitation, future research should consider replicating the conceptual model of this study in different countries or conducting a multi-country analysis involving PhD students from diverse nations. This approach would not only enhance our existing knowledge but also increase the
generalizability of the results. In addition, the use of convenience sampling in this study may introduce bias into the sample, as it may not be representative of all PhD students in the study areas. Instead, those who are more active on WhatsApp or willing to respond to online surveys may be overrepresented, while others may be excluded. Thus, future studies can consider adopting probability sampling techniques to enhance the generalizability of findings. Furthermore, in this study, a cross-sectional design was employed, which limits the ability to capture changes in psychological capital and academic success over time. Future studies could utilize longitudinal designs to examine how the variables used in this study evolve over time, which can potentially leading to different conclusions.

References


Further reading


Appendix

Self-efficacy
I am confident that I could deal efficiently with unexpected events (SE 1)
I can solve most problems if I invest the necessary effort (SE 2)
I can remain calm when facing difficulties because I can rely on my coping abilities (SE 3)

Hope
If I should find myself in a jam, I could think of many ways to get out of it (HP 1)
Right now, I see myself as being pretty successful (HP 2)
I can think of many ways to reach my current goals (HP 3)

Optimism
I am looking forward to the life ahead of me (OPT 1)
The future holds a lot of good in store for me (OPT 2)
Overall, I expect more good things to happen to me than bad (OPT 3)

Resilience
Sometimes I make myself do things whether I want to or not (RE 1)
When I'm in a difficult situation, I can usually find my way out of it (RE 2)
It's okay if there are people who don't like me (RE 3)

Student's academic success in a PhD journey
I am satisfied with my PhD journey (SS 1)
I have never considered quitting my PhD studies (SS 2)
I am on schedule with my PhD Studies (SS 3)

Table A1. Measurement scales

Source(s): The HERO items were adapted from the Compound Psycap Scale (CPC-12), developed by Timo et al. (2016) and further categorized by Dudasova et al. (2021). The items related on students' academic success in a PhD journey was adapted from van Rooij et al. (2021)

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