



Adopting Research Practices in Cambodian Teacher Education Colleges: Effects on Educator and Student Competence

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Abstract

Research is vital for enhancing the professional development and pedagogical practices of teacher educators. This study examines current research practices among teacher educators, the relation of research performance and research competencies, and the research competence of student teachers at Teacher Education Colleges (TECs) in Cambodia. A total of 106 teacher educators completed surveys, while 337 student teachers participated in tests via Google Forms for efficient data collection. Statistical analyses were performed using SPSS, including both descriptive and inferential methods. These methods, such as ANOVA and regression analyses, were used to find relationships and identify factors that could predict outcomes. The findings revealed that a majority of teacher educators exhibited restricted research experience, thereby highlighting the necessity for focused interventions aimed at enhancing their research capabilities. Notably, regression analysis revealed that only research experience has a positive influence on teacher educators' research knowledge ($\beta = 0.640$, Sig. < 0.001) and research skills ($\beta = 0.436$, Sig. < 0.001), while research attitude ($\beta = 0.085$, Sig. = 0.399) does not show significance. The model explaining student teachers' research competence accounted for only 16% of the variance. Addressing these findings, TEC administrators should create research training programs, promote collaborative workshops, incentivize publication, and allocate resources to foster an environment that prioritizes academic inquiry and innovation, ultimately enhancing educational outcomes.

Keywords: Research Performance, Research Competencies, Research Competence, Professional

Development, Teacher Education

Introduction

In the ever-changing education landscape, the importance of research performance among Cambodian teacher educators has been increasingly acknowledged (Willegems et al., 2017). Teacher educators, who play a crucial role in shaping student teachers' research performance, significantly impact their learning outcomes (Brew & Saunders, 2020; Salmento et al., 2021). With its unique and significant focus on Cambodia, the Ministry of Education, Youth and Sport (MoEYS) has made "Improving the Quality of Education, Science and Technology" a top priority in its strategic plan for 2019-2030, with an expectation that teacher educators at Teacher Education College (TECs) possess the necessary level of competency in progressive education for several reasons. Initially, these institutions serve as vital hubs for teacher education in Cambodia, shaping the next generation of educators who will influence the country's educational landscape.

The term 'research performance' refers to the essential role of teacher educators in shaping their research competencies (Corres et al., 2024). As education systems globally emphasize evidence-based practices, it becomes imperative to understand how teacher educators' research capabilities, including research knowledge, research skills, research attitude, publication in peer-reviewed journals, presentation at conferences, and collaboration with colleagues on research projects, influence student teachers' ability to succeed in research activities (Paine et al., 2025; Ventista & Brown, 2023). Importantly, the practical research competencies of teacher educators are essential for student teachers as they prepare to transition into their classrooms and contribute to the teaching profession; however, they often face numerous challenges (Menter & Flores, 2021; Van Katwijk et al., 2023).

Additionally, research competence refers to the effectiveness of future educators and their participation in evidence-based practices. This competence encompasses knowledge of research methodologies and the ability to critically analyze data (Lorenzetti et al., 2020; Wiethe-Körprich & Bley, 2017). Developing this skill fosters an inquiry-based approach, enabling student teachers to critically examine current practices and refine their pedagogical methods (McKeown et al., 2016; Uibu et al., 2023). Incorporating research training into teacher education programs equips them with essential tools for reflective practice and informed decision-making (Hill et al., 2024; Pozo-Rico et al., 2023). Ultimately, fostering research competence prepares student teachers to meet the dynamic challenges of contemporary education, contributing to continuous improvement in instructional strategies and student outcomes (Keles & Munthe, 2025; Yang & Han, 2025). According to Pregua (2024), Insorio (2024) noted that focusing research efforts within these colleges can provide valuable insights into the challenges and opportunities faced by teacher educators and student teachers, particularly regarding the research competencies

required for research papers and publications. Moreover, conducting research in these settings enables the exploration of local pedagogical practices and their impact on student teachers' learning outcomes (Antonsen et al., 2024), providing data that can significantly inform and shape future educational policies and practices (Valle et al., 2025); however, it still faces many challenges.

Several studies have found that institutional and policy-related factors, including workload, access to resources, and organizational support, further shape research engagement, with teaching-intensive environments often limiting research opportunities (Aalbergsjø et al., 2023; Valle et al., 2025). Another study found that teacher educators face multifaceted challenges in conducting research, many of which stem from heavy teaching workloads and administrative responsibilities that leave little time for scholarly activity (Jiang, 2019; Sengsoulintha, 2025). In addition, Bou et al. (2025) and Insorio (2024) found that inadequate funding and limited access to research resources further hinder rigorous research, resulting in skill gaps and outdated practices. Moreover, Oestar & Marzo (2022) and Shkedi (1998) note that many teacher educators also lack advanced training in research methodologies and statistical analysis, which reduces their confidence and productivity. Furthermore, a significant challenge is participants' potential resistance to disclosing their true perceptions of research competencies due to fear of criticism or evaluation (Andrade, 2019; Qureshi et al., 2023; Tsai, 2024). Additionally, Tight (2015) noted that logistical issues, such as coordinating survey and interview schedules, can make it difficult to ensure comprehensive participation.

Likewise, Cambodian TECs have a diverse educational background, enabling the study of various factors influencing research competence across different demographics and academic backgrounds. TECs' teacher educators may also face challenges in designing studies, conducting data analysis, critically evaluating findings, publishing, and enriching student teachers' research experiences, as well as empowering them to engage in evidence-based practices. Teacher educators with strong research performance are better positioned to mentor student teachers in developing these critical skills. Despite the recognized importance of these relationships, there is a notable lack of empirical research investigating the interplay between the current research practices of teacher educators at Teacher Education Colleges, the relationship between teacher educators' research competencies, and student teachers' research competence in the Cambodian context. This gap is particularly critical, as teacher education programs in Cambodian TECs are undergoing significant reforms to improve the quality of teacher training.

To address the gaps, there were three main objectives to verify the research results: 1) to examine the level of current research practice of teacher educators at Teacher Education Colleges, 2) to investigate the relationship between teacher educators' research competencies and their gender, qualification, teaching experience, and research experience, and 3) to assess the relationship between teacher educators' research

competencies and student teachers' research competence. These three main objectives were all addressed through three research questions as follows:

1. What is the level of current research practice of Cambodian teacher educators at teacher education colleges?
2. Is there a relationship between Cambodian teacher educators' research competencies and their gender, qualification, teaching experience, and research experience?
3. Is there a relationship between teacher educators' research competencies and student teachers' research competence?

The significance of this study extends beyond academia; it has practical implications for Cambodian Teacher Education Colleges, policymakers, and educational stakeholders. Understanding the dynamic relationship between teacher educators' performance and research competencies can enhance the preparation of teacher educators to effectively conduct research and fulfill supervisory roles. Additionally, insights from this exploration inform professional development initiatives to enhance research competencies among teacher educators, with the goal of increasing publication rates among these educators. This, in turn, will ultimately benefit student teachers and the educational system by providing a roadmap for improving research practices within teacher training programs, potentially revolutionizing the field of teacher education in Cambodia.

Literature Review

Research on teacher educators' performance is essential for future educators. Various studies emphasize the role of teacher educators in sharing and guiding student teachers through the complexities of research processes, highlighting that student teachers' research performance significantly influences the development of their research capabilities (Ciraso-Calí et al., 2022; Gess et al., 2019; Keiler, 2018). Teacher educators with robust research knowledge can create a conducive learning environment that nurtures inquiry and critical thinking, both crucial to effective teaching practice.

Specifically, Kuzembayeva et al. (2025), Liu et al. (2025), and Prananto et al. (2025) demonstrated that teacher educators' engagement in research is influenced by a range of demographic and contextual factors that impact their research competence and participation. In addition, other studies have indicated that personal characteristics, such as age, gender, educational background, and teaching experience, play significant roles in shaping research engagement levels and perceived competence (Kyaw, 2021; Tanner & Davies, 2009; Yogev & Yogev, 2006). For example, educators with higher academic qualifications, such as PhDs, are generally better prepared to supervise research and engage in scholarly activities, while those with experience-based qualifications may face challenges in adapting to research-intensive roles. Additionally, Kırkıç et al. (2025),

Groothuijsen et al. (2023), and Nagel et al. (2023) revealed that these challenges highlight the need for targeted support and professional development to enhance research competence among teacher educators, particularly in diverse educational contexts. According to Georgiou et al. (2023) explained that institutional barriers such as insufficient administrative support and a lack of collaborative opportunities exacerbate these issues, while emotional stress and low motivation, driven by competing demands, may lead to burnout or job dissatisfaction.

Moreover, teacher educators' research competencies significantly hinder their research output, limiting productivity and the quality of scholarly contributions. In addition, Kuzembayeva et al. (2025) and Pedrajas (2024) noted that many educators struggle with advanced methodological skills, statistical analysis, and academic writing, which are essential for producing publishable and impactful research. According to Šorgo & Heric (2020) and Yarris et al. (2014), the lack of confidence in these areas often leads to fewer completed studies and lower motivation to engage in research projects. Additionally, time constraints resulting from teaching responsibilities, insufficient mentorship, and limited access to research resources further hinder their ability to develop and utilize vital research competencies (Denti et al., 2023; Peyton et al., 2025). Also, Alhija and Majdob (2017) highlighted that competence in areas such as data interpretation, topic selection, and technical skills directly correlates with research productivity, while deficits in these domains reduce outputs and overall academic impact.

Otherwise, teacher educators' research competencies have a significant and direct influence on student teachers' research competence, such as critical inquiry, academic writing, and methodological rigor, in relation to scholarly inquiry (Alamettälä & Sormunen, 2020). Magnaye (2022) and Srikham & Seehamongkon (2023) suggest that the systematic integration of research-based teaching, under the guidance of competent educators, leads to improved inquiry skills, confidence, and motivation among student teachers. In contrast, gaps in teacher educators' research knowledge or practice can limit students' engagement and achievement in research activities (Basilio & Bueno, 2019; Guo et al., 2024; Röhl et al., 2025). Strengthening teacher educators' research competencies is thus key to building a research-rich learning culture for future educators. While there is a growing body of literature on the importance of teacher educators' competencies, there remains a scarcity of empirical studies that examine their interactions and cumulative effects on student teachers' research competence, particularly in the Cambodian context (Em et al., 2022; Smekalova et al., 2024; Tep, 2024). This study aims to fill this gap by examining the current research practices of teacher educators at Teacher Education Colleges, their research competencies, and the ability of student teachers to conduct research effectively. The findings will provide a foundational understanding that can guide improvements in teacher education programs, ensuring that both teacher educators and student teachers are equipped with the necessary competencies to thrive in a research-

oriented environment. According to the research literature and research gaps, the concepts are designed to indicate.

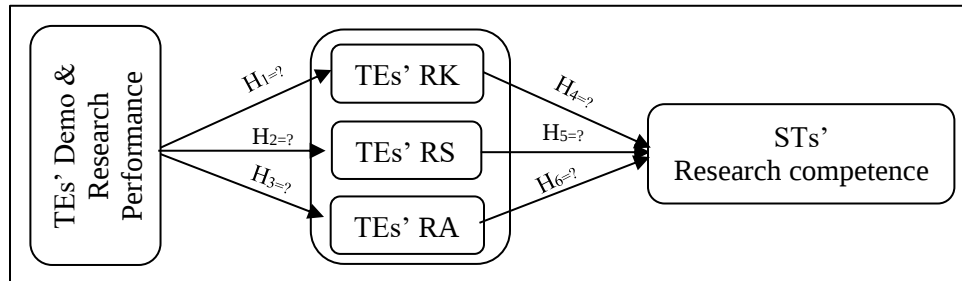


Figure 1: The model of the conceptual framework

According to the conceptual framework of the study, the aim is to investigate the relationship between teacher educators' demographics (gender, qualification, teaching experience) and research performance (research experience, focus on paper publication), specifically the influence on their research competencies—namely, research knowledge, research skills, and research attitudes—and the research competence of student teachers at Cambodian Teacher Education College (TECs) context. The findings also highlighted a connection between teacher educators' demographics, research performance, and their research competencies. Additionally, the study intentionally explored whether there is a correlation between teacher educators' research competencies and student teachers' research competence.

Methodology Study Design

This study employed a quantitative research design to examine the current practices of Cambodian teacher educators in research activities, the relationship between teacher educators' research competencies and their gender, qualification, teaching experience, and research experience, and investigate the relationship between teacher educators' research competencies and those of student teachers' research competence.

Participants and Sampling Techniques

The quantitative components utilized a structured survey questionnaire and item tests designed to assess these variables, involving 106 teacher educators and 337 student teachers from TECs in Cambodia, representing a subset of a larger population of 615. These participants were selected through simple random sampling to ensure they have

relevant experience and can offer valuable insights pertinent to the research questions.

Data Collection Instruments

The survey was adapted and validated for validity by three experts and 63 teacher educators participating in the pilot survey, and for reliability, it employed standardized instruments validated to gauge teacher educators' research performance and competencies. In contrast, student teachers' research competence was assessed through a research items test, as indicated in Table 1, which verified the test's reliability among 150 student teachers participating in a test pilot. Additionally, the quantitative survey questionnaires were distributed online via Google Forms, ensuring convenient participation. Reminder emails were sent to enhance response rates and facilitate participation.

Validity and Reliability of Instruments

Table 1: The validity and reliability analysis of the data collection instruments

Factors	Items	Cronbach's Alpha
Research knowledge (RK)	RK1-RK16	.975
Research skills (RS)	RS1-RS20	.983
Research attitude (RA)	RA1-RA14	.952
Research items test (RIT)	RIT1-RIT84	.927

Table 1 presents a comprehensive overview of factors related to research competencies, including Research Knowledge (RK), Research Skills (RS), Research Attitude (RA), and Research Items Test (RIT), along with their corresponding items and reliability measures as indicated by Cronbach's Alpha. Research Knowledge comprises 16 items (RK1-RK16) that assess participants' understanding of research concepts, while Research Skills comprises 20 items (RS1-RS20) that evaluate practical abilities in conducting research. Research Attitude comprises 14 items (RA1-RA14) designed to gauge participants' dispositions toward research endeavors. The Cronbach's Alpha values indicate the internal consistency of these factors: Research Knowledge at 0.975, Research Skills at 0.983, Research Attitude at 0.952, and Research Items Test at 0.927. These high reliability coefficients indicate that the items within each factor are well-correlated and effectively measure their respective constructs. Overall, the robust Cronbach's Alpha values affirm the reliability of the assessment instruments utilized to evaluate research competencies among participants.

Data Analysis

Meanwhile, collected data involved statistical procedures using SPSS for the quantitative data analysis, where descriptive (percentage, frequency, etc.) statistics were used to reveal the participants' demographics, and inferential statistics summarized the responses, followed by correlational (r) and regression (β) analyses to determine relationships and predictors. This rigorous methodological framework aims to provide a nuanced understanding of the dynamics at play in teacher education and its impact on the development of the research community in the TECs context.

Results

This section analyzes the frequency and percentiles derived from the survey questionnaire, which addressed the demographic characteristics of teacher educators and their research experiences, on a one-to-one basis

RQ1: What is the level of current research practice of Cambodian teacher educators' research performance at TECs?

Table 2: Demographics of respondents

Parameters	Variables	Frequency	Percentage %
Sex	Female	30	33.7
	Male	59	66.3
Institutions	TEC I	52	49.05
	TEC II	54	50.94
Qualification	Doctor	3	3.4
	Master	84	94.4
	Bachelor	2	2.2
Teaching experiences	2-3 years	2	2.2
	4-5 years	1	1.1
	> 6 years	86	96.6
Research Training	Never	8	9
	1 time	7	7.9
	2 times	30	33.7
	3 times	0	0
	4 times	17	19.1
	5 times	5	5.6
	> 5 times	22	24.7
	Never	25	28.1
	1 manuscript	33	37.1
Manuscripts	2 manuscripts	17	19.1
	3 manuscripts	8	9
	4 manuscripts	2	2.2
	> 5 manuscripts	4	4.5
	No publication	45	50.6
Publications	1 article	22	24.7
	2 articles	12	13.5
	3 articles	5	5.6
	4 articles	0	0
	> 5 articles	5	5.6
Satisfaction	Strongly dissatisfied	1	1.1
	Dissatisfied	3	3.4
	Satisfied	68	76.4
	Strongly satisfied	17	19.1

Table 2 presents the current research activities of the participants, providing

important insights into the characteristics of teacher educators involved in research. The majority of respondents are male, making up 66.3% of the total. Additionally, participants are nearly equally distributed between the two institutions, TEC I (49.05%) and TEC II (50.94%), indicating balanced representation from both organizations. The participants' qualifications reveal that a substantial majority (94.4%) hold a Master's degree, indicating a highly educated group, which is crucial for promoting research productivity. Furthermore, teaching experience is largely concentrated within those with over six years of experience (96.6%), thus emphasizing a group of teacher educators with considerable expertise and skills that could significantly influence their research activities. Regarding research training, the data demonstrate varied levels of exposure: 24.7% of respondents have participated in more than 5 training sessions, whereas a notable 9% reported no prior research training. This variation could potentially affect the overall quality of research and education among teacher educators. The distribution of manuscripts reveals that 37.1% have produced one manuscript, while 28.1% have never authored one, suggesting that while some teacher educators are actively engaging in research, a notable portion remains inactive in manuscript production. Furthermore, the publication data indicate that 50.6% of articles have not been published, suggesting ongoing research efforts; however, only a small percentage have multiple articles published. Overall satisfaction levels are significantly elevated, as evidenced by the 76.4% of participants expressing contentment with their current involvement in research endeavors. This favorable disposition could be linked to their academic credentials and pedagogical background, suggesting that these factors bolster their self-assurance and satisfaction in their research capacities. Conversely, the observation of heightened satisfaction levels, coupled with limited research experience, underscores the need to implement targeted interventions to enhance research productivity, especially among those with limited training and exposure to research methodologies. This examination emphasizes the importance of cultivating a supportive research environment that simultaneously addresses the training requirements and motivational factors influencing the research performance of teacher educators.

RQ2: Is there a relationship between Cambodian teacher educators' research competencies and their gender, qualification, teaching experience, and research experience?

Table 3: The ANOVA analysis between the predictors and the dependent variable

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1184.717	4	296.179	4.198	.003 ^b
	Residual	7126.047	101	70.555		
	Total	8310.764	105			
a. Dependent Variable: Research knowledge						
b. Predictors: (Constant), Gender, Qualification, Teaching Experience, Research Experience						

Table 3 displays the ANOVA results for the regression model evaluating predictors of research knowledge; the results indicate a statistically significant association among the independent variables, including gender, qualification, teaching experience, and research experience. The regression sum of squares, amounting to 1184.717, illustrates the variance in research knowledge these predictors account for, whereas the residual sum of squares, at 7126.047, indicates the variance that remains unexplained. With degrees of freedom of 4 for the regression and 101 for the residuals, the mean square values are calculated as 296.179 for the regression and 70.555 for the residuals, yielding an F-statistic of 4.198. The F-statistic, which evaluates the proportion of variance accounted for by the model relative to the unexplained variance, yielded a p-value of 0.003. Because this value is less than the standard 0.05 level, the model is considered statistically significant, thereby leading to the rejection of the null hypothesis. As a result, it can be concluded that at least one predictor variable significantly contributes to the explanation of variance in research knowledge, thereby justifying further examination of the individual effects of each predictor.

Table 4: Multiple regression analysis of gender, qualification, teacher experience, research experience, and research knowledge of teacher educators

Predictors	Coefficient	St. Error	t-Statistic	Sig.	Confidence Interval (95%)
Research Knowledge		8.902	6.817	.000***	[43.023 – 78.343]
Gender	-.045	1.859	-.485	.628	[-4.590 – 2.786]
Qualification	-.076	3.294	-.798	.427	[-9.161 – 3.907]
Teaching experience	.002	2.740	.022	.983	[-5.376 – 5.496]
Research experience	.390	.640	4.057	.000***	[1.327 – 3.865]
Model Statistics					
R	.378				
R-squared	.143				
Adjusted R-squared	.109				
F-statistic	4.198			.003**	
Residual St. Error	8.316				
Sample Size (n)	106				

Table 4 displays the results of the multiple regression analysis, elucidating the determinants of the participants' research knowledge. The coefficient associated with research knowledge is statistically significant, registering a value of (St. Error = 8.902; Sig. < 0.001), thereby suggesting a robust positive correlation. Furthermore, the 95% confidence interval for this coefficient extends from 43.023 to 78.343. This suggests that for each unit increase in research knowledge, the predicted score increases substantially, emphasizing its critical role in the model. In contrast, neither gender ($\beta = -0.045$, Sig. = 0.628) nor qualification ($\beta = -0.076$, Sig. = 0.427) shows a statistically significant effect on research knowledge, as both hypotheses fail to reject the null at conventional significance levels, and their confidence intervals include zero. Teaching experience shows a negligible effect ($\beta = 0.002$, $t(1, 1) = 0.390$, Sig = 0.022) on research experience, indicating a positive contribution ($\beta = 0.640$, Sig = 0.001). The model's analysis revealed a statistically significant relationship with research knowledge, as evidenced by a 95% confidence interval ranging from 1.327 to 3.865. The R-squared value of 0.143 indicates that the independent variables explain only 14.3% of the variance in research knowledge, underscoring the need for further research to identify other relevant factors. Moreover, the F-statistic of 4.198, with a significance level of 0.003, confirms the model's overall significance; this implies that at least one of the predictors significantly contributes to explaining the research knowledge, despite the model's limited explanatory power.

Table 5: The ANOVA analysis between the predictors and the dependent variable

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3727.653	4	931.913	5.562	.000 ^b
	Residual	16922.611	101	167.551		
	Total	20650.264	105			
a. Dependent Variable: Research skills						
b. Predictors: (Constant), Gender, Qualification, Teaching Experience, Research Experience						

Table 5 presents the Analysis of Variance (ANOVA) outcomes derived from the regression model. This model was used to evaluate the determinants of research skills. The study's outcomes indicate statistically significant associations between the independent variables—gender, qualifications, teaching experience, and research experience—and the dependent variable, research skills. The regression sum of squares, quantified at 3727.653, quantifies the extent to which the model's predictors account for the observed variance in research skills. Conversely, the residual sum of squares, 16922.611, represents the variation unexplained by the model. The regression has 4 degrees of freedom, and the residuals have 101 degrees of freedom. The mean square for the regression analysis is 931.913. The F-statistic, which evaluates the model's overall significance by comparing the explained variance with the unexplained variance, is 5.562. The estimated p-value of 0.000, well below the standard 0.05 level, furnishes compelling evidence against the null hypothesis. As a result, the data suggest that at least one predictor variable significantly contributes to the observed variance in research skills. This finding highlights the importance of these qualities in developing research skills. Given the model's overall significance, a more detailed study of each predictor's effect is warranted.

Table 6: Multiple regression analysis of gender, qualification, teacher experience, research experience, and research skills of teacher educators

Predictors	Coefficient	St. Error	t-Statistic	Sig.	Confidence Interval (95%)
Research skills		13.719	5.818	.000**	[52.598 – 107.027]
Gender	-.111	2.865	-1.213	.228	[-9.158 – 2.209]
Qualification	-.117	5.076	-1.250	.214	[-16.414 – 3.724]
Teaching experience	-.064	4.223	-.697	.488	[-11.318 – 5.435]
Research experience	.436	.986	4.637	.000***	[2.616 – 6.528]
Model Statistics					
R	.425				
R-squared	.181				
Adjusted R-squared	.148				
F-statistic	5.562			.000***	
Residual St. Error	12.944				
Sample Size (n)	106				

Table 6 indicates that the multiple regression results offer critical insights into the predictors of research skills among the study participants. The coefficient for research skills is highly significant (St. Error = 13.719; Sig. < 0.001), indicating a robust positive relationship: for every unit increase in the predictor, research skills increase by approximately 13.719 units, with a 95% confidence interval ranging from 52.598 to 107.027. In contrast, the predictors' gender ($\beta = -0.111$, Sig. = 0.228) and qualification ($\beta = -0.117$, Sig. = 0.214) do not demonstrate statistically significant effects on research skills, as their p-values exceed the 0.05 threshold and their confidence intervals include zero, indicating no meaningful contribution. Teaching experience shows a negligible coefficient ($\beta = -0.064$), while research experience shows a significant positive influence ($\beta = 0.436$, Sig. < 0.001). The results showed a statistically significant effect, suggesting that more research experience significantly improves research skills, with a confidence interval of 2.616 to 6.528. The model's fit was moderate, as indicated by an R-squared value of 0.181, which means the model explained about 18.1% of the differences in research skills. However, the adjusted R-squared of 0.148 suggests limited explanatory power, suggesting that other factors may also influence research skills. The model's overall significance was confirmed by an F-statistic of 5.562 (Sig. < 0.001), supporting the conclusion that at least one predictor significantly affects research skills and indicating the need for further investigation of these relationships.

Table 7: The ANOVA analysis between the predictors and the dependent variable

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	243.082	4	60.771	1.473	.216 ^b
	Residual	4166.776	101	41.255		
	Total	4409.858	105			

a. Dependent Variable: Research attitude

b. Predictors: (Constant), Gender, Qualification, Teaching Experience, Research Experience

Table 7 presents the ANOVA results for the regression model examining the factors affecting research attitude. The results showed that the relationships between the independent variables—gender, qualification, teaching experience, and research experience—and the dependent variable were not statistically significant. The regression sum of squares, which was 243.082, indicates the amount of variance in research attitude explained by the predictor variables. In contrast, the residual sum of squares of 4166.776 highlights considerable variance that the model did not explain. With four degrees of freedom allocated to the regression and 101 to the residuals, the mean square for the regression is 60.771. The computed F-statistic (1.473) evaluates the proportion of variance explained relative to that unexplained; however, a significance value of $\beta = 0.216$ suggests insignificance at the standard 0.05 level. Therefore, the null hypothesis is not rejected, indicating that the predictor variables don't significantly explain differences in research attitude. This result highlights the need for further investigation into additional factors or variables that could improve our understanding of research attitudes, given that the current model doesn't fully explain the observed differences.

Table 8: Multiple regression analysis of gender, qualification, teacher experience, research experience, and research attitude of teacher educators

Predictors	Coefficient	St. Error	t-Statistic	Sig.	Confidence Interval (95%)
Research attitude		6.807	6.652	.000	[31.781 – 58.789]
Gender	.123	1.422	1.252	.214	[-1.041 – 4.599]
Qualification	.072	2.519	.721	.473	[-3.181 – 6.812]
Teaching experience	.148	2.095	1.510	.134	[-.993 – 7.320]
Research experience	.085	.489	.847	.399	[-.556 – 1.385]
Model Statistics					
R	.235				
R-squared	.055				
Adjusted R-squared	.018				
F-statistic	1.473			.216	
Residual St. Error	6.4230				
Sample Size (n)	106				

Table 8 indicates that the multiple regression analysis results provide a crucial understanding of the factors influencing participants' research attitudes. The coefficient for research attitude is statistically significant (St. Error = 6.807; Sig. < 0.001), indicating a positive correlation; specifically, an increase in the predictor is associated with a substantial increase in research attitude, as the 95% confidence interval spans from 31.781 to 58.789. Conversely, the predictors of gender ($\beta = 0.123$, Sig. = 0.214) and qualification ($\beta = 0.072$, Sig. = 0.473) do not exhibit statistically significant effects on research attitude, given that their significance levels exceed the standard 0.05 threshold and that both confidence intervals include zero. The teaching experience shows a coefficient of ($\beta = 0.148$, Sig. = 0.134), while research experience shows a coefficient of ($\beta = 0.085$, Sig. = 0.399). The coefficients for the independent variables are not statistically significant, implying that they do not substantially affect research attitude. The model's overall fit is relatively weak, as evidenced by an R-squared of 0.235, indicating that the independent variables account for only 23.5% of the variance in research attitude. Therefore, the adjusted R-squared value of 0.018 indicates that the model has a limited ability to explain the observed data. Furthermore, the F-statistic of 1.473 (Sig. = 0.216) corroborates the finding that the predictors, when considered together, do not significantly account for the variance in research attitude, suggesting that further investigation into other potential influences on the participants' research attitudes is warranted.

RQ3: Is there a relationship between teacher educators' research competencies and student teachers' research competence?

Table 9: The ANOVA analysis between the predictors and the dependent variable

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	516.683	3	172.228	.897	.446 ^b
	Residual	19588.156	102	192.041		
	Total	20104.840	105			

a. Dependent Variable: Student teachers' research competence
b. Predictors: (Constant), RK, RS, RA

Table 9 displays the ANOVA results for the regression model assessing predictors of student teachers' research competence; the results suggest that the model's overall contribution to explaining the variance in the dependent variable is not statistically significant. The regression sum of squares, 516.683, reflects the variability in research competence attributable to the predictors: Research Knowledge (RK), Research Skills (RS), and Research Attitude (RA). Conversely, the residual sum of squares is considerably greater, at 19588.156, thereby underscoring the substantial unexplained variance within the model. Given that the regression has 3 degrees of freedom and the residuals have 102 degrees of freedom, the mean square for the regression is 172.228. The F-statistic is presented as 0.897, which represents the ratio of explained variance to unexplained variance. Conversely, the associated significance level of 0.446 exceeds the conventional 0.05 threshold, indicating insufficient evidence to reject the null hypothesis. Consequently, the variables under investigation do not demonstrably influence the research competencies of the student teachers involved in the study. These findings underscore the need for further exploration of alternative variables or factors that might more effectively elucidate research competence within this population, given that the existing model does not adequately account for the underlying mechanisms influencing this outcome.

Table 10: The cross-sectional multiple regression analysis of teacher educators' research competencies and student teachers' research competence

Predictors	Coefficient	St. Error	t-Statistic	Sig.	Confidence Interval (95%)
Research competence		10.751	5.298	.000	[35.634 – 78.281]
RK	-.064	.184	-.528	.598	[-.462 – .267]
RS	-.067	.153	-.680	.498	[-.408 – .199]
RA	.178	.237	1.456	.148	[-.125 – .814]
Model Statistics					
R	.160				
R-squared	.026				
Adjusted R-squared	-.003				
F-statistic	.897			.448	
Residual St. Error	13.857				
Sample Size (n)	106				

Table 10 presents the results of the multiple regression analysis, providing insights into the predictors of student teachers' research competence and revealing several important findings. The coefficient for the dependent variable, student teachers' research competence, is significantly positive (St. Error = 10.751; Sig. < 0.001), indicating that for each unit increase in this predictor, student teachers' research competence increases substantially, as evidenced by a confidence interval of 35.634 to 78.281. Conversely, the predictors research knowledge ($\beta = -0.064$, Sig. = 0.598) and research skills ($\beta = -0.067$, Sig. = 0.498) show negative coefficients; however, neither is statistically significant, suggesting they do not contribute meaningfully to variations in research competence. Additionally, research attitude shows a significant effect ($\beta = 0.178$, Sig. = 0.148), but it is not statistically significant. The overall model explains only 16% of the variance in research competence, as indicated by the R-squared value of 0.160. An adjusted R-squared of -0.003 indicates that the model does not provide an adequate fit to the data. The F-statistic of 0.897 with a (Sig. = 0.448) further confirms that the regression model does not significantly predict student teachers' research competence. These findings underscore the need for further investigation into additional factors that may help explain the dynamics of research competence among student teachers, as the current model falls short of explaining the observed variability.

Discussion

An examination of current research practices among teacher educators reveals several critical factors that shape their engagement in research. The demographic analysis reveals a considerable male representation (66.3%) and a balanced distribution between

the two institutions, PTEC (49.05%) and BTEC (50.94%), indicating a supportive research environment across both settings. The overwhelming majority of respondents holding Master's degrees (94.4%) suggest that these educators are well-equipped with the necessary academic foundation to advance research performance and innovate within educational contexts (Akhtar et al., 2024; Brown & Dueñas, 2020). Additionally, the concentration of teaching experience among those with over six years (96.6%) suggests that these seasoned educators bring invaluable practical and theoretical expertise to their research, enabling them to develop relevant and impactful research questions grounded in classroom realities. Nevertheless, disparities in research training are concerning, particularly the 9% of respondents who reported no formal training. According to Jilcha (2025) and Elivio Bonollo (2014), this gap in exposure to essential methodologies could undermine the quality and rigor of their research, thereby affecting students' educational outcomes. Moreover, while 37.1% of respondents have produced at least one manuscript, a notable 28.1% remain inactive in publication efforts, indicating a disengagement from contributing to the wider academic dialogue (Rørstad & Aksnes, 2015; To & Yu, 2020). The fact that 50.6% of the articles have not been published further underscores the ongoing research efforts that may require additional support to transition from theoretical work to tangible publications. Despite these challenges, a significant 76.4% of respondents express high satisfaction with their research engagement, suggesting that their qualifications and teaching experience bolster their confidence in their research roles. This high level of satisfaction may reflect a positive perception of the role of research in enriching their professional development. However, the contrast between satisfaction levels and training gaps, as well as the need for original research and publication in peer-reviewed journals, underscores the necessity of targeted interventions, such as mentorship programs and professional development workshops. Such initiatives could enhance skills and encourage deeper engagement in the research process (Comon & Corpuz, 2024; Ivanenko et al., 2015).

The multiple regression analysis sheds light on the predictors of research knowledge, skills, attitude, and competence among participants. The significant positive coefficient for research knowledge (St. Error = 8.902; Sig. < 0.001) underscores its importance, suggesting a direct correlation between higher research knowledge and enhanced research capabilities (Kuzembayeva et al., 2025). Notably, neither gender, qualification, nor teaching experience emerged as significant predictors, suggesting that these factors may not play a critical role in shaping research performance (Puuska, 2010; Rørstad & Aksnes, 2015). Instead, research experience shows a positive contribution ($\beta = 0.640$), reinforcing the idea that practical experience significantly enhances knowledge acquisition. Similarly, the analysis of research skills reveals a strong positive relationship (St. Error = 13.719; Sig. < 0.001), indicating that improved research skills are correlated with a greater capacity for effective research (Borg & Alshumaimeri, 2012; Cardona, 2020;

Heng et al., 2020). The repeated insignificance of gender, qualification, and teaching experience implies that additional contextual or motivational factors may be more influential in developing these skills. The importance of research experience in fostering research skills ($\beta = 0.436$) further emphasizes the necessity of practical engagement in research activities. In addition, the exploratory research attitude, the analysis found a significant positive coefficient (St. Error = 6.807; Sig. < 0.001), suggesting that enhanced research knowledge and skills contribute to a favorable research disposition. However, the lack of significance for predictors such as gender, qualifications, and teaching experience indicates that other determinants, potentially involving institutional culture or personal motivation, may play a more crucial role in cultivating a positive research attitude. Moreover, the regression analysis of student teachers' research competence reveals additional complexities, indicating that the model explains only 16% of the variance in this competence. While the lack of significant contributions from research knowledge, skills, and attitude suggests these factors alone do not fully account for the intricacies of student teachers' research competence.

Conclusion

In conclusion, these findings delineate the nuanced landscape of research performance among teacher educators and advocate for a multifaceted approach to address identified training and motivational gaps. By fostering supportive environments that enhance educators' capabilities through targeted training, mentorship, and collaborative research opportunities, educational institutions can cultivate a culture of inquiry that not only improves research output but also enriches teaching practices, ultimately enhancing student learning outcomes. Continued exploration of additional variables affecting research performance will be essential for cultivating effective research engagement among teacher educators.

Based on the findings, Cambodian TEC administrators, policymakers, and stakeholders were proposed several key recommendations to enhance the research performance of teacher educators. First, develop comprehensive research training programs focused on methodologies, data analysis, and manuscript preparation, specifically targeting individuals without formal training. Second, establish mentorship opportunities by pairing less experienced teacher educators with seasoned researchers to foster skill development and confidence. Third, promote collaborative research initiatives between institutions through workshops and interdisciplinary groups to facilitate knowledge sharing and exchange. Fourth, incentivize research publication by providing funding for fees and recognizing contributions in performance evaluations, thereby creating a culture that values academic discourse. Fifth, foster a supportive research environment by allocating resources to individuals who lack them, providing administrative assistance, and ensuring dedicated research time for educators. Lastly,

conduct ongoing evaluations of training programs and publication rates to assess effectiveness, and explore additional factors that influence research engagement, such as institutional culture and personal motivation. By implementing these recommendations, TECs can enhance research performance and improve teaching and learning outcomes for student teachers.

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