# Does having prior research experience influence postgraduate students' research competency?

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**ABSTRACT**

Mastering research courses at the postgraduate level is challenging, as students consider them complex and stressful. Anecdotal evidence reveals that most postgraduate students are expressing frustration about their difficulties in mastering the research course at the postgraduate level. Although some postgraduate students have prior research experience, it's been difficult to distinguish them from those without experience. Using Experiential Learning Theory, this study aimed to investigate whether prior research experience influences research competency at the postgraduate level. A cross-sectional study was conducted among 85 postgraduate students at Mzumbe University, Tanzania. The sample was drawn using a stratified sampling technique from a population of 150 students, with schools, campuses, and faculties serving as strata. Descriptive and regression analysis was conducted using SPSS version 20 software. The results indicate that having prior research experience and conducting research at the undergraduate level significantly influenced research competency at the postgraduate level at P = 0.01 and P = 0.011, respectively. Nonetheless, undertaking a research course at the undergraduate level was determined to be statistically insignificant in improving graduate research competencies. The study concluded that enhancing research competencies and learning structure requires integration of both the theoretical and practical components of teaching methodologies. This calls for higher learning institutions to review their undergraduate curricula to reflect the learning needs of their students.

**Keywords:** Experimental Learning, Higher Learning Institutions, Postgraduate Research, Research Competency

## I. INTRODUCTION

In today's 21st-century economy, postgraduate research has become a critical concern in fostering thinking, innovation, and competency in the academic community. Research involves a process of generating, discovering, inverting, and creating new knowledge. It provides a basis for responding to societal transformation and solving local and global issues (Afolabi et al., 2023; Ndenje-Sichalwe & Elia, 2021). In this regard, Higher Learning Institutions (HLIs) remain the backbone of generating research-based knowledge by both faculty and students through scholarly works, mainly reports, dissertations, and publications.

While some HLIs start building research competencies in their students from the undergraduate level, others do not until students join postgraduate courses. In most cases, undergraduate research training is elementary, and they are made more rigorous at the postgraduate level. Postgraduate research entails a study offered by a university or any institution of advanced learning such with the emphasis is to developing systematic skills of investigation in the research process. It resembles nomenclatures like postgraduate diploma, master's studies, master of philosophy, PhD, or higher PhD (Kadoke & Kennedy, 2022), offered in different forms, like a combination of coursework and thesis (research) or by thesis (research) only (Mutula, 2011). Thus, research competency remains a critical concern in shaping the behavior, attitude, and research performance among postgraduate students (Mutula, 2011).

Research competency involves having the right research knowledge, skills, and attitude in understanding and applying the required research concepts and principles in a scientific field through scientific inquiry (Afolabi et al., 2023; Prosekov et al., 2020). It includes student mastery of all research proposal and dissertation sections, such as mastery of the background of the problem, statement of the problem, designing research objectives and questions, conducting critical literature review, sample size and sampling procedure, research design, research philosophy, understanding and applying data collection techniques, data analysis, data interpretation, and considering ethical issues in research (Magali, 2019; Ndenje-Sichalwe & Elia, 2021; Obuku et al., 2018; Prosekov et al., 2020).

However, despite the increasing demand for research-driven solutions, concerns remain over whether postgraduate students around the world, including Tanzania, are adequately equipped with the competencies necessary for independent research work. In this respect, the role of prior research experience in shaping postgraduate students' research performance has been a subject of scholarly interest. HLIs often consider previous research exposure as a

criterion, anticipating that it equips students with essential skills for academic success. Empirical evidence presents a nuanced perspective that research experience at the undergraduate level is considered the best intervention to impart postgraduate research competence (Miller et al., 2021). This is because research concepts and practices become familiar among postgraduate students, thus making it the easiest way of navigating those principles. Also, Craney et al. (2011) provided that undergraduate research experience is highly associated with increased levels of communication, problem-solving skills, and increased interest in graduate research. Moreover, engaging students in research during undergraduate studies is also considered another way of boosting research competencies. According to Shapiro (2004) and Bransford and Johnson (1972), those who did a research project as an undergraduate were found to be more competent than those who didn't in a way of increased learning and memory, and knowledge retention.

In another way, teaching research subjects is perceived as another intervention in stimulating postgraduate research (Kadikilo et al., 2023; Ndenje-Sichalwe & Elia, 2021). Research subject is included in undergraduate and postgraduate curricula where students are eager to understand research concepts, principles, and methodology. Class sessions, lectures, and discussions are set in a way that students are able to diagnose any critical concepts that emerge. In this, students learn the introduction to research, theorizing research, and research design to disseminate research findings.

Despite the initiatives, empirical literature found that research competencies among postgraduate students remain very low. For example, Isa and Ahmad (2018) in Malaysia found that most postgraduate students are lagging in executing research, especially in academic writing, research methods, and techniques. Others suffer from plagiarism, scientific writing skills, and language barriers (Jeyaraj, 2018), while others struggle in setting the problem, designing objectives, conducting literature reviews, analyzing data, discussing the findings in line with the subject, and writing manuscripts and publications (Ndenje-Sichalwe & Elia, 2021; Obuku et al., 2018; Saeidi & Ahour, 2021).

In Tanzania, postgraduate research training is increasingly viewed as a strategic priority in national development. Universities have incorporated research courses into curricula and established research support units (Komba, 2015). Despite formal research courses being part of most undergraduate and postgraduate programs, evidence shows that many students struggle to demonstrate essential research competencies (Elia & Ndenje-Sichalwe, 2024; Kanyopa, 2025; Magali, 2019; Saeidi & Ahour, 2021). This has led to the low involvement of postgraduate students in research, resulting in low research outputs and increased stress among postgraduate students (Fussy, 2024; Kadikilo et al., 2023; Kessy, 2020).

Despite some studies backing having research experience at the undergraduate level to influence research competency at the postgraduate level (Miller et al., 2021; Craney et al., 2011; Shapiro, 2004; Bransford & Johnson, 1972), such evidence is scanty in the context of the developing world, particularly Tanzania. Without clear evidence, educational institutions in developing countries may continue to rely on ineffective pedagogical strategies, potentially compromising the quality of postgraduate research output.

### 1.1 Research Hypotheses

This study bridges the existing knowledge gap by testing the following three hypotheses: -

i. Prior research experience significantly influences postgraduate research competency
ii. Studying research courses at the undergraduate level significantly influences research competency at the postgraduate level.
iii. Conducting research projects at the undergraduate level significantly influences research competency at the postgraduate level.

The first hypothesis takes into consideration that some students who have graduated at the undergraduate level do not join postgraduate programs directly rather get employed on a permanent or temporary basis, whereby some of them gain research experiences through involvement in research activities, including coaching and mentorship in research.

## II. LITERATURE REVIEW

### 2.1 Theoretical Framework

#### 2.1.1 Experiential Learning Theory

Experiential Learning theory (ELT) provides a prominent insight into how prior research experience influences mastery of research among postgraduate students. According to Kolb (1984), "learning is the process whereby knowledge is created through the transformation of experience". Unlike traditional learning models that treat knowledge as something transmitted from teacher to student, the theory views learning as a cyclical process where individuals continuously build and refine their understanding through experience and reflection, resulting from the interaction between the individual and environments where ideas and knowledge are derived from natural settings. The theory proposes four learning stages; first, concrete experience, where learning begins with engaging in direct, hands-on

activity, eg, a student who undertakes a research project gains practical exposure to research than anyone. Second, Reflective Observation- after the experience, the learner reflects on what worked, challenges encountered, and how it can be improved. From the first example, the student can identify gaps and strengths in their skills for improvement. Third, Abstract Conceptualization - here, a learner connects experience with theories, principles, or structured knowledge. An example of taking a research course enables students to formalize what they have experienced into methodological understanding in class. Fourth, Active Experimentation-whereby a learner applies what they have learned in a new context (Ilyas et al., 2020).

The increased enrollment of postgraduate students in HLIs highlights the necessity of experiential learning among students. Universities and students are directly involved in tasks/ activities that build their experiences in learning. Regarding research competencies, students are first engaged in research courses, where primary observations and insights from the theories, principles, and practices occur (Ghazali, 2008). They engaged in hands-on activities that stimulate their knowledge and learning (Davidson & Palermo, 2015; Ilyas et al., 2020), while others engaged and conducted field or practical research where they applied what they had learnt in classes to reality (Ilyas et al., 2020; Prosekov et al., 2020). However, empirical evidence reveals that most postgraduate students possess lower competencies in navigating research concepts, principles, theories, and practice (Afolabi et al., 2023; Guo et al., 2021; Magali, 2019; Ndenje-Sichalwe & Elia, 2021; Wang, 2013).

### 2.1.2 Understanding Postgraduate Research Competency

Recently, postgraduate research has been viewed as a critical aspect in developing research competency among postgraduate students. It is not only viewed as an intervention for increasing research productivity but also as the criterion for admitting students into postgraduate courses (Isa & Ahmad, 2018). However, due to the need and efficacy of research in the academic arena, curricula are designed to improve research competency among both undergraduate and graduate students (Afolabi et al., 2023). Research competency can be explained in different ways regarding the needs and situation of the HLIs. For example, Guo et al. (2021) defined postgraduate competencies in terms of self-management, research ability, attitude quality, psychological attitude, research method, and professional knowledge. The definition emphasizes the psychological aspect of research among students, since it is perceived not only as distressing but also as difficult to navigate theoretically and practically. Studies by Wang (2013) and Mutula (2011) added student mastery of the validity and reliability, presenting arguments argumentatively, and knowledge mastery about the topic as research competencies. In another way, mastery of the English language and the ability to produce manuscripts and publications are also confirmed as research competencies (Isa & Ahmad, 2018).

Scholars like Prosekov et al. (2020) identified four components of research competency consisting of motivation, gnoseological, operational, and personal. In the motivation component, it explains the ability of the student to demonstrate internal desire/motivation for self-education activity. Since research is scientific, it is thus perceived to be difficult among students and scholars. Therefore, for someone to be regarded as competent in research, the desire must be driven internally, showing the need, spirit, and commitment to learn and practice research. The gnoseological component explains student knowledge of the main component of the methodological apparatus. This mostly considers knowing scientific methods, methodology, and logical presentation of the research activity. The operational component explains the ability of the students to organize the research process from formulating the problem, hypothesis, and materials to report writing. Lastly, the personal component explains a student's ability to demonstrate initiative in the search for a research topic and to involve others in the process. Thus, postgraduate research is very important in HLIs, as it provides valuable contributions to the community and academic arena. It is the way of generating new knowledge through testing the empirical assumptions and hypotheses in identifying and diagnosing real-world phenomena. It is therefore the role of HLIs to prepare these postgraduate students to effectively conduct research in their country and beyond.

### 2.1.3 Building Students' Research Competency in HLIs

Building research competency in HLIs is not a very simple task. Most postgraduate students perceive research as not only complex but also a stressor in their academic life (Khalaf, 2023). This is mostly driven by a low level of skills and knowledge of understanding research components and practices. Among others, governments around the world recognize the need for strengthening research capabilities for students in HLIs. They invest in research and development, improving library infrastructures, ICT investments, and use (Tammam et al., 2024). This not only simplifies access to materials but also drives the desire of students into scholarly work.

In some HLIs, developing research competencies at the postgraduate level starts from undergraduate education through classroom lectures, class research projects, and other practical settings (Davidson & Palermo, 2015). This builds students with enough knowledge, attitude, and skills to understand and conduct research. University curricula embed research as a core subject to learn. At the postgraduate level, research is taught as an independent and core course through which students attend classroom sessions and start navigating research concepts in real-life settings, addressing

major social, economic, and political phenomena (Afolabi et al., 2023). Moreover, they practically engage in developing concept notes, proposals, and final research reports/dissertations under the supervision of qualified staff. In some HLIs, students must develop manuscripts and publish in non-predatory research journals or other academic platforms. Despite being trained and practicing, postgraduate students face different challenges in comprehending subjects and applying research knowledge when conducting research. These challenges not only delay the completion of their studies but also cause difficulties in framing the right questions, conducting critical literature reviews, choosing the right methodology, and producing high-quality research (Isa & Ahmad, 2018; Komba, 2015).

**2.2 Empirical Evidence**

Guo et al. (2021) developed tools for assessing postgraduate research competencies and identified research ability as the strongest predictor of student performance. However, studies reveal that many postgraduate students demonstrate limited research competencies. For instance, Magali (2019) found that most students at the Open University of Tanzania lacked adequate knowledge in key aspects of research writing, while Wang (2013) highlighted potential challenges in understanding qualitative research paradigms among postgraduate students. Similarly, Mutula (2011) reported poor understanding of research methodology sections, including the selection of design, sampling procedures, and data analysis. Other studies identified difficulties in designing questionnaires and applying statistical tests (Saeidi & Ahour, 2021), while others pointed to plagiarism, citation, and language issues (Komba & Chiwamba, 2016). Conversely, some research has shown strong competencies among postgraduate students. For example, Prosekov et al. 2020) found high motivation and research skills among American students, while Afolabi et al. (2023) reported that most Nigerian students demonstrated competencies in developing statements of the problem, literature review, and data analysis.

From the first hypothesis, ideally, someone with experience might have a higher understanding compared to someone a less experience. This has been shown by Ellaway et al. (2014), who wanted to test the impact of combining medical students with and without a background in biomedical science. The results show a big difference between them, especially in terms of preparedness, stress level, endurance, and performance. Despite limited empirical evidence, the available literature on the table proves that prior research experience has been linked to improved research performance and competencies. For instance, Guo, Chen & Zeng (2021) examined 364 postgraduate students in China and found that prior research exposure enhanced research ability and academic performance through psychological capital. Similarly, Bakina (2023) also emphasized that postgraduates with earlier exposure to research activities adapted more quickly to advanced research requirements. The study by Ilyas et al. (2020) also found the positive value of experiential learning in strengthening research skills among students, while Mwangi et al. (2020) confirmed the impact of the effectiveness of a comprehensive postgraduate research curriculum in improving students' performance.

The second hypothesis, universities have designed undergraduate curricula to reflect the needs and demands of the labor market and postgraduate requirements. Among them, research has been taught as a separate subject. The available literature suggests that teaching research significantly influences students' research mastery. For example, Tammam et al. (2024) revealed that in Saudi Arabia, the public universities have used research capacity building as a strategy to improve student research capacity. The study indicated that universities encouraged researchers to participate in seminars and conferences designed to improve research knowledge and skills. Similarly, the study by Kadikilo et al. (2023) indicated capacity development as a powerful tool in enhancing research productivity in Tanzania HLIs. Researchers are groomed with theoretical knowledge gained through assignments, group work, and other learning approaches dedicated to mitigating research obsoleteness, skills, and stress levels. In South Africa, the collaborations between Higher Education Institutions and the Flemish University have been found to have strong implications for research competencies among researchers. Members interact with others from different disciplines. Short courses, curriculum development, and conferences emerged as the central part of improving research competencies. Innovative research training was linked to completing studies on time and publication competency (Frantz et al., 2016). Also, the study by Szecsi (2024) evaluated a series of course-based undergraduate research experiences (CUREs) and reported significant improvements in students' research knowledge, data analysis skills, and dispositions toward inquiry-based learning. Overall, these findings suggest that formal research education at the undergraduate level provides students with methodological foundations and cognitive readiness essential for advanced research training.

Regarding conducting research projects, several empirical studies have confirmed the positive impact of engaging in an undergraduate research project on postgraduate research performance. In an experimental study, Khalaf (2023) revealed that project-based learning in undergraduate research courses improved proposal writing and data analysis skills, both of which are central to postgraduate research. The study by Craney et al. (2011) further associated prior research exposure with positive attitude and enhanced problem-solving abilities. Overall, evidence suggests that while research competence varies across contexts, proper exposure to research, practical learning experience, and well-designed curricula play a crucial role in strengthening postgraduate research ability. The study by Allsopp et al. (2006) bridged the gap between theory and practice. The study reveals the value of connecting courses with the field. Students

gain practical knowledge by applying what they have learnt in the classes to the field. Furthermore, Davidson and Palermo (2015) and Prosekov et al. (2020) revealed that hands-on learning has a significant impact on developing students' research competencies. The study provided evidence that evidence-based practices form the strongest foundation of learning. Students gain practical knowledge, skills, and experiences of navigating different research knowledge in a real-life setting. However, few studies have examined the specific influence of undergraduate research experience on postgraduate research mastery, with most focusing instead on demographic and background factors such as family income, parental education, and GPA (Stegers-Jager et al., 2015; Kombo Okioga, 2013; Ghazali, 2008).

## III. METHODOLOGY

### 3.1 Research Design and Approach

The study employed a positivist approach and adopted a cross-sectional research design to compare postgraduate students with and without research experiences in relation to their mastery of research competencies. The design enabled the researcher to collect data at a single point in time from second-year postgraduate students at Mzumbe University, Tanzania. The second-year students were chosen as the researcher assumed that they had gained sufficient exposure and experience in research activities and related challenges.

### 3.2 Sampling Strategy

The study targeted second-year master's students at Mzumbe University, with a total population of 150. Using Yamane's (1967) formula, a sample size of 108 respondents was determined. Out of these, 85 respondents (Representing a 78% response rate) completed and returned the questionnaire, forming the basis for data analysis. The stratified sample ensured adequate representation of students with and without research experiences from different strata, which were schools, institutes, and faculties of the university.

### 3.3 Data Collection

Data were collected using a structured questionnaire administered to the second-year master's students. The questionnaire was designed to capture information related to students' research competencies, teaching research exposure, and research experience. Its structured nature facilitated uniformity and consistency in responses, allowing for accurate quantitative analysis.

### 3.4 Data Analysis

The study employed descriptive statistics, including mean and frequency analyses, to determine the level of research competencies among students. In addition, Multiple Linear Regression analysis was performed to examine the statistical influence of research experience, teaching research, and conducting research on students' research competencies. All data were analyzed using SPSS Version 20 software to ensure reliability and accuracy.

### 3.5 Ethical Consideration

The study adhered to ethical research principles by ensuring voluntary participation and informed consent from all respondents. Participants were fully informed about the purpose and procedures of the study before taking part. Confidentiality and anonymity were maintained throughout the research process to safeguard participants' privacy and rights.

## IV. FINDINGS & DISCUSSION

### 4.1 Descriptive Analysis Results

**Table 1**

*Descriptive Statistics*

| Category | Sub-category | Frequency (f) | Percentage (%) |
|---|---|---|---|
| Gender | Male | 50 | 58.82 |
| | Female | 35 | 41.18 |
| School/Faculty/Campus | Dar es Salaam Campus College | 14 | 16.47 |
| | Faculty of Social Science | 6 | 7.06 |
| | Institute of Development Studies | 1 | 1.18 |
| | School of Business | 9 | 10.59 |
| | School of Public Administration and Management | 55 | 64.71 |

Table 1 summarizes the respondent's characteristics of the sample. This distribution indicates a moderate gender imbalance, with a higher proportion of male respondents. The discrepancy suggests either a higher participation rate among male students or a demographic trend in the postgraduate population studied. Moreover, the School of Public Administration and Management (SOPAM) had the highest representation compared to other schools or faculties. The dominant presence of SOPAM respondents may reflect the structure of the postgraduate programs surveyed or variations in research engagement levels across schools.

### 4.2 Students' Prior Research Experiences – Embedded in the Undertaking Research Course at the Undergraduate level

Out of the total 85 respondents surveyed, the majority (87.06%) reported that their previous education included research components, while only 12.94% indicated otherwise. This suggests that most respondents had prior exposure to research-related learning during their academic journey. The high proportion of individuals with such a background may reflect the integration of research elements in undergraduate or earlier programs, potentially influencing their preparedness and confidence in engaging with research activities at the postgraduate level.

**Table 2**

*Response to whether Postgraduate Students Studied a Research Course at the Undergraduate Level*

| Have you studied a research course at the undergraduate level? | Frequency | Percent |
|---|---|---|
| No | 11 | 12.94 |
| Yes | 74 | 87.06 |
| **Total** | **85** | **100** |

### 4.3 Students' Prior Research Experiences – Embedded in Practical Experience of Doing Research at the Undergraduate Level

Among the 85 respondents, 54 individuals (63.53%) indicated that they had conducted research projects before their current postgraduate program, while 31 individuals (36.47%) had not. This indicates that while a majority had some hands-on research experience before entering their postgraduate studies, a substantial proportion, over one-third, lacked direct experience conducting research projects. These results highlight a possible variation in research preparedness among postgraduate students, which could influence their academic adjustment and performance in research-intensive programs.

**Table 3.**

*Response to whether Students Conducted Research at the Undergraduate Level*

| Did you conduct a research project at the undergraduate level? | Frequency | Percent |
|---|---|---|
| No | 31 | 36 |
| Yes | 54 | 63.53 |
| **Total** | **85** | **100** |

### 4.4 Postgraduate Students' Research Competencies

Students were asked to rate their current research competencies using a scale of 1 to 5, whereby 1= Very low; 2 = Low; 3 = Average; 4 = High; and 5 = Very high. The bar chart below shows the research competency levels among postgraduate students (RC1–RC22). The findings provide a detailed picture of strengths and weaknesses among postgraduate students across various research-related skills. Each competency (RC1–RC22) was measured as a percentage, representing the extent of self-reported competency among 85 respondents. The chart highlights areas of concern in red color competencies where less than 60% of participants reported confidence or mastery.

#### 4.4.1 High Competency Areas

The chart shows that most students reported strong competence in foundational research tasks. For instance, *RC9 (Adhering to Research Ethics)* scored the highest at 74%, followed closely by *RC1 (Developing Researchable Title/Idea)* at 73%, and both *RC3 (Developing Statement of the Problem)* and *RC6 (Finding Relevant Literature)* at 72%. Similarly, *RC2 (Background Development)*, *RC4 (Research Objectives)* at 71% and *RC5 (Formulating Research Questions)* scored 70%. These results suggest that postgraduate students are generally well-prepared in the initial stages of the research process, especially in formulating ideas and understanding other research issues.

#### 4.4.2 Moderate Competency Areas

Several intermediate skills demonstrated moderate competency levels. For example, *RC13 (Data Collection Mastery)* and *RC7 (Critical Literature Review)* each scored 69%, *RC8 (writing research proposal)* scored 68%, while

*RC16 (Writing Research Report)* and *RC22 (Confidence to Overcome Research Challenges)* scored 67%. Skills such as *RC10 (Using Qualitative Methods)* and *RC21 (Minimal Supervision)* each scored around 65%. Also, *RC11 (Designing and using Quantitative Research Methods)* scored 64%, *RC12 (Designing and using Quantitative Research Methods)* and *RC15 (Analyzing, Interpreting and Presenting Data)* each scored 63% and *RC19 (Managing Research Deadline)* at 61%. These results indicate the level of familiarity with research methods and confidence. Thus, highlight potential areas for reinforcement through further training and supervision.

### 4.4.3 Low Competency Areas

The most concerning findings relate to advanced and technical research competencies. *RC18 (Writing and Publishing Journal Articles)* received the lowest score at 53%, followed by *RC14 (Using Research Software)* at 55%, and *RC17 (Developing Manuscripts)* at 57%, and *RC20 (Understanding Complex Concepts)* scored 60%. These lower scores suggest that postgraduate students struggle significantly with tasks requiring deeper methodological knowledge, technical tool use, and scholarly communication. Such gaps could impact their ability to complete research independently and disseminate findings in academic settings. Therefore, while the chart reveals that postgraduate students demonstrate strong capabilities in the basic stages of research, there is a critical need to build competence in advanced analytical tools, publication skills, and complex concept mastery. The results highlight the importance of targeted capacity-building efforts, especially in areas such as research software training, manuscript writing, and scholarly publishing, to ensure well-rounded research preparedness.

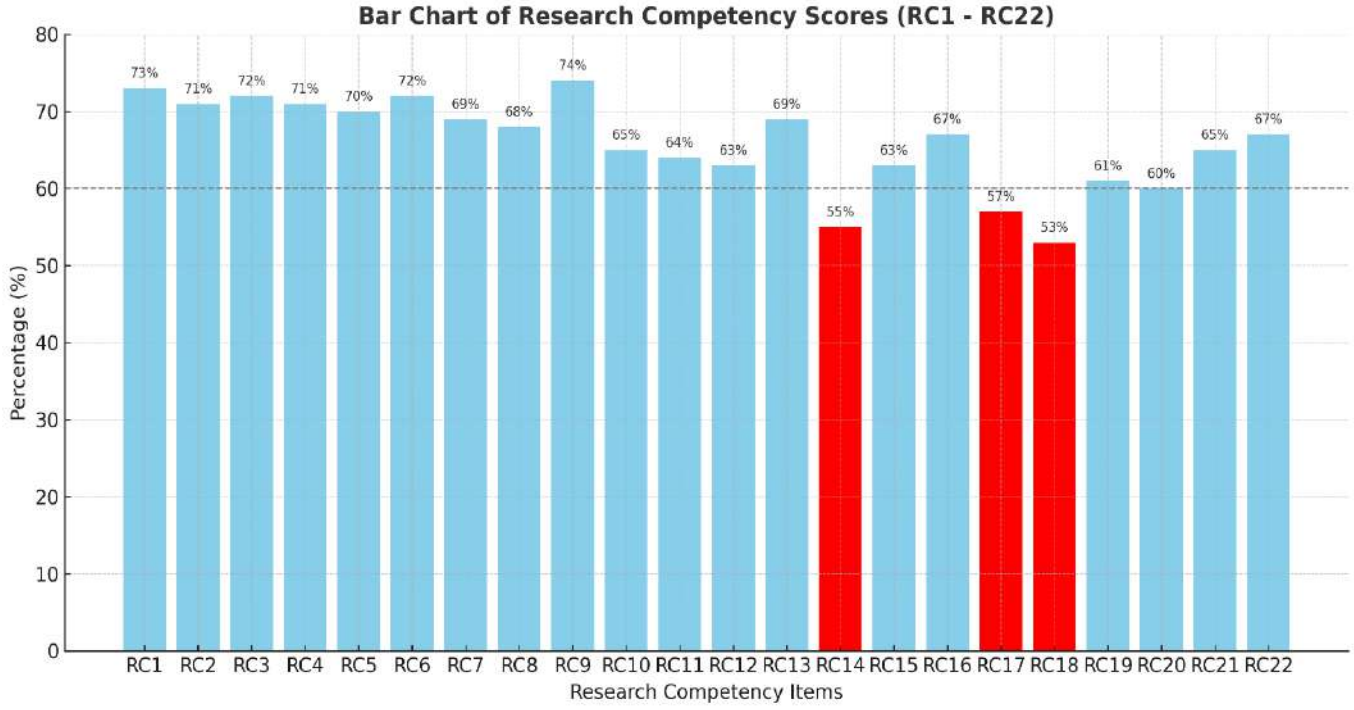


**Figure 1**
*Research Competency Scores among Postgraduate Students*

**Table 4**
*Arrangement of Students' Competency Areas from High to Low*

| Code | Competence |
|---|---|
| RC9 | Adhering to Research ethics |
| RC1 | Developing a researchable title/ Idea |
| RC3 | Developing the statement of the problem |
| RC6 | Finding relevant literature |
| RC2 | Developing a relevant background of the research problem |
| RC4 | Developing relevant research objectives |
| RC5 | Formulating research questions/hypotheses |
| RC7 | Conducting a Critical Literature Review |
| RC13 | Data collection mastery |
| RC8 | Writing a research proposal |
| RC16 | Writing a research report |

| | |
|---|---|
| RC22 | Confidence to overcome research-related challenges |
| RC10 | Designing and using Qualitative research methods |
| RC21 | Minimal supervision when conducting research. |
| RC11 | Designing and using quantitative methods |
| RC12 | Designing and using Mixed research methods |
| RC15 | Analyzing, interpreting, and presenting data |
| RC19 | Managing research deadlines effectively |
| RC20 | Understanding complex research concepts. |
| RC17 | Developing manuscript |
| RC14 | Using research software (e.g., SAS, STATA, NVivo, etc.) |
| RC18 | Writing and publishing journal articles |

### 4.5 Regression Analysis

#### 4.5.1 Model Fit for Regression

**Table 5**

*Model Summary*

| | |
|---|---|
| Number of observations | 85 |
| R-squared | 0.589 |
| F-test | 38.72 |
| Prob > F | 0.01 |
| Akaike crit. (AIC) | 665.21 |
| Bayesian crit. (BIC) | 674.983 |

To assess how research experience, studying a research course, and conducting a research project influence research competency among postgraduate students. Table 5 above shows that the multiple regression model was fitted over 85 observations, whereby the multiple regression model was a significant model to analyze the influence of research experience, studying a research course, and conducting a research project on research competency ($p<0.05$) (0.001). Since the value of R-squared was 0.589, this indicates that about 60% of the variation in research competency is explained by research experience, studying a research course, and conducting research. Additionally, the Akaike Information Criterion (AIC) of 665.21 and Bayesian Information Criterion (BIC) of 674.983 provide useful benchmarks for comparing model performance with alternative specifications, with lower values indicating a better fit. Overall, the results suggest that the model is a good fit and statistically reliable for explaining the observed outcomes.

#### 4.5.2 Multiple Linear Regression Results

**Table 6**

*Multiple Linear Regression Results.*

| **Research Competence** | **Estimate** | **SE** | **p-value** | **95% Confidence Interval** |
|---|---|---|---|---|
| Constant (Intercept) | 23.992 | 5.144 | 0.010 | [13.758, 34.226] |
| Research Experience | 0.666 | 0.073 | 0.010 | [0.521, 0.811] |
| Studied Research Course (Yes) | -4.445 | 4.660 | 0.343 | [-13.717, 4.828] |
| Conducted Research Project (Yes) | 8.134 | 3.117 | 0.011 | [1.931, 14.336] |

Research experience was a significant factor influencing research competency, $p> 0.05$ (0.01), meaning that an increase in research experience causes an increase in research competence, provided that the study research course and conduct research project remain the same (Coefficient = 0.666). This indicates that participants with higher levels of research experience demonstrated significantly greater research competency. The coefficient for research experience was 0.666 ($p = 0.01$), indicating that for every one-unit increase in research experience, there was an average increase of 0.666 points in research competency, holding other variables constant. This result suggests a strong, positive, and statistically significant relationship. It implies that individuals with more exposure to research activities over time are likely to develop stronger competencies in conducting and understanding research. Conversely, those with limited or no research experience scored lower in research competency. Since experience was measured as a continuous variable, lower values corresponded to fewer research engagements. These individuals lacked the incremental benefits that come with hands-on exposure, leading to comparatively weaker performance. The model implies that building research competency requires time and accumulated involvement, highlighting the importance of sustained research practice in educational and professional settings.

#### 4.5.3 Studied a Research Course at the Undergraduate Level

For participants who reported having studied a research course, the regression coefficient was -4.445. This means that, on average, they scored 4.445 points lower in research competency than those who did not take such a course. However, this effect was not statistically significant ($p = 0.343$), suggesting that the observed difference could be due to chance. Although these participants engaged in formal learning, it appears that studying a research course alone did not guarantee improved competency. This might reflect a lack of practical components or real-world applications within the course structure. In contrast, participants who had not studied a research course served as the reference group in the model. These individuals scored higher on average than those who had not taken a course, although this difference was not statistically significant. Their higher scores may be explained by alternative forms of learning, such as experiential research involvement, self-learning, or mentorship. While this finding may seem counterintuitive, it emphasizes that competency development may depend more on applied learning than on classroom-based instruction alone.

#### 4.5.4 Conducted a Research Project Prior to Joining the Postgraduate Level

Participants who had conducted a research project before joining the postgraduate level scored significantly higher in research competency compared to those who had not. The regression coefficient for this group was 8.134 ($p = 0.011$), meaning their competency scores were, on average, 8.134 points greater. This is a statistically significant effect, underscoring the value of hands-on, project-based research experience. It indicates that being directly involved in planning, executing, and reporting a research project can greatly enhance an individual's understanding and capability in research-related tasks. On the other hand, participants who had not conducted a research project used as the reference group had lower research competency scores. These individuals missed out on the practical learning and critical thinking opportunities that research projects typically offer. Their lower scores suggest that theoretical knowledge without application may not be sufficient for building strong research competencies. This finding supports the idea that experiential learning, particularly through independent or supervised research projects, plays a vital role in competency development.

### 4.6 Discussion

The first part of the descriptive results provides dual narratives indicating the level of competencies possessed by postgraduate students. First, students seem to have more competencies possessed in early-career research skills, mainly in areas like developing a researchable title, stating the problem, adhering to research ethics, developing research objectives, conducting a literature review, and stating the problem. These findings concur with Afolabi et al. (2023) and Davidson and Palermo (2015), showing that most graduate students are competent in stating the problem, formulating research objectives, formulating hypotheses, narrating the significance of the study, and conducting literature reviews. Looking at it, perhaps these skills are highly developed after being emphasized during class sessions (coursework). These findings call for the need for comprehensive implementation of research curricula covering all aspects of research during seminars and class lectures.

On the other hand, competencies related to advanced skills, including writing journal articles, using research software, and developing manuscripts, were significantly lower. They require students to integrate technical expertise and a high level of scholarly writing, which are rarely taught thoroughly in class. They demand students' transition from theoretical knowledge to practical knowledge that could enable them to gain practical experiences of writing and producing research outputs. These findings are in line with different scholars, Afolabi et al. (2023), who found students' weaknesses in using statistical software for analysis, Jeyaraj (2018), and Saeidi and Ahour (2021), who reveal that most postgraduate students underscoring weak ability in scientific writing, language, and plagiarism. Moreover, Ndenje-Sichalwe & Elia (2021), Wang (2013), and Magali (2019) agree that most postgraduate students have insufficient understanding and application of methodology concepts, mainly qualitative and quantitative data analysis, and present arguments argumentatively. These findings suggest that students are not adequately prepared for academic publishing, which is a core output of postgraduate education and the requirements for graduation.

Research experience was found to be very significant in influencing research competency among postgraduate students compared to those who have no exposure to research activity. Being introduced, observed, or learned before joining postgraduate studies might have equipped students more than those who were not. These findings consistently relate to the study conducted by Craney et al. (2011), indicating that students with research experience at the undergraduate level have more competencies in conducting research at the postgraduate level, mostly associated with increased levels of communication, problem-solving, working independently, and increased motivation to graduate research. Also, the study by Shapiro (2004) indicated that having prior knowledge of research is strongly associated with the performance of postgraduate students. This is because students require less time to conduct research with minimal supervision from their supervisor.

Surprisingly, studying a research course at the undergraduate level was not found to be significant to research competencies at the postgraduate level. It reflects that students lack practical components to research or real-world application of research within the course structure. These findings are in line with the study conducted by Prosekov et al. (2020), indicating that to build research competencies is not enough to teach in classes; other basic techniques and methods are required to bring a higher competency level, including conducting research (practical research), an internship in research, and more exposure to research. Also, the study conducted by Saeidi and Ahour (2021) proved that the course was not useful to postgraduate students in Teaching English as a Foreign Language (TEFL), indicating that it was too theoretical, insufficient, and not relevant to their writing competencies. Further, the study by Elia & Ndenje-Sichalwe (2024) found that although students were trained, they face different challenges in applying research knowledge when conducting research. These challenges encounter research difficulties, especially in framing the right questions, conducting critical literature reviews, using weak methodology, and poor quality of their research.

Lastly, the study proves that conducting research at the undergraduate level is significant in impacting research competency among postgraduate students. This confirms the notion that learning occurs more by doing than observing or listening, as supported by Ilyas et al. (2020), who proved that experiential learning has a direct impact on student learning, as it applies what has been learned in the classroom to reality. Some universities do not include practical components of research for their undergraduate students, thus limiting their ability to conduct research. Having practical components to research might increase the ability to have a deep understanding and application of basic research principles in the real world, including setting problems and objectives, linking theories with problems, data collection, data analysis, and producing research outputs. It also gives them a chance to navigate different challenges impacting their research. For example, overcoming low response challenges, ethical issues, data collection and analysis challenges, publication challenges, etc.

## V. CONCLUSIONS & RECOMMENDATIONS

### 5.1 Conclusion

This study wanted to identify any differences between students with and without a research background in mastery research. It was found that research experience and conducting research at the undergraduate level had a positive impact on postgraduate students' research competency. However, the study found that studying a research course has no significant relationship with research competency at the postgraduate level. The findings underscore the importance of experiential learning/practical learning at undergraduate research studies in fostering postgraduate research competencies. While theoretical courses remain a critical foundation, undergraduate students must be complemented with practical components in their learning, such as project-based learning, mentorship, and publication workshops. Mere attendance in research classes without hands-on engagement does not sufficiently prepare students for the demands of independent research.

### 5.2 Recommendations

The study recommends that Higher Learning Institutions comprehensively review their undergraduate teaching curricula and critically re-evaluate their existing pedagogical approaches. This process should aim to ensure that the content, teaching methodologies, and assessment strategies are aligned with the practical demands of contemporary research and innovations. The curricula should foster critical thinking, creativity, and problem-solving abilities that are essential for advanced academic inquiry. Moreover, the study recommends that Higher Learning Institutions provide both theoretical knowledge and hands-on experience, enabling them to apply research skills effectively in addressing real-world challenges and successfully undertake postgraduate research studies.

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