



Research Proficiency of Pre-Service Teachers: Basis for Proposed Enhancement Program

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ABSTRACT

The study was designed to determine the level of research proficiency among the pre-service teachers as a basis in crafting a research enhancement program. The descriptive method was employed to describe, explain, and interpret the focus of the study. The second- and third-year Bachelor of Secondary Education students majoring in English were selected as respondents. A researcher-made questionnaire was used to gather data. Descriptive statistics were utilized to analyze the data. Findings revealed that majority of the respondents believed that they had a general understanding of the key principles of research, but had limited or insufficient applied experience. Hence, their level of proficiency was still developing in the following areas: formulating research problems, reviewing related literature, identifying appropriate research methods, research instruments, and statistical tools, and drawing conclusions and formulating recommendations. The respondents also identified several challenges in conducting research such as the pandemic, limited time, financial constraints, internet connection, respondents' participation, availability of research materials, writing skills, and insufficient knowledge in research. Therefore, sufficient training and workshops, research funding, mentoring and coaching, and access to research-related learning materials are needed to strengthen their ability in conducting quality research.

Keywords: Research proficiency, Pre-service teachers, Enhancement program

INTRODUCTION

Teaching is a research-based profession. Thus, teachers are expected to be equipped with the technical knowledge and skills in research to conceptualize and conduct research that will further improve teaching and learning processes and practices based on evidence. One way of preparing teachers, particularly pre-service teachers, is by providing learning opportunities where they can be exposed to and become familiar with the processes involved in conducting research.

As pointed out by Bruce (2016), higher education institutions require students to demonstrate their research skills. Students are required to complete at least one approved research project as part of their training in research. Different academic or degree programs now require students to conduct and complete research as a major requirement of their program.

However, these students find the research process challenging. In the longitudinal study conducted by Neumann (2015) involving more than 11,000 students from 57 universities and colleges, 84% reported difficulty conceptualizing the focus of inquiry, 66% encountered difficulty defining a topic or research problem, and 66% experienced difficulty narrowing down a topic.

This holds true in the context of the study. If students are expected to produce quality research outputs, they must be provided with sufficient and appropriate research training to strengthen the knowledge and skills they acquired in basic education.

In support of the university's goal of building a strong culture of research, the proponent sought to instill interest and motivation for conducting research among future teachers. As Brook and Moss (2014) emphasized, teachers should not be the only ones who understand where learning is heading; students should also be aware of the learning goals and criteria for success through appropriate feedback mechanisms. Thus, determining the level of



research proficiency of the respondents is necessary to provide a basis for developing a program that will strengthen their research knowledge and skills. The proposed research enhancement program is intended to provide the respondents with meaningful opportunities to develop their research competencies and foster a lasting interest in research. Hence, this study was conducted.

Statement of the Problem

This study was designed to determine the level of research proficiency among the pre-service teachers which served as the basis in crafting a research enhancement program. Specifically, it sought to answer the following questions.

1. What is the level of research proficiency among the pre-service teachers in terms of:
 - a. conceptualizing research problem;
 - c. reviewing and citing related literature and studies;
 - d. determining appropriate research methods, identifying appropriate research instruments, and statistical tools;
 - e. analyzing and interpreting research results; and,
 - f. drawing conclusions and formulating recommendations?
2. What other difficulties encountered by the respondents in conducting research?
3. What course of action should be undertaken to further improve their research skills?

METHODOLOGY

This research employed a descriptive design using the survey method to describe, explain, and interpret the level of research proficiency as reported by the pre-service teachers. The second- and third-year Bachelor of Secondary Education students specializing in English were selected using total enumeration.

The instrument used in the study was a researcher-made questionnaire. It was subjected to validation by selected experts in educational research to ensure its relevance, clarity, and appropriateness to the objectives of the study. The experts' comments and suggestions were carefully reviewed and incorporated into the questionnaire. The revised questionnaire was pilot-tested among a group of students who were not included in the actual sample but had characteristics similar to those of the intended respondents. The results of the pilot test were carefully examined and used to further revise the instrument, particularly in terms of clarity, appropriateness, and consistency of the items.

To determine the reliability of the instrument, Cronbach's alpha was used to analyze the data gathered from the pilot test. The instrument obtained the following reliability coefficients: .903 for the level of proficiency in formulating and developing the research problem; .948 for the level of proficiency in reviewing and citing related literature and studies; .910 for the level of proficiency in designing appropriate research methods and identifying research instruments and statistical tools; .817 for the level of proficiency in analyzing and interpreting data; and, .844 for the level of proficiency in drawing conclusions and formulating recommendations. The instrument obtained an overall reliability coefficient of .972. The final version of the survey questionnaire was administered to the pre-service teachers. Due to the pandemic, the researcher collected the data via Google form. Descriptive statistics were used to analyze the data.

RESULTS AND DISCUSSION

Table 1. Level of Proficiency in Formulating Research Problems

Indicators	Mean Score	Qualitative Description
Identify sources of problems in the area of inquiry	2.38	Developing
Describe the background or rationale of the problem	2.53	Proficient
Provide justifications/reasons for conducting the research	2.43	Developing



Indicators	Mean Score	Qualitative Description
Identify sources of problems in the area of inquiry	2.38	Developing
Formulate clear statement of research problem	2.48	Developing
Write a good research title	2.53	Proficient
Know when to generate hypothesis in a study	2.40	Developing
Formulate research hypothesis	2.35	Developing
Weighted Mean	2.44	Developing

The data show that the respondents obtained a weighted mean of 2.44, described as Developing, in the formulation and development of a research problem. This indicates that the respondents have some knowledge and skills in identifying and developing research problems but still experience difficulties in performing these tasks consistently. The highest mean scores were recorded for describing the background or rationale of the problem and writing a good research title, both with 2.53, described as Proficient. In contrast, formulating a research hypothesis obtained the lowest mean of 2.35, followed by identifying sources of problems in the area of inquiry with 2.38 and knowing when to generate a hypothesis with 2.40, all described as Developing. These results suggest that the respondents are relatively more capable of presenting the context and title of a study but need greater assistance in identifying researchable problems and determining and formulating appropriate hypotheses.

The findings support the observation that many beginning researchers struggle to identify the focus of their inquiry and to narrow a general concern into a specific and researchable problem. Even after identifying a possible problem, they may find it difficult to formulate clear research questions, objectives, and hypotheses. Calmorin and Calmorin (2007) noted that beginning researchers may have difficulty distinguishing research objectives from learning objectives, while O'Leary (2020) emphasized that formulating a research question can be one of the more challenging aspects of beginning a study. The results reflect these difficulties, particularly in identifying sources of research problems, providing justification for conducting the study, formulating a clear statement of the problem, and developing hypotheses. The finding is also consistent with Neumann (2015), who reported that a considerable proportion of respondents experienced difficulty getting started with their studies, defining a topic, and narrowing it down.

Overall, the 2.44 weighted mean (Developing) indicates that the respondents are still developing the skills needed to formulate and develop a research problem. Identifying a researchable topic or problem is a fundamental stage of research because it establishes the direction, scope, and purpose of the study and influences the succeeding research procedures. The results therefore point to the need for continued guidance and practical training, particularly in identifying research gaps, narrowing broad topics, formulating clear research problems and questions, establishing the rationale for the study, and determining when hypotheses are appropriate. Strengthening these skills among beginning researchers can help them develop focused and manageable research studies and provide a stronger foundation for the succeeding stages of the research process.

Table 2. Level of Proficiency in Reviewing and Citing Related Literature

Indicators	Mean Score	Qualitative Description
Select relevant literature	2.60	Proficient
Cite sources of related literature using standard style	2.75	Proficient
Synthesize information from relevant literature	2.45	Developing
Write coherent in-text citation	2.33	Developing
Follow ethical standards in writing related literature and studies	2.50	Developing
Illustrate and explain conceptual framework	2.40	Developing
Weighted Mean	2.50	Developing

The results indicate that the respondents' overall competence in reviewing related literature was Developing, as shown by the weighted mean of 2.50. They performed better in citing sources using standard style (2.75) and selecting relevant literature (2.60), both rated Proficient. However, they were rated Developing in synthesizing information from relevant literature (2.45), following ethical standards in writing related literature and studies

(2.50), illustrating and explaining the conceptual framework (2.40), and writing coherent in-text citations (2.33). The results suggest that while respondents can identify sources and apply basic citation practices, they have greater difficulty critically processing, integrating, and presenting information from different sources.

The difficulty in synthesis is particularly notable because a meaningful literature review requires researchers to identify, organize, critically evaluate, and integrate relevant information from various sources and relate these ideas to their own study (Garrard, 2017). Thomson (2018) similarly emphasized that literature reviewing involves critical evaluation, categorization, and synthesis, requiring researchers to think carefully about information while simultaneously organizing it into coherent academic writing. This may explain the respondents' Developing rating in synthesis and in writing coherent in-text citations. A literature review is not simply a collection of summaries or citations; it requires the researcher to understand the concepts in the sources, determine their relevance and quality, establish relationships among ideas, and present them in a logical discussion. The challenge is further increased by the absence of fixed rules for organizing a literature review, since its structure and content depend on the nature and purpose of the study.

The findings also point to the need to strengthen the respondents' ability to use scholarly sources appropriately and ethically. Effective academic writing requires knowledge of the research topic, the intended readers, academic conventions, writing processes, citation practices, and the ethical responsibility of acknowledging the contributions of other scholars. These requirements make literature review writing a complex task that cannot be developed through citation practice alone. The Developing overall rating therefore suggests that the respondents need continued instruction and practical experience in evaluating sources, synthesizing ideas, integrating evidence, using citations coherently, observing scholarly ethics, and developing conceptual frameworks. Regular writing exercises, research coaching, and sustained guidance from teachers and research advisers can help respondents gradually develop these skills and become more capable of producing organized and meaningful literature reviews.

Table 3. Level of Proficiency in Identifying Appropriate Research Methods

Indicators	Mean Score	Qualitative Description
Determine appropriate research method for a given problem	2.25	Developing
Write clear research methodology	2.53	Proficient
Identify appropriate sampling procedure and sample	2.38	Developing
Plan for data collection procedure	2.58	Proficient
Describe intervention (if applicable)	2.23	Developing
Plan for data analysis using statistics and hypothesis testing (if appropriate)	2.10	Developing
Determine the most pertinent research instrument for a given variable.	2.38	Developing
Construct a research instrument for collecting data on certain research variables	2.43	Developing
Establish the validity and reliability of research instrument.	2.35	Developing
Weighted Mean	2.36	Developing

Information plays an important role in making sound decisions. When information is accurate and appropriately gathered, researchers are more likely to arrive at valid findings and conclusions. This makes the careful selection of research methods, instruments, sampling procedures, and statistical tools an essential part of the research process. The data in Table 3, however, show that the respondents obtained a weighted mean of 2.36, described as Developing, indicating that they still have insufficient knowledge and experience in designing appropriate research methods and identifying suitable research instruments and statistical procedures. Among the nine indicators, "Plan for data analysis using statistics and hypothesis testing (if appropriate)" obtained the lowest mean of 2.10, described as Developing. This suggests that the respondents particularly need assistance in determining and applying appropriate statistical procedures to analyze research data.

The other results further indicate areas that require improvement. The respondents were Proficient in writing a

clear research methodology (2.53) and planning data collection procedures (2.58), suggesting that they are relatively more capable of describing the procedures of a study and planning how data will be gathered. However, they were Developing in determining the appropriate research method (2.25), describing an intervention (2.23), identifying appropriate sampling procedures and samples (2.38), determining suitable research instruments (2.38), constructing research instruments (2.43), and establishing instrument validity and reliability (2.35). These findings support the observation that beginning researchers often find it difficult to identify and develop a researchable problem and to translate it into appropriate research procedures (Calmorin and Calmorin, 2007; Neumann, 2015; O'Leary, 2020). Such difficulties may affect subsequent decisions concerning research design, sampling, instrumentation, data collection, and analysis.

Overall, the weighted mean of 2.36 (Developing) indicates that the respondents have basic knowledge of research methodology but need further development in applying this knowledge to actual research situations. The accuracy of research results and the validity of the conclusions drawn from them depend greatly on the appropriate selection and application of research methods, instruments, and statistical tools. Inaccurate or inappropriate methodological decisions may produce misleading findings and affect the decisions or conclusions based on those findings. Therefore, the respondents need adequate training, close guidance, and sufficient practical exposure to the different stages of research design, particularly in selecting appropriate methods, developing and validating instruments, determining suitable sampling procedures, and choosing statistical tools for data analysis. Strengthening these competencies is necessary to help them produce more reliable research results and draw conclusions that are properly supported by evidence.

Table 4. Level of Proficiency in Analyzing and Interpreting Results

Indicators	Mean Score	Qualitative Description
1. Use of statistical techniques to analyze data	2.38	Developing
2. Present and interpret data in tabular, graphical and textual forms	2.45	Developing
3. Infer and explain patterns and themes from data	2.33	Developing
4. Relate the findings to pertinent literature and studies	2.45	Developing
Weighted Mean	2.40	Developing

The respondents obtained a weighted mean of 2.40, described as Developing, in their ability to analyze and interpret research results. This indicates that they possess some knowledge of data analysis and interpretation but still need further practice and guidance in examining data and drawing appropriate conclusions. Data serve as the basis for answering research questions and supporting conclusions, but they become meaningful only when properly analyzed and interpreted. Researchers must therefore examine the results carefully, relate them to the research questions and objectives, and consider factors that may influence the findings.

The Developing rating may be associated with difficulties in selecting appropriate statistical procedures and explaining the meaning of the results. Analysis involves systematically examining the data, while interpretation involves explaining what the findings mean in relation to the research problem. These processes are closely related, since analysis is incomplete without interpretation, and interpretation cannot be properly made without analysis. The result may also indicate limited experience in identifying patterns and trends and using these to answer research questions. As noted by Egger and Capri (2021), researchers need to draw on their knowledge and experience when examining patterns in data and developing explanations based on evidence.

Overall, the weighted mean of 2.40 (Developing) shows that the respondents need to strengthen their competence in analyzing and interpreting research results. This is particularly important for pre-service teachers, as research skills can help them make informed decisions about teaching and learning, assess learners' needs, and evaluate instructional practices. Greater emphasis should therefore be given to selecting appropriate statistical tools, interpreting results, recognizing patterns and trends, and developing conclusions supported by evidence. Practical exercises using actual research data, together with appropriate guidance, may help improve their confidence and skills in this area.

Table 5. Level of Proficiency in Drawing Conclusions and Formulating Recommendations

Indicators	Mean Score	Qualitative Description
1. Identify the basic guidelines in structuring the research summary	2.33	Developing
2. Draw conclusions from research findings	2.55	Proficient
3. Formulate recommendations based on the findings and conclusions	2.45	Developing
Weighted Mean	2.44	Developing

The data in Table 5 show that the respondents obtained a weighted mean of 2.44, described as Developing, in their ability to draw conclusions and formulate recommendations from research findings. This indicates that they have some understanding of the final stages of research but still need to strengthen their skills in organizing findings, drawing appropriate conclusions, and developing recommendations supported by evidence. Among the indicators, “Draw conclusions from research findings” obtained the highest mean of 2.55 (Proficient), suggesting that the respondents are relatively more capable of formulating conclusions from their findings. However, the score is only slightly within the Proficient range, indicating that further improvement is needed, particularly in synthesizing findings and explaining their significance rather than merely restating results.

“Formulate recommendations based on the findings and conclusions” obtained a mean of 2.45 (Developing), indicating difficulty in translating research findings into specific and appropriate recommendations. Recommendations should directly address the research problem and be supported by the findings and conclusions rather than personal assumptions. Meanwhile, “Identify the basic guidelines in structuring the research summary” received the lowest mean of 2.33 (Developing). This suggests that the respondents may have difficulty identifying and organizing the essential components of a research summary, including the problem, methodology, major findings, conclusions, and implications. Such difficulty may affect their ability to present their research clearly and coherently.

Overall, the weighted mean of 2.44 (Developing) indicates that the respondents need further development in handling the concluding parts of research. In particular, they need to improve their ability to synthesize important findings, relate conclusions to the research questions, and formulate recommendations that are practical and evidence-based. Guided activities using actual research findings, exercises in writing conclusions and summaries, and practice in developing recommendations from specific results may help strengthen these competencies. Developing these skills is important because the value of research depends not only on presenting findings but also on how effectively those findings are synthesized into meaningful conclusions and appropriate recommendations.

Other Difficulties Encountered in Conducting Research

In addition to determining the level of proficiency of the respondents, the respondents were also asked to identify other difficulties encountered in conducting research. These include the pandemic, limited time, financial constraints, internet connection, respondents’ participation, availability of research materials, writing skills, and insufficient knowledge. The pandemic, for instance, may restrict face-to-face data gathering and cause delays in communicating with participants. Limited time may also make it difficult to balance research activities with academic and other responsibilities, while financial constraints may limit access to transportation, printing, communication, and other research-related expenses.

Internet connection and availability of research materials may likewise affect the research process. Reliable internet access is needed to search for related literature, access online databases, communicate with respondents, and administer online research instruments. Poor connectivity can interrupt these activities and delay the completion of the study. Similarly, limited access to books, journals, computers, printing facilities, and other research materials may make it difficult for respondents to obtain relevant information and complete their research requirements. Respondents’ participation can also pose a challenge when participants are unavailable, unwilling to participate, or unable to provide responses within the required period.

Furthermore, writing skills and insufficient knowledge in research may affect the respondents' ability to prepare and complete their research papers. Research requires clear organization and presentation of ideas, appropriate academic writing, and an understanding of research design, data gathering, statistical treatment, analysis, interpretation, and research ethics. Difficulties in these areas may require additional time and guidance. Overall, the identified factors show that challenges in conducting research are not confined to technical research skills but also involve practical, financial, technological, and academic concerns. Addressing these difficulties through adequate resources, guidance, time, and opportunities for practical research experience may help respondents develop greater confidence and competence in conducting research.

These findings are consistent with the study of Alsied and Winis (2017), which identified lack of motivation, insufficient knowledge of research, inadequate library resources, an insufficient number of research-related courses, and unstable or unavailable internet connections as among the problems encountered in conducting research. Similarly, Bocar (2014) reported that obtaining assistance from respondents outside educational institutions was a challenging aspect of conducting research among student researchers. The study also noted that concerns related to time and stress management affected students' concentration and made it difficult for them to complete their research activities. Ocbian and Gamba (2015) also found out that even graduate students encountered difficulties in conducting research, particularly the lack of motivation and commitment and financial constraints.

CONCLUSION AND RECOMMENDATION

The level of proficiency in research among the pre-service teachers was still developing. They demonstrated a need to further strengthen their competencies in formulating research problems, reviewing and citing related literature, selecting appropriate research instruments and statistical tools, analyzing and interpreting data, and drawing conclusions and formulating recommendations. These areas indicate the need for sustained guidance and practical opportunities to enhance their research competencies.

It was also concluded that the conduct of research among the respondents was affected by several academic, technological, financial, and logistical challenges. These included the pandemic, limited time, financial constraints, unreliable internet connection, difficulties in securing respondents' participation, limited availability of research materials, writing difficulties, and insufficient research knowledge. Addressing these challenges is therefore essential to support the development of research competence among pre-service teachers and enable them to conduct research more effectively.

Hence, the proposed research enhancement program is strongly recommended for implementation to improve the research proficiency of respondents and other education students. The program can include seminars and workshops on formulating research problems and titles, developing conceptual frameworks, reviewing and citing related literature and studies, selecting appropriate research designs, constructing and validating research instruments, gathering and analyzing data, selecting statistical tools, interpreting results, and writing conclusions and recommendations. A research literature and academic writing clinic, proposal development workshop, research mentoring and coaching sessions, peer and in-house research reviews, student research presentations, and classroom-based research activities shall also be conducted to provide students with opportunities to apply what they have learned. These activities can be implemented throughout the academic year, with intensive proposal development and mentoring conducted during the research-writing semesters. The college dean, research coordinator, research instructors, research advisers, faculty members, statisticians, librarians, and invited research experts shall be responsible for the implementation of the program. Necessary resources shall include research modules and workbooks, computers, internet and library resources, statistical and reference-management software, presentation facilities, printing materials, and funds for data gathering, research presentation, and other legitimate research expenses. To address financial constraints, a student research assistance fund may be considered to support qualified research projects. The effectiveness of the program shall be evaluated through pretest and posttest assessments, evaluation of research outputs using appropriate rubrics, monitoring of participation and research completion, mentoring and peer evaluation forms, student feedback, and comparison of students' research proficiency before and after the implementation of the program. The results of the evaluation shall be used to identify remaining research difficulties and improve succeeding research enhancement activities.

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