Original Research

Designing Training Package for Pre-Service Teachers: A Dick and Carey Approach

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Abstract: Instructional design is a systematic process that uses instructional theory and art science learning to produce effective and engaging educational materials in a supportive environment. Along with developing activities and resources, instructional design also includes analyzing the needs and concerns of learners. This research generally sought to design and develop a training package and instructional material for teaching thesis writing among pre-service teachers of Mindanao State University at Naawan. This research employed the research and developmental (R and D) research design utilizing the Dick and Carey Model, a structured method of instructional design that highlights relationships among all elements in the teaching and learning processes. Results revealed that pre-service teachers lacked training in research writing and had a moderate level of competency in research; a training package in the form of learning intervention using an instructional module was developed through a seminar-workshop; instruments used to assess the training are Teaching Pedagogy, Materials, and Exercise, Satisfaction with the Program (SAT), Learning Environment, and Program Schedule (PS). Meanwhile, a researcher-made performance assessment for effectiveness and efficiency of the instructional material developed through Spearman rank rho correlation yielded a reliable result; instructional strategies were used in the implementation of the training package; ADDIE Model was used to design and develop the instructional material; the Dick and Carey Model was used to create the training package; and the training was found to be effective and efficient. The instructional material was effective, as shown in the performance scores of pre-service teachers.

Keywords: Training Package, Research Competency, Pre-Service Teachers

Introduction

In a world that is becoming increasingly more information and technology-driven, the ability to conduct thorough research and present it in an organized, understandable way is essential. By becoming proficient in research writing, pre-service teachers can effectively communicate their ideas and gain the skills necessary to contribute significantly to their academic fields. Nevertheless, recent studies have consistently found various difficulties pre-service teachers encounter when writing their theses, which cause them to put off writing. Lack of research materials and references on thesis topics, insufficient research methodology skills, and ignorance of the rules for writing scientific articles were among the challenges. These obstacles include poor research training and abilities, restricted resource availability, data collection and analysis challenges, procrastination, and time management problems (Villanueva 2017). As a result, there is an increasing need in the current educational system

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to prepare pre-service teachers with research skills better. Training packages containing educational resources created especially to teach research is one method to accomplish this. With a focus on research, these training programs are designed to give participants a clear path to gaining the knowledge and abilities they need to succeed. To help pre-service teachers understand precisely what is expected of them, this training package breaks down skills into specific units of competency. A training package for thesis-writing instruction comprises a structured collection of instructional materials to assist pre-service teachers in acquiring the abilities necessary to conduct and compose a thesis successfully. The fundamental skills and knowledge needed for every phase of the thesis-writing process—from developing a research question to carrying out a literature review and presenting findings—are usually covered in an instructional module. It is simpler for pre-service teachers to comprehend and accomplish each learning objective step-by-step when these skills are arranged into distinct units of competency. Balida and Elcullada (2023) extended this line of research by showing that workshops can positively influence students' ethical behavior in research writing. Together, these studies suggest that practical, hands-on training in research writing helps students improve the quality of their work but also assists them in overcoming common difficulties in research writing. The reviewed studies emphasize how important experiential research-writing workshops are for enhancing undergraduate students' confidence and academic writing abilities. These workshops give students the skills to write excellent research articles by addressing common issues like disorganization, a short vocabulary, and a lack of knowledge about research techniques. Based on the self-efficacy theory, the interventions prioritize hands-on interactive learning that promotes coherence, clarity, and moral research procedures. Through individualized and structured instruction, students writing skills and engagement have improved significantly. These workshops are significant because they can help students develop their skills, increase their self-esteem, and prepare for more difficult academic and professional challenges—all of which contribute to the overall quality of education and institutional excellence.

According to Martinez and Montoya (2021), these abilities also promote critical thinking, information, and academic reading and writing. However, not all students who practice research will become academic researchers. Instead, it trains them to be experts who can use strong theoretical and practical underpinnings to solve challenging issues in their fields (Reyes and Morales 2021). Divergent viewpoints exist regarding what research skills entail for students. These abilities are essential for advancing scientific knowledge and developing skills like reading, observing, debating, recognizing issues, and disseminating research findings. Academic institutions must foster these skills while incorporating technological advancements to meet the demands of changing work and educational environments by incorporating training package in the teaching of research subjects through seminar-workshop (Garay et al. 2021).

Additionally, the scientific work of students and teachers is positively impacted by digital skills (Rodríguez et al. 2019). According to Mas (2016), research skills help cultivate a habit of ongoing inquiry and critical thinking. Offering undergraduate students structured writing workshops can improve their research-writing abilities and help them succeed academically. Yusof (2019) discovered that seminar workshops were successful in helping college students develop their writing abilities. Students gained skills in writing more substantial introductions, clearly organizing information, and creating compelling conclusions due to these workshops. Additionally, the study discussed the advantages of seminar workshops for students who are engaged in research writing and its findings imply that workshops greatly enhance students' behavior and attitude toward the writing process, in addition to helping them develop a more positive understanding of research writing.

Offering undergraduate students structured writing workshops can improve their research-writing abilities and help them succeed academically. Writing workshops function as an instructional package by emphasizing the development of students' self-efficacy and confidence in research writing, offering helpful criticism, and providing easily accessible learning materials. These instructional packages guarantee that students receive individualized support by customizing these workshops to fit each student's particular needs and abilities and combining various learning strategies and activities. Additionally, these workshops' effectiveness depends on continuous evaluation, which aids in improving their methods and content and guarantees ongoing progress in student outcomes.

This study aims to help pre-service teachers at Mindanao State University write their theses more effectively. This will help pre-service teachers develop their confidence and competency by guiding them through the entire thesis-writing process through the implementation of a structured training package. The results will also give research instructors vital information to help them improve their teaching strategies and better assist students in writing a thesis. This study will help improve educational quality overall and encourage innovation in teaching and learning by giving aspiring teachers the skills to conduct and communicate research effectively, especially to pre-service teachers who are the product of the COVID-19 pandemic. In particular, the study intends to assess the instructional needs of research by pre-service teachers, design and develop training packages based on instructional needs, and evaluate the effectiveness and efficiency of the training and instructional material.

Research Design

This research employed the research and developmental research design utilizing the Dick and Carey Model, which is a structured method of instructional design that highlights the relationships among all elements in the teaching and learning process. It encompasses nine essential steps: defining instructional goals, performing instructional analysis, identifying learner and contextual attributes, formulating performance objectives, creating assessment

tools, planning instructional strategies, developing instructional resources, carrying out formative evaluation, and updating the instruction. This model relies on the concept that teaching must be organized and carried out as a cohesive system, with each stage playing a role in reaching the intended learning results. It emphasizes clarity, organization, and ongoing enhancement, ensuring that teaching resources are customized to students' requirements and aligned with the specified educational objectives.

Research Sample

This study specifically targeted third-year students pursuing a Bachelor of Secondary Education degree specializing in Mathematics at Mindanao State University, Naawan. The chosen participants were those presently enrolled in the course CPE 198, which centered on the comprehensive understanding and application of research methods.

Research Instruments

There were four research instruments used in this study: (1) a needs assessment questionnaire, (2) a training analysis matrix, (3) an instructional module, (4) a performance assessment questionnaire, and (5) a training evaluation tool.

Data Gathering Procedure

Phase 1: Needs Assessment to Identify Instructional Goals

The first step in analyzing the needs of the pre-service teachers in the course CPE 198 was identifying them. Before the needs analysis, the research subjects' learning objectives, competencies, and contents were examined and assessed. A researcher-made questionnaire was then administered to pre-service teachers before the start of the actual training.

Phase 2: Analyzing Participants' Needs and Contexts

Pre-service teachers at Mindanao State University in Naawan were given a needs assessment questionnaire created by the researcher to assess their research competency skills in terms of their procedural knowledge, conceptual knowledge, and writing ability in producing research article outputs. The assessment was designed to identify pre-service teachers' strengths and weaknesses in the research methodology course, especially if they need more help, like training and teaching resources, to improve their writing skills. Prior knowledge and experience of pre-service teachers, preferred learning strategies, preferred instructional materials (both digital and printed), and preferred training days and duration were all included in the instrument. Participants were asked if they had ever attended formal research-writing training and attempted to write research articles during their senior high school and the preceding semesters of their college careers to gauge pre-service teachers' prior knowledge.

Pre-service teachers were also asked to score their research competencies outlined in the research methodology. Following the completion of needs assessment, key informant interview was used to ask pre-service teachers about their experiences, primarily focusing on the challenges or obstacles they had faced during their research experiences in college and senior high school, presuming that their professors had assigned them research articles as a requirement for the class.

Phase 3: Assessment Instruments Used for Evaluation

For the training, the instrument utilized in this study to assess the efficacy and efficiency of the thesis-writing seminar-workshop was taken from the study of Duwale (2020), Students Satisfaction on Training cum Workshop Program on Thesis Writing and General Research Skill Development. Finding out how satisfied students were with the knowledge creation and internalization in the hospitality sector—including hotel travel and training/workshop programs on their thesis-writing and general research skills—was the goal of his study. As for the instructional material, a performance assessment was crafted to measure the effectiveness of the developed instructional module. This assessment was constructed based on the learning needs of pre-service teachers. The assessment tool covered developing research questions, literature review, research methodology, data analysis (quantitative and qualitative software), and writing a publishable article, comprising ten questions per topic with fifty items for the whole test. Before this was utilized, three experts checked and validated the content, grammar structure, and assessment construction instruments. After the revision, this instrument was administered to education students for pilot testing. Before the pilot testing, education students were instructed to comment and provide feedback on their observations per test item. All of these education students' comments were considered and incorporated to improve the test content further. This was returned to the panel of experts for further verification and evaluation. The test–retest method was the reliability method utilized through pre-assessment and post-assessment, and the r value that was computed after administering the assessment was −0.88, implying that the test items administered have a high correlation. The experts then checked back and evaluated the instrument using the interpretation matrix, and they sought the certificate of validation that was ready for utilization.

Phase 4: Developing and Selecting Instructional Strategies

Pre-service teachers' needs were analyzed to carefully develop and choose the instructional strategies. This analysis aimed to determine the difficulties they encountered when writing their theses and the areas where they required assistance. Experts teaching research methods in the teacher education program were invited to a roundtable discussion to ensure the instructional strategies would work. These professionals contributed their knowledge and assisted in creating plans of action that would produce the intended learning results. Their participation was

essential to guaranteeing that the teaching strategies were realistic and catered to the pre-service teachers' needs. A clear picture of the pre-service teachers' strengths and shortcomings was obtained by applying descriptive analysis to the needs analysis results. Specific goals were developed to direct the instructional strategies in light of these findings. These goals were centered on three key areas: assisting pre-service teachers in developing and refining their thesis-writing abilities, improving the skills of those with some prior experience, and promoting group learning where students could help and learn from one another. These objectives ensured that teaching methods accommodated students with varying skill levels and fostered a positive learning atmosphere. The performance assessment was used to gauge pre-service teachers' progress. The pre-service teachers' progress in honing their thesis-writing skills was monitored by this evaluation, which also pointed out areas in which they might require more assistance. The performance assessment results were utilized to modify the teaching methods and give the students feedback. Through consistent progress monitoring, the program ensured the pre-service teachers were improving steadily and developing the abilities needed to finish their thesis projects.

The purpose of the discussion was to ask for their expertise on how to address some of the challenges experienced by the pre-service teachers in writing theses. The results of the analysis were presented to them, showing that pre-service teachers lack a strong foundation in research skills.

Phase 5: Developing Instructional Materials

Development of the module was based on the findings of the needs analysis module, particularly focusing on areas of competency that were moderately mastered. These included skills, such as formulating research questions, conducting literature reviews, choosing research methodologies, analyzing data using quantitative and qualitative software, and writing articles suitable for publication. The module was structured utilizing Merrill's Principle of Learning instructional model, incorporating activities designed to support the learning process effectively. The Dick and Carey Instructional Model was an instructional design model used for the content and learning activities in the module, and this development process on the creation of the module was just part of the Dick and Carey process in general. This approach ensured pre-service teachers gained the essential knowledge and skills required for rigorous academic research and scholarly writing. The instructional sequence within the module followed a structured path, beginning with task-centered activities, followed by the activation of prior knowledge, demonstration of concepts, application of skills, and integration of learning. The module underwent several revisions, undergoing meticulous scrutiny by panel members and subsequent evaluation by experts before it was utilized. After acquiring the comments from the panel of evaluators, suggestions and corrections were incorporated, and afterward, the learning module was returned to the experts for final remarks and evaluation with permission that the material was ready for pilot testing.

In the pilot testing phase, the material was utilized by the lower-year education students who were still enrolled in methods of research subject following all the learning procedures and learning activities reflected in the module. Afterward, pre-service teachers were asked to give feedback and comments about their observations in the learning module introduced to them. The feedback was thoroughly considered and integrated into the developed learning module for betterment and further improvement. After pilot testing, the instrument was checked back and evaluated by experts using the interpretation matrix pattern from Micayabas (2022), and the certificate of validation ready for utilization was sought.

Phase 6: Implementation of Training

Before the conduct of the study, a letter of permission addressed to the members of the committee was first secured, and later on, an endorsement letter from the Office of the Dean was acquired asking approval from the Office of the Chancellor of the Mindanao State University at Naawan channeled to the Dean's Office and Vice-Chancellor for Academic Affair's Office to allow the researcher conduct a seminar-workshop for research writing among third-year BSEd mathematics pre-service teachers. These pre-service teachers were oriented on the expected learning objectives of the activity. Briefing for the lecturers who were conducting the seminar-workshop was also made possible by introducing to them the step-by-step procedure of the workshop utilizing the Dick and Carey Instructional Model to ensure that each step of the activity will not be missed. All the necessary materials needed for the activity were prepared, including the invitation of the speakers, program, certificates, venue, the sound system, industrial fans, and the food for the lecturers and students. Since the training was conducted at the Mindanao State University at Naawan, a permission letter asking for approval from the Office of the Chancellor to use the university facilities was sought. The activity was supposed to last for two days, but in the actual plotting, an abrupt decision was made, and the training eventually lasted for three days. Whereas the morning session was allotted for the engaging lecture-discussion, the afternoon was allotted for the interactive workshop and feedback. The topics covered for the two-day training workshop were the contents and competencies moderately mastered by pre-service teachers.

Phase 7: Evaluating the Efficiency and Effectiveness of the Instructional Material

At the end of the seminar-workshop, pre-service teachers were asked to evaluate the effectiveness of the thesis-writing seminar-workshop in terms of the program schedule (PS), teaching pedagogy, materials, and exercises, learning environment, thesis-writing and general research skills development, and general satisfaction with the training workshop. Students were also asked to give comments and feedback about their experience and the learning they gained from the workshop.

Ethical Consideration

Throughout the entire study, ethical guidelines for research were strictly adhered to. Approval from the dissertation committee members was secured first and letter of endorsement from the Office of the Dean was obtained and sent to the Office of the Chancellor of the Mindanao State University at Naawan for permission to conduct the study. Furthermore, the participants were approached for their informed consent, which was crucial for their involvement in the study. This process involved communicating to them that their participation was voluntary and that any information collected during the study would be handled with the highest level of confidentiality, ensuring their privacy and trust were maintained throughout the research process.

Data Analysis

The data was analyzed using descriptive statistics, particularly the percentage, mean, and standard deviation. These statistical tools were very useful in diagnosing the needs analysis and effectiveness of the training workshop and the developed instructional module. Furthermore, inferential statistics, specifically the Spearman-rho correlation, was used in computing the reliability of the researcher-made performance assessment tool using the test–retest method and the Richardson-Kuder formula in measuring the internal consistency of the test items administered to the respondents. Qualitative data were also taken from the open-ended questions to support and strengthen the results and the findings through focused-group discussion.

Results and Discussion

Instructional Needs of Research for Pre-Service Teachers

Table 1 shows pre-service teachers' moderate competence in research, specifically in developing research questions, writing literature reviews, materials and methods, data analysis, and writing publishable articles. Thus, this study implies that pre-service teachers have moderate research competencies in various topics of research methodology.

Table 1: Pre-Service Teacher's Learning Competency in Research Methodology

Research Topics	Mean	Competency
Developing Research Questions	3.1	Moderately Mastered
Literature Review	3.21	Moderately Mastered
Materials and Methods	3.25	Moderately Mastered
Data Analysis	3.23	Moderately Mastered
Writing Publishable Paper	3.15	Moderately Mastered

Note: 4.2–5.0—Highly Mastered; 3.4–4.19—Well Mastered; 2.6–3.39—Moderately Mastered; 1.8–2.59—Slightly Mastered; 1.0–1.79—Not Mastered.

Some pre-service teachers said writing research articles is challenging because they cannot directly ask their research teacher for guidance. This datum suggests that teachers' motivation and guidance are essential for producing successful research outputs. Students understand the research-writing process through an extensive research lecture. For their teachers to mentor and support them while they write their research articles, they must also participate in writing their theses. It is proof that teachers' direction and encouragement are essential to students' academic achievement.

The results of this study are consistent with the findings of Hulu (2020), who found that teachers can help students become more motivated to learn. Moreover, Mauliya et al. (2020) found that low student academic achievement resulted from a lack of teacher–teacher support. Thus, the dynamic and interactive nature can influence a student's learning success. As such, teachers are expected to give them a thorough pedagogical instruction process, beginning with the subject development process, continuing through the creation of a strong thesis. Teachers must dynamically fulfill their duties in the current environment to support students' academic endeavors.

Data further suggest that a lack of teachers' support can be one of the contributing factors that hindered pre-service teachers from acquiring the skills to the fullest extent possible. Most pre-service teachers were forced to use modules to learn at home during the pandemic rather than attending classes. As a result, they did not receive the same level of instruction from their teachers as they would have in a traditional classroom. Pre-service teachers could learn at their own pace before the pandemic with their teacher's assistance. However, distance learning made that impossible. The disruptions brought on by the COVID-19 pandemic could be one explanation for these moderate scores.

Furthermore, pre-service teachers shared that it was difficult for them to write a review of related literature because their teachers did not guide them well in their research outputs. Since this was their first time writing a research article and much of it was done individually, they did not have ideas on how to do it, although samples and tips were provided in the learning module. They also faced significant challenges because they lacked a solid foundation in research writing. This demonstrates that creating a thorough research article is more difficult when one lacks concepts related to research fundamentals. Additionally, one factor that contributes to the challenges students face when writing their theses is a limited vocabulary. The study by Ekasari (2020) revealed that when writing research articles in English, which necessitates vocabulary, students encounter several challenges. Most struggle with understanding new terms, identifying words with related or similar meanings, and having a limited vocabulary. Moreover, the participants discussed their inability to apply various techniques to assess and critique existing literature related to their research topics. Due to their limited comprehension of the research process, the students could not compose a good literature review, even though this part of the research is crucial in supporting the results and findings of the study.

This suggests that a problem significantly impacts a student's life, particularly when it comes to writing research articles. This is particularly because writing a thesis involves several steps, including planning, drafting, revising, and editing. As such, college students must follow a set of procedures to write a well-developed research article. Most students struggle with several stages of thesis writing due to the challenges they face. Students frequently struggle with starting with ideas and concepts, lacking vocabulary, and rewriting or paraphrasing difficulties when writing a thesis. These issues are all related to their research and language backgrounds. Writing research is not an easy task because it takes a lot of effort and hard work on the part of the student researcher.

Furthermore, time and prior knowledge are needed (Alsied and Ibrahim 2018). Its process also includes editing, rewriting, drafting, and planning. Therefore, one must go through the steps necessary to produce a well-developed piece of writing to write correctly. The majority of students encounter difficulties with many aspects of academic writing, especially when it comes to writing their theses. Concept structures, a lack of language, and revision or paraphrasing difficulties are common problems students face when writing theses (Shahsavar and Kourepaz 2020). Aside from these reasons, pre-service teachers also shared that they found it difficult to write literature reviews because the resources and references related to their research that can be found on the internet are limited.

Given that pre-service teachers' research competency is moderately mastered, this is still considered significant given the pre-service teachers' apparent learning gains and assumed that the pre-service teachers were enrolled in a modular learning modality that strongly emphasized individualized learning; the insufficient teacher–student interaction can explain this. Though students in higher education are already expected to show and exhibit an in-depth understanding of a solid background or foundation of learning and proficient skills in creating research projects, this result is still a concern. In light of the concerning results regarding pre-service teachers' research competency, the transcript interview of the instructor/professor teaching research methods offers a clear perspective that intervention activities are necessary to teach research methods to pre-service teachers who exhibit low and moderate levels of research competency and develop streamlined course materials that cover the principles of research writing while incorporating twenty-first-century skills and design seminar training workshops that will advance and improve each pre-service teachers' research abilities.

According to research on how pre-service teachers wrote research articles during the pandemic, significant issues and room for improvement exist. Garcia and Martinez (2019) examined the impact of the pandemic on pre-service teachers' research skills. They discovered that pre-service teachers found it more challenging to conduct quality research when learning remotely because they could not visit locations like laboratories and libraries. Additionally, pre-service teachers had fewer opportunities to interact with teachers and receive assistance when classes shifted online, making it more challenging to conduct quality research. Pre-

service teachers' ability to conduct research has also been hampered by their feelings of stress, anxiety, and loneliness brought on by the pandemic. They also discovered that pre-service teachers' motivation and focus on their research decreased due to these emotions and online learning. They found it even more challenging to perform well in their research articles. Particularly for those from less-affluent homes, not all pre-service teachers have equal access to computers and the internet.

Designing and Developing a Training Package Based on Instructional Needs

Prior to the preliminary conduct of the study, a needs assessment questionnaire was developed and presented to the panel committee members for correction and suggestions before the experts validated it. After meticulously incorporating the suggestions, experts validated the instrument through written corrections and suggestions before they rated it using an instrument adapted from Muraina (2015). Table 2 presents the result of validating the needs assessment questionnaire for pre-service teachers. The table shows the overall mean of 4.93 from the validation process carried out by experts. This result suggests that validators strongly agree that the assessment tool has met the necessary standards with remarkable performance. It is clear from looking more closely at the individual item mean in the table that several essential components of the tool support its validity for use in the needs assessment. It is clear from this result that the training matrix is excellent in both its description and application.

Table 2: Result of the Validation of Needs Assessment Questionnaire for Pre-Service Teachers

Components	Mean	Degree of Agreement	Qualitative Statement
The items in the instrument are relevant to answer the objectives of the study	5.0	Strongly Agree	The requirement is fulfilled exceptionally well.
The items in the instrument are stated clearly	4.66	Strongly Agree	The requirement is fulfilled exceptionally well.
The format of the instrument is technically sound	5.0	Strongly Agree	The requirement is fulfilled exceptionally well.
The instrument as a whole could answer the basic purpose for which it is designed	5.0	Strongly Agree	The requirement is fulfilled exceptionally well.
The instrument is culturally acceptable when administered in the local setting	5.0	Strongly Agree	The requirement is fulfilled exceptionally well.
Overall Mean	4.93	Strongly Agree	The requirement is fulfilled exceptionally well.

Note: 4.20–5.0—Strongly Agree; 3.40–4.19—Agree; 2.60–3.39—Uncertain; 1.80–2.59—Disagree; 1.0–1.79—Strongly Disagree.

Based on the result presented in Table 3, most pre-service teachers, or 46% of the total, indicated a strong preference for attending research workshops, according to a thorough data analysis. One possible explanation for this preference for workshops is their interactive and hands-on format, which offers chances for real-world implementation and close interaction

with research methods and strategies. Furthermore, 19% of pre-service teachers preferred lectures and one-on-one learning support. This preference may be explained by the lecture's structured format and individualized attention, which can accommodate various learning needs and styles. Regarding the length and timing of research training, pre-service teachers have specific preferences; 55% of the twenty-nine respondents indicated that they would prefer a training workshop that lasted twenty-four hours or was spread over two days. They may choose a shorter but more intensive training period to optimize learning effectiveness and minimize interference with their regular tasks from other subjects.

Table 3: Learning Methods and Preferences of the Pre-Service Teachers

Learning Methods	Preferences	Frequency (%)
Preferred Learning Method	Lectures	19
	One-on-One Guidance	19
	Online Resources	16
	Workshops	46
Preferred Duration of Training	8 hours	24
	16 hours	21
	24 hours	55
Preferred Day of Training	Weekdays	5
	Saturday	38
	Sunday	3
	Saturday and Sunday	52

Table 4 shows the result of the pre-service teachers' preferred instructional material. Of these, 59% responded that they prefer using modules. Its systematic and structured approach may cause this preference for modular learning. Key concepts are easier for pre-service teachers to understand and retain when complicated subjects are divided into smaller, more manageable units, which is one of the benefits of modules. Since modules are systematic, they help arrange information logically, which improves understanding and memory. This preference emphasizes how well modular learning works to give pre-service teachers a structured framework for learning that meets the needs of pre-service teachers who want cohesive and explicit instructional materials.

In contrast, 35% of those surveyed said they would instead use printed materials that are handed out. One possible explanation for this preference for printed materials is their accessibility and ease of use. Printed materials provide a tangible format that makes reference and review simple without requiring digital devices or internet connectivity. A dependable and easily accessible source of information for pre-service teachers who appreciate simplicity and conventional teaching approaches is printed material. Those who preferred printed materials highlight the significance of accommodating individuals who prefer more traditional teaching methods and a range of learning preferences.

Moreover, 59% of pre-service teachers prefer e-modules regarding digital resources. The flexibility and adaptability of digital modules may be the reason for this preference. By removing time and location restrictions, e-modules allow pre-service teachers to access material at their own pace and convenience. Furthermore, the interactive elements of e-modules improve interaction and engagement, offering a dynamic educational experience that appeals to contemporary pre-service teachers. The preference for e-modules indicates a growing trend toward digital learning solutions fueled by technological advancements and the increasing use of digital tools in classrooms.

However, 41% of pre-service teachers prefer e-books for further education, especially regarding research topics. This inclination toward video resources can be explained by their capacity to convey intricate ideas visually. Videos can utilize multimedia components that improve comprehension and retention, such as animations, graphics, and demonstrations. Learning becomes more immersive and engaging when abstract concepts are clarified and real-world applications are illustrated through visual aids. The preference for video resources emphasizes how crucial it is to include multimedia components in teaching materials to accommodate a range of learning preferences and styles. These preferences accommodate a variety of learning styles and promote a more dynamic and engaging learning environment when creating training instructional materials. The instructional design is more coherent and consistent when made from scratch. These resources produce a logical flow of learning activities by blending in perfectly with the overall plan, eventually enhancing pre-service teachers' comprehension and delivering the intended learning results. This focus on unique materials aligns with the difficulties that Philippine teacher education programs face. According to Tolentino et al. (2023), new educational delivery methods are needed to guarantee that pre-service teachers acquire research competencies, and as discussed by Baan (2021), instructional materials are essential to pre-service teachers' success because these materials help them make sense of the material and distribute information. Additional research by Garingan (2019) and Abubakar (2020) showed how effective instructional materials can improve pre-service teachers' learning and academic achievement in subjects like research writing.

Table 4: Preferred Instructional Material

Preference	Types of IM	Frequency (%)
Preferred Learning Method	Textbooks	3
	Workbooks	1.3
	Handouts	35
	Modules	59
Digital Material	e-Books	41
	Video Tutorials	0
	e-Modules	59

Table 5 shows the grand mean of 3.53, which indicates that the design is considered scientifically appropriate to facilitate research seminar workshops for lecturers. The training analysis matrix indicates that it is exemplary, with most components meeting or surpassing expectations. The design offers instructors clear instructions for conducting research seminars and workshops and is suitable from a scientific standpoint. It guarantees that the goals and objectives of instruction are well-articulated, that instructional strategies are suitable, that technologies are used efficiently, and that the required materials are easily accessible. This all-encompassing approach to training design eventually helps pre-service teachers and instructors advance their careers by creating an atmosphere that supports efficient teaching and learning. With the findings, a seminar-workshop and instructional material were developed to address and fill in the knowledge and skill gaps. The designed seminar-workshop and developed instructional module aimed to provide pre-service teachers with a systematic approach that would allow them to confidently and gradually increase their competencies.

Table 5: Result of the Evaluation of Training Analysis Matrix for Pre-Service Teachers

Components	Mean	Quantitative Description
Instructional Goal and Objectives	3.67	Exemplary
Instructional Strategies	3.67	Exemplary
Technology Used	3.67	Exemplary
Materials Needed	3.0	Accomplished
Organization and Presentation	3.67	Exemplary
Overall mean	3.53	

Note: 3.40–4.0—Exemplary; 2.50–3.39—Accomplished; 1.75–2.49—Developing; 1.00–1.74—Beginning.

The third step in the Dick and Carey Instructional Design Model is the development of the assessment tool to measure the effectiveness and efficiency of the instructional module used in the training. There were fifty items included in the test, with ten items representing each learning content. This instrument was first checked and validated by experts in English, assessment, and content. Then, the instrument was pilot-tested for reliability using the test and retest method and yielded a moderate correlation at 0.88. As to the training evaluation, the instrument was not developed anymore since an adopted questionnaire was already available. Instructional strategies are identified based on the instructional needs of pre-service teachers. These strategies are patterned from their least mastered competencies in writing research.

Table 6: Reliability Result of Performance Assessment for the Training

Factor Description	No. of Items	Mean	SD	r Value	Remarks
Pre-Test	50	28.82	7.67	0.88	Moderate
Post-Test	50	42.64	6.66		Association

Note: 0.00–Zero Correlation; 0.01 ±0.20–Negligible Correlation; 0.21 ±0.40–Slight Correlation; 0.41 ±0.70–Moderate Relationship; 0.71 ±0.90–High Relationship; ±1.0–Perfect Correlation.

The next phase of the training process involved the development of the instructional module. This development is embedded in the training process. However, a specific instructional model called the ADDIE Model was used. This instructional material underwent several validations before the pre-service teachers finally used it. The crafting of this material started with the planning stage, wherein each learning content is tailored based on the pre-service teachers' learning needs in the needs analysis phase of the training phase. A panel of experts validated the designed training. The results presented in Table 7 show that the instructional module offers sufficient information and learning activities, earning a high average rating of 4 83. This indicates that the module successfully supports the learning goals of the research methods course and is likely to improve the pre-service teachers' comprehension and interest in the topic. Lastly, before the actual training commenced, pilot testing of the training and the materials used in this study was administered to lower-year education students. Their comments and feedback were considered and incorporated into the instructional material before pre-service teachers, the study's respondents, finally used it.

Table 7: Result of the Evaluation of Instructional
Material on Methods of Research for Pre-Service Teachers

Components	Mean	Degree of Agreement	Qualitative Statement
Content and Accuracy	4.96	Strongly Agree	The provision is satisfied very adequately
Clarity	4.76	Strongly Agree	The provision is satisfied very adequately
Appropriateness	4.76	Strongly Agree	The provision is satisfied very adequately
Overall Mean	4.83	Strongly Agree	The provision is satisfied very adequately

Note: 4.20–5.0—Strongly Agree; 3.40–4.19—Agree; 2.60–3.39—Uncertain; 1.80–2.59—Disagree; 1.0–1.79—Strongly Disagree.

Pre-service teachers attended orientation sessions before the seminar-workshop started to acquaint them with the expected learning goals of the activity. Similarly, invited lecturers assigned to lead the seminar-workshop received thorough briefings detailing the workshop's step-by-step process. This methodical approach ensured no crucial step was missed, maximizing the activity's efficacy. In addition, the researcher undertook careful planning to cover all logistical requirements from organizing speaker invitations, creating programs, creating certificates, finding a suitable location, setting up a sound system and industrial fans, and ensuring food was available for lecturers and pre-service teachers. Significantly, because the training was held at Mindanao State University in Naawan, the researcher obtained approval from the Office of the Chancellor to use the university's facilities. An unanticipated decision led to a three-day extension of the original two-day plan, with interactive workshops, feedback sessions in the afternoons, and lively lecture discussions in the mornings. The researcher carefully chose the training workshop topics to match the pre-service teachers' moderately mastered content and competencies, demonstrating a customized approach to promote professional development. A rich learning experience was made possible by the

seminar-workshop's careful preparation and execution, highlighting its effectiveness in developing pedagogical competencies. After the training and utilization of the instructional module, review and revision of the instruments used were done to improve the designing process of the training and development process of the instructional material used

Effectiveness and Efficiency of the Training and Instructional Material

Table 8 reveals the effectiveness and efficiency of the training. It can be gleaned from the presentation that the mean scores of the responses for the PS, teaching pedagogy, materials, and exercises, learning environment, thesis-writing and general research skills development, and satisfaction about the training workshop are 3.97, 4.01, 4.23, 4.10, and 4.05, respectively. The corresponding standard value of each factor signified a positive note that the pre-service teachers' responses from the training are closely similar since the standard values are lower than the mean scores. These scores imply that most of them agree with the statements of each factor.

Based on the descriptive equivalent presented in Table 8, the rating for the mean scores is in the excellent range. Further, evidence shows that the pre-service teachers' responses are consistent and closely clustered around the average since standard deviation values are lower than the mean. In particular, pre-service teachers emphasized in their feedback that the PS was well-structured and included enough time for breaks. The data also highlight that to grab the pre-service teachers' interest and attention successfully, lecturers used collaborative teaching techniques and styles. Every learning content had interactive exercises in materials that made learning fun and interesting. The pre-service teachers reported that the training offered individualized attention from the invited lecturers and helpful assistance in clarifying the concepts. They also agreed that the training was engaging because they took part in an activity that lecturers and their peers later assessed, and they also listened to several discussions. The training helped them learn more about how to write a research article and enhance their writing skills as they have moderate research expertise. They also agreed that the lecturers were approachable enough to let them ask questions if they had any doubts about the topic being covered. They learned more about solving research puzzles they were inspired to be more interactive.

The study's findings show no issues with the learning environment for either the lecturers or the pre-service teachers. The deliberate choice of a site that fostered an environment conducive to learning can be credited with this positive outcome. Additionally, the lecturers contributed substantially by providing adequate tools and support to enhance the learning environment. These trainings ensured that the educational and physical environments promoted effective learning.

Responses from pre-service teachers indicated that they were delighted with the instruction they received in developing their general research skills and writing theses. Their responses from the evaluation showed that the training fully met their needs and expectations. The pre-service

teachers' satisfaction demonstrates how well the training equipped them to write theses and conduct scholarly research. Based on these findings, the training was very beneficial in preparing the pre-service teachers for their thesis work. Writing their research proposals and finished manuscripts should be easier for them. During the training, they were introduced to the essential elements of research writing, such as crafting the introduction, analyzing the literature, and formulating the methodology.

The training also used a well-designed module to ensure that the students gained theoretical knowledge and real-world experience. Due to this exposure, they are more equipped to generate research results that meet scholarly requirements and may be published. Thus, with the findings of this study, pre-service teachers have learning gaps in writing research, as writing undergraduate research is a crucial skill that would allow the pre-service teachers to communicate their findings through well-crafted articles effectively. However, the writing process can be challenging, hindering academic progress. This research addresses this issue by evaluating a workshop designed to improve undergraduate research-writing skills (Ghosh and Mukherjee 2021). The workshop is built on self-efficacy, which suggests that believing in one's abilities influences motivation and performance (Bandura 1977, cited in Durmusoglu and Ayas 2022). The goal is to boost pre-service teachers' confidence in research writing while equipping them with the necessary skills and knowledge to write strong articles. Through a workshop format, the study aims to empower pre-service teachers to navigate research writing competently, ultimately promoting their academic success.

Table 8: Result of the Effectiveness of the Training

Components	Mean	Standard Deviation	Descriptive Equivalent
Program Schedule	3.97	3.48	Agree
Teaching Pedagogy, Materials, and Exercises	4.01	3.53	Agree
Learning Environment	4.23	3.75	Agree
Thesis Writing and General Research Skills Development	4.10	3.62	Agree
Satisfaction with the Training Workshop	4.05	3.56	Agree
Overall Mean	4.07	3.59	Agree

Note: 4.20–5.0—Strongly Agree; 3.40–4.19—Agree; 2.60–3.39—Uncertain; 1.80–2.59—Disagree; 1.0–1.79—Strongly Disagree.

Table 9 displays the performance distribution of pre-service teachers based on their research skills. Data indicate that most pre-service teachers, at 41.38%, scored between 61% and 80%, which is considered highly competent. This shows that the vast majority of pre-service teachers demonstrated an understanding of the research methods that were discussed during the training. Moreover, lower scores indicating very highly competent performance ranging from 81% to 100% were obtained by 33.10% of the pre-service teachers. These individuals showed some understanding of the subject matter even though they still have

room for improvement. This group demonstrates that not all pre-service teachers have reached the highest level of competency despite making up a smaller portion of the participants. In contrast, 25.51% of the pre-service teachers, on the other hand, scored in the moderately competent range, which is between 61% and 80%. This group's exceptional research skills demonstrate how training has enhanced their capabilities.

Data further indicate that most pre-service teachers have made great strides, with many reaching a highly competent level, though some remain in the moderately competent range. These results demonstrate that the training workshop and the developed instructional materials successfully enhanced pre-service teachers' research abilities. Through the seminar, pre-service teachers acquired practical knowledge, experience, and the tools necessary to improve their performance. Additionally, since most pre-service teachers showed a noticeable improvement, it is only obvious that the training successfully improved their research competencies.

Table 9: Results of the Performance Assessment of Pre-Service Teachers

Competency	Mod. 1 (%)	Mod. 2 (%)	Mod. 3 (%)	Mod. 4 (%)	Mod. 5 (%)	Overall (%)
Not at All Competent	0	0	0	0	0	0
Barely Competent	0	0	0	0	0	0
Moderately Competent	27.59	24.13	24.13	27.59	24.13	25.51
Highly Competent	34.48	51.72	55.17	34.48	31.03	41.38
Very Highly Competent	37.93	24.13	20.69	37.93	44.83	33.10

Note: 81%–100%—Very Highly Competent; 61%–80%—Highly Competent; 41%–60%—Moderately Competent; 21%–40%—Barely Competent; 1%–20%—Not at all Competent.

To further enhance the research abilities of pre-service teachers using developed and enhanced instructional materials, aside from ongoing support and training, the developed material must be reviewed and evaluated by experts and instructors handling methods of research to further improve the quality of the instructional material in terms of its content and learning activities aligned to the learning outcomes of methods of the research subject. Since each learner has a unique learning style, it is crucial to create instructional materials that are in line with their needs and have the potential to enhance their academic performance. The results of this study show a significant improvement in pre-service teachers' research skills, confidence, and overall thesis-writing accomplishments due to these teaching resources. The study emphasizes how important it is to provide thorough and easily navigable educational materials that are suited to the unique needs of pre-service teachers to enhance their academic achievements and thesis-writing efforts.

Conclusion

Many pre-service teachers seek to strengthen their basic understanding of research, highlighting the need for customized instructional materials focusing on fundamental

concepts. The majority of the pre-service teachers are interested in attending seminar workshops and prefer to use the instructional module for the training. The instructional material that was designed and developed offers sufficient information and learning activities indicating high satisfaction from pre-service teachers and significantly support pre-service teachers' thesis writing endeavor.

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The author acknowledges that Grammarly should be used to enhance the proper and technical use of research terms. The prompts used include the presentation of results and discussion in (1) identifying the instructional needs of pre-service teachers and their learning preferences, (2) designing and developing a training package, and (3) finding out the effectiveness of the training conducted using the developed instructional material. The output from these prompts was used to enhance the discussion further so that the presented and discussed data provided ample, clear, and specific details targeting the study's objectives.

Informed Consent

The author declares that informed consent was acquired from participants.

Conflict of Interest

The author declares that there is no conflict of interest.

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