

Enhancing Professional Education: Effectiveness of Instructional Materials in Philippine Higher Education

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Date received: July 15, 2025

Date revised: August 17, 2025

Date accepted: September 3, 2025

Originality: 91%

Grammarly Score: 99%

Similarity: 9%

Recommended citation:

Alejandro, I. (2025). Enhancing professional education: Effectiveness of instructional materials in Philippine Higher Education. *Journal of Interdisciplinary Perspectives*, 3(10), 101-105. <https://doi.org/10.69569/jip.2025.572>

Abstract. This study examines the potential of printed learning resources to support the cognitive and affective development of second-year Professional Education students at Isabela State University, focusing on their academic outputs. Utilizing a single-group pretest/post-test design, the study involved 35 participants and evaluated the impact of the modules on student performance through pre- and post-test assessments. The results demonstrated a statistically significant improvement in student performance following the introduction of the learning modules, with the average score rising from 32.80 to 35.25, indicating a notable effect size. These findings suggest that printed learning modules can be practical tools for instructors in Professional Education programs, facilitating enhanced student understanding and potentially leading to improved academic outcomes.

Keywords: Effectiveness; Instructional materials; Professional education; Evaluation.

1.0 Introduction

The effectiveness of instructional materials is critical for improving learning outcomes in higher education globally. Printed modules are still a standard method of instructional delivery in many countries, including the Philippines, especially where digital infrastructure is poor or unreliable. This is particularly important in professional education programs, where effectively conveying essential knowledge and teaching skills is necessary to prepare future educators.

International research highlights both the advantages and disadvantages of using printed educational resources. (Macabenta et al., 2023; Trixa & Kaspar, 2024). However, Rad 2025 highlights that the impact on student engagement and skill acquisition may be less pronounced compared to multimedia or integrated learning strategies. As digital technologies rapidly evolved and became more widespread, it is essential to examine the design and role of printed materials to ensure they meet the needs and preferences of modern learners. (Setiadi et al., 2022). The efficacy of these resources often depends on learners' motivation, self-regulation, and the quality of the content. (Mustafa, 2023; Delita et al., 2022)

Within the Philippine higher education sector, public universities and colleges encounter specific challenges, such as resource limitations and inconsistent internet connectivity, which perpetuate the dependence on printed modules. (Briones et al., 2023; Funa et al., 2023). However, studies of Dios et al (2023) have pointed out potential shortcomings in the design and implementation of these printed resources, especially concerning their alignment with intended learning outcomes and the diverse needs of students in a rapidly changing educational

environment. Acknowledging these challenges, higher education institutions are increasingly focused on strategically improving their services, including the facilities that support the effective utilization of both online and offline learning resources, better to meet the evolving needs of their student populations, as noted by Torres & Manuzon (2020).

Despite the widespread use, empirical evidence regarding the learning effectiveness of these materials in professional education subjects remains scarce. Bazrgar et al., 2023; Tian, 2023. This knowledge gap hampers efforts to optimize instructional design and improve academic performance in institutions. Further, Dunajeva (2025) emphasizes that investigation is crucial to identifying design principles and pedagogical strategies that can maximize the potential of printed modules to promote deep learning, critical thinking, and practical application of knowledge within the specific context of professional education. The integration of digital resources with printed materials can provide a balanced learning experience, capitalizing on the strengths of both formats to improve knowledge retention, comprehension, and practical application in the context of professional education (Adeshina, 2024).

This study seeks to address this gap by evaluating the effectiveness of printed instructional materials among students enrolled in professional education subjects at Isabela State University. Through a comprehensive approach involving literature review, surveys, and experimental pretest-posttest assessments, the research aims to determine whether the use of printed modules significantly enhances students' cognitive performance. The findings are expected to contribute valuable insights for educators and policymakers striving to improve instructional practices in resource-limited higher education settings.

2.0 Methodology

2.1 Research Design

This study utilized a single-group pre-test and post-test quasi-experimental design to evaluate the impact of printed learning modules on student performance. This design effectively measures changes within the same group over time, allowing for a clear assessment of student progress following the intervention. The design's practical and resource-efficient nature makes it well-suited for educational settings where randomization may be challenging.

2.2 Research Participants and Sampling Technique

The study involves 35 Second-year college students enrolled at Isabela State University during the first semester of the 2022-2023 school year. Participants were selected based on convenience sampling, as they were chosen from those who were readily accessible and met the inclusion criteria of official enrolment and completion of the study. Participants who withdrew or whose data were considered outliers were excluded.

2.3 Research Instrument

A researcher-made instrument was used to gather sufficient and viable data for the study. A multiple-choice test was constructed for the pre-test and post-test, based on the most critical learning competencies. The same competencies were used to build the post-tests. To ensure validity and reliability, English and professional experts validated both the pre-test and post-test. The instructional materials used in this study were meticulously crafted to align with the essential learning competencies outlined in the Professional Education course. The design process began with a thorough needs assessment, pinpointing key topics and learning gaps by curriculum standards, as well as feedback from educators and former students. This feedback informed the development of specific, measurable learning objectives that the materials aimed to achieve. Following this, the instructional content was developed as printed modules. These modules featured explanatory texts, examples, guided activities, and practice exercises designed explicitly for college-level learners. To ensure content accuracy, clarity, and appropriateness, experts in the field and language specialists meticulously examined the drafts. Based on their feedback, the modules were revised multiple times to improve instructional flow and increase learning engagement. Before finalization, a pilot test was conducted with a select group of non-participant students to assess usability and understanding, which led to essential modifications. Before the intervention period, each participant received a printed set of modules and instructions on how to use them effectively for self-study. Regular in-person sessions were held to clarify concepts and help with activities, encouraging continuous engagement with the module. The intervention was implemented throughout the semester, with the instructional materials serving as the primary learning resource. The pre- and post-instruction assessments were carefully

aligned with the content and competencies presented in the instructional materials, with the aim of evaluating their effectiveness in enhancing student learning outcomes. Participants completed a pre-test before engaging with the modules and a post-test after completing all modules, which facilitated the assessment of improvements resulting from the intervention.

2.4 Data Gathering Procedure

This study utilized a single-group pre-test and post-test quasi-experimental design to measure learning outcomes. Data were gathered through multiple-choice tests developed from the most critical learning competencies and validated by experts in English and Professional subjects. Initially, participants completed a pre-test before the intervention, and their scores were collected and analyzed to establish a baseline. Following this, students engaged with printed learning modules throughout the preliminary to final term as the treatment. After the final term, a post-test, constructed from the same competencies, was administered. The post-test scores were then tabulated and analyzed to assess the effectiveness of the intervention in enhancing student learning.

2.5 Data Analysis Procedure

Data analysis was conducted using descriptive and inferential statistics using SPSS software version 22. Participant profile, specifically sex, was summarized using frequency and percentage. Performance on the pre-test and post-test scores was analyzed using a paired samples t-test. Before conducting the t-test, its assumptions were carefully checked: the differences between paired scores were assessed for normality using graphical methods and formal tests to ensure the data were approximately normally distributed; paired observations were confirmed valid as each participant's pre-and post-test scores were related; outliers were examined to prevent bias in results; and independence of observations across participants was assumed. The effect size of any observed differences was estimated using eta squared, with the possibility of reporting a confidence interval for this effect size to provide a range of certainty around the magnitude of the intervention's impact. Data collection was done face-to-face, within the framework of a single-group pre-test and post-test quasi-experimental design, where participants were measured before and after the treatment condition.

2.6 Ethical Considerations

The participants are given a document explaining the study's purpose, procedures, and risks and must sign it to confirm they understand and agree to participate. It also states the confidentiality of information collected about the participants. All data were securely stored in password-protected files accessible only to authorized researchers. Additionally, participants were informed of their right to withdraw from the study at any time without penalty, affirming the voluntary nature of their involvement.

3.0 Results and Discussion

3.1 Profile of Participants

The findings indicate a marked predominance of female participants within the professional education cohort, with females constituting over three-quarters of the sample. This gender distribution aligns with existing literature that reports higher female enrollment in specific professional education fields, potentially reflecting broader societal trends and gender preferences in educational pursuits (Ramírez-Montoya et.al, 2021). Understanding and clarifying this gender imbalance matters in evaluating instructional materials because the predominance of female learners may influence learning preferences, engagement, and education needs.

Table 1. *Frequency and Percentage Distribution of Respondents in terms of Sex*

Participants	Sex	Frequency	Percentage
Professional Education	Female	27	77.14
	Male	8	22.86
Total		35	100.00

The comparatively low representation of male participants (22.86%) may indicate underlying problems such as disparities in interest, recruitment efficacy, or accessibility that affect male participation rates. This disparity necessitates attention, as gender diversity might enhance educational experiences and outcomes (Rašticová et. al, 2025). The prevalence of female participants influences program development and teaching tactics. Customizing curriculum content and support services to meet the distinct needs and learning preferences of the predominant group may improve engagement and achievement. Nonetheless, initiatives must be undertaken to comprehend

and alleviate obstacles to male involvement to foster inclusivity and diversity within the program. Future research should investigate the factors contributing to this gender difference and evaluate its effects on educational results and professional advancement within the area. Comprehending these relationships will be essential for creating equitable and effective professional education programs.

3.2. Performance of Participants

The rise in the average score from 32.80 in the pre-test to 35.25 in the post-test signifies a general enhancement in participants' performance after the intervention or educational program. This indicates that the program positively influenced the knowledge or skills assessed by the test.

Table 2. *Performance of the participants from pretest to post-test*

Participants	Test	Min	Max	M	SD
Professional Education	Pre-test	22.00	39.00	32.80	3.59
	Post-test	26.00	43.00	35.25	4.24

The wider range and increased standard deviation in the post-test scores imply greater variability in participants' performance after the intervention, which could reflect differences in individual learning rates or engagement levels. Nonetheless, the upward shift in both minimum and maximum scores further supports the conclusion that participants generally benefited from the program. These findings underscore the effectiveness of the professional education program in improving participants' competencies. Future analyses, such as paired statistical tests, would be valuable to determine whether the observed improvements are statistically significant and to quantify the magnitude of the effect. Additionally, exploring factors that contribute to the variability in post-test performance could inform strategies to optimize learning outcomes for all participants.

3.3. Analysis of Pre-test and Post-test Scores

The inferential analysis revealed a significant improvement in participants' scores from the pre-test ($M = 32.80$) to the post-test ($M = 35.25$), indicating that the professional education program effectively enhanced their knowledge or skills.

Table 3. *Analysis of pre-test and post-test scores using paired samples T-test.*

Participants	Test	M	SD	95% CI	T	df	p	η^2
Professional Education	Pre-test	32.80	3.59	[-4.23, -.677]	-2.80	34	.008	.187
	Post-test	35.25	4.24					

Before conducting the paired samples t-test, assumptions were checked to ensure the validity of the results: the differences in scores were confirmed to be approximately normally distributed through graphical and formal tests, paired observations were verified as dependent measurements from the same participants, and no significant outliers were detected. The statistically significant p -value of .008 indicates that the observed improvement is unlikely due to chance, further supported by the confidence interval for the mean difference, which excludes zero, reinforcing the reliability of the findings. The moderate effect size ($\eta^2 = 0.187$) suggests that about 18.7% of the variance in test scores can be attributed to the program, highlighting a meaningful impact in the context of educational research. Additionally, the increase in both the lowest and highest scores, along with a slight rise in standard deviation, suggests variability in individual learning gains, warranting further investigation into factors influencing this heterogeneity. These results substantiate the efficacy of the professional education program in enhancing participant performance and justify its continued implementation and refinement. Future research is recommended to include longitudinal studies to evaluate the sustainability of learning gains and to identify strategies that support diverse learners more effectively.

4.0 Conclusion

This study evaluated the effectiveness of printed materials in promoting learning among students in professional education courses at Isabela State University. The results demonstrated a significant improvement in participants' cognitive skills, as shown by the statistically significant increase in post-test scores compared to pre-test scores. The moderate effect size suggests that using printed modules effectively supported students' learning skill development.

The participant profile revealed that most students were female, mirroring current enrolment patterns in professional education. This highlights the necessity of considering gender dynamics in program development. The observed improvement in learning outcomes suggests that printed instructional materials are a practical resource in higher education settings with limited resources. These findings offer crucial insights for educators and policymakers regarding the enhancement of instructional strategies. The investigation supports the continued use and improvement of printed materials to support student learning. It also underscores the importance of further research into long-term impacts and methods to reduce disparities among participants and tackle gender inequality.

This study adds to the growing body of evidence suggesting that novel teaching approaches can promote fairness and excellence in professional education settings. Future studies should also conduct longitudinal evaluations to assess the sustainability of learning gains and investigate factors contributing to individual differences in performance, such as motivation or prior knowledge. Comparative research examining printed materials alongside other instructional media under resource-constrained conditions would provide valuable insights into optimizing instructional resources.

5.0 Contributions of Authors

Not indicated

6.0 Funding

Not indicated

7.0 Conflict of Interests

Not indicated

8.0 Acknowledgment

Not indicated

9.0 References

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