Development Of a Comprehensive Research Module and Its Impact on Research Skills of Tourism and Hospitality Management Students in Philippines

Amante Luis P. Olivar II[1]*, Jennifer U. Garcia[2]

A R T I C L E I N F O	A B S T R A C T

Purpose. This study developed, implemented, and improved a comprehensive module on research and how it affected the research skills of tourism and hospitality management students. **Methodology.** Using sequential-quantitative/ quasi-experimental study, this research generated data from 90 CTHM students and employed self-made instruments (item analysis, diagnostic test, pre-tests, and post-tests). Data were analyzed through descriptive statistics, independent samples t-test, standard deviation, and coefficient variation. **Results.** The control groups' pre-test results were rated low average. The post-test results for the control group showed a moderate but significant improvement from the pre-test. The post-test results for the control group showed a moderate but significant improvement from the pre-test. The experimental group's post-test results imply a significant progress from the pre-test. The experimental group got a higher rating than the control group. This improvement in the scores can be attributed to the delivery of the developed comprehensive module on research. **Implications for research and practice.** The study's results and findings highlight the importance of institutional support in organizing relevant, college-based engagements related to curriculum, supervision, and instruction, which improve competency development among college instructors in creating educational resources that expose them to the pedagogy of teaching and learning research subjects, as well improving the research skills of CTHM students.

Introduction

Instructional supervision is an essential element in educational management for it provides guidelines to enhance teaching quality, collaboration, and student outcomes. This validates Joseph and Fonkeng George (2022)'s findings that educational institutions are more effective when supervisory approaches such as pedagogical, administrative, and instructional are completely adopted. The expansion of tourism and hospitality sectors have led to the need for innovative educational approaches, as outlined in Commission on Higher Education (CHED) Memorandum 52, which urges higher education institutions in the

[1] Faculty, Institute for Social Development and Nation Building, University of Makati, Makati City, Philippines.
ORCID: https://orcid.org/0000-0002-3136-1357 , Email: amanteluis.olivar@umak.edu.ph
[2] Faculty, Institute for Social Development and Nation Building, University of Makati, Makati City, Philippines.
ORCID: https://orcid.org/0000-0001-5267-5788 , Email: jennifer.garcia@umak.edu.ph
*Correspondence: amanteluis.olivar@umak.edu.ph

Philippines to promote innovation, research, and community outreach. This mandates a proactive adoption of a "culture of research" among colleges and universities, emphasizing the need for environmental scanning and the development of research competencies applicable across disciplines (Vieno et al., 2022). Research forums and conferences are increasingly recognized as crucial platforms for undergraduates to present their work, with financial grants available for both faculty and student researchers.

For College of Tourism and Hospitality Management (CTHM) students, a well-structured curriculum is relevant for ensuring relevant and effective tertiary-level training, necessitating continuous revision and upgrading of existing programs per the Commission on Higher Education's directives. College instructors, aspiring to be instructional developers, must master responsibilities related to assessment and facilitation to fulfill their roles as instructional leaders. However, due to insufficient skills, knowledge, and understanding of instructional materials, limited policy support, and inadequate administrative assistance are the concerns of instructors today (Cayabas Jr & Sumeg-ang, 2023).

It is also well known that curriculum experts face the challenge of addressing issues that arise during module development, requiring consistent needs assessments and ongoing improvements to meet the learning demands of CTHM students. Within the CTHM curriculum, research subjects are integral to undergraduate education, particularly in the fourth year. Effective research paper writing requires familiarity with rigorous methodologies, which often poses challenges for students, including poor writing skills, limited access to online resources, and compliance with rigorous processes. These challenges can lead to diminished interest in research subjects among CTHM students.

Meanwhile, in the current study, a comprehensive module on research has been developed with the goal of enhancing research skills and fostering a positive view of research activities among CTHM students. This initiative aims to not only equip students with the necessary skills for scholarly research but also serve as a framework for future curriculum developers to emphasize mentorship and collaboration critical to the implementation of research subjects in tourism and hospitality curriculum. The proponents consider this output to be their greatest contribution to the tourism and hospitality management discipline as it dictates the conceptual foundation of a comprehensive, well-drafted, critical experimentation, and detailed module on research that the tourism and hospitality curriculum needs.

Literature Review

Theoretical Review

A. Integration of the ADDIE model in module development

ADDIE model has been an effective framework in designing and developing instructional materials since it focuses on the needs of learners, flexibility, modifiable when necessary, and involves continuous improvement based on feedback from learners. The application of the ADDIE model has improved teaching practices and techniques. Almelhi (2021) provided ADDIE model's effectiveness in online teaching platforms built on Learning Management Systems (LMS), discussion board features, and the improvement of EFL college students' writing abilities. Moreso, Spatioti et al. (2022) investigated effective teaching practices and

approaches in a distance learning environment designed using the ADDIE model. As a result, this model was regarded as a valuable source of information because it identifies effective teaching practices.

Innovations connected to the ADDIE model have significantly enhanced students' level and interest in a particular subject. Li and Cheong (2023) used ADDIE model to create and design a training program and eventually increased students' interest in physical fitness which can be implemented in colleges and universities. More so, Tu et al. (2021) explored the effectiveness of a design education course using the ADDIE model. It used three-dimensional composition to view the connection of multiple dimensions of design education. Based on the study's findings, students' confidence and satisfaction increased significantly. Likewise, Suratnu (2023) claimed that the ADDIE model perfectly matches the objectives of teaching and learning because it includes a systematic approach that is required to identify and meet the needs of learners

B. Experimental Studies

Positive results have been obtained through experimental research. Hebebci (2023) probed the experimental studies related to science, technology, engineering, and mathematics (STEM) education. These methods had positive results from experimentation when dealing with STEM education. In addition, Aripin et al. (2021) concluded that this inquiry approach is the most suggested to master in order to improve research skills. Calma (2023) investigated the issues and challenges facing students in enhancing their research skills and academicians are advised to communicate clear expectations for writing tasks and provide encouragement to write research for students.

Meanwhile, Banu et al. (2022) concluded that students are not taking their interest in research seriously, and they are doing it as part of their academic requirements. Thus, undergraduate students be more exposed to research. Furthermore, Abylkassymov et al. (2023) recommended that educational institutions should update their education systems so that they can create positive motivation for learning activities related to research.

Based on the above, the following research hypotheses were framed for the study"

H1: *There are no significant differences in the performances on research skills in the pre-tests of the control group and experimental group using the developed comprehensive module on research; and*
H2: *There are no significant differences in the performances on research skills in the post-tests of the control group and experimental group using the developed comprehensive module on research.*

Methodology

Research design

Sequential-quantitative research design is a methodological approach which provides results based on three phases such as (a) initial quantitative phase, (b) quantitative exploration, and (c) follow-up on the quantitative phase results (Berman, 2017). The first phase which comprised the diagnostic test that helped identify specific features of a comprehensive module on research. Meanwhile, the second phase involved experimentation. This step pointed out the outcomes of the comprehensive module on research. Lastly, enhancements to the comprehensive module developed on research were done based on the

results of the experimentation phase.

Quasi-experimental research design provides the causal relationships between variables, of which the independent variable is not controlled. In addition, groups were selected based on pre-existing characteristics or conditions, such as gender and age. Likewise, the use of quasi-experimental research allows researchers to address serious social issues through intervention (Hassan, 2023).

Sampling Technique

This study's population consisted of two groups, namely, a control group (45 tourism management students) and an experimental group (45 hospitality management students). They were selected heterogeneously through purposive sampling. The control group made use of the discussions based on the syllabus on the subject of research in tourism, while the experimental group made use of the discussions from the developed comprehensive module on research. Both groups received diagnostic tests, pre-tests, and post-test assessments.

Instruments and Data collection

Self-made instruments were applied throughout data gathering. Diagnostic tests underwent item analysis to measure respondents' responses to individual test items. Based on the results of diagnostic tests, the comprehensive module on research was formulated. This module was endorsed to three faculty members assigned as content validators. Whereas, pre-test assessments and implementation followed. The conventional method of teaching was administered to the control group. The developed comprehensive module on research was facilitated for the experimental group. Post-test assessments were conducted on both groups to measure their performance on research skills. Analysis based on the results of the diagnostic test and post-test assessments were included in the enhancement of the developed comprehensive module on research.

Data Analysis

Descriptive and inferential statistics were applied in this study. The U-L item index method conceptualized by Stocklein in 1957 was used in the diagnostic test to measure the respondents' answers in the item analysis. Meanwhile, range computed the difference between the highest score and the lowest score. Meanwhile, frequency count and relative frequency in percent determined the number of respondents who provided greater than or less than 50 percent correct answers in the diagnostic test and post-test assessments. Mean identified the performance on the aspects of research skills of the two groups of respondents. While the t-test compared the performance on the aspects of research skills of the two groups of respondents.

Standard deviation provided reliable data on how it was distributed in relation to the mean scores of respondents in the pre-test and post-test assessments. While coefficient variation provided the proportion of standard deviation to the mean scores of the respondents in the pre-test and post-test assessments. The SPSS software provided reliable results from the collected data.

Results

Table 1 presents the results of the diagnostic test on the aspects of research skills—paraphrasing. The items with less than 50% correct answers by the respondents on the features of the comprehensive module on research aspects of research skills on paraphrasing were developed. The results were as follows: For test item 1, 'This *term refers to the process of incorporating someone else's ideas or information into one's own while retaining meaning,'* only 25 out of 90 respondents, or 27.78%, knew the topic. For test item 2, "*This is the most standard recent format prescribed among researchers,*" only 38 out of 90 respondents, or 42.22%, were aware of the subject at hand. For test item 6, "*This is a paraphrasing context where a researcher may use the same, shorter, or longer length as the original texts, depending on how the content was rephrased,*" only 29 out of 90 respondents, or 32.22%, knew the subject at hand. For test item 7, "*This is a paraphrasing context whereby student-researchers may use their own words, but they need to provide a citation to the original source,*" only 18 out of 90 respondents, or 20.00%, knew the subject at hand. For test item 9, "*APA writing style and format stands for,*" only 34 out of 90 respondents, or 37.78%, knew the subject at hand. For test item 10, "*Which of the following is not a step for effective paraphrasing?*", only 28 out of 90 respondents, or 31.11%, were knowledgeable on the subject at hand.

Table 1

Specific Features of a Comprehensive Module on Research- Paraphrasing

Aspect of Research Skills	N= 90	
A. Paraphrasing	**F***	**%**
1. *This term refers to the process of incorporating someone else's ideas or information into one's own while retaining meaning.*	25	27.78
2. *This is the most recent standard format prescribed among researchers.*	38	42.22
3. *This term pertains to a violation of research ethics to utilize the work of others without providing appropriate credit.*	56	62.22
4. *This is a paraphrasing context where a term is used to indicate direct speech and quotations.*	45	50.00
5. *This is a paraphrasing context where researcher might use his/her own words to describe concepts acquired from another source.*	49	54.44
6. *This is a paraphrasing context where a researcher may use the same, shorter, or longer length as the original texts, depending on how the content was rephrased.*	29	32.22
7. *This is a paraphrasing context whereby student-researchers may use their own words, but they need to provide a citation to the original source.*	18	20.00
8. *Which of the following is not a guideline for paraphrasing?*	62	68.89
9. *APA writing style and format stands for:*	34	37.78
10. *Which of the following is not a step for effective paraphrasing?*	28	31.11

*F - number of participants who provided the correct answers

Table 2 clarifies the specific features of a comprehensive module on research-aspect of research skills on referencing. This is the result of the 50 - item diagnostic test with less than 50% correct answers by the respondents. For instance, the test item 6, "*This term refers to citing a source with an organization using the most recent APA format*", only 43 out of 90 respondents or 47.78 % knew the subject at hand. Test item 7, "*This refers to a source of the quotation or paraphrase that is indicated within parentheses in accordance with the most recent*

APA format, only 36 out of 90 respondents or 40.00% were aware of the topic. Test item 8, "*This pertains to citing a reference where the author's name is designated within the sentence, omitting the need for parentheses*, only 28 out of 90 respondents or 31.11% knew the topic provided.

Table 2

Specific Features of a Comprehensive Module on Research- Referencing

Aspect of Research Skills	N= 90	
B. Referencing	**F***	**%**
1. This is a research skill to accurately document sources, such as journals, books, web information, and others.	47	52.22
2. This term refers to citing sources from reliable books using the most recent APA format.	50	55.56
3. This term refers to citing sources from citing sources from dissertation/thesis using the most recent APA format.	58	64.44
4. This term refers to citing a source with two authors using the most recent APA format.	65	72.22
5. This term refers to citing reference from journal articles using the most recent APA format.	68	75.56
6. This term refers to citing a source with an organization using the most recent APA format.	43	47.78
7. This refers to a source of the quotation or paraphrase that is indicated within parentheses in accordance with the most recent APA format.	36	40.00
8. This pertains to citing a reference where the author's name is designated within the sentence, omitting the need for parentheses	28	31.11
9. This refers to citing a source with single author using the most recent APA format.	48	53.33
10. This term refers to citing a source with three or more authors using the most recent APA format.	66	73.33

*F - number of participants who provided the correct answers

Table 3 summarizes the results of the diagnostic test on the aspects of research skills-data interpretation. Test item *1, "This is a research skill of reviewing data and drawing conclusions by applying statistical tools"*, Only 39 out of 90 respondents or 43.33% knew the subject at hand. Test item 2, *"This term refers to a statistical tool to assess the significant difference between multiple groups".* only 33 out of 90 respondents or 34.67% knew the subject at hand. Test item 3, *"This is a common statistical tool used to ascertain the frequency of occurrence for a specific value or category, such as text analysis"*, only 23 out of 90 respondents or 24.11% knew the subject at hand. Test item 4, *"This is the sum of all values in the sample and the quantity of values in the sample"* 43 out of 90 respondents or 45.22% knew the subject at hand. Test item 5, *"This is a tool to determine the mathematical coefficient as represented by the relationship between two variables"*, only 29 out of 90 respondents or 32.22% knew the subject at hand. Test item 6," *This is a statement that presents a research question and puts forth an anticipated outcome"*. Only 29 out of 90 respondents or 32.22% knew the subject on study. Test item 7, "*This is an indicator of the degree of dispersion of the data in relation to the mean"*, 43 out of 90 respondents or 45.11% knew the topic. Test item 8*, "This is a statistical tool to assess the significant difference between multiple groups"*, only 38 respondents or 42.22% knew the subject at hand.

Table 3

Specific Features of a Comprehensive Module on Research- Data Interpretation

Aspect of Research Skills	N= 90	
C. Data Interpretation	**F***	**%**
1. *This is a research skill of reviewing data and drawing conclusions by applying statistical tools.*	*39*	43.33
2. *This term refers to a statistical tool to assess the significant difference between multiple groups.*	*33*	34.67
3. *This is a common statistical tool used to ascertain the frequency of occurrence for a specific value or category, such as text analysis.*	*23*	24.11
4. *This is the sum of all values in the sample and the quantity of values in the sample.*	*43*	45.22
5. *This is a tool to determine the mathematical coefficient as represented by the relationship between two variables.*	*29*	32.22
6. *This is a statement that presents a research question and puts forth an anticipated outcome.*	*29*	32.22
7. *This is an indicator of the degree of dispersion of the data in relation to the mean*	*43*	45.11
8. *This is a statistical tool to assess the significant difference between multiple groups*	*38*	42.22
9. *This is a tool in analyzing the relationship between single dependent variable and multiple independent variables*	*47*	52.22
10. *A researcher wants to come up with conclusions and draw inferences regarding the research questions after performing statistical tests on the data. This represents which step in the data interpretation process is needed.*	*47*	52.22

*F - number of participants who provided the correct answers

Table 4 highlights the results of the diagnostic test, which was included in the features of a comprehensive module on research on information searching. For test item 1, "*He is an American librarian who is a critic of predatory references,*" only 35, or 38.89%, knew the subject at hand. For test item 3, "*These are publications that present themselves as authentic scholarly journals while misleadingly describing their methods of publication,*" only 31 out of 90 respondents, or 34.44%, were aware of the topic. For test item 4, "*These are journals that provide unrestricted online access to scholarly publications and data,*" only 23 of 90 participants, or 25.56%, knew the topic. Test item 5, "*A hospitality management student-researcher is looking to access tourism and hospitality management research articles. Which database would be best suited for this situation?*" 42 out of 90 respondents, or 46.67%, knew the subject at hand. Test item 6, "*A researcher is trying to find reliable sources for information about laws and regulations. What kind of website would be the best place to look for information?*" Only 35 out of 90 respondents, or 38.89%, were knowledgeable about the topic. Test item 7, "*Student researchers are searching for open access journals to help them complete their literature review. Which of these links would be most beneficial*?" Only 24 out of 90 respondents, or 26.67%, knew the subject at hand. Test item 8, "*A tourism student-researcher is searching for academic publications related to a particular subject. Which website from the list below would be best suited for this?*" Only 38 out of 90 respondents, or 42.22%, knew the subject at hand. Test item 9, "*A hospitality management student-researcher wishes to have access to a broad selection of books, scholarly journals, and primary sources from various fields. Which internet-based platform would be the best*

option?" only 31 out of 90, or 34.44%, knew the subject at hand, and for test item 10, *"What are the benefits for researchers of publishing in an open access journal?"* only 36 out of 45 respondents, or 40.00%, knew the subject at hand.

Table 4

Specific Features of a Comprehensive Module on Research- Information Searching

Aspect of Research Skills	N= 90	
D. Information Searching	**F***	**%**
1. He is an American librarian who is a critic of predatory references.	*35*	*38.89*
2. This research skill also known as querying, pertains to the deliberate and specific pursuit of information in response to a clearly stated information requirement, specifically when one possesses a reasonable understanding of the nature of the information required.	*55*	*61.11*
3. These are publications that present themselves as authentic scholarly journals while misleadingly describing their methods of publication.	*31*	*34.44*
4. These are journals that provide unrestricted online access to scholarly publications and data.	*23*	*25.56*
5. A hospitality management student-researcher is looking to access tourism and hospitality management research articles. Which database would be best suited for this situation?	*42*	*46.67*
6. A researcher is trying to find reliable sources for information about laws and regulations. What kind of website would be the best place to look for information?	*35*	*38.89*
7. Student researchers are searching for open access journals to help them complete their literature review. Which of these links would be most beneficial?	*24*	*26.67*
8. A tourism student-researcher is searching for academic publications related to a particular subject. Which website from the list below would be best suited for this?	*38*	*42.22*
9. A hospitality management student-researcher wishes to have access to a broad selection of books, scholarly journals, and primary sources from a variety of fields. Which internet-based platform would be the best option?	*31*	*34.44*
10. What are the benefits for researchers of publishing in an open access journal?	*36*	*40.00*

*F - number of participants who provided the correct answers

Table 5 outlines the specific features of a comprehensive module on research and technical writing. For test item 1, *"This term refers to the transitioning of words and identifying its purposes in technical writing,"* only 30 out of 90 respondents, or 33.33%, knew the subject at hand. For test item 2, *"It is a form of writing that researchers use to convey knowledge regarding specialized fields, such as engineering, chemistry, finance, forestry, and others,"* only 41 out of 90 respondents, or 45.56%, knew the subject at hand. For test item 3, *"This pertains to the word choices, tense and mood, voice, capitalization, acronyms, use of foreign words, expressions, numbers, and pronouns used in technical writing,"* only 38 out of 90 respondents, or 42.22%, knew the subject at hand. For test item 4, *"This pertains to the title page, approval sheet, abstract, acknowledgement, table of contents, and list of tables/figures as part of the manuscript,"* only 30 out of 90 respondents, or 33.33%, knew the subject at hand. Test item 5, *"This compilation of 5 chapters is not limited to areas of HM and TM. The term "manuscript" is applicable to a variety of writing outputs or documents;* only 38 out of 90 respondents, or 42.22%, knew the subject at hand. For test item 6, *"Which of the following is a rule in writing a research title?"* only 28 out of 90 respondents, or 31.11%, knew the subject at hand. For test item 7, *"Which of the*

following are components of Chapter 1?", only 34 out of 90 respondents, or 37.78%, knew the subject at hand. *For test* item 9, *"Which of the following are components of Chapter 3?"*, only 38 out of 90 respondents, or 42.22%, knew the subject at hand. For test item 10, *"Which of the following are components of Chapter 5?"*, only 32 out of 90 respondents, or 35.56%, knew the subject at hand.

Table 5

Specific Features of a Comprehensive Module on Research- Technical Writing

Aspect of Research Skills	N= 90	
E. Technical Writing	F*	%
1. This term refers to the transitioning of words and identifying its purposes in technical writing.	30	33.33
2. It is a form of writing that researchers use to convey knowledge regarding specialized fields, such as engineering, chemistry, finance, forestry, and others.	41	45.56
3. This pertains to the word choices, tense and mood, voice, capitalization, acronyms, use of foreign word, expressions, numbers, and pronouns used in technical writing.	38	42.22
4. This pertains to title page, approval sheet, abstract, acknowledgement, table of contents, and list of tables/figures as part of the manuscript.	30	33.33
5. This compilation of 5 chapters is not limited to areas of HM and TM. The term manuscript is applicable to a variety of writing outputs or documents.	38	42.22
6. Which of the following is a rule in writing a research title?	28	31.11
7. Which of the following are components of Chapter 1?	34	37.78
8. Which of the following are components of Chapter 2?	48	53.33
9. Which of the following are components of Chapter 3?	38	42.22
10. Which of the following are components of Chapter 4?	32	35.56

F - number of participants who provided the correct answers

Data from Table 6 provides the performance on the aspects of research skills in the pre-tests of the two groups of respondents. The highest score garnered by the control group in the pre-test was 23, and the lowest score was 9. The computed mean was 18.53, or 37.06%, with a computed standard deviation of 11.19% and a coefficient of variation of 60.39%. The pretest was a 50-item test covering aspects of research skills. The highest score garnered by the experimental group in the pre-test was 24, and the lowest score was 9. This data signifies that there was a wide range of test scores among the participants in the experimental group. The computed mean was 18.60, or 37.20%, with a computed standard deviation of 8.79 and a coefficient of variation of 47.26%.

Table 6

Performance on the Aspects of Research Skills in the Pre-Test of the Control Group and Experimental Group

Pre-test	N	LS	HS	Mean	SD	CV	Description
Control Group	45	9	23	18.53 (37.06%)	11.19	60.39%	Heterogenous
Experimental Group	45	9	24	18.60 (37.20%)	8.79	47.26%	Heterogenous

Note: N- Number of participants, SD- Standard Deviation, LS- lowest score, CV- Coefficient Variation, HS- highest score

Table 7 illustrates the performance on the aspects of research skills in the post-tests of the two groups of respondents. The highest score garnered by the control group in the post-test was 33 and the lowest score was 25. The computed mean was 27.47 or 54.94%, the computed standard deviation was 7.62, and the coefficient variation was 27.73%. The scores of the respondents - control group in the post-test - were heterogeneous. However, the mean of 27.47 or 54.94% was higher than the performance in the pre-test. The highest score garnered by the experimental group in the post-test was 45 and the lowest score was 25. The computed mean was 41.27 or 82.54%. The computed standard deviation was 18.20 and the coefficient variation was 36.83%. The scores of the participants in the experimental group in the post-test were heterogeneous.

Table 7

Performance on the Aspects of Research Skills in the Post-Test of the Control Group and Experimental Group

Post-Test	N	LS	HS	Mean	SD	CV	Description
Control Group	45	25	33	27.47(54.94%)	7.62	27.73%	Heterogenous
Experimental Group	45	25	45	41.27(82.54%)	18.20	36.83%	Heterogenous

Note: N- Number of participants, SD- Standard Deviation, LS- lowest score, CV- Coefficient Variation

Table 8 highlights the comparison of the performance on research skills of the control group and experimental group in the pre-tests. In the pre-test, the control group had a mean performance of 18.53, while the experimental group had a mean performance of 18.60. The computed t-value was -1.002 with a significance of 0.92 using degrees of freedom of 87. This was not significant. The null hypothesis of no significant differences between the research skills performance of the control group and the experimental group in the pre-test was accepted.

Table 8

Comparison of the Performance on the Aspects of Research Skills of the Participants in the Pre-test

Group	Mean	t-value	df	Significance	Description
Pre-test		-1.002	87	0.92	NS
Control Group	18.53				
Experimental Group	18.60				

Note: df- degrees of freedom, NS- not significant

Data from Table 9 confirms the comparison of the performance on research skills of the control group and experimental group in the post-tests. In the post-test, the control group had a mean performance of 27.47, while the experimental group had a mean performance of 41.27. This indicates a remarkable progress in the experimental groups' performance on research skills. The computed t-value was -18.218 with a significance of .000 using degrees of freedom of 75. This was highly significant. This indicates that there was substantial difference between the control group and experimental groups' performances on research skills. The null hypothesis of no significant differences between the performance on research skills of the control group and experimental group was rejected. The control group

learned 27.47 or 54.94% of the lessons while the experimental group learned more than 41.27 or 82.54% of the lessons.

Table 9

Comparison of the Performance on the Aspects of Research Skills of the Participants in the Post-Test

Group	Mean	t-value	df	Significance	Description
Post-test		-18.218	75	.000	HS
Control Group	27.47(54.94%)				
Experimental Group	41.27(82.54%)				

Note: df- degrees of freedom, HS- Highly significant

Data from Table 10 indicates the enhancements to the developed comprehensive module on research based on the results of experimentation. Eight topics were identified for paraphrasing, eight topics were classified for referencing, eight topics were enumerated for data interpreting, and one topic for technical writing.

Table 10

Enhancements to the Developed Comprehensive Module on Research

Aspect of Research Skills	Enhancements to the Developed Comprehensive Module on Research
Control group A. Paraphrasing	Steps for effective paraphrasing
	Role of paraphrasing in maintaining academic integrity
	Crucial role of paraphrasing in research
	Characteristics of paraphrasing in research
	How plagiarism is applied
	Quotation mark usage
	Choice of word
	Application of length
Control group B. Referencing	Crucial role of referencing
	Definition of parenthetical citation
	Definition of narrative citation
	Application of parenthetical citation
	Application of narrative citation
	Application of double authorship referencing
	Use of DOI
Experimental group B.1. Referencing	Hanging indention referencing format application
	Application of narrative citation
	Application of frequency count
C. Data Interpretating	Application of mean/averaging
	Definition of data analysis
	How to interpret data using t-test
	How to interpret data using Pearson-r correlation
	Definition of ANOVA
	How to interpret data using ANOVA
Control group D. Technical writing	Definition of conceptual framework
	Components of Chapter 5

Discussion

This study identified the features of a comprehensive module on research. These particular topics were highlighted on the aspects of research skills focused on paraphrasing (Table 1), which is similar to the findings in the study of Sanjaya (2021) that college students' paraphrasing proficiency was not adequate. It was discovered that the participants' problems included using their own words, creating sentences, and substituting terms appropriately. Topics on referencing (Table 2) share in common with the study of Mejorada et al. (2023) that college students would need to demonstrate proficiency in both referencing. Likewise, topics on data interpreting (Table 3) were parallel to the study of Sari et al. (2025), which found that the challenges identified by college students in writing theses were linguistics and writing knowledge issues and data analyzing. Meanwhile, topics on information searching (Table 4) were similar to the claim of Adedeji (2023) that using search engines, like Google Scholar, can help them. Additionally, a strong correlation was found between the use of search engines and college students' research skills in finding information and technical writing (Table 5), which aligns with Alaraj (2022)'s results indicating that college students faced technical challenges in producing research papers, including issues with spelling, technical language, and coherence.

The mean performance in the pre-test of the control group was low, a moderate level of variability in the test scores, and distinct differences in the performance. The mean performance in the pre-test of the experimental group was low, a moderate level of variability in the test scores (Table 6). Individual performance variations were evidential though they were not very noticeable and most scores were relatively distinct to the mean. These findings are similar to Kalghatgi et al. (2024)'s findings that there was an improvement in the attendees ' knowledge after the intervention, using intensive training on the test model of leaning among students pursuing dentistry. The experimental group's mean performance on the post-test provided a high rating for their research skills (Table 7). There were moderate levels of relative variability in the individual test scores of participants. There were significant differences in the individual scores compared to the mean, and there were varying levels of proficiency among participants. The mean performance in the post-test of the control group showed an improvement in the aspects of research skills (Table 8). There was a low to moderate level of relative variability in the individual test scores. These individual scores reflected a diverse level of understanding of the aspects of research skills although improvement in the scores was evident. This is similar to Yang et al. (2025)'s finding that post-test class scores of health education intervention were significantly higher than the pre-test class scores

In comparison of the performance on the aspects of research skills of participants in the pre-tests, both groups demonstrated low ratings (Table 9). It also showed that there were minimal differences in the two groups' mean scores; there was a substantial probability that the observed differences were the result of chance rather than actual effect. This showed that there was no significant difference in the mean performance on the aspects of research skills of the control group and experimental group pre-test. In a comparison of the performance on the aspects of research skills of participants in the post-tests, the experimental group achieved a greater rating compared to the control group. There were significant differences between the mean scores of the two groups. This achievement was

attributed to the delivery of the comprehensive module on research. This is parallel to the claim of Kim et al. (2023) that the use of experimentation provides strong empirical evidence for validity.

Conclusions And Recommendations

The features of the developed comprehensive were topics on paraphrasing, referencing, data interpreting, information searching, and technical writing. The control groups' pre-test results on the performance on the aspects of research skills were rated low average, indicating a moderate variability in their individual scores. These individual scores reflect a diverse level of understanding of the aspects of research skills.

The experimental groups' pre-test results on the performance on the aspects of research skills were rated low average, indicating a moderate variability in their individual scores. These individual scores reflect a diverse level of understanding of the aspects of research skills. The control group's post-test results on the aspects of research skills were rated moderate but significantly improved from the pre-test. It also implies that there were variations of more consistency on understanding the aspects of research skills among participants. These individual scores reflect a diverse level of understanding of the aspects of research skills.

The experimental group's post-test results on the aspects of research skills imply a significant improvement from the pre-test. It also indicates that most participants scored high; however, there was a diverse level of understanding on the aspects of research skills.

The pre-test results of the control group and experimental group show similar low scores on the aspects of research skills, which rreflects a diverse level of understanding on the aspects of research skills. The post-test results of the control group and experimental group indicate statistically significant improvement on the aspects of research skills. Experimental group got higher rating compared to that of the control group. This improvement can be attributed to the delivery of the developed comprehensive module on research.

The developed comprehensive module on research was enhanced based on the results of post-tests given to two groups of participants. The post-tests focused on topics on paraphrasing, referencing, and data interpreting. While the least enhanced topics were information searching and technical writing.

Based on the research findings, the following recommendations were proposed:

- **Continuous evaluation.** Research skills of CTHM students of the University of Makati could be evaluated comprehensively every year to monitor its progress and development.
- **Intensification of developmental plans for faculty members.** University of Makati administrators could be tapped to organize relevant and college- based engagements related to curriculum supervision and instruction, which will improve competency development among college instructors in devising educational resources.

- **Adoption of the said module and subject for refinement**. This educational material will enhance the research skills of CTHM students and improve the teaching quality of college instructors handling research subjects.

References

Abylkassymov, A., Bazhi, A., Dyussov, M., Ardabayeva, A., Zhadrayeva, L., Tuyakov, Y., & Kenzhebek, K. (2023). Mathematical Problems as a Means of Developing Students' Research Skills in the Context of School Education Content Updating. *Journal of Law and Sustainable Development*, *11*(4), e607. https://doi.org/10.55908/sdgs.v11i4.607

Adedeji, A. A. (2023). Use of Search Engines as Predictors of Research Skills of Postgraduate Students in Library Schools: A Case Study of South-West, Nigeria. *Library Philosophy & Practice*. https://digitalcommons.unl.edu/libphilprac/7893

Alaraj, M. (2022). An Investigation into Technical Writing Difficulties, Causes and Solutions. *Technium Social Sciences Journal*, *28*, 220-235. https://doi.org/10.47577/tssj.v28i1.5919

Almelhi, A. M. (2021). Effectiveness of the Addie Model within an E-Learning Environment in Developing Creative Writing in Efl Students. *English Language Teaching*, *14*(2), 20. https://doi.org/10.5539/elt.v14n2p20

Aripin, I., Hidayat, T., Rustaman, N., & Riandi, R. (2021). The Effectiveness of Science Learning Research Skills: A Meta-Analysis Study. *Scientiae Educatia*, *10*(1), 40. https://doi.org/10.24235/sc.educatia.v10i1.8486

Banu, S. R., Banu, S. B., & Thulasi, V. (2022). Assessment of Research Skills in Undergraduates. *Journal of Positive School Psychology http://journalppw. com*, *6*(6), 6938-6948. https://www.journalppw.com/index.php/jpsp/article/view/8732

Berman, E. (2017). An Exploratory Sequential Mixed Methods Approach to Understanding Researchers' Data Management Practices at Uvm: Integrated Findings to Develop Research Data Services. *Journal of eScience Librarianship*, *6*(1), e1104. https://doi.org/10.7191/jeslib.2017.1104

Calma, A. (2023). Using Assurance of Learning Data to Assess Business Students' Research Skills. *Quality Assurance in Education*, *31*(4), 586-599. https://doi.org/10.1108/qae-01-2023-0003

Cayabas Jr, J. P., & Sumeg-ang, D. A. (2023). Challenges and Interventions in Developing Instructional Materials: Perspectives of Public School Teachers in Basic Education. *International Journal of Innovative Research and Scientific Studies*, *6*(4), 849-855. https://doi.org/10.53894/ijirss.v6i4.2059

Hassan, M. (2023). *Quasi-Experimental Research Design-Types and Method*. https://researchmethod.net/quasi-experimental-design/

Hebebci, M. T. (2023). A Systematic Review of Experimental Studies on Stem Education. *Journal of Education in Science, Environment and Health*, 56-73. https://doi.org/10.55549/jeseh.1239074

Joseph, M. L., & Fonkeng George, E. (2022). The Effect of Curriculum Supervision on School Effectiveness: The Case of Some Selected Public Nursery and Primary Schools in Fako Division, South West Region of Cameroon. *International Journal on Integrated Education*, *5*(1), 1-27. http://eprints.umsida.ac.id/id/eprint/9257

Kalghatgi, S., Dalvi, T., Kamble, P., Komble, R., Patil, C., & hemgude, p. (2024). Effectiveness of Pre-Test Post-Test Model of Learning in a Dental School. *Indian Journal of Natural Sciences*, *15*, 82332-82335. https://www.researchgate.net/profile/Tanushri-Dalvi/publication/386582318

Kim, J., Kim, S., Jhang, J., Kwon, Y., & Baah, N. G. (2023). Experimental Design Studies in Hospitality and Tourism Research: Constructive Recommendations. *International Journal of Contemporary Hospitality Management*, *35*(10), 3570-3591. https://doi.org/10.1108/ijchm-06-2022-0720

Li, H., & Cheong, J. P. G. (2023). Using the Addie Model to Design and Develop Physical Education Lessons Incorporated with a Functional Training Component. *Frontiers in Public Health*, *11*. https://doi.org/10.3389/fpubh.2023.1201228

Mejorada, E., Doong, J. D., Retorta, M. A. P., Curayag, C. M. P., Lonzon, W. A., Ederio, N. T., & Calaca, N. I. (2023). Students' Knowledge in Citing Sources at St. Paul University. *International Journal of Current Science Research and Review*, *06*(01). https://doi.org/10.47191/ijcsrr/v6-i1-21

Sanjaya, N. I. (2021). *Students' Paraphrasing Skills in Academic Writing: A Case Study at English Literature Department of Muslim University of Indonesia* Universitas Hasanuddin]. https://repository.unhas.ac.id/id/eprint/7427/2/F022191011_tesis%201-2.pdf

Sari, R., Putro, H. P. N., Rochgiyanti, R., Abbas, E. W., & Awang, M. M. (2025). Students' Financial Literacy through Educational Materials Based on Banjar Cultural Values. *Journal of Innovation in Educational and Cultural Research*, *6*(1), 69-83. https://doi.org/10.46843/jiecr.v6i1.2066

Spatioti, A. G., Kazanidis, I., & Pange, J. (2022). A Comparative Study of the Addie Instructional Design Model in Distance Education. *Information*, *13*(9), 402. https://doi.org/10.3390/info13090402

Suratnu, R. (2023). The Adoption of the Addie Model in Designing an Instructional Module: The Case of Malay Language Remove Students. *IJIET (International Journal of Indonesian Education and Teaching)*, *7*(2), 262-270. https://doi.org/10.24071/ijiet.v7i2.3521

Tu, J.-C., Zhang, X., & Zhang, X.-Y. (2021). Basic Courses of Design Major Based on the Addie Model: Shed Light on Response to Social Trends and Needs. *Sustainability*, *13*(8), 4414. https://doi.org/10.3390/su13084414

Vieno, K., Rogers, K. A., & Campbell, N. (2022). Broadening the Definition of 'Research Skills' to Enhance Students' Competence across Undergraduate and Master's Programs. *Education Sciences*, *12*(10), 642. https://doi.org/10.3390/educsci12100642

Yang, X., Ye, Q., Su, S., Yang, Y., & Li, X. (2025). Effectiveness of a Pre-Test/Post-Test Model in Hpv Health Education among Undergraduate Medical Students. *BMC Medical Education*, *25*(1). https://doi.org/10.1186/s12909-025-06717-7