Mabalacat City College

UNDERGRADUATE RESEARCH MANUAL

Authors: Glen S. Nolasco, MS
Marilyn S. Arcilla, PhD

2026
First Edition

MABALACAT CITY COLLEGE

Office of the Vice President for Research, Innovation, and Extension Services

Undergraduate Research Manual

The Official Manual of the Undergraduate Students of the Mabalacat City College

1st Edition

2026

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Undergraduate Research Manual
Mabalacat City College, Mabalacat City, Pampanga

First Edition, 2026

This Manual serves as the official guide for the policies, procedures, and operational framework governing undergraduate research of different institute of the collge. The contents of this manual are intended for institutional use and for guiding administrators, faculty members, staff, and researchers in the implementation of research-related initiatives.

The policies, procedures, and guidelines contained in this manual may be reviewed, revised, or updated as deemed necessary by the Office of the Vice President for Research, Innovation, and Extension Services, subject to approval by the appropriate institutional authorities.

Authors

Glen S. Nolasco, MSc.
Marilyn S. Arcilla, PhD.

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PREFACE

The *Mabalacat City College Research Manual for Undergraduate Students* embodies the comprehensive research guidelines of every MCC Institute. It outlines and standardizes the general policies, procedures, forms, and overall research workflow of the College. This Manual serves as a foundational framework that promotes innovation and the adoption of more advanced research methodologies and techniques, in line with the continuous enhancement of the College's educational system.

This Manual shall be periodically reviewed and revised in accordance with evolving institutional policies. Any proposed revisions must be reviewed and approved by the Board of Trustees prior to implementation. The principle of *ex post facto* shall not apply to the provisions of this Manual. Updated versions shall be made available to faculty members in both printed and digital formats through the official MCC website.

About the Authors

Prof. Glen S. Nolasco, MS is a faculty member at Mabalacat City College with a strong background in teaching, research development, and academic mentorship. He holds a Master of Science degree and has been actively involved in guiding undergraduate students in research methodology, scientific writing, and project development. His academic interests include research education, laboratory instruction, and the promotion of evidence-based learning in higher education. Through his teaching and scholarly activities, he continues to support the development of students' research competencies and critical thinking skills.

Dr. Marilyn S. Arcilla is a distinguished academic leader and healthcare professional whose career is defined by a deep commitment to nursing excellence and developmental education. Currently serving as the Vice President for Academic Affairs and Dean of the Institute of Arts and Sciences at Mabalacat City College in Pampanga, Dr. Arcilla has been a cornerstone of the institution's faculty since 2012. Her trajectory from clinical instructor to executive leadership reflects a steadfast dedication to institutional growth and academic quality in the Philippines.

Dr. Arcilla's professional journey began with a strong foundation in clinical care. After graduating Cum Laude with a Bachelor of Science in Nursing from Jose C. Feliciano College, where she also received the Excellence Award, she successfully passed the Nurse Licensure Examination in November 2008. She furthered her clinical expertise by earning a Master of Arts in Nursing in 2013.

About the Manual

The Undergraduate Research Manual of Mabalacat City College serves as a comprehensive guide for students in the conduct of scholarly research. This manual provides a systematic framework that assists undergraduate students in understanding the essential components of the research process—from conceptualizing a research problem to presenting and disseminating research findings.

The manual outlines the fundamental principles, procedures, and ethical considerations involved in academic research. It also presents practical guidelines on research design, data collection, data analysis, and the proper documentation of scholarly work following established academic standards.

Designed to support both students and faculty mentors, this manual aims to promote consistency, rigor, and academic integrity in the preparation of undergraduate research outputs. By providing clear instructions and structured guidance, it seeks to enhance students' critical thinking, analytical skills, and capacity to contribute meaningful knowledge to their respective fields of study.

Ultimately, this manual supports the institution's commitment to fostering a strong research culture and preparing students to become competent researchers and responsible contributors to the advancement of knowledge and society.

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Undergraduate Research General Provisions

This section outlines the General Provisions of the Undergraduate Research Manual, which shall govern and apply to all officially recognized academic programs of Mabalacat City College (MCC).

The Preliminary Pages

The preliminary pages serve as the introductory section of the research manuscript and provide essential information regarding the authorship, certification, and organization of the study. These pages shall appear before the main body of the research and must be arranged in the following order:

1. Blank Pages (Two Pages, Unnumbered)

Two blank pages shall be placed at the beginning of the manuscript to serve as protective and formatting pages for binding purposes. No page numbers or markings shall appear on these pages.

2. Title Page

The Title Page presents the essential identifying information of the research manuscript. The title of the study shall be written in inverted pyramid style and positioned at the center of the uppermost portion of the page. This format begins with the main title on the first line, followed by progressively shorter lines forming a balanced inverted pyramid arrangement.

The Title Page shall also contain the following information:

- Complete title of the research study
- Name(s) of the researcher(s)
- A statement indicating that the manuscript is submitted in partial fulfillment of the requirements of the academic program
- Name of the institution
- Month and year of submission

3. Abstract

This section present the abstract of the manuscript comprises of 200-300 words depending on the program of student.

4. Approval Sheet

This page certifies that the research manuscript has been reviewed and approved by the research adviser and the panel of examiners. It shall include the names, designations, signatures of the panel members, and the date of approval.

5. Certification of the Adviser

This section contains the formal certification of the research adviser confirming that the study was conducted under his or her supervision and has been reviewed and recommended for submission.

6. Certification of the Statistician and Proofreader

This page contains certification statements from the statistician and proofreader. The statistician certifies that the statistical procedures and analyses used in the study are appropriate and properly interpreted, while the proofreader certifies that the manuscript has been reviewed for grammar, clarity, and adherence to academic writing standards.

7. Acknowledgment/Dedication

This section allows the researcher(s) to formally recognize individuals, offices, or institutions that provided assistance, guidance, or support during the completion of the research study.

8. Abstract

The Abstract presents a concise summary of the research study, including the research problem, objectives, methodology, major findings, and conclusions.

9. Table of Contents

The Table of Contents provides an organized listing of the chapters, sections, and major parts of the manuscript, together with their corresponding page numbers.

10. List of Appendices

This section enumerates all supplementary documents included at the end of the manuscript, such as research instruments, letters of permission, and other supporting materials.

11. List of Plates

The List of Plates provides a sequential listing of photographs, images, or visual documentation included in the manuscript, together with their corresponding titles and page numbers.

12. The Manuscript

This section showcases the 4-5 chapters (Background of the Study and/ Review of Related Literature, Methodology, Results and Discussion, Conclusions/recommendations/summary) of the manuscript depending on the program of the student.

Proposal/Final Defense Requirements

All undergraduate research manuscripts shall undergo a formal Proposal Defense prior to data collection. The Proposal Defense serves as a quality assurance mechanism to evaluate the scholarly merit, methodological rigor, feasibility, and ethical soundness of the proposed study.

Students are required to submit 1 printed copy of the proposal manuscript to the research committee at least one (1) week prior to the scheduled defense, unless otherwise specified by the Research Instructor. Softcopies will also be distributed to all the committee members same day of the hardcopy submission. The proposal manuscript shall include, at minimum, Chapter 1 (Background of the Study), Chapter 2 (Review of Related Literature and Framework), and Chapter 3 (Methodology), depending on the structure prescribed by the academic unit and the nature of the research design. For IMRaDC and IMFaDC formats, this typically corresponds to Chapters 1–2. For final defense, the entire manuscript including preliminary page, plates, appendices, and bibliography will be submitted to the committee a week prior to the schedule.

Students who are unable to adequately defend their study shall receive a failing grade and will be required to re-enroll in the course as a prerequisite for graduation. In the event that a panel member is unavailable, the Research Instructor may opt to reschedule the defense or proceed with the presentation. The adviser is required to attend both the proposal and final defense. However, at the discretion of the chairperson, the defense may proceed in the adviser's absence, provided that the adviser has submitted a letter of explanation addressed to and approved by the Research Committee.

The Proposal Defense shall formally assess the clarity of the research problem, alignment of objectives, theoretical or conceptual grounding, appropriateness of the research design, sampling strategy, instrumentation, data collection procedures, ethical considerations, and statistical or qualitative analysis plan. Approval of the proposal is mandatory before the commencement of data gathering activities. Conducting data collection without formal proposal approval shall constitute a violation of institutional research policy.

Composition and Qualifications of the Research Panel

The Research Defense Committee for both Proposal and Final Defense shall consist of the following members:

- One (1) Chairperson
- Two (2) Panel Members (Internal or external)
- Research Adviser
- Research Instructor
- Grammarian
- Statistician (if applicable to the study design)
- Validator (if applicable)

All members of the panel shall be physically or virtually present during the defense proceedings. Failure of any designated committee member to attend the scheduled defense without prior approval and valid justification shall be formally reported by the Chairperson to the Office concerned. Non-attendance shall automatically result in the forfeiture of the honorarium for that specific defense schedule. The Research Instructor shall oversee program flow, documentation, and scheduling during the defense but shall not interfere with the academic evaluation process conducted by the Chairperson and Panel Members.

The Chairperson and two (2) Panel Members shall serve as the primary evaluators and shall determine the outcome of the defense using the officially approved institutional rubrics (*see Annex ___ and ___*). Their assessment shall carry decisive weight in determining whether the manuscript is approved, conditionally approved, or requires major revisions.

The Research Adviser shall be present during the Proposal Defense to provide academic guidance and intellectual support when necessary. However, the Adviser shall not dominate or override the deliberation process of the panel nor the presentation of the students.

A Grammarian shall attend the Proposal Defense, particularly during the presentation and approval of the research title and Statement of the Problem. This ensures linguistic precision, structural alignment between the title and research objectives, and elimination of grammatical inconsistencies that may compromise scholarly clarity. If one of the appointed panel members is an English or Language specialist, the presence of a separate Nevertheless, in the absence of an available grammarian during defense, a Grammarian Certification Form *(See Annex ___),* signed by the appointed grammarian,

shall be required as documentary evidence that the research title and Statement of the Problems (SOPs) have been reviewed for grammatical accuracy and clarity.

A Statistician shall be required for studies employing quantitative or mixed-method designs involving inferential statistical analysis. The Statistician shall evaluate the appropriateness of sampling techniques, statistical tools, hypothesis testing procedures, and interpretation of quantitative results during the title/proposal defense only. If one of the appointed panel members is a statistician, the presence of a separate statistician shall no longer be mandatory. In the context of descriptive statistics, a researcher or a faculty member with a master's degree whose expertise aligns with the research area may serve as the statistician for a qualitative study, provided they possess sufficient research experience.

All professionals involved in undergraduate research supervision and evaluation preferably with completed Master's degree in a relevant field and demonstrate substantial academic or research experience. Faculty members handling research subjects must be full-time instructors of the College. Part-time faculty members shall not be assigned to teach research courses to ensure continuity, accountability, and academic quality control, except in cases where there is an insufficient number of qualified faculty members available to handle the subject.

Roles of the Research Committee

1. **Chairperson** – The Chairperson serves as the principal authority of the Research Committee, ensuring the integrity, transparency, and compliance of all research activities under the purview of the Institute. The Chairperson convenes and presides over committee meetings, facilitates deliberations, and exercises executive oversight in the assessment, approval, and monitoring of research outputs. This includes validating compliance with institutional policies, ethical standards, and regulatory mandates. The Chairperson has the authority to resolve disputes arising from research evaluations, adjudicate on procedural irregularities, and ensure that the final approval of student research aligns with both scholarly rigor and institutional guidelines. Furthermore, the Chairperson provides formal certification of committee decisions and signs all official records, including approval forms, clearance certificates, and research outcome reports. *Note: The specialization of the chairperson should align with the nature of the students' research, unless otherwise specified in the Commission on Higher Education Memorandum Order (CMO) governing the program.*

2. **Panel Members** – The Research Panelists are charged with critically evaluating and rating research outputs in accordance with the rubrics and criteria prescribed by the Institute. They assess both the intellectual merit of the manuscript and the quality of oral presentations, offering substantive critiques aimed at enhancing methodological rigor, analytical depth, and scholarly clarity. Panelists exercise

academic discretion in determining outcomes of the oral defense, including the decisions to pass, require revisions, or fail proponents based on established standards. Following satisfactory compliance with all required revisions and submission of the final printed manuscript, the Panelists formally affix their signatures to signify endorsement. *Note: Panel members should preferably possess a master's degree or have formal research training with demonstrated research outputs. Their area of expertise should also be aligned with the nature of the research being evaluated.*

3. **Adviser** – The Research Adviser provides continuous academic mentorship throughout the research lifecycle. Responsibilities include guiding the conceptualization of research topics, validating research instruments, authorizing data collection, and monitoring adherence to methodological and ethical standards. Advisers schedule regular consultations to oversee progress, supervise mock defenses, and provide constructive critique on manuscripts, recommending refinements as needed. Upon completion of the study, the Adviser evaluates the research work, endorses students for oral defense, and ensures incorporation of panelists' revisions into the final manuscript prior to submission. *Note: The adviser should preferably possess a master's degree or have formal research training with demonstrated research outputs. Their area of expertise should also be aligned with the nature of the research being evaluated.*

4. **Research Instructor** – The Research Instructor is responsible for the preparation and implementation of the Outcomes-Based Teaching and Learning Plan (OBTLP) for research courses. The instructor delivers lectures on research methodologies, supervises the assignment of Advisers, monitors submission timelines, coordinates selection of Panelists, schedules oral defenses, and ensures proper archival of final manuscripts in the Institute, Research Office, or Library. The instructor also submits final course grades, while ensuring strict adherence to institutional research standards, policies, and procedural compliance. *Note: The instructor should preferably possess a master's degree or have formal research training with demonstrated research outputs.*

5. **Grammarian** – The Grammarian ensures that all research manuscripts conform to established linguistic, syntactic, and stylistic standards. Responsibilities include proofreading, editing, and verifying the clarity, coherence, and consistency of the written work, ensuring compliance with formal academic writing conventions. Upon completion of the review, the Grammarian provides certification attesting to the grammatical and linguistic quality of the manuscript. To maintain the quality, consistency, and validity of proofreading, a grammarian shall review no more than ten (10) research manuscripts per semester. *Note: The grammarian should possess at least an ongoing master's degree and must have completed a bachelor's degree*

in English, Language Studies, Mass Communication, or any related field with specialization in language or English.

6. **Statistician** – The Statistician collaborates with the Adviser and student researchers to ensure statistical appropriateness and methodological robustness of research instruments. Responsibilities include recommending suitable statistical tools, assisting in data processing, performing analyses, and interpreting results. The Statistician verifies that all tables, figures, and statistical summaries are accurate, properly presented, and aligned with the manuscript discussion. Upon satisfactory review, the Statistician issues certification attesting to the validity and reliability of the statistical analyses conducted. *Note: The statistician should possess at least an ongoing master's degree and must be a statistician by practice or profession. In the absence of a qualified statistician, a professional from an allied field with expertise in quantitative data analysis may be designated. For qualitative studies, an experienced faculty member with relevant published or unpublished research outputs may serve as the qualitative research expert.*

7. **Validator (if necessary)** – The Research Validator examines the alignment and validity of research instruments, including questionnaires, interview guides, and observational tools, to ensure consistency with the research objectives and the Statement of the Problem. In cases involving self-made or modified instruments, the validator shall review, enhance, revise, and validate the tool prior to its use. These instruments are required for pilot testing and subsequent reliability analysis, such as the Cronbach's alpha test. The Validator evaluates the clarity, relevance, and methodological soundness of instrument items and, upon satisfactory review, formally certifies the instruments on the Research Instrument Validation Form *(see Annex ___),* ensuring their academic appropriateness for data collection.

   Note: The validator should possess at least an ongoing master's degree and must have an area of specialization aligned with the nature and content of the research instrument being validated.

Revision Timeline

Following the Proposal or Final Defense, the Research Instructor shall formally communicate the required revisions and establish the official timeline for submission of the revised manuscript. The revision period shall be reasonable and commensurate with the extent of corrections required (minor, moderate, or major revisions).

Failure to comply with the prescribed revision timeline without valid justification may result in deferment of subsequent defense schedules or non-endorsement for final approval.

All revisions must be clearly reflected in the resubmitted manuscript, and a summary of revision form must be signed by the research committee. (*see Annex* ___)

Final Manuscript Submission Procedure

The manuscript shall be formatted on short bond paper (8.5 × 11 inches) with uniform one (1) inch margins on the top, bottom, left, and right sides. All text must be typed in Times New Roman, 12-point font, and double-spaced throughout. Standard paragraph indentation shall be observed, and the body text must be fully justified. Page numbering shall appear at the bottom-right margin of each page, beginning from the first page of Chapter 1 unless otherwise specified in the preliminary pages formatting guidelines. Body is not in bold face; Titles/Headings are boldface; and Chapter numbers are in sentence-case while chapter titles are in capital letters.

Prior to hardbinding of the approved manuscript, students must secure and complete the following institutional requirements:

1. All required research forms must be fully accomplished and signed by the respective members of the Research Committee.
2. The Research Committee must formally concur that all required revisions have been incorporated satisfactorily.
3. The manuscript must undergo plagiarism detection using the official similarity-checking software designated by the College.
4. The manuscript must obtain a maximum similarity index of not more than ten percent (≤ 10%) overall similarity. Any manuscript exceeding this threshold shall be returned for revision and re-evaluation.

Only after satisfying the above requirements may students proceed to hardbinding.

A one (1) copy should be submitted to the appropriate library office of the program. *E.g. IBE – MCC dapdap library.*

The official hardbound cover colors per academic institute shall be as follows:

- Institute of Teacher Education (ITE) – Blue
- Institute of Arts and Sciences (IAS) – White
- Institute of Hospitality and Tourism Management (IHTM) – Pink
- Institute of Business Education (IBE) – Yellow
- Institute of Computer Studies (ICS) – Gray

The approved defense rubrics for both Proposal and Final Defense shall be distributed to students at least one (1) week prior to their scheduled defense to ensure transparency and alignment of expectations. (*see Annex ___ for Proposal Defense Rubric and Annex ___ for Final Defense Rubric.*)

Research Ethics Clearance Requirement

All research conducted at the MCC must consider the specific clearances required for their implementation and adhere to OVPRIES Memo No. 4, S. 2025 *(see Annex ___).* Ethics clearance varies depending on the nature of the research; therefore, the adviser and/or the OVPAA should assist undergraduate students in securing the necessary clearance. Researchers must obtain all required ethical and institutional approvals prior to data collection. Depending on the nature of the study, this may include Institutional Research Ethics Committee approval, Data Privacy compliance certification, parental consent and assent forms, NCIP clearance, LGU endorsement, and other regulatory permissions mandated by law or institutional policy. No data collection shall commence without the appropriate documented clearances.

Data Retention and Archiving Policy

All research data generated under MCC shall be properly managed, stored, and archived in accordance with institutional policies, applicable laws, and ethical standards. Researchers are responsible for ensuring that outdated manuscripts, raw data, consent forms, instruments, transcripts, recordings, laboratory results, and other relevant research materials are securely stored for a minimum of five (5) years after the completion of the study. All files will then be transferred to the Archive Office for an additional two-year extension. After completing a total of seven (7) years of storage, the manuscripts may be shredded and properly disposed of.

Digital files shall be stored in password-protected and encrypted storage systems, while physical documents shall be kept in locked cabinets with access limited only to authorized personnel (QA office). Confidential and sensitive data must be anonymized or de-identified prior to archiving to ensure the protection of participants' privacy in compliance with the Data Privacy Act of 2012 (RA 10173).

After the prescribed retention period, data shall be disposed of securely (e.g., shredding of physical copies, permanent deletion of digital files). For studies with long-term academic or institutional value, anonymized datasets may be archived in the institutional repository subject to approval by the Research Office.

Defense Descriptive Remarks Classification

To standardize evaluation outcomes, research defenses shall be classified using the following descriptive remarks:

1. **Approved Without Revisions** – The research meets all academic, ethical, and methodological standards. No revisions are required.
2. **Approved with Minor Revisions** – The research is acceptable but requires minor corrections (e.g., formatting, clarifications, minor methodological adjustments). Revisions shall be verified by the adviser.
3. **Approved with Major Revisions** – Substantial revisions are required in methodology, analysis, interpretation, or structure. The revised manuscript must be reviewed and approved by the panel before final acceptance.
4. **Deferred for Re-Defense** – The research does not yet meet the minimum academic standards. The proponents must substantially revise the manuscript and undergo another defense.
5. **Disapproved** – The research fails to satisfy academic, ethical, or institutional standards and is not recommended for completion in its present form.

Intellectual Property Ownership and Authorship, and Publication Policy

All intellectual property (IP) generated through research conducted under MCC shall be governed by existing institutional IP policies and relevant national laws (RA 8293). In general, undergraduate research outputs remain the intellectual property of the student-researchers, subject to institutional rights for academic, archival, and promotional use. For externally funded research, ownership shall follow the stipulations indicated in the Memorandum of Agreement (MOA) or funding contract. In instances where a faculty member or research adviser provides financial support for the conduct of an undergraduate research project, a formal written agreement shall be executed prior to the commencement of the study. Such agreement must clearly stipulate the terms and conditions governing intellectual property rights, authorship, data ownership, financial accountability, and publication privileges. The document shall be duly signed by all concerned parties and filed with the Office of the Vice President for Academic Affairs (OVPAA) or the designated Research Office to ensure institutional transparency and legal compliance.

Authorship shall be based on substantial intellectual contribution to the conception and design of the study, data collection, data analysis and interpretation, manuscript drafting, or critical revision of the work. The order of authorship must be mutually agreed upon by all contributors prior to submission for publication. Advisers shall be

acknowledged appropriately depending on the level of their scholarly contribution. *Note that advisership in undergraduate research does not, by default, confer co-authorship status. Any violation of this provision shall constitute academic misconduct and may subject the faculty member to appropriate administrative sanctions in accordance with existing institutional policies, civil service regulations, and applicable national laws.*

Plagiarism, data fabrication, falsification, and other forms of academic misconduct are strictly prohibited and shall be subject to institutional disciplinary procedures. Any research intended for publication, presentation, or public dissemination must secure clearance from the appropriate academic authority prior to submission.

RESEARCH MISCONDUCT AND DUE PROCESS MECHANISM

Section 1. Definition of Research Misconduct

Research misconduct refers to any act that violates accepted ethical, scholarly, and institutional standards in the conduct, reporting, review, or publication of research.

The following acts shall constitute research misconduct:

1.1 Plagiarism

Plagiarism refers to the act of presenting another person's ideas, processes, results, words, data, or intellectual property as one's own without proper acknowledgment or citation.

For institutional compliance, all undergraduate research manuscripts must obtain a maximum overall similarity index of not more than ten percent (≤10%) using the officially designated plagiarism detection software of the College.

However, compliance with the ≤10% similarity threshold shall not automatically exempt a manuscript from plagiarism if:

- Improper citation practices are present;
- Sources are inappropriately paraphrased;
- Significant unattributed conceptual borrowing is detected.

Exceeding the ≤10% threshold shall constitute a prima facie indicator of potential plagiarism and shall require formal review and revision.

1.2 Fabrication

Fabrication refers to the making up of data, results, interviews, survey responses, experiments, or sources and recording or reporting them as genuine.

This includes:

- Inventing respondents or participants;
- Creating fictitious statistical outputs;
- Reporting experiments or procedures that were never conducted.

Self-plagiarism shall not fall under fabrication but shall instead be treated under plagiarism or redundant publication policies.

1.3 Falsification

Falsification refers to the manipulation of research materials, equipment, processes, data, or results such that the research is not accurately represented in the research record.

This includes:

- Altering data to achieve statistically significant results;
- Omitting relevant findings;
- Modifying instruments after data collection without disclosure;
- Selective reporting of results.

1.4 Unauthorized Authorship

Unauthorized authorship refers to the inclusion or exclusion of an individual as an author without substantial intellectual contribution or without their consent.

This includes:

- Listing a faculty member as co-author without qualifying contributions;
- Excluding a legitimate contributor;
- Claiming ownership of a student's research without formal agreement.

Advisership alone does not constitute authorship.

1.5 Data Manipulation

Data manipulation refers to improper alteration, suppression, selective coding, or statistical distortion of research data in order to influence outcomes.

1.6 Ghostwriting

Ghostwriting refers to the practice of commissioning or allowing an external individual to write or substantially compose the manuscript without proper acknowledgment.

This includes:

- Hiring third-party writers;
- Purchasing pre-written theses;
- Undisclosed AI-generated full manuscript production.

Section 2. Due Process and Formal Complaint Procedure

The College recognizes that allegations of research misconduct may have serious academic and administrative consequences. Therefore, all proceedings shall strictly observe procedural due process consistent with constitutional principles and Civil Service Commission (CSC) regulations.

2.1 Filing of Complaint

A formal written complaint, duly signed and notarized, when necessary, shall be addressed to any of the following executive offices:

- The Legal Officer of Mabalacat City College
- The Office of the Vice President for Academic Affairs (OVPAA)
- The Office of the Vice President (OVPRIES)

The complaint must contain:

- Specific allegations;
- Supporting documentary evidence;
- Identification of respondent(s).

Anonymous complaints shall only be entertained if accompanied by substantial documentary evidence.

2.2 Creation of the Research Integrity Review Committee (RIRC)

Upon receipt of a valid complaint, a Research Integrity Review Committee shall be constituted, composed of:

- Representative from the Legal Office
- Representative from the Office of the Vice President Research, Innovation, and Extension Services
- Representative from the Office of the Vice President for Academic Affairs

In the event that any of the above offices is directly involved in the complaint, such office shall be excluded from the Review Committee to preserve impartiality.

The Committee shall conduct a preliminary evaluation to determine whether a prima facie case exists.

2.3 Investigation Timeline

Upon determination of a prima facie case, a formal investigation shall commence.

The investigation process shall be completed within a reasonable period not exceeding six (6) months from the issuance of formal notice to the respondent, unless extended for justifiable cause.

The respondent shall:

- Be formally notified in writing of the charges;
- Be provided access to evidence;
- Be given reasonable opportunity to submit a written explanation;
- Be allowed to present counter-evidence.

2.4 Appeal Mechanism

The respondent shall have the right to file a motion for reconsideration within fifteen (15) working days from receipt of the decision.

Final administrative remedies shall follow the procedures prescribed under applicable Civil Service Commission rules and institutional grievance mechanisms.

Section 3. Sanction Matrix

Sanctions shall be imposed proportionate to the gravity of the offense and consistent with Civil Service Commission regulations, institutional policies, and principles of progressive discipline.

Sanctions may include, but are not limited to:

For Students:

- Written reprimand
- Mandatory revision and re-defense
- Grade invalidation
- Suspension of research privileges
- Disqualification from graduation honors
- Non-approval of manuscript
- Suspension or expulsion in grave cases

For Faculty or Employees:

- Written reprimand
- Withholding of honorarium
- Removal from research panel assignments
- Suspension from research advisership
- Administrative charges pursuant to CSC rules
- Other penalties consistent with civil service law

All sanctions shall be imposed only after completion of due process.

CONFLICT OF INTEREST POLICY

The College recognizes that conflicts of interest (COI) may compromise, or appear to compromise, the integrity, objectivity, and credibility of research activities. All individuals involved in undergraduate research including student-researchers, research advisers, panel members, statisticians, grammarians, and administrators are required to uphold transparency and avoid situations that may result in actual, potential, or perceived conflicts of interest.

A conflict of interest exists when an individual's personal, financial, professional, or relational interests may improperly influence, or reasonably appear to influence, the design, conduct, evaluation, supervision, or publication of research.

Conflicts of interest may include, but are not limited to:

- Financial interests in organizations, entities, or projects related to the research;
- Personal or familial relationships between student-researchers and panel members or advisers;
- Professional rivalries or supervisory relationships that may affect impartial judgment;
- External consultancy or employment directly connected to the research topic;
- Undisclosed involvement in competing or overlapping studies.

All research advisers and panel members shall formally disclose any actual or potential conflict of interest prior to accepting their designation. When a conflict is identified, the concerned individual shall voluntarily inhibit from participating in the research supervision, evaluation, or deliberation process.

A Conflict-of-Interest Disclosure (COID) Form (*see Annex* ___) shall be accomplished prior to Proposal Defense to ensure transparency and institutional accountability. If in the case the one of the committees is substitute/change, there should be a refiling of COID form

RESEARCH TIMELINE AND ACADEMIC CALENDAR ALIGNMENT

The implementation of undergraduate research activities shall strictly align with the officially approved Academic Calendar of Mabalacat City College.

The specific research timeline, including but not limited to proposal submission, proposal defense, ethics clearance processing, data collection, final defense, manuscript revision, and hardbinding deadlines, shall be determined and approved by:

- The Office of the Vice President for Academic Affairs (OVPAA);
- The Dean of the respective Institute; and/or
- The Program Head concerned.

Such timelines must ensure orderly academic progression, equitable scheduling of defenses, and compliance with institutional graduation clearance requirements.

No research defense or manuscript approval shall be conducted beyond the officially prescribed deadlines unless authorized in writing by the appropriate academic authority for meritorious reasons.

Failure to comply with the approved research calendar may result in deferment of defense, delayed graduation clearance, or non-endorsement for final approval.

INSTITUTIONAL REPOSITORY AND OPEN ACCESS POLICY

Mandatory Digital Submission

All approved undergraduate research manuscripts and corresponding Research Articles (journal-type format) shall be submitted in digital Portable Document Format (PDF) as one of the mandatory requirements for final approval and graduation clearance.

Digital copies shall be submitted to the designated Research Office or institutional repository administrator prior to hardbinding.

Institutional Repository Upload

All completed and approved undergraduate research outputs shall be archived in the official Institutional Repository of Mabalacat City College for academic, archival, and quality assurance purposes.

The repository shall be hosted on the official MCC website or designated digital platform managed by the College.

Prior to repository upload, student-researchers shall accomplish and sign a Repository and Publication Agreement Form (*see Annex* ___), indicating:

- Consent for digital archiving;
- Permission level (open access, restricted access, or embargo subject to approval);
- Acknowledgment of intellectual property rights;
- Confirmation of originality and compliance with institutional policies.

Only research articles that are formally published in the officially registered journal of the respective Institute or the College shall be made publicly accessible through the MCC website.

Unpublished undergraduate manuscripts shall be archived for institutional record purposes but shall not be made publicly accessible without prior authorization.

College or Institute Colloquium

The Office of the Vice President for Research, Innovation, and Extension Services (OVPRIES) shall facilitate the Institutional Colloquium, in which the three to five best undergraduate research papers from each program will be selected for presentation. Participation in the colloquium is mandatory for all chosen students.

In cases where an individual institute conducts its own research colloquium, participation in the College-level colloquium is not mandatory, provided that the institute submits a program proposal for approval by the Vice President for Academic Affairs (VPAA). Regardless, all institutes are required to organize and execute their respective research colloquia.

Awards for Best Thesis, Best Oral Presenter, and other relevant recognitions shall be determined by the Research Committee after the final defense. The criteria and rubrics will be provided by the research committee in choosing their best awards. To promote active participation, the announcement of these distinctions shall be reserved for the Institutional Colloquium, thereby encouraging students to engage fully in the event. The decision of the research committee for these recognitions is final and irrevocable.

INSTITUTE OF TEACHER EDUCATION

Research Format and General Provisions

All undergraduate research outputs under the Institute of Teacher Education (ITE) shall adhere to the Chapter 1-5 format (Background of the study, Review of Related literature, Methodology, Results and Discussion, and Conclusion).

All citations within the manuscript and entries in the reference list must strictly conform to the American Psychological Association (APA) 7th Edition guidelines. Proper attribution of sources is mandatory to uphold academic integrity and avoid plagiarism.

Undergraduate research shall normally be conducted in groups consisting of three (3) to five (5) members, depending on the enrollment size and academic considerations of the program. Requests to conduct individual research shall be subject to the evaluation and approval of the Program Head and/or Dean. Approval shall be based on feasibility, academic merit, and the demonstrated capacity of the student to independently complete the research requirements.

CHAPTER 1

Background of the Study

Chapter 1 establishes the scholarly and contextual foundation of the research. It articulates the rationale for conducting the study and situates the research problem within existing academic discourse.

Introduction

The Introduction provides the contextual background of the study. It presents what is currently known about the topic, identifies existing gaps in the literature, and clearly articulates the purpose and direction of the research. This section must demonstrate the researchers' comprehensive understanding of the research problem, supported by empirical evidence, theoretical arguments, and findings from prior studies. The discussion should logically progress from general context to specific issues that justify the conduct of the present study.

Theoretical and/or Conceptual Framework

The selection of a theoretical or conceptual framework shall depend on the nature, design, and objectives of the study. Research intended to test, validate, apply, or extend existing theories shall employ a Theoretical Framework. In such cases, the theory or theories guiding the study must be thoroughly explained, including their relevance to the research variables and objectives.

For studies that are not directly theory-driven, a Conceptual Framework may be utilized. The conceptual framework shall present the key variables or constructs of the study, derived from the literature review, and illustrate the presumed relationships among them. Any framework diagram included must be clearly labeled and accompanied by a comprehensive explanation.

Statement of the Problem

The Statement of the Problem presents the general objective of the study, which must directly correspond to the research title. This is followed by specific research questions or objectives that are clear, logically sequenced, measurable (for quantitative research), or thematically aligned (for qualitative research). The objectives must be feasible in terms of available human, financial, material, and time resources.

Significance of the Study

This section discusses the potential contributions and practical implications of the research. The discussion shall follow a macro-to-micro progression, beginning with broader levels such as international and national significance, followed by local,

institutional, and individual stakeholder significance. The section must clearly articulate how the findings may contribute to theory, policy, practice, or future research.

Scope and Limitations

The Scope and Limitations define the boundaries of the study. This includes the research locale, respondents or participants, time frame of the study, variables considered, and methodological constraints. Limitations refer to factors beyond the researchers' control that may affect the findings or generalizability of results. These must be acknowledged transparently and objectively.

Definition of Terms

This section provides definitions of key terminologies used in the study. Definitions may be conceptual, describing the theoretical meaning of terms, or operational, explaining how the terms are specifically used or measured in the context of the study. Where instructed by the research adviser, operational definitions alone may be required.

CHAPTER 2

Review of Related Literature (RRL)

The Review of Related Literature and Studies (RRLS) provide a comprehensive synthesis of existing knowledge relevant to the research problem. It establishes the theoretical and empirical foundation of the study, identifies research gaps, and justifies the need for the present investigation.

Related Literature

Related literature refers to published and unpublished sources that discuss concepts, theories, frameworks, and general information relevant to the study but do not necessarily present original research findings. These include, but are not limited to, books, e-books, scholarly articles, website content, blogs, newspapers, and other non-empirical materials.

Related Studies

Related studies pertain to empirical research works that present original findings derived from systematic investigation. These include research articles, theses, dissertations, and undergraduate research manuscripts.

Related studies shall be categorized as follows:

- **Foreign Studies** – Studies conducted in international contexts.
- **Local Studies** – Studies conducted within the national or local setting.

The Review of Related Literature synthesizes scholarly works relevant to the research problem. Sources must include peer-reviewed journal articles, academic books, reputable electronic publications, and other credible scholarly materials. While literature from research article and other research study references may be included, priority shall be given to review articles (*e.g. meta-analyses, systematic review, correspondence, and other related papers)*.

Researchers are strongly encouraged to incorporate local studies to ensure contextual relevance and applicability of findings. For foreign studies, only recent publications—preferably within the last five (5) years—from reputable and recognized journals shall be utilized. The section shall culminate in a Literature Synthesis that integrates, compares, and critically evaluates the reviewed works. This synthesis must go beyond summary and demonstrate analytical insight and knowledge construction.

CHAPTER 3

Methodology

The Methodology chapter describes in detail how the study is conducted. It ensures transparency, methodological rigor, and replicability. The discussion must be sufficiently detailed to allow other researchers to understand and potentially replicate the procedures.

Research Design

The Research Design describes the overall strategy and structure of the study. It outlines the conditions under which data are collected and analyzed. The design may be quantitative, qualitative, or mixed methods. Quantitative designs may include but not limited to descriptive, correlational, survey, experimental, or quasi-experimental approaches. Qualitative designs may include but not limited to phenomenology, ethnography, grounded theory, case study, or narrative inquiry. The selected design must be justified in congruent to the research objectives.

Research Locale / Study Area

This section describes the setting where the study is conducted. Only relevant characteristics that have direct bearing on the research problem should be included. Where necessary, geographical or environmental features may be described, particularly if they influence the variables under investigation. If coordination is needed, the researchers may include the land area, coordination, or elevation of the study area if necessary or crucial for the research*. e.g. BSEd-Science program conducted experimental research in Sitio Haduan or other remote area*.

Subjects, Respondents, Participants, and Samples

Appropriate terminology shall be observed. The term “subjects” is generally used in experimental quantitative research. “Respondents” refers to individuals who answer structured questionnaires or surveys. “Participants” is used in qualitative research, where individuals actively engage in interviews or discussions. The term “sample” is used when referring to non-human specimens such as soil, water, or biological materials.

This section must also describe the sampling technique employed and justify its appropriateness. Sample size computation (e.g., Slovin’s formula, G*Power, Cochran) should be considered to make the study feasible. Also, Data saturation principle should be considered especially in qualitative design. This principle can be cited by the researchers if no new information, themes, or insights are emerging from additional interviews or observations.

Instruments and Research Procedures

A detailed description of the instruments used in the study shall be provided. This includes the development, adaptation, validation, and administration of questionnaires, interview guides, observation checklists, or tests. The validity and reliability of instruments must be established, such as through expert validation or reliability testing (e.g., Cronbach’s alpha). The acceptability threshold should be considered in this test (≥ 0.7). Furthermore, the research instrument shall undergo content validation and face validity assessment by at least two (2) to three (3) subject-matter experts whose academic credentials and professional experience are directly relevant to the research domain. If the research committee demanded to increase the number of validators, the chairperson has the final verdict.

In studies involving laboratory equipment, technological tools, or apparatus, the procedures for their use must be clearly explained. Where appropriate, this subsection may be titled Research Procedure.

Data Collection

This section outlines the step-by-step process of gathering data. It shall describe how permissions were obtained, how participants were informed, and how the instruments were administered. In experimental studies, this includes the formation of groups, experimental manipulations, and control mechanisms. Any procedural weaknesses encountered during data collection must be disclosed, along with their possible impact on results.

Data Analysis

Data analysis procedures must align with the research design. In quantitative research, statistical analyses may include descriptive statistics and inferential statistics. The specific statistical tools or software used (e.g., SPSS, GraphPad Prism, or equivalent statistical software) must be identified. The methods used to test hypotheses must be clearly explained. The level of significance set will be 0.05 confidence level (study can utilize 0.01 CL if the research committee granted).

In qualitative research, data analysis methods may follow established traditions such as phenomenological analysis (e.g., Colaizzi, Van Kaam, Giorgi), grounded theory (Strauss & Glaser), or case study analysis (Yin). In mixed-method studies, qualitative analysis may supplement quantitative findings in either explanatory or exploratory sequences. Applicable online tools or AI tools could be used in this analysis if needed. *E.g. Atlas.ti*

Ethical Considerations and AI Declaration

This section explains how ethical standards were upheld throughout the research process. Compliance with the Data Privacy Act of 2012 must be explicitly stated. Where applicable, ethical clearance from relevant authorities (e.g., institutional ethics board, NCIP clearance, or clearance for research involving vulnerable participants) must be secured prior to data collection.

The ethical handling, storage, and disposal of data including both digital and printed materials must be described. Confidentiality and informed consent procedures must be clearly stated. *See the Annex __ for informed consent and Annex ___ for Asset form.*

The final paragraph of this section shall contain an AI Declaration. Researchers must explicitly disclose any artificial intelligence (AI) tools used in drafting, generating figures, editing, formatting, or analyzing portions of the manuscript. The use of AI tools shall be limited to language enhancement, grammar checking, and formatting assistance only. AI tools shall not be used to generate research data, fabricate results, or produce unverified scholarly content.

Any AI-assisted text included in the manuscript must be critically reviewed, validated, and substantially edited by the researchers to ensure accuracy, originality, and intellectual ownership. The researchers shall remain fully accountable for the integrity and authenticity of the entire manuscript.

Failure to properly declare AI usage, or submission of plagiarized or AI-generated content without appropriate acknowledgment, shall constitute academic misconduct and may result in institutional sanctions, including failure during proposal defense or final defense.

CHAPTER 3

Results and Discussion

This chapter presents the findings of the study. Data shall be presented objectively and in past tense, as data collection has already been completed. Tables, figures, and graphs may be used where appropriate. Table captions shall be placed above the table, while figure captions shall be placed below the figure.

The Results section shall present findings without interpretation. Interpretation, analysis, and integration with the literature shall be presented in the Discussion section. The Discussion shall explain how the findings relate to the research questions, theoretical framework, and prior studies.

CHAPTER 4

Conclusion, Summary, and Recommendations

The Conclusion shall directly address the Statement of the Problem. Each conclusion must correspond to a specific research question, regardless of whether the findings support or reject the hypotheses. Conclusions must be concise, evidence-based, and free from new data.

The Summary provides a concise overview of the entire study, including the research problem, methodology, major findings, and encountered challenges.

The Recommendations shall be grounded in the study's findings and limitations. Researchers shall suggest practical applications of the results and propose directions for future research, particularly identifying variables or parameters not included in the present study but which may warrant further investigation.

INSTITUTE OF ARTS AND SCIENCES

Research Format and General Provisions

All undergraduate research outputs under the Institute of Arts and Sciences (IAS) shall adhere to the traditional chapter format (Introduction, Review of Related Literature, Methodology, Results and Discussion, and Conclusion).

All citations within the manuscript and entries in the reference list must strictly conform to the American Psychological Association (APA) 7th Edition guidelines for BS-Biology program, and Chicago style for AB-History program. Proper attribution of sources is mandatory to uphold academic integrity and avoid plagiarism.

Undergraduate research shall normally be conducted in groups consisting of two (2) to three (3) members, depending on the enrollment size and academic considerations of the program. Requests to conduct individual research shall be subject to the evaluation and approval of the Program Head and/or Dean. Approval shall be based on feasibility, academic merit, and the demonstrated capacity of the student to independently complete the research requirements.

Bachelor of Arts in History

Historical Research Defined

Historical research is the systematic and objective identification, evaluation, and synthesis of evidence to establish facts and draw conclusions about past events (Riello, 2009). It involves critical inquiry into previous periods to reconstruct an accurate representation of the past (Howell & Prevenier, 2001). The research emphasizes time as the main variable and seeks to identify how specific phenomena occurred within a temporally defined context (Shafer, 1974; Grassby, 2005).

Common methodological characteristics of historical research include (Grassby, 2005; Dannehl, 2009; Riello, 2009):

1. Reviewing primary and secondary sources;
2. Identifying a research topic examining past events;
3. Systematic collection and objective evaluation of historical data, applying techniques of criticism;
4. Synthesizing and interpreting findings using theoretical frameworks to explain historical causes, effects, or trends.

Historical research provides understanding of past events and informs both contemporary insights and future strategies.

Purpose of Historical Research

Historical research serves multiple purposes:

1. **Understanding Human Accomplishments** – By identifying achievements of humanity, researchers reveal human potential and societal identity.
2. **Explaining the Present** – Current experiences and social phenomena are often rooted in historical events; research illuminates these causes.
3. **Guiding the Future** – While the future cannot be fully predicted, historical research provides lessons to avoid past mistakes and replicate successful strategies.

Characteristics of Historical Research

1. **Analytical Nature** – Historical research interprets rather than merely collects data.
2. **Variety of Focus** – It may examine events, movements, concepts, or individual contributions.
3. **Documentation of Achievements** – Evaluates accomplishments of people, institutions, or agencies.
4. **Use of Existing Data** – Research is based on discovered evidence, not data creation.
5. **Narrative Flow** – Research reports are dynamic narratives capturing events, ideas, and personalities.
6. **Integrated Process** – Data collection, reading, and writing occur simultaneously rather than sequentially.

Approaches to Historical Research

a. **Qualitative Approach** – Reconstructs narratives from written or printed evidence; organized chronologically or thematically. Examples: biographies, letters, diaries, archival records.

b. **Quantitative Approach** – Uses numerical data for historical interpretation. Examples: census records, economic data, survey results.

c. **Content Analysis** – Examines textual materials systematically, combining qualitative and quantitative aspects. Useful for analyzing constructs like race, caste, or gender.

d. **Oral History** – Focuses on **living memory**, collecting firsthand accounts through interviews. Often complements qualitative and quantitative approaches.

These approaches can be integrated depending on research questions, topic, and period under study. Historical studies may be descriptive or explanatory.

Scientific Nature of Historical Research

Historical research is conducted objectively, minimizing bias, distortion, or prejudice. Though non-empirical, it qualifies as scientific because it applies systematic evaluation and synthesis of evidence to draw conclusions. Researchers in other fields also rely on historical methods for literature review, theory evaluation, and empirical contextualization.

2. The Writing Process

The research writing process involves the following steps:

1. **Identify a Topic and Define the Problem**
    - Choose a research theme from fields such as Political, Economic, Social, Cultural, Military, Local, Institutional, or Religious History.
    - Scope the study using Gottschalk's four guiding questions:
        - Where did the events take place?
        - Who were the persons involved?
        - When did the events occur?
        - What kinds of human activities were involved?
2. **Search for Sources of Data**
    - **Primary Sources (PS)** – Eyewitness accounts, documents produced contemporaneously with events, artifacts, official records, letters, diaries.
    - **Secondary Sources (SS)** – Interpretations or descriptions from other historians or publications, textbooks, biographies, encyclopedias.
3. **Evaluate Historical Sources**
    - **External Criticism** – Verify authenticity of sources (e.g., handwriting, ink, paper, dating, originality).
    - **Internal Criticism** – Assess accuracy, reliability, and meaning of content.
4. **Organize, Analyze, and Interpret Data**
    - Use **note cards and bibliography cards** for systematic organization.
    - Quantitative data should be evaluated for relevance and reliability.
    - Interpret findings cautiously, considering motives, context, and potential biases.
    - Incorporate concepts from social sciences (sociology, psychology, anthropology, management) to deepen analysis.

5. **Writing the Research Report**
    - Reports may be organized by:

1. Research questions
2. Chronological periods
3. Themes/topics
4. Locations
5. Key historical figures

    - Avoid common weaknesses such as:
        - Overly broad or unsupported problems
        - Reliance on secondary sources only
        - Biased interpretations or unfounded causal claims
        - Poor logic, analogies, or unsupported generalizations

6. **Criteria for Evaluating Historical Research**

Criterion	Guiding Questions
Problem	Clearly defined, researchable, and within investigator competence
Data	Primary sources sufficient, appropriate use of secondary sources
Analysis	Data relevance and dependability evaluated objectively
Interpretation	Hypotheses plausible, tested, and historically grounded
Presentation	Coherent structure, clarity, and scholarly tone maintained

Three Parts of Historical Research

I. The Introduction

The Introduction serves as the foundation of the historical research, where the main problem of the study is articulated and the gap in the body of historical knowledge is identified. This gap forms the core of the investigation, and its careful elaboration confirms the feasibility of the chosen topic. Within the Introduction, the researcher presents the Background of the Study, the Statement of the Problem, the Significance of the Study, the Scope and Limitations, the Review of Related Literature, the Research Methodology, the Theoretical Framework, and the Research Outline.

The *Background of the Study* provides the historical context of the topic, situating it within relevant events and circumstances. Researchers may begin with immediate events that led to the topic, broader historical contexts, or widely accepted interpretations of events that the study examines. This section not only contextualizes the research but also demonstrates the existence of a gap in historical knowledge that the study intends to address.

In the *Statement of the Problem*, the main research problem is articulated clearly and specifically, along with the sub-questions that guide the investigation. These sub-questions are structured so that their collective answers provide a comprehensive response to the overarching problem. The Significance of the Study highlights the purpose and value of the research, explaining why it is undertaken and what contributions it is expected to make to historical scholarship and society.

The *Scope and Limitations* section defines the boundaries of the study, specifying which aspects of the historical events will be discussed, the perspectives applied, and which elements are deliberately excluded to avoid misunderstanding. The Review of Related Literature surveys both primary and secondary sources, examining prior studies that relate to the research topic, and identifies gaps that the current study addresses.

The *Research Methodology* explains the procedures employed, emphasizing the historical nature of the study, which is descriptive, narrative, and analytical. Researchers may also describe the use of oral history or other supplementary approaches to enrich their data. The Theoretical Framework outlines the conceptual lens applied in analyzing and interpreting the evidence, demonstrating how theory informs the research process. The Research Outline provides a preview of the chapter structure, summarizing the expected content and showing how each sub-question will be addressed.

II. The Body of the Research

The Body constitutes the main portion of the manuscript, where the researcher presents findings in a descriptive-narrative manner. Each chapter typically corresponds to a sub-question derived from the main problem, with data presented alongside interpretation. Historical research emphasizes the integration of narrative and analysis, and the number of chapters reflects the complexity and number of sub-questions.

Within the Body, the researcher synthesizes information drawn from various sources and interprets it according to the chosen framework. This ensures that the research addresses the problem identified in the Introduction. Analysis can be interwoven with the narrative or presented at the end of each chapter, provided that the descriptive-analytic approach is maintained throughout.

III. The Synthesis of the Study

The Synthesis summarizes the findings and provides the researcher's final interpretation, answering the main research problem. It represents the culmination of the study, integrating the results from all chapters to address the identified gap in historical knowledge. The Synthesis demonstrates the researcher's critical reasoning and ability to make sense of historical evidence within the chosen theoretical framework.

Chicago Style Formatting Guidelines

The manual follows the Chicago Manual of Style, 16th edition, and Turabian's *A Manual for Writers*, 8th edition. Direct quotes of four lines or fewer should be enclosed in double quotation marks and integrated into the sentence with a footnote, endnote, or parenthetical citation. Longer quotations should be formatted as block quotes, indented 0.5 inches, single-spaced, and separated from the text by blank lines.

Two citation styles are recognized: the Notes-Bibliography Style, commonly used in humanities, which employs footnotes or endnotes, and the Author-Date Style, suitable for natural and social sciences, which uses parenthetical citations and a reference list. Footnotes and endnotes include the author, title, publication details, and page numbers, and repeated citations may be shortened. All sources are listed in the bibliography, with authors presented in standard order, and essential publication details separated by periods. Digital sources should include a DOI or URL where applicable.

Bachelor of Science in Biology

Scientific Research

Science is the systematic process of gathering, comparing, and evaluating proposed models against observable phenomena. These models may take the form of simulations, mathematical formulas, chemical equations, or structured procedures. Research, as defined by Merriam-Webster, is a careful and methodical study conducted to generate and report new knowledge. Across disciplines, research follows a structured process aimed at producing new insights, which can take the form of exploratory research, constructive research, or empirical research. Exploratory research identifies and defines new problems, constructive research develops solutions, and empirical research tests the feasibility of these solutions using evidence-based methods.

Scientific research is a critical investigation aimed at discovering and interpreting facts. It employs the scientific method, a rigorous approach to evaluating natural patterns and phenomena and testing potential causal relationships. The method generally involves:

- **Observation**, where a question or problem is identified.
- **Hypothesis formulation and prediction**, proposing a potential solution or explanation.
- **Experimental testing**, where the hypothesis is evaluated through controlled procedures.
- **Data evaluation**, comparing new findings with previously published studies.
- **Dissemination**, sharing results through presentations, publications, or other formal communication channels.

It is important to note that any single study does not definitively prove or disprove a hypothesis. Instead, results are interpreted as either supporting or not supporting the proposed hypothesis, emphasizing the iterative nature of scientific inquiry.

Key Components of a Scientific Manuscript

A well-prepared scientific manuscript should address three essential aspects (Percival et al., 2015):

1. *The overall idea* – the conceptual framework and rationale for the study.
2. *Execution* – the methodological rigor and reliability of procedures.
3. *Presentation* – clear, coherent, and accurate reporting of findings.

Characteristics of Good Scientific Research

Quality research is distinguished by several core characteristics:

- *Reliability* – the consistency of results when repeated under similar conditions.
- *Validity* – the strength and applicability of conclusions drawn from the study.
- *Accuracy* – proper alignment between research tools, procedures, and objectives.
- *Credibility* – use of the best sources and adherence to established protocols.
- *Empirical basis* – grounded in observation and experimentation.
- *Systematic approach* – follows a logical, sequential procedure.
- *Controlled variables* – all non-tested variables are maintained constant.
- *Hypothesis-driven* – guides the investigation and analysis.
- *Analytical rigor* – critical evaluation of data to avoid misinterpretation.
- *Objectivity and logic* – conclusions are based on evidence, free from bias.
- *Quantitative and statistical methods* – data are measurable and analyzed to enhance reliability.

Research Themes in Biological Sciences

Scientific research within the biological sciences spans a wide range of areas, including:

- Pharmacology and drug development
- Environmental analysis and pollution control
- Ethnobotany and traditional medicine
- Nutrition and food production
- Renewable and non-conventional energy sources
- Process technology and biotechnology
- Microbiology and cellular biology
- Natural pesticides and insecticides
- Agricultural productivity and sustainability
- Health sciences and medical research
- Waste management and toxicology

- Biophysics and molecular biology
- Biodiversity and conservation
- Natural products research
- Regionally significant studies, such as Balakat tree-related research, CHEd Agenda (e.g. ACHIEVE)

I. Title

The title of a scientific research paper serves as the first point of communication with the reader and must succinctly reflect the content and focus of the study. It should be concise, clear, and specific, avoiding unnecessary words or ambiguity. A well-crafted title enables readers to understand the essence of the research without needing to read the full manuscript.

Key considerations for an effective scientific title include:

1. **Brevity and clarity** – Use the fewest words necessary to convey the study's focus while maintaining precision.
2. **Descriptive content** – Include terms that directly relate to the variables, phenomena, or systems investigated.
3. **Self-explanatory** – The title should stand alone, providing a clear indication of the scope, methodology, or main outcome of the research.
4. **Avoidance of non-informative phrasing** – Phrases like "A Study of…" or "Investigation on…" should be replaced with more precise, informative descriptors.
5. **Relevance to the discipline** – Use terminology familiar to specialists in the field to ensure immediate comprehension and context.

For example, instead of titling a paper **"***A Study on Plant Growth***,"** a more informative and precise title would be **"***Effect of Nitrogen Concentration on the Growth Rate and Chlorophyll Content of Phaseolus vulgaris L.***"** This approach immediately informs the reader about the subject, independent variable, and measurable outcomes, aligning with the expectations of scientific rigor and clarity.

A well-crafted title not only conveys the topic of the research but also communicates the key experimental elements, variables, and, if possible, the main result.

Consider the following illustration:

Poor Title:
Mouse Behavior

*Why it is insufficient***:** This title is overly broad and nonspecific. It could refer to any aspect of mouse activity, offering little guidance to the reader about the focus or scope of the study.

Better Title:
Assessment of Varying Levels of Estrogen on the Nose-Twitch Courtship Behavior in ICR Mice (Mus musculus L.)

*Why it is effective***:** This title specifies the experimental manipulation (varying levels of estrogen), the precise behavior under observation (nose-twitch courtship behavior), and the experimental organism (ICR mice, *Mus musculus* L.). The inclusion of these key elements immediately informs the reader of the subject, experimental variable, and target organism, ensuring clarity and precision.

Formatting Note: Scientific names are always italicized. Only the genus name begins with an uppercase letter, while the species name remains lowercase. Parentheses are used to enclose the taxonomic authority (e.g., *L.* for Linnaeus). Bold formatting is not used for scientific names in the title.

*Additional Tip***:** Whenever feasible, include the main finding or outcome in the title to make it more informative and compelling, as this allows readers to quickly grasp the significance of the study.

II. Abstract

The abstract is a concise summary of the research, typically between 150–250 words, that provides the reader with a clear overview of the study's purpose, methodology, results, and significance. It functions as a stand-alone section, allowing readers to quickly determine the relevance of the research without reading the entire manuscript. For clarity and completeness, it is generally recommended to write the abstract after completing the full manuscript, as it summarizes all main sections in a condensed form.

A well-written abstract should clearly address the following elements:

1. *Research Problem or Knowledge Gap* – Identify the broad problem or gap in existing knowledge that the study addresses.
2. *Purpose of the Study* – State the specific objective(s) of the research in relation to the identified knowledge gap.
3. *Hypothesis or Research Question* – Clearly present the hypothesis or hypotheses being tested, or the research question guiding the study.

4. *Methodology* – Briefly describe the overall approach, design, or experimental strategy employed to address the hypothesis or research question.
5. *Results* – Summarize the key findings of the study, emphasizing outcomes that are central to the research problem.
6. *Implications* – Highlight the broader significance, contribution to the field, promising results, or practical applications of the results.

The abstract must be written in complete sentences, generally in past tense, with concise and precise language. Active voice is preferred, but passive voice may be necessary when describing experiments or results. The abstract must not include:

- Lengthy background information or contextual discussion
- Citations or references to other literature
- Elliptical or incomplete sentences (e.g., ending with "…")
- Unfamiliar abbreviations or specialized terms that may be unclear to a general reader
- Figures, tables, or references to visual elements

*Keywords***:** At the end of the abstract, include 3–6 keywords that represent the main concepts, methodology, or subject of the study. These keywords aid in indexing, searching, and categorizing the research in databases and institutional repositories. The keywords should be ordered alphabetically.

Example of Keywords: *Courtship behavior, estrogen, hormone dosing, ICR mice,*

III. Introduction

The Introduction provides the broader scientific context of the research, often referred to as the "big picture." It establishes the theoretical and empirical foundation of the study, identifies the specific hypotheses or research questions, and briefly outlines the methodological rationale for testing them. A well-written introduction moves logically from general to specific information, presenting a clear argument that the research problem is significant and that the proposed approach is scientifically sound.

As Chapter 1 of the manuscript, the Introduction must clearly state the purpose of the investigation and explain why the study was undertaken. It should demonstrate both intellectual merit and practical relevance. The Introduction typically consists of the following components:

- Background of the Study
- Statement of the Problem
- Hypothesis (if applicable/falsifiable)
- Significance of the Study
- Scope and Delimitations
- Definition of Terms

A. Background of the Study

The Background situates the research within the broader scientific landscape. It begins by describing the general question, problem, or knowledge gap and explaining why it is important to address. The discussion should present the current state of knowledge, drawing from relevant scientific literature, and clearly identify what remains unknown or insufficiently understood.

The presentation should follow a funnel structure: first discussing the broader theory or problem, then narrowing down to the specific organism, system, process, or context under investigation. All background information must be properly referenced using the prescribed citation style.

B. Statement of the Problem

The Statement of the Problem clearly articulates the research question(s) the study seeks to answer. These questions must be measurable and answerable through the experimental procedures described in the methodology. The main problem may be broken down into specific sub-questions that guide the investigation.

Clarity and precision are essential. Each question should directly correspond to variables that can be observed, measured, or experimentally tested.

C. Hypothesis

When applicable, the Introduction must state the hypothesis or hypotheses guiding the study. A hypothesis is a testable prediction derived from theory or prior research. It should establish a clear relationship between independent and dependent variables and be framed in a manner that allows empirical testing.

In experimental research, both the null hypothesis and alternative hypothesis may be explicitly stated.

D. Significance of the Study

This section explains the importance of the research and identifies who may benefit from its findings. The significance may include:

- Contribution to scientific knowledge
- Practical applications in industry, medicine, agriculture, or environmental management
- Policy implications
- Local or regional relevance

The societal, academic, or disciplinary value of the study must be clearly articulated.

E. Scope and Delimitations of the Study

The Scope defines the coverage and boundaries of the research, including variables, population or sample, timeframe, and methodological constraints. Delimitations refer to intentional boundaries set by the researcher, clarifying what is excluded from the study.

This section prevents misinterpretation and establishes realistic expectations for the findings.

F. Definition of Terms

Key technical terms, operational definitions, and specialized terminology used in the study must be clearly defined. Definitions should reflect how the terms are specifically used within the context of the research, particularly when measurement or interpretation depends on precise meaning.

Guidelines in Refining the Topic for Scientific Research

When developing and refining a scientific topic, the researcher must ensure conceptual clarity and methodological feasibility. The following principles should guide topic refinement:

First, clearly describe the general problem or theoretical gap and explain its importance. Second, review and synthesize previous studies to establish the current state of knowledge and identify what remains unresolved. This literature-based grounding ensures that the research is not redundant and contributes new understanding.

If the investigation focuses on a specific biological entity (e.g., an organ, species, or ecosystem), sufficient background must be provided to justify its relevance. However, if the study examines a broader biological process—such as transcription in eukaryotes, oogenesis, or behavioral ecology—the chosen model system must be clearly justified.

For example, traditional model organisms such as *Drosophila melanogaster* or *Saccharomyces cerevisiae* may be selected due to established genetic or experimental advantages. Alternatively, non-traditional models (e.g., avian species or deciduous trees) may be justified based on ecological or regional significance. When a model system has been used in similar research, proper citation of supporting studies is required.

The Introduction must also briefly describe the general methodological strategy and explain how the investigation will clarify, expand, or challenge existing knowledge. One essential function of the Introduction is to inform the reader of what to expect in the remainder of the manuscript.

Finally, the purpose and importance of the study must be unmistakably clear, along with the intended beneficiaries of the research.

IV. Review of Related Literature

The Review of Related Literature (RRL) presents a comprehensive and critical examination of scholarly works relevant to the research topic. This chapter situates the study within the existing body of knowledge and establishes its academic and scientific foundation. Sources may include books, peer-reviewed journals, conference proceedings, previous theses and dissertations (published or unpublished), periodicals, review articles, and credible electronic databases.

The primary purpose of this section is to demonstrate what has already been studied, where the studies were conducted, and how previous findings relate to the present investigation. It should identify similarities and differences between prior research and the current study, including related species, populations, systems, or processes that support or contextualize the research problem. More importantly, the Review must clearly establish what remains unresolved or insufficiently explored, thereby justifying the necessity of the present study.

This chapter generally consists of two major components: Related Literature and Related Studies.

Related Literature refers to conceptual, theoretical, and descriptive works drawn from books, scholarly articles, and review publications. These sources provide theoretical frameworks, definitions, models, and foundational principles that underpin the study.

Related Studies refer to empirical investigations directly related to the research problem. These are commonly drawn from peer-reviewed journals and are typically categorized into:

- *Foreign Studies* – Internationally published research conducted outside the country; and
- *Local Studies* – Research conducted within the country, including published journal articles and, when appropriate, unpublished theses or institutional studies.

The literature review should be organized logically, preferably in relation to the context of the research problems.

It is essential that all cited works be properly paraphrased and synthesized. Direct copying of text is strictly prohibited and constitutes plagiarism. The Review should not merely summarize individual studies but must synthesize them by identifying patterns, agreements, contradictions, methodological trends, and existing research gaps.

A *literature synthesis* must be included at the end of the chapter. This synthesis integrates the reviewed materials and explicitly highlights:

- Established findings in the field;
- Methodological strengths or limitations of previous studies;
- Conceptual or empirical gaps that remain unaddressed; and
- How the present study intends to fill these identified gaps.

The Review of Related Literature should ultimately demonstrate scholarly rigor, critical thinking, and a clear justification for undertaking the proposed research.

V. Methodology

The Methodology section, also referred to as Methods or Materials and Methods, provides a clear and systematic description of how the research was conducted. This chapter ensures transparency, reproducibility, and scientific rigor by detailing the procedures, materials, and analytical approaches employed in the study. It typically includes the research design, study area, treatment groups (for experimental research), research materials, research procedures, data collection methods, statistical analysis, ethical considerations, AI declaration (if applicable), and other relevant methodological components. To ensure coherence and logical progression, the sequence of topics presented in this chapter should be directly aligned with the Statement of the Problems. Each

methodological component must correspond to a specific research question or objective, thereby establishing a smooth and systematic flow of discussion.

Research Design

The Research Design introduces the overall structure of the investigation and specifies whether the study is descriptive or experimental in nature. For experimental studies, the design (e.g., Completely Randomized Design, Randomized Complete Block Design, factorial design) must be clearly identified and described. The rationale for selecting the design should also be briefly explained.

For both descriptive and experimental research, the groups, treatments, or variables under investigation must be clearly presented. In experimental studies, treatment groups are often summarized in tabular form to enhance clarity, including descriptions of control and experimental groups. Students are expected to apply foundational knowledge in research design and statistical methods acquired in earlier coursework.

Study Area (if applicable)

For field-based or ecological research, the Study Area must be described in terms of geographic location, environmental conditions, climate, and other relevant contextual factors. Coordinates, maps, or institutional affiliations may be included where appropriate.

Research Materials

This subsection identifies the materials and instruments used in the study. These may include laboratory equipment, experimental organisms (e.g., plants, animals, microorganisms), chemicals, reagents, survey instruments, questionnaires, software tools, or measuring devices. The description should be sufficiently detailed to allow replication but should avoid listing materials in a procedural or instructional manner.

Research Procedures

The Research Procedures describe the methodological steps or bioassays undertaken to collect data. This section must be written in a concise, objective, and past-tense narrative form. The description should focus on the experimental design and methodological strategy rather than on step-by-step instructions.

The Methods section must not resemble a laboratory manual. It should not provide instructional commands, stated the materials, or narrate actions as personal experiences. Instead, it should present procedures in a formal scientific tone.

For example, an inappropriate format would be:

“For this experiment you will need six petri plates, one liter of agar, and one inoculating loop. First, pour agar into the six petri plates, then inoculate the plates with a fungus using the inoculating loop. Then place the plates into the incubator.”

An acceptable scientific format would be:

“Six petri plates were prepared with agar, inoculated using a sterile inoculating loop, and incubated at 37°C for 10 hours.”

Standardized protocols must be strictly followed to ensure reliability and validity of the data. If established methods from prior studies are adopted or modified, proper citation must be provided. Any modifications to standard procedures should be clearly described and justified.

If the conduction requires certain clearance, the students and adviser should secure the document prior to conduction.

Data Collection and Statistical Analysis

The methodology must specify how data were collected, measured, and recorded. Variables should be clearly identified as independent, dependent, or controlled variables.

The statistical methods used for data analysis must be explicitly stated. This may include descriptive statistics (mean, standard deviation, frequency distribution) and inferential tests (e.g., t-test, ANOVA, regression analysis, chi-square test). The level of significance (e.g., $\alpha = 0.05$) and statistical software utilized should also be indicated.

The statistical approach must align with the research design and objectives, ensuring that conclusions are scientifically supported.

Ethical Considerations

If the research involves human participants, animals, or environmentally sensitive areas, ethical approval must be secured from the appropriate Institutional Review Board (IRB) or ethics committee prior to data collection to ensure compliance with established ethical standards. The methodology section should briefly indicate adherence to relevant protocols, such as informed consent procedures, confidentiality and data privacy measures, animal welfare guidelines, and applicable biosafety or environmental regulations. In cases where ethical clearance is not available within the college, students may obtain approval from a recognized third-party or accredited institution, provided that proper documentation is secured before the conduct of the study.

AI Declaration (if applicable)

If artificial intelligence tools were used in data analysis, language editing, simulation modeling, creation of diagram/figure, or other aspects of the research process,

a clear declaration must be included specifying the extent and nature of AI assistance. AI tools must not replace intellectual contributions of the researcher and must comply with institutional academic integrity policies.

V. RESULTS AND DISCUSSION

This chapter presents the findings of the study and provides their corresponding interpretations in a clear, logical, and integrated manner. The Results and Discussion are written as a unified section, wherein the presentation of data is immediately followed by its analysis and interpretation, supported by related literature and previous studies cited in Chapter II.

The Results portion aims to describe the analytical findings concisely and objectively, supported by appropriate statistical information, tables, and figures. Data must be presented in summarized form using tables and/or graphical representations, with each table provided with a header placed above it and each figure accompanied by a caption below it. Text should always precede the presentation of tables and figures on a page, and each group of tables or figures must be introduced in a separate paragraph highlighting overall trends, patterns, and data points of particular importance. The placement of a specific table or figure should be clearly indicated within the text (e.g., “Figure 1 shows…”).

For experimental studies, essential statistical details must be reported, including the number of samples (n), measures of central tendency (mean, median, or mode), and measures of variability or dispersion (SD or SEM). The specific statistical tests used (e.g., one-way ANOVA, t-test) must be identified, and exact statistical values such as p-values should be indicated. Results should be stated using simple, declarative sentences describing what the analysis revealed. Statistical information must only be reported once to avoid redundancy; the same data should not be repeated in both text and table, or in both table and figure. Likewise, raw or unreduced data should not be included. The format chosen (table or figure) should be the one that most clearly communicates the analyzed data.

The text in this section should guide the reader toward understanding the general trends illustrated by the tables and figures rather than describing every individual data point. For example, instead of listing all numerical values, the researcher may state: “The number of bacterial colonies increased up to 40°C but decreased at higher temperatures (Figure 1). The greatest growth was observed between 35°C and 40°C.” Such statements emphasize relationships and patterns rather than mere repetition of numerical values.

Immediately after presenting the results for each variable, the Discussion must interpret these findings in relation to the research questions or hypotheses. The researcher should restate the main findings in clear, plain language and indicate whether the results support or refute the hypotheses. The findings must then be compared with previous studies

to determine whether they are consistent with established knowledge or whether discrepancies exist. If the results align with earlier studies, they may suggest a broader principle beyond the limited conditions of the experiment. If inconsistencies arise, plausible explanations must be proposed, avoiding the simplistic attribution of unexpected results to human error.

The discussion should also generate alternative explanations where appropriate, identify limitations or methodological shortcomings, and suggest how these limitations may be addressed in future investigations. Any newly emerging questions or contradictions uncovered by the results must be acknowledged. Since hypotheses are tested under specific and limited conditions often involving a single species or experimental context generalizations should be made cautiously. Conclusions must be drawn strictly within the scope of the study and then related to the broader body of research. If conflicting findings with previous studies are identified, a reasoned explanation for these differences must be provided.

Overall, Chapter IV integrates numerical findings with scholarly interpretation. It presents analyzed data clearly and interprets them thoughtfully using supporting literature, thereby demonstrating how the study contributes to existing knowledge and indicating possible directions for future research.

Example #1: Descriptive Figure

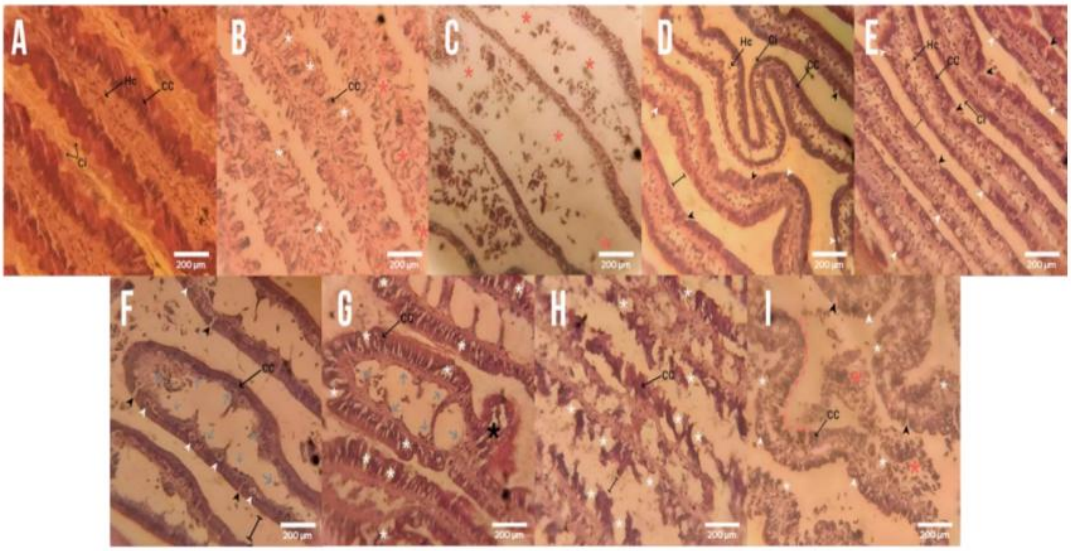


Figure-1: Histology of the gills of *P. canaliculata* subjected to different treatments (A-I) observed after 12-48 hours. (A) negative control (T-); (B) Positive control, 12hrs(T+); (C) Positive control, 24hrs (T+); (D) 200 mg/L ELEMC (T1); (E) 400 mg/L ELEMC (T2); (F) 600 mg/L ELEMC (T3); (G) 800 mg/L ELEMC (T4); (H) 1000 mg/L ELEMC, 36hrs (T5); (I) 1000 mg/L ELEMC, 48hrs (T5).*Ci=cilia; CC=columnar cells; Hc=hemocytes.* White asterisk=severe degeneration of CC; Red asterisk=disintegration of tissue; Gray arrow=dilated hemolymph space; Black arrow head=split; Red dashed line=wavy-like folding of gill filament; Measure line icon=larger gap in the interlamellar space. H&E. HPO 800x. Note: The black spots visible in the figure are artefacts.

Example #2: Descriptive stats table

Table 2. Mean body weight of rats in different treatment groups over a 2-week observation period

Treatment		Week 0 (g)	Week 1 (g)	Week 2 (g)
Symbol	Name			
T-	Negative control	154.0±8	154.0±9	153.7±8
T+	Positive control	192.3±12	171±5	151.3±4*
T1	400 mg/kg ZTELE	186.0±11	160.7±5	145.7±9*
T2	800 mg/kg ZTELE	172.3±16	151±11	143.0±3*

* Significant difference between Weeks 0 and Week 2 ($p<0.05$)

Example #3: Graphical Figure

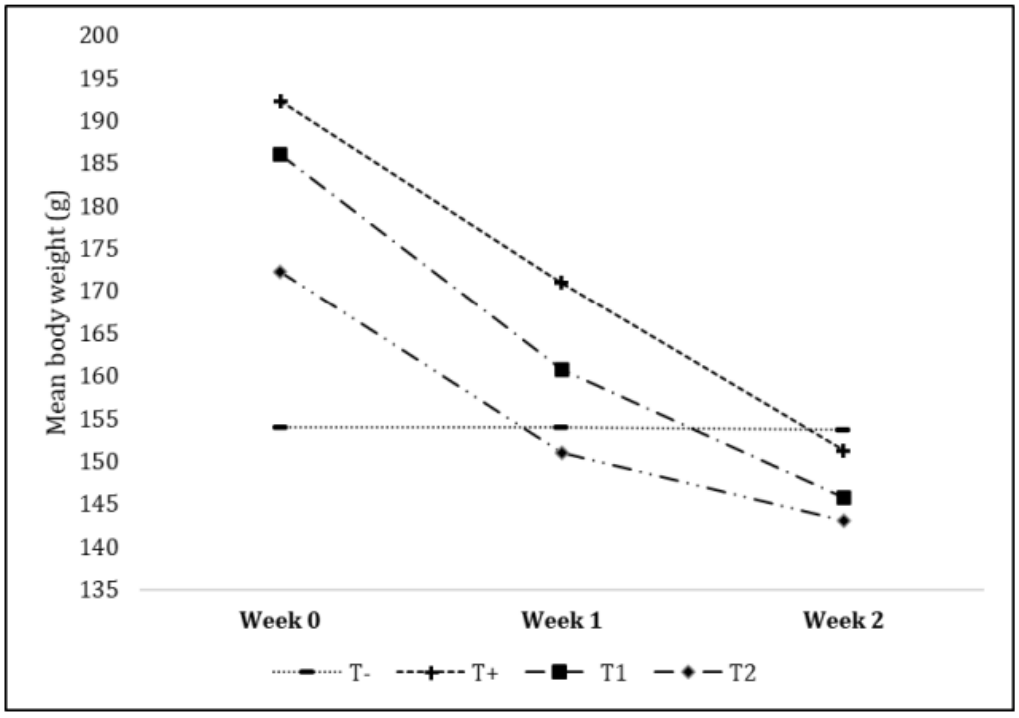


Figure 1. Line graph showing the mean body weight (± SD) of albino rats treated with different treatments.

Example #4: Inferential-graph Figure

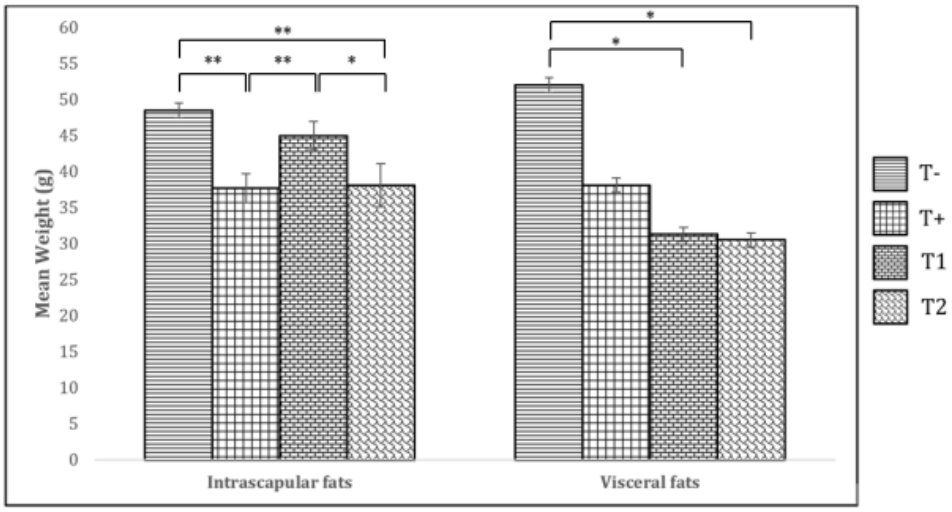


Figure 2. Bar graph showing the mean intrascapular and visceral fat weight (± SD) of albino rats in different treatments.
*- p≤0.05 to 0.01, ** - 0.01≤ p > 0.001, *** - p ≤0.001

Note: Tables and graphs must be presented in a simple and professional format using only black and white. Avoid the use of colors, shading, or decorative elements that may cause issues during printing or journal publication. Use clear borders, readable fonts, and consistent formatting throughout. For graphical presentations, use standard patterns (e.g., solid, dashed, or dotted lines) or distinct markers instead of colors to differentiate groups.

For descriptive figures, all images representing the treatment groups should be collated into a single composite figure whenever appropriate. Each image within the composite must be clearly and properly labeled (e.g., Figure 2A, Figure 2B, Figure 2C) to allow accurate citation and discussion within the chapter. Proper labeling ensures clarity, organization, and ease of reference when interpreting and discussing the results.

VI. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The Summary provides a concise overview of the entire study, usually written in one to two pages. It briefly presents the background of the study, objectives, methodology, and major findings in a clear and direct manner. The summary should synthesize the essential parts of the research without presenting detailed explanations or numerical data.

It serves as a comprehensive yet compact narrative of what was done, how it was conducted, and what was discovered.

Conclusions

The Conclusions section restates the major findings of the study in a brief and coherent manner. It highlights the most significant and promising results, as well as the focal observations generated by the research. This section must align directly with the Statement of the Problem presented in Chapter I, ensuring that each research question is clearly answered based on the study's findings.

There is no need to restate whether the hypotheses were accepted or rejected, as this has already been addressed in the Results and Discussion section. Instead, the focus should be on presenting the overall insights derived from the findings and their contribution to the field of study.

Recommendations

The Recommendations section outlines practical suggestions, proposed actions, and directions for future research based on the findings and limitations of the study. It may include improvements in methodology, additional variables to explore, alternative experimental designs, or broader applications of the results.

This section should identify aspects that were not undertaken due to time, resource, or methodological constraints and propose how these may be addressed in subsequent studies. Recommendations must be realistic, research-based, and directly connected to the conclusions drawn from the study.

VII. BIBLIOGRAPHY

The Bibliography (or References section) lists all sources cited in the manuscript, including books, scholarly journals (published or unpublished), periodicals, and credible website sources.

All references must follow the format prescribed by the American Psychological Association using APA 7th edition guidelines. Entries should be arranged alphabetically by the surname of the first author and formatted consistently according to APA standards for in-text citations and reference listings. Include all the DOIs each reference.

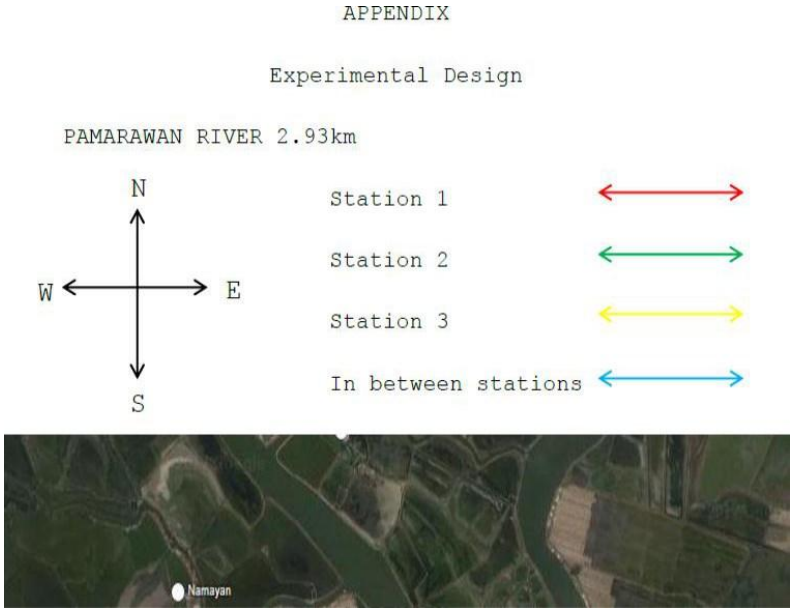
VIII. APPENDICES

The Appendices contain supplementary materials that support the study but are too detailed to be included in the main body of the manuscript. These include:

- Raw numerical data
- Statistical analysis outputs (e.g., ANOVA tables)
- Additional data tables
- Maps (if applicable)
- Certifications and ethical clearances
- Letters of permission
- Official receipts or supporting documents

All appendix materials must be properly labeled with appropriate headers (e.g., Appendix A, Appendix B) and arranged in logical order based on their sequence of use or mention in the study.

Example #1:



IX. PLATES

The Plates section presents the pictorial documentation that supports and validates the conduct of the study. These photographs provide visual evidence of important procedures, materials, experimental setups, field activities, treatment applications, data collection processes, and other relevant stages of the research.

Each plate must be clearly labeled (e.g., Plate 1, Plate 2) and accompanied by a brief caption written in the present tense. The caption should concisely describe what is shown in the image without being overly detailed. For example:

- *Plate 1. Preparation of the experimental setup for treatment administration.*
- *Plate 2. Measurement of leaf extract dosage using a digital weighing scale.*

All images should be clear, properly arranged, and relevant to the study. The formatting must be consistent throughout, and only necessary and appropriate photographs should be included to maintain professionalism and clarity in presentation.

CITING LITERATURE IN THE TEXT OF A SCIENTIFIC PAPER

Whenever information is presented that is not common knowledge or was not obtained directly through the researcher's own experiments or observations, a reference must be included to indicate the source. Proper citation not only gives credit to the original authors but also avoids plagiarism, which is a serious academic violation.

Scientific papers usually do not use footnotes for citations. Instead, in-text citations are incorporated into the text itself. The format depends on the number of authors of the source:

1. Single-author publication:

- Example within a sentence: *"Most of the information in this guide on how to write a scientific research report originally appeared in Gubanich (1985)."*
- Example at the end of a sentence: *"Purple flowers are often pollinated by yellow-tailed bats at higher latitudes (Martinez, 2001)."*

2. Two-author publication:

- Example within a sentence: *"Johnston and Peters (2014) also showed that pigs sometimes vomit after eating pickled yams."*
- Example at the end of a sentence: *"Some birds are primarily insectivorous and probably obtain all the water they need from the body fluids of the insects they eat (Jones & Smith, 1963)."*

Use the in-sentence format sparingly; the focus should remain on the information rather than the authors.

3. Three or more authors:

- Cite only the first author followed by *et al.* (Latin for "and others"): *"The zebra finch was found to differ in these respects from the species observed in this study (Oksche et al., 1963)."*

In the Literature Cited or reference list, all authors must be included in full.

4. Multiple references in the same sentence:

- Place each citation in the appropriate part of the sentence: *"Although not all birds have to drink water (Jones and Smith, 1963), there are numerous exceptions (Taylor, 1964; Smith & Smith, 1968; Altert et al., 1969). The metabolic rate of the species seems to play a role (Harrigan, 1965) as well as the food source (Montgomery & Landers, 1966)."*

INSTITUTE OF HOSPITALITY AND TOURISM MANAGEMENT

Research Format and General Provisions

The research topics of undergraduate students must be aligned with the approved research agenda of the Institute and the College. Furthermore, proposed studies should demonstrate relevance to the research priorities of the Local Government Unit (LGU) and the mandates and priority areas established by the Commission on Higher Education (CHED). This alignment ensures that student research contributes meaningfully to institutional development, addresses local community needs, and supports national research priorities.

All tables, figures, graphs, and other forms of data presentation included in the research manuscript must adhere to the formatting and presentation standards adopted by the Bachelor of Science in Biology (BS Biology) program. These standards shall serve as the institutional reference for the proper organization and presentation of quantitative and qualitative data, ensuring clarity, consistency, and scientific rigor across all undergraduate research outputs.

For the conduct of the study, students shall be organized into research groups composed of three (3) to five (5) members, depending on the total number of enrolled students in the course. The grouping shall be determined by the course instructor or research adviser to ensure balanced distribution of responsibilities and effective collaboration in the completion of the research project.

Priority Areas for Institute Student Research

The Institute encourages student research aligned with strategic priorities, addressing contemporary challenges, and contributing to both academic knowledge and societal development. Research initiatives shall be designed to advance evidence-based practices, promote innovation, and comply with ethical and methodological standards. The following thematic areas constitute the designated priority research domains:

1. **Sustainable Tourism and Destination Management**
    - Conduct empirical and applied studies on sustainable tourism practices, environmental stewardship, and responsible destination management.
    - Investigate wellness tourism, eco-tourism, and other emerging trends, assessing their social, economic, and environmental impacts.
    - Evaluate policy frameworks, operational strategies, and governance models that enhance sustainable tourism outcomes while preserving cultural and natural heritage.
2. **Hospitality Innovation and Experience Design**
    - Develop innovative hospitality products and service delivery models to meet evolving consumer preferences and market demands.
    - Apply principles of design thinking, user experience, and service innovation to enhance guest satisfaction and operational efficiency.
    - Examine strategic implementation of creative solutions within hospitality management, including branding, marketing, and service customization.
3. **Technology and Transformation in Hospitality & Tourism**
    - Analyze the integration of digital technologies, experience economy frameworks, and sustainable practices in the hospitality and tourism sectors.
    - Conduct studies on digital transformation, smart tourism, data-driven management, and technology adoption in service operations.
    - Investigate how technological interventions influence operational efficiency, customer experience, and competitive advantage in the industry.
4. **Community-Engaged Tourism and Hospitality**
    - Explore community-based tourism and hospitality initiatives, emphasizing local stakeholder engagement and participatory development.

- Examine socio-economic, cultural, and environmental impacts of tourism on local communities.
- Study resilience strategies, sustainable development frameworks, and cultural heritage preservation mechanisms that enhance community wellbeing and inclusive growth.

5. **Institutional, Local, Regional, and National Research Agenda Alignment**
    - Conduct research in compliance with the MCC Research Agenda and the national higher education framework, including the Commission on Higher Education (CHED) programs such as ACHIEVE.
    - Align student research with local and regional development priorities to support evidence-based policy-making, capacity building, and socio-economic advancement.
    - Promote interdisciplinary studies that contribute to institutional objectives, national development goals, and global competitiveness, ensuring that research outputs are relevant, actionable, and sustainable.
    - Encourage collaboration with local government units, industry stakeholders, and national agencies to ensure research addresses real-world problems and produces measurable impact.

Bachelor of Science in Tourism Management

All undergraduate research outputs under this program shall conform to the following structure to ensure consistency, methodological rigor, and adherence to institutional standards. Each section is mandatory unless explicitly noted otherwise.

1. Research Title

- Must concisely and precisely describe the contents of the manuscript.
- Should clearly indicate the topic, scope, and focus of the study, providing a preliminary understanding of the research problem.
- Titles shall avoid ambiguity and be compliant with institutional formatting and stylistic standards.

2. Abstract

- A cohesive and self-contained summary of the research manuscript, not exceeding 250 words.
- Shall summarize:
    - The study area and significance
    - Statement of the problem
    - Purpose and objectives
    - Methodological approach
    - Key findings, conclusions, and recommendations
- The abstract should enable readers to rapidly grasp the essence, methodology, and outcomes of the study.
- *Keywords***:** At the end of the abstract, include 3–6 keywords that represent the main concepts, methodology, or subject of the study. These keywords aid in indexing, searching, and categorizing the research in databases and institutional repositories. The keywords should be ordered alphabetically.

  Example of Keywords: *Eco-tourism*, *logistics*, *sustainable Tourism*

3. Approval Sheet

- Must bear the signatures of the Research Adviser, Research Panelists, and other relevant officials, certifying compliance with institutional and ethical standards.

4. Preliminary Pages

- **Table of Contents** – Organized list of sections, subsections, figures, tables, and appendices.
- **List of Figures and Tables** – Enumerates all graphical and tabular representations.
- **List of Appendices** – Includes supplementary materials such as questionnaires, interview guides, and supporting documents.
- **Acknowledgement (Optional)** – Formal recognition of contributions, guidance, or institutional support.

5. Introduction

- **Background of the Study** – Provides contextual information and rationale underpinning the research topic.
- **Review of Related Studies** – Synthesizes existing literature to establish a conceptual and empirical knowledge base.
- **Conceptual Framework** – Constructs a theoretical framework to guide the study and operationalize variables.
- **Statement of the Problem** – Clearly articulates the primary and secondary research problems.
- **Research Objectives** – Defines specific goals and measurable aims of the study.
- **Significance of the Study** – Highlights the practical, academic, SDG-coherence, and societal relevance of the research.
- **Scope and Limitations** – Explicitly defines the boundaries, constraints, and delimitations of the study.

6. Methodology

- **Research Design** – The details of research design used in the study which could be quantitative and qualitative research design and the rationale of using that design.
- **Research Locale** – Specifies the geographic or institutional setting, with justification for selection. Include the sampling technique used in the study.
- **Sample/participants/respondents** – Describes participant characteristics, inclusion/exclusion criteria, and sampling methodology.
- **Instruments** – Identifies tools or measures used for data collection; provides detailed description of survey questionnaires, interview guides, or observational protocols.

- **Data Collection Procedures** – Step-by-step description of methods used to gather data, including timelines, protocols, and researcher responsibilities.
- **Data Analysis Procedures** – Explains the inferential or descriptive analysis employed to process and interpret collected data, including software or tools used.
- **Ethical Consideration and AI Declaration** – Details ethical protocols, including informed consent, confidentiality, and compliance with institutional and national research ethics guidelines.

7. Results

- **Presentation of Data** – Findings shall be presented in tables, figures, and descriptive narratives.
- Data must be accurately computed, appropriately labeled, and consistent with methodological design.

8. Discussion

- **Summary of Findings and Conclusion** – Synthesizes key results; interprets findings in relation to research objectives, hypotheses, or theoretical framework; draws evidence-based conclusions.
- **Recommendations** – Provides actionable guidance for future research, policy-making, or practical application, grounded in study findings. Recommendations must reflect the significance and potential impact of the study.

9. References

- All sources must be cited in accordance with recognized academic citation (APA version 7)
- References must reflect both primary and secondary sources, demonstrating thorough literature engagement if applicable.

10. Appendices

- Supplementary materials that support the study, including questionnaires, interview guides, consent forms, raw data tables, or additional figures.

11. Curriculum Vitae (CV)

- Provides a brief professional and academic profile of the student researcher(s), including educational background, research experience, and relevant achievements.

Bachelor of Science in Hospitality Management

Research Title

The title should concisely and accurately reflect the content of the research manuscript. It must clearly indicate the primary variables or focus of the study while providing readers with an immediate understanding of the research problem and scope. The title should be specific, informative, and free from unnecessary words, while maintaining clarity and precision.

Abstract

The abstract is a comprehensive and cohesive summary of the entire research manuscript and should generally not exceed 250 words. It should briefly present the background and significance of the study, clearly state the research problem, and outline the purpose and specific objectives of the investigation. In addition, it should summarize the research methodology employed, including the research design and data collection approach. The abstract must also highlight the major findings, key conclusions, and principal recommendations of the study. Its purpose is to provide readers with a concise overview that allows them to quickly grasp the essence, scope, and contribution of the research.

Approval Sheet

The approval sheet certifies that the research manuscript has been reviewed and formally approved by the research adviser, panel members, and other authorized academic officials in accordance with institutional requirements.

Table of Contents, List of Figures and Tables, and List of Appendices

These sections provide an organized outline of the manuscript to facilitate ease of navigation and reference. The Table of Contents lists the major sections and subsections of the manuscript along with their corresponding page numbers. The List of Figures and Tables enumerate all graphical and tabular presentations included in the study, while the List of Appendices identifies supplementary materials provided at the end of the manuscript.

Acknowledgement (Optional)

This section provides the researchers with the opportunity to formally express gratitude to individuals, institutions, and organizations that contributed support, guidance, or resources to the completion of the research.

Introduction

Background of the Study

This section provides the contextual foundation of the research by presenting relevant information about the topic under investigation. It explains the rationale and justification for conducting the study, identifies existing issues or gaps in knowledge, and establishes the importance of the research within the field of hospitality management.

Review of Related Studies

This section presents a critical synthesis of relevant scholarly literature, previous studies, and theoretical frameworks related to the research topic. It establishes the conceptual and empirical foundation of the study, identifies research gaps, and demonstrates how the current research contributes to the existing body of knowledge.

Product Development Process

For studies involving hospitality product development, this section outlines the stages involved in the conceptualization and creation of the product. This includes:

- **Description:** Presentation of the product concept, including its name, logo, packaging design, and general characteristics.
- **Process:** Detailed explanation of the preparation procedure, including ingredients, formulation, cooking or preparation techniques, and standard operating procedures.
- **Post-Production:** Discussion of the final presentation and evaluation of the product, including serving style, portioning, cost analysis, and potential market viability.

Statement of the Problem

This section clearly articulates the primary research problem and the specific questions that the study seeks to address. The problem statement should be logically derived from the background and supported by existing literature.

Research Objectives

The objectives define the specific aims and intended outcomes of the study. These objectives should directly correspond to the research problem and guide the overall direction of the investigation.

Significance of the Study

This section explains the potential contributions and benefits of the research to various stakeholders, such as hospitality practitioners, industry partners, local communities, academic institutions, SDG-coherence, and future researchers.

Scope and Limitations

The scope defines the boundaries and coverage of the research, including the variables, population, and context investigated. The limitations describe constraints or factors beyond the researchers' control that may affect the results or generalizability of the study.

Methods

Research Design

This section describes the overall research approach adopted in the study, including the type of research design used (e.g., descriptive, experimental, developmental, or mixed methods) and the justification for its selection.

Research Locale

This subsection identifies and describes the geographical location or institutional setting where the research was conducted. It should provide sufficient contextual information relevant to the study.

Samples/Participants/Respondents

This section describes the target population, sampling technique, and the number and characteristics of respondents or participants included in the study.

Research Instruments

This subsection identifies and describes the data collection tools used in the research, such as survey questionnaires, interview guides, sensory evaluation forms, or observation checklists. It should also explain the structure and content of these instruments.

Data Collection Procedures

This section explains the systematic procedures followed in gathering the data, including preparation, administration of instruments, and documentation of responses.

Ethical Considerations

This subsection outlines the ethical standards observed during the conduct of the research, including informed consent, confidentiality of participants, voluntary participation, and adherence to institutional research ethics policies.

Data Analysis Procedures

This section describes the statistical or analytical techniques employed to process and interpret the collected data. It should specify the methods used to summarize, analyze, and draw conclusions from the data.

Results

Presentation of Results

This section presents the findings of the study in a systematic and logical manner using tables, figures, and other appropriate graphical representations. Each table or figure must be accompanied by a clear narrative explanation that highlights the significant results relevant to the research objectives.

Discussion

Summary of Findings and Conclusion

This section synthesizes the major results of the study and interprets their implications in relation to the research objectives and existing literature. The conclusion should present well-supported inferences derived from the findings and demonstrate how the research problem has been addressed.

Recommendations

This subsection provides practical and research-based recommendations derived from the study's findings. These may include suggestions for industry application, improvements in hospitality practices, policy implications, or directions for future research.

References

This section lists all sources cited (APA version 7) in the manuscript following the prescribed citation format required by the institution.

Appendices

The appendices contain supplementary materials that support the research but are not included in the main body of the manuscript, such as survey instruments, interview guides, raw data summaries, ethical clearance documents, and additional tables or figures.

Curriculum Vitae

This section presents the brief academic and professional profiles of the student researchers, including educational background, academic achievements, and relevant experiences.

INSTITUTE OF COMPUTING STUDIES

Research Format and General Provisions

All undergraduate capstone projects under the programs offered by the Institute of Computing Studies (ICS) shall focus on the development of complex computing solutions in line with the suggested areas identified by the Commission on Higher Education (CHED). These areas include Complex Web System Development such as Transaction Processing Systems, Information Management Systems, and Content Management Systems; Internet of Things (IoT) solutions controlled and monitored by Mobile Computing Systems; Software Customization Development; and Multimedia Systems. In addition to the academic manuscript, each capstone project shall also require the preparation of an Academic Poster and a Video Presentation to comprehensively showcase the research process, system development, and project outcomes. The ICS adheres to both the Germanic style of research writing and the IMRaD format (Introduction, Methods, Results and Discussion, and Conclusion) for developmental research in system development, which is classified as Quantitative Descriptive Research. This ensures that student outputs are aligned with international scholarly standards and are suitable for publication.

All citations within the manuscript and entries in the reference list must strictly conform to the American Psychological Association (APA) 7th Edition guidelines. Proper attribution of sources is mandatory to uphold academic integrity, and plagiarism in any form shall be subject to institutional sanctions. Undergraduate capstone projects shall be conducted in groups composed of three (3) to four (4) members. The grouping shall be determined by the Capstone Project Instructor or Research Adviser to ensure a balanced distribution of duties and responsibilities, as well as effective collaboration in the completion of the project.

Completed undergraduate capstone projects shall be published annually in the ICS MCC-IT Research Journal, which carries the ISSN ONLINE 3082-6373. The journal shall be made available for download through the official MCC website, thereby ensuring accessibility, visibility, and recognition of student research contributions within the academic and professional community.

Scope

The capstone project focuses on the infrastructure, application, or processes involved in introducing a Computing Solution to a problem. The scope of the capstone project must ensure that the recommended infrastructure and its implications on other systems should be clearly specified in the final report with the introduction of the project.

Capstone Groups are encouraged to produce innovative results, generate new knowledge or theories, or explore new frontiers of knowledge or application areas.

The Capstone Instructor and the Capstone Adviser consultation should initially determine the appropriate complexity level of the specific problem being addressed and the proposed solution, considering the duration of the project, the composition of the team, and the resources available.

The Suggested Areas of Topics or Investigations for an I.T. Capstone Project

Below are topics that identify the areas of investigation for an IT Capstone, which graduating students can freely undertake:

- **Software Development**
  - ○ Software Customization
  - ○ Information Systems Development for an actual client (with pilot testing)
  - ○ Web Applications Development (with at least alpha testing on live servers)
  - ○ Mobile Computing Systems
- **Multimedia Systems**
  - ○ Game Development
  - ○ e-Learning Systems
  - ○ Interactive Systems
  - ○ Information Kiosks
- **Network Design and Implementation, Server Farm Configuration and Management**
- **IT Management**
  - ○ IT Strategic Plan for Sufficiently Complex Enterprises
  - ○ IT Security Analysis, Planning, and Implementation

CHAPTER 1

The Problem and Its Background

1.1 Introduction

The goal of the introduction is simply to enable the reader to determine if the study is relevant to the area of interest. The introduction is typically 1-3 pages. The introduction is a pragmatic argument of the study about an issue. It primarily answers the questions "What are the most important issues for this topic in terms of the goals of the project and the effects in society?" and "What is the research all about?". Speculation is not acceptable unless it is supported by specific evidence or a published reference.

The Introduction presents the specific issues/topics of the Capstone Project and the general strategy used to address the issue(s). This section may present some background information; overall trends, and references to studies and literature pertinent to the topic of the project, but thoroughly addressed in the Literature Review section.

The first paragraph of the introduction should focus on the long-term history of the topic or the topic in general view. The succeeding paragraphs present more recent research trends. It also contains the researcher/s' firm stand on the need to bridge the gap between existing bodies of knowledge and the prevailing situation. The final section of the introduction states the purpose of the project and the rationale for the approach used to complete it.

1.2 Background of the Study

The introduction should provide proper context both technical and economic motivation that allows the reader to understand the problem and issue presented. It should present: 1) the topic in specific manner; 2) establish the need for conducting the study; 3) problems with existing research/design/locale/system and; 4) how other researchers addressed the problem. The project setting should clarify the location and the most relevant background of the project: 1) description of the company; 2) the product; 3) the market and transition into the area that will be the focus of the project. It also includes discussion on the current status of the process or system that reasonably describes the need for the improvement or redesign and challenge or opportunity the project presents.

1.3 Objectives of the Study

This section states the purpose of the project, providing the reasons for pursuing the study, and identifies its significance. It must name the specific and concrete – if possible, measurable – accomplishments (external and personal) intention of the project. It should answer: "What, exactly, the project is going to accomplish, produce, and/or deliver?". It also includes the necessary deliverables and defines a reasonable scope of work.

Example:

The general objective of this study is to … <It is to be anchored on the Title/Final Capstone Project output of the study>

In line with this, this study aims to achieve the following specific objectives:

1. To gather…
2. To identify…
3. To design…
4. To construct… <IoT>
5. To integrate… <Algorithm>
6. To create…
7. To test … in terms of…
8. To evaluate…
9. To measure…
10. To increase the…<by ???%>
11. To maximize…
12. To deploy…

The objective of the study should follow the expected deliverable/s in each phase of the research methodology to be used.

1.4 Scope and Limitation of the Study

This section should be anchored to the objectives of the study. It presents the focus and boundaries of the research study in detail. It also includes limitations, which are descriptions of the restrictions that have been imposed on the study that are beyond the researcher/s' concern. Typically, limitations deal with restrictions such as: 1) the voluntary nature of the subjects; 2) inability to control all of the variables which may influence the outcome, and; 3) limit/impose on the study by participating in the organizations.

The description of the scope and limitations pertaining to the research defines the restrictions placed on the study to make it doable. The complexity and scope of the project must go significantly beyond the topics covered in any relevant BSIT course. In companies that employ and supervise IT professionals, standards are generally established by the organization and the student will be expected to follow those standards.

Example:

The study covers …. <it is to be anchored on the general objective>. Furthermore, the study aims to … < It is to be anchored on the specific objectives>. This research intends to … . <Detailed discussion of the coverage of the study>. The study will be conducted in … < Details of when and where the research is to be conducted>.

Due to design constraints, this study does not cover …. <Details of what are the things the study will not include intentionally (boundaries to reduce the amount of time spent in certain areas)>

1.5 Significance of the Study

This section rationalizes the objectives of the research. It explains why the research must be done in the selected area. It also shows detailed and specific discussions on who benefits from the output of the study and how they are going to benefit from it. It may focus on significant contributions in various contexts, such as global, economic, environmental, societal, and others.

Example:

Below is a list of the significant contributions of the study:

In the global context, the study will…

In the economic context, the study will…

In the environmental context, the study will…

In the societal context, the study will…

1.6 Definition of Terms

Many terms are subject to variety of interpretations. In a research study, there is a need to define the terms clearly to avoid ambiguity and confusion. Such terms should be defined operationally according to the precise meanings they are intended to convey. There are two types of definitions: 1) Conceptual, which is the universal meaning given to a word or group of words, and is usually has a citation; 2) Operational, which is the meaning of the concept or term as use in a particular study.

Example:

Term <Sample term to be defined>. It is the … (Author/Source, Date) <Conceptual definition>. It is … used in this study <Operational definition>.

CHAPTER 2

Review of Related Literature

This section presents the written works and studies that exhibit importance and similarity with the proposed study. It also discusses the capabilities and limitations of existing researches, theories and paradigms that are related to the study.

A literature review surveys a minimum of twenty (20) scholarly articles, books, and other sources relevant to the area of the research study, which should mainly include current (within 3-5 years) literature and studies. The focus of the literature review is to summarize and synthesize information from these sources. It should explain: 1) what is known or is unknown about the problem; 2) identify areas of controversy in the literature, and 3) formulate questions that need further research.

The literature review has an introduction, a body, and a conclusion, and should be a minimum of five (5) pages. A brief introduction should preview the type of literature that will be reviewed, identifying the main literature that made a great impact on the study. In the body, research studies and other types of literature are grouped according to themes (logically) and arranged chronologically. Subsets of the literature are organized under subheadings. Each subset is concluded with a summary statement relating that section to the problem/objective. At the end of the chapter, a concluding paragraph summarizes the main findings that will lead to the research questions.

In the body, research studies and other types of literature are grouped according to what they have in common, i.e., qualitative versus quantitative approaches, conclusions of authors, specific purpose or objective, chronology, etc. The studies or articles are summarized using the most space for the most important ones.

Reviewing the literature is a continuous process. It begins before a research study is finalized and continues until the document is finished. The process involves several steps: 1) searching for existing literature and studies within the area of study; 2) reviewing the selected materials, and; 3) developing a conceptual framework which becomes the basis of the study.

The conceptual framework is an analytical tool with several variations and contexts, and defined the overall picture of the objective of the study. It is used to make conceptual distinctions and organize ideas to capture something real and do this in a way that is easy to remember and apply.

Formats for references, citations, and quotations must be based from the American Psychological Association (APA 7th).

Conceptual Framework

The direction of this study was presented using the conceptual framework …

Examples:

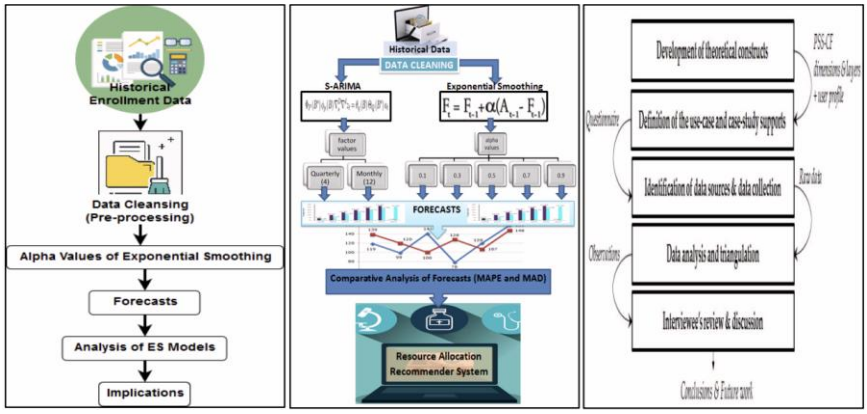


Figure 1. Conceptual Framework

Chapter 3

Methodology

This section is the schema that maps out the sources of data, the type of data to be collected, how the data will be collected, and the methods to be used in data analysis. Identify, in this section, the intended methods or modes of research (more on the "how" – and this is an important requirement of every Capstone Project). It should present the general method to be utilized in the study and the procedures anchored in the objective of the study. Some components are: 1) Requirements Analysis / Documentation; 2) Design of Software, Product / Processes; 3) Development and Testing Plans; 4) Description of Prototype and; 5) Implementation Plan.

Specific analysis tools are used to illustrate the existing and the proposed systems, as well as the requirements of the project. The analysis tools that may be used are:

- Visual Table of Contents;
- Data Flow Diagrams;
- Entity-Relationship Diagram;
- System Flowchart;
- Program Flowchart;
- Character Models;
- Storyboard;
- Others.

Example:

This study used descriptive method of research... <Discuss in detail how descriptive method will be used>

In software development, prototyping … <Anchored on the objective and support it with figures and cite its source>

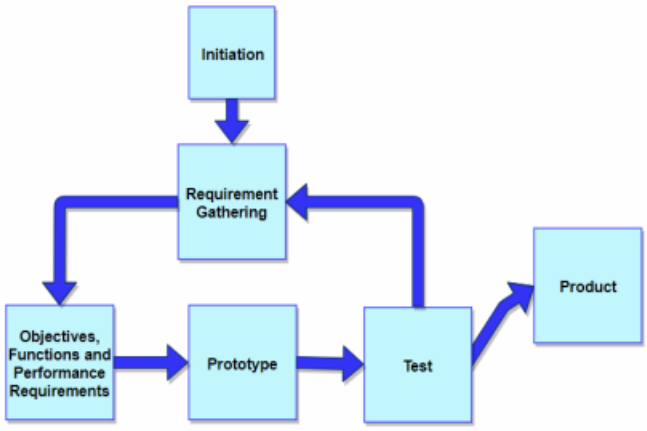


Figure 2. Prototyping

(Source: Infosys, 2015)

CHAPTER 4

Results and Discussion

This chapter presents the findings of the research in a clear and organized manner using tables, figures, graphs, and narrative explanations. Data are analyzed and interpreted based on the objectives of the study.

The discussion explains the significance of the findings, relates them to existing literature, and highlights patterns, relationships, or implications derived from the results.

CHAPTER 5

Summary of Findings, Conclusions, and Recommendations

Summary of Findings

This section summarizes the major results of the study based on the research objectives and findings presented in Chapter 4.

Conclusions

Conclusions interpret the results and determine whether the objectives of the study have been achieved. They should be logically derived from the findings.

Recommendations

This section presents practical suggestions or proposed actions based on the conclusions. Recommendations may include improvements, policy implications, or directions for future research.

REFERENCES

The References section lists all sources cited in the manuscript. A minimum of twenty (20) credible scholarly sources should be included. All references must follow the IEEE citation format and be arranged according to their order of appearance in the text.

APPENDICES

Appendices contain supplementary materials that support the study but are too detailed for inclusion in the main text. These may include:

- User manuals
- Letters, certifications, or communications
- System diagrams or models
- Survey questionnaires or research instruments
- Plagiarism and language certification
- Curriculum Vitae of the researchers

If multiple appendices are included, they should be labeled sequentially as Appendix A, Appendix B, Appendix C, and so forth.

INSTITUTE OF BUSINESS EDUCATION

Research Format and General Provisions

All undergraduate research outputs under the Institute of Business Education (IBE) shall adhere to the IMRaDC format (Introduction, Methods, Results and Discussion, and Conclusion) for quantitative studies and the IMFaDC format (Introduction, Methods, Findings and Discussion, and Conclusion) for qualitative studies. In cases where a mixed-method research design is employed, the manuscript shall generally follow the IMRaDC structure, as this format remains the prevailing standard in peer-reviewed journals and scholarly publications within the fields of business, management, marketing, finance, entrepreneurship, and organizational studies.

All citations within the manuscript and entries in the reference list must strictly conform to the American Psychological Association (APA) 7th Edition guidelines. Proper attribution of sources is mandatory to uphold academic integrity, avoid plagiarism, and ensure the credibility of scholarly work.

Undergraduate research shall normally be conducted in groups consisting of three (3) to five (5) members, depending on the enrollment size and academic considerations of the program. Requests to conduct individual research shall be subject to the evaluation and approval of the Program Head and/or Dean. Approval shall be based on feasibility, academic merit, and the demonstrated capacity of the student to independently complete the research requirements.

CHAPTER 1

Background of the Study

Chapter 1 establishes the scholarly and contextual foundation of the research. It articulates the rationale for conducting the study and situates the research problem within existing business, economic, and organizational contexts.

Introduction

The Introduction provides the contextual background of the study. It presents the current situation or conditions related to the research topic within the business environment, industry sector, organization, or market context.

This section identifies existing gaps in knowledge, operational challenges, managerial concerns, or emerging trends that justify the need for the present investigation. The discussion should demonstrate the researchers' comprehensive understanding of the research problem supported by empirical evidence, industry reports, theoretical perspectives, and prior studies.

The discussion must logically progress from the general business environment to the specific issue being addressed, culminating in the justification for conducting the study.

Review of Related Literature (RRL)

The Review of Related Literature synthesizes scholarly works relevant to the research problem. Sources must include peer-reviewed journal articles, academic books, conference papers, reputable industry publications, and credible electronic sources.

Priority shall be given to recent publications, preferably within the last five (5) years, particularly those appearing in reputable journals in the fields of business administration, marketing, management, finance, entrepreneurship, economics, and organizational studies.

Researchers are strongly encouraged to incorporate local studies and industry reports to ensure contextual relevance to the Philippine business environment. However, relevant international literature may also be utilized to establish theoretical and global perspectives.

The section shall culminate in a Literature Synthesis, which integrates, compares, and critically evaluates the reviewed works. This synthesis must go beyond simple summary and demonstrate analytical insight, theoretical integration, and identification of research gaps that justify the present study.

Theoretical and/or Conceptual Framework

The selection of a theoretical or conceptual framework shall depend on the nature and objectives of the study.

Studies that aim to test, apply, validate, or extend established theories in business or management shall employ a Theoretical Framework. Relevant theories may include, but are not limited to, theories in consumer behavior, organizational behavior, marketing strategy, leadership, innovation, entrepreneurship, or financial decision-making.

For studies that are not strictly theory-driven, a Conceptual Framework may be utilized. The conceptual framework shall identify the key variables or constructs of the study, derived from the literature review, and illustrate the presumed relationships among them.

Any framework diagram included in the manuscript must be clearly labeled and accompanied by a detailed explanation describing how the variables interact within the study.

Statement of the Problem

The Statement of the Problem presents the general objective of the study, which must correspond directly to the research title.

This is followed by specific research questions or objectives that are clear, logically sequenced, and measurable for quantitative research, or thematically aligned for qualitative studies.

The objectives must be feasible within the available time frame, resources, and scope of undergraduate research.

Significance of the Study

This section discusses the potential contributions and practical implications of the research findings.

The discussion shall follow a macro-to-micro progression, beginning with broader levels such as national economic development, industry advancement, or sectoral improvement, followed by the potential contributions to local businesses, organizations, academic institutions, managers, entrepreneurs, and future researchers.

The section must clearly explain how the findings may contribute to managerial practice, business decision-making, policy development, and future academic research.

Scope and Limitations

The Scope and Limitations define the boundaries of the study.

This includes the:

- research locale or organization
- respondents or participants
- industry sector or business context
- time frame of the study
- variables examined
- methodological limitations

Limitations refer to factors beyond the researchers' control that may affect the findings or generalizability of the results, such as access to data, organizational restrictions, or limited sample size.

These limitations must be acknowledged transparently and objectively.

Definition of Terms

This section provides definitions of key terms and concepts used in the study.

Definitions may be:

- **Conceptual**, describing the theoretical meaning of the terms, or
- **Operational**, explaining how the terms are specifically measured or applied within the study.

Where required by the research adviser, operational definitions alone may be presented.

CHAPTER 2

Methodology

The Methodology chapter describes in detail how the study was conducted. It ensures transparency, methodological rigor, and replicability.

The procedures must be described clearly enough to allow other researchers to replicate or understand the research process.

Research Design

The Research Design describes the overall strategy used to conduct the study.

Business research may employ quantitative, qualitative, or mixed-method approaches.

Quantitative designs may include:

- descriptive research
- survey research
- correlational studies
- comparative analysis
- regression analysis
- experimental or quasi-experimental studies

Qualitative designs may include:

- case study analysis
- phenomenological inquiry
- grounded theory
- narrative research
- organizational or managerial analysis

The selected research design must be clearly justified and aligned with the research objectives.

Research Locale / Study Area

This section describes the organization, business establishment, industry sector, or geographic area where the study was conducted.

Only characteristics that are relevant to the research problem should be included, such as:

- organizational structure
- industry type
- market environment
- business operations
- economic or competitive conditions

Subjects, Respondents, Participants, and Samples

Appropriate terminology shall be observed.

- **Respondents** refer to individuals who answer structured questionnaires or surveys.
- **Participants** are individuals involved in qualitative interviews or discussions.
- **Subjects** are typically used in experimental studies.

This section must also describe the sampling technique used and justify its appropriateness.

Sample size determination may use accepted statistical procedures such as:

- Slovin's formula
- Cochran's formula
- G*Power analysis

For qualitative research, the principle of data saturation shall be observed.

Instruments and Research Procedures

A detailed description of the research instruments used in the study shall be provided.

These may include:

- survey questionnaires
- interview guides

- observation checklists
- document analysis forms

The development, adaptation, validation, and administration of the instruments must be explained.

Research instruments shall undergo content validation and face validity assessment by two (2) to three (3) subject-matter experts whose academic qualifications or professional experience are relevant to the field of business or management.

Reliability testing (e.g., Cronbach's Alpha) may also be conducted, with an acceptable threshold of 0.70 or higher.

Data Collection

This section explains the step-by-step process of gathering data.

It must describe:

- how permission from organizations or respondents was obtained
- how respondents were informed about the study
- how instruments were distributed and retrieved
- how interviews or surveys were conducted

Any procedural challenges encountered during the data collection process must also be disclosed.

Data Analysis

Data analysis procedures must be consistent with the research design.

For quantitative studies, statistical analyses may include:

- frequency and percentage distribution
- mean and standard deviation
- correlation analysis
- regression analysis
- t-test or ANOVA

Statistical software such as SPSS, Jamovi, JASP, Excel, or other statistical packages may be used.

The level of significance shall generally be set at 0.05 unless otherwise justified.

For qualitative studies, analysis methods may include thematic analysis, coding procedures, content analysis, or narrative analysis.

Ethical Considerations and AI Declaration

This section explains how ethical standards were maintained throughout the research process.

Researchers must ensure compliance with the Data Privacy Act of 2012, particularly when collecting information from individuals or organizations.

Confidentiality, voluntary participation, and informed consent procedures must be clearly described.

Researchers must also disclose any Artificial Intelligence (AI) tools used in the preparation of the manuscript.

AI tools may be used only for:

- grammar checking
- language editing
- formatting assistance

AI tools must not be used to generate research data, fabricate results, or produce unverified academic content.

Researchers remain fully responsible for the accuracy, integrity, and originality of the manuscript.

Failure to properly declare AI usage or submission of plagiarized or AI-generated content without disclosure shall constitute academic misconduct and may result in institutional sanctions.

CHAPTER 3

Results and Discussion

This chapter presents the findings of the study.

Data shall be presented objectively and in past tense, as the data collection process has already been completed.

Tables, figures, and graphs may be used to present results clearly.

- Table titles shall appear above the table
- Figure captions shall appear below the figure

The Results section presents the data without interpretation, while the Discussion section explains the meaning of the findings, relates them to the research questions, theoretical framework, and previous studies, and discusses their implications in the business or organizational context.

CHAPTER 4

Conclusion, Summary, and Recommendations

The Conclusion directly answers the Statement of the Problem. Each conclusion must correspond to a specific research question and must be based strictly on the findings of the study.

The Summary provides a concise overview of the entire research, including the research problem, methodology, major findings, and challenges encountered.

The Recommendations must be grounded in the study's findings and limitations. Researchers may suggest practical applications for businesses, organizations, or managers, as well as directions for future research.