A GRADUATE TEXTBOOK

RESEARCH MANAGEMENT

for

EDUCATIONAL LEADERS

AUTHOR

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RESEARCH MANAGEMENT FOR EDUCATIONAL LEADERS

A Graduate Textbook for Educational Managers

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Research Management for Educational Leaders

Published by: Philippine Technical Institute Inc.
Guilig Street, Poblacion, Lingayen, Pangasinan 2401, Philippines

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Email: po@pti.edu.ph
Website: press.pti.edu.ph

Date of Publication: June 30, 2026

ISBN:
PDF Downloadable: 978-621-8546-14-1
PDF Read-Only: 978-621-8546-13-4

Cover Design: PTI Press Creative Team

Published in the Philippines by PTI Press.

Foreword

The educational manager occupies a position in the research enterprise that is easily misunderstood. She is rarely the lone investigator at a laboratory bench. More often, she commissions studies, stewards limited resources, protects the welfare of participants who are frequently learners, and carries the responsibility of turning findings into decisions that shape schools and divisions. A textbook that recognizes this position and treats research not merely as a method to be mastered but as a system to be governed addresses a need that the standard research methods literature has largely left unmet.

This volume is notable for the seriousness with which it holds two commitments together. It insists on rigor, developing question formulation, design, validity, and analysis with the depth a graduate program demands. And it insists on use, devoting an entire Part to the communication and translation of evidence, and treating the structural gap between what research shows and what policy does as a problem to be solved rather than lamented. A study that is methodologically flawless but never applied has failed, and this book never lets the reader forget it.

For Filipino educational leaders working under real constraints of time, budget, and access, and now within a landscape reshaped by data privacy regulation and artificial intelligence, this text offers exactly the disciplined, practical, and honest foundation the work requires. Its cumulative Research Management Plan ensures that the competencies it teaches are not merely studied but exercised. It is offered in that spirit: as a foundation to build upon.

Dr. Phillip G. Queroda

Dr. Renato E. Salcedo

Preface

This book was developed for graduate students in the Master of Arts in Education, Major in Educational Management, enrolled in the Research Management course of the Pangasinan State University Open University System. It gathers, expands, and restructures a complete nine-module instructional package into a single coherent volume of fourteen chapters across five Parts, moving the learner from the first principles of managing research to the demanding work of disseminating findings and translating evidence into policy.

The volume was written with three commitments in mind. The first is fidelity to the approved syllabus. Every chapter maps to the official course learning plan, and the intended course outcomes are preserved and made explicit. The second is graduate depth. Rather than summarizing, each chapter builds a conceptual foundation, situates ideas within their theoretical lineage, and then presses toward application through worked cases and reflective tasks. The third is contemporaneity. Because research management now unfolds inside a landscape reshaped by open science, data privacy regulation, and artificial intelligence, the book treats these forces and the professional judgment they demand as central rather than peripheral.

The educational manager occupies a distinctive position in the research enterprise. She is rarely the lone investigator. More often, she commissions studies, stewards limited resources, protects the welfare of participants who are frequently learners, and carries the responsibility of turning findings into decisions that shape schools and divisions. This book, therefore, treats research not merely as a method to be mastered but as a system to be governed. That orientation runs through every chapter.

The book's central spine is the Research Management Plan, a cumulative project developed one step at a time across the fourteen chapters. The student identifies a real institutional problem in Chapter 1 and grows the plan as each competency is introduced, so that a question is formed, a design justified, ethics secured, data collection and analysis planned, validity addressed, dissemination and publication strategized, translation designed, and risks anticipated, culminating in a complete, coherent plan in Chapter 14. This structure ensures the book teaches not just concepts but the capacity to manage real research.

A word on the writing is in order. The prose favors clarity over ornament, integrates theory with practice, and invites the reader to think rather than to memorize. Reflection prompts, discussion questions, and case analyses appear throughout precisely because the competencies

at stake are exercised in judgment, not recall. Instructors are free to adapt the sequence, select among the assessments, and localize the cases to their own divisions.

This edition has been formatted according to the Philippine Technical Institute Inc. (PTI Press) house style. One item remains outstanding before final publication: a full reference-accuracy audit against APA 7th edition standards. It is noted transparently here rather than presented as complete.

Caren Orlanda-Ventayen

How to Use This Book

Each chapter follows a consistent architecture so that learners always know where they are and what is expected. A chapter opens with an Overview and Learning Outcomes, then introduces its topic through an Introduction and Historical Background that give context before details. The Definitions section gathers key terms, and the Core Concepts section develops the material around a central figure. Each chapter then offers summary tables, a discussion of the Philippine context with an illustrative composite case study, best practices and common pitfalls, and a Summary with Key Takeaways. Every chapter closes with Key Terms, reflection and discussion prompts, a step of the cumulative Research Management Plan, and a self-check.

The Research Management Plan activity at the end of each chapter should be treated as an ongoing project carried across the whole book, not as a set of isolated exercises. Its steps are cumulative, and completing them in sequence produces, by Chapter 14, a complete and defensible plan for a real study. Students are encouraged to anchor the plan in a genuine problem from their own institution, since the competencies this book develops are exercised in judgment about real constraints, real participants, and real decisions.

For Instructors: Each Part corresponds to a natural instructional unit, and Parts may be paced across weeks in accordance with your course calendar. The cumulative Research Management Plan serves as the course's primary summative assessment, culminating in the Chapter 14 capstone and its presentation. The Appendix A worksheet packet may be distributed at the start of the term as a running companion document.

Acknowledgments

This book builds directly on the nine-module Research Management instructional material and the approved course syllabus for Prof. Ed TVL 110 (Pangasinan State University Open University System, Master of Arts in Education, Major in Educational Management), whose topic sequence, from the foundations of research management through question formulation, IMRAD, methodologies, data collection and analysis, validity and reliability, dissemination, stakeholder engagement, and research challenges, provided the structure this fourteen-chapter, five-Part expansion restructures and deepens. The book's development mapped each chapter's scope back to the three course outcomes: understanding and planning research management, applying research principles and methods, and conducting and completing research with attention to ethics and data privacy.

Thanks are due to the graduate students of the Open University System whose questions and difficulties shaped the explanations offered here, to the colleagues who reviewed the instructional material from which this book grew, and to the many authors of the foundational research methods and knowledge translation literature, cited throughout, on whose work any graduate treatment necessarily stands.

Table of Contents

PART I

FOUNDATIONS OF RESEARCH MANAGEMENT

Part I establishes what research management is and why the educational manager occupies a distinctive position within the research enterprise. It defines the discipline and its life cycle, establishes the planning and data governance that underpin every well-managed study, and concludes with the formulation of the research question and objectives on which everything that follows depends.

INTRODUCTION TO RESEARCH MANAGEMENT

Research as a System to Be Governed

"Research is formalized curiosity. It is poking and prying with a purpose. (Zora Neale Hurston)"

1.0 Chapter Overview

This chapter opens the study of research management by establishing what it is, why it matters, and why the educational manager occupies a distinctive position within the research enterprise. The educational manager is rarely the lone investigator at a laboratory bench. More often, she commissions studies, stewards limited resources, protects the welfare of participants who are frequently learners, and carries the responsibility of turning findings into decisions that shape schools and divisions. This chapter, therefore, treats research not merely as a method to be mastered but as a system to be governed, an orientation that runs through the entire book. It also introduces the Research Management Plan, the cumulative project developed across all fourteen chapters.

1.1 Learning Outcomes

- LO 1.1 Explain the nature and foundations of research management in educational settings.
- LO 1.2 Articulate why educational research matters at the levels of the learner, the institution, and the system.
- LO 1.3 Describe the research life cycle and the manager's responsibility across its stages.

1.2 Introduction

Every school division that decides what to study, every university that stewards a research fund, and every manager who commissions an evaluation is practicing research management, whether or not the term is used. Research management is the connective tissue that holds the

stages of inquiry together, from the first framing of a question to the translation of findings into policy. For the educational manager, it is a leadership competency, exercised in judgment rather than recall, and increasingly essential in a landscape reshaped by open science, data privacy regulation, and artificial intelligence.

This chapter lays the conceptual foundation for the rest of the book. It defines research management, traces its emergence as a distinct function, situates it within its theoretical lineage, and then shows why managed educational research creates value at three levels: the individual learner, the institution, and the system. Understanding these levels helps a manager justify research investment to stakeholders who may see it as a luxury rather than the foundation of sound decisions.

1.3 Historical Background

The management of research as a distinct function emerged in the twentieth century as science became organized, funded, and accountable at scale. The rise of large research councils after the Second World War, the professionalization of grant administration, and the later emphasis on research ethics following well-documented abuses of human participants all pushed research from a solitary craft toward a governed enterprise. What had once been the pursuit of individual scholars became an institutional activity requiring planning, resourcing, oversight, and accountability.

In education specifically, the movement toward evidence-based practice from the 1990s onward, and the parallel demand for accountability in the use of public funds, made competent research management a leadership expectation rather than a technical nicety. School systems were increasingly asked not merely to spend on programs but to demonstrate that their programs worked, and to base decisions on evidence rather than conviction. This shift placed research management at the center of educational leadership, where it remains.

1.4 Definitions

KEY TERMS

Research Management: The systematic planning, organizing, resourcing, safeguarding, and directing of research activities so that they produce trustworthy evidence and useful results within an institution's constraints.

Research Life Cycle: The framing of a study as a sequence of managed stages, from question to dissemination, rather than a single act.

Evidence-Based Practice: The use of the best available research evidence, alongside professional judgment, to guide educational decisions.

Research Governance: The structures and rules by which an institution oversees research to protect participants, ensure integrity, and account for resources.

Educational Manager: A leader who commissions, resources, oversees, and applies research within a school, division, or university.

1.5 Core Concepts of Research Management

1.5.1 The Nature and Foundations

Research management is the systematic planning, organizing, resourcing, safeguarding, and directing of research activities to produce trustworthy evidence and useful results within an institution's constraints. In educational settings, it is the discipline through which schools, divisions, and universities decide what to study, how to fund and staff the work, how to protect participants and data, and how to ensure that findings inform practice and policy. It is, in short, the governance of inquiry from beginning to end.

Research management draws on three intellectual streams. Project management inherits the discipline of scope, schedule, cost, quality, and risk. From research ethics and governance, it inherits the primacy of participant welfare, informed consent, and integrity. From evidence-based policy, it inherits the insistence that inquiry must ultimately serve decisions. A useful integrating idea is the research life cycle, which frames a study as a sequence of managed stages rather than a single act, and the manager's responsibility spans the entire cycle. Each part of this book develops one or more stages of that cycle.

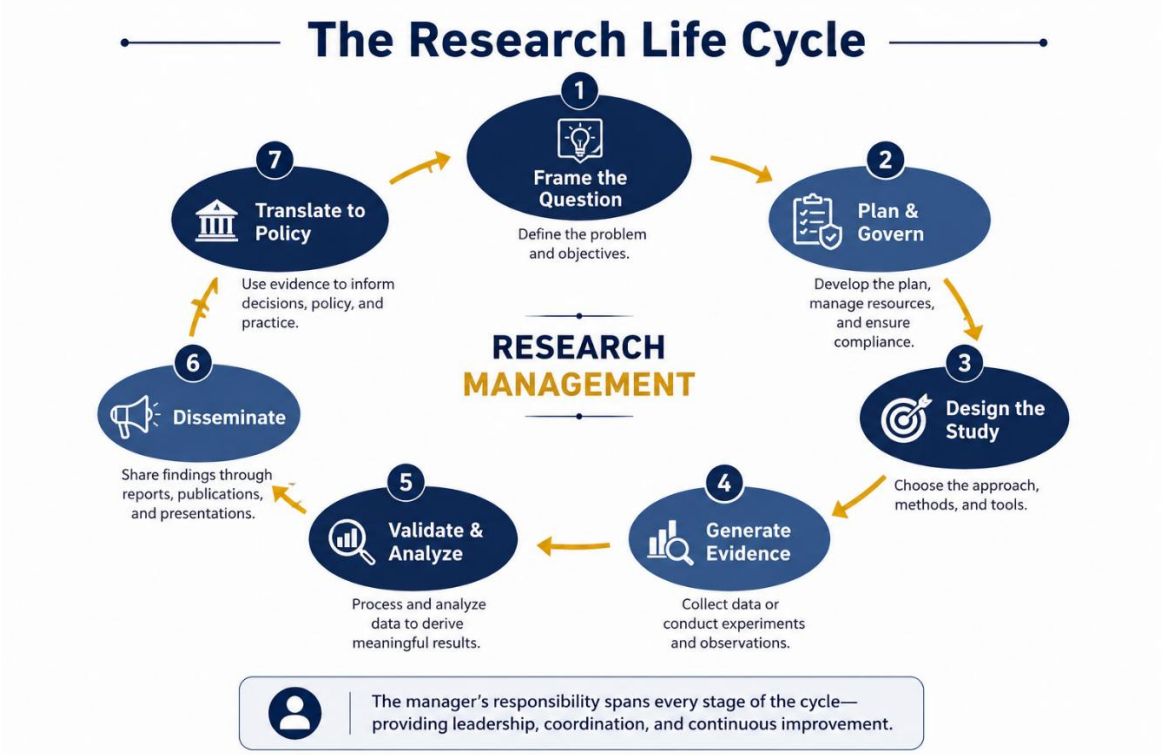

Figure 1.1. The research life cycle. Research management is the connective tissue that holds its stages together, and the manager's responsibility spans all of them.

1.5.2 Why Educational Research Matters

Educational research earns its place in a manager's priorities because it improves decisions at three levels. At the level of the individual learner, research equips schools with tools and strategies calibrated to real student needs: early warning systems that identify signals of disengagement, such as chronic absence and failing marks, so educators can intervene before a learner is lost, and programs such as remediation and alternative learning that are structured on evidence about what works and when. At the institutional level, research provides data that allows limited funds to be directed toward high-impact programs rather than spread across every promising idea. At the system level, research builds cumulative knowledge about how learners grow and how policies shape outcomes, enabling leaders to anticipate emerging issues and challenge outdated conventions.

1.5.3 The Manager's Distinctive Position

The educational manager occupies a distinctive position in the research enterprise precisely because she is usually not the investigator. She commissions studies, stewards limited resources, protects participants who are frequently learners, and turns findings into decisions. This vantage point makes research management a leadership discipline rather than a technical

one: its competencies are exercised in judgment, in weighing what to study against what can be afforded, in balancing the welfare of participants against the value of knowledge, and in deciding when evidence is strong enough to act upon. The questions a division chooses to study today quietly shape the system its learners will inherit tomorrow.

1.6 Table 1.1, The Three Levels of Value

Level	What research enables	Philippine example
Learner	Timely, targeted support based on identified needs	Early warning and remediation guided by dropout-risk studies
Institution	Efficient allocation of scarce resources to high-impact programs	Directing division funds toward evidence-backed reading interventions
System	Cumulative knowledge for reform and long-range planning	Evaluating the effects of the K to 12 and MATATAG curricula over time

Table 1.1. The three levels at which managed educational research creates value.

1.7 The Research Management Mindset

To manage research well is to hold two commitments at once: a commitment to rigor, so that the evidence produced is trustworthy, and a commitment to use, so that the evidence produced actually informs decisions. A study that is methodologically flawless but never applied has failed as surely as a study that was applied but produced misleading conclusions. The research manager's mindset is therefore integrative, spanning the whole life cycle and refusing to treat any single stage, whether design, ethics, analysis, or dissemination, as someone else's problem. This mindset is what the remaining chapters develop, one competency at a time, and what the cumulative Research Management Plan puts into practice.

1.8 Philippine Context and Case Study

PHILIPPINE CONTEXT

Research management is institutionalized across the Philippine education system. The Department of Education steers teacher-led inquiry through its Basic Education Research Agenda and supports it with the Basic Education Research Fund and division research committees. The Commission on Higher Education presses universities to raise research productivity and align studies with national development priorities. The Department of Science and Technology funds and coordinates research capacity across sectors. For the Filipino educational manager, competent research management is thus not optional but a defined expectation embedded in national policy and funding structures.

CASE STUDY

Illustrative composite case.

A division superintendent faced pressure to expand a costly reading program division-wide on the strength of enthusiastic reports from a few schools. Rather than commit the budget immediately, she treated the decision as a research management problem: she commissioned a small, well-designed evaluation comparing schools that had adopted the program with comparable schools that had not, ensured the study protected pupil data, and waited for evidence before scaling. The evaluation revealed that the program helped only where teachers had received sustained training, redirecting the investment toward training rather than materials. The case illustrates the book's central orientation: research managed as a system, from question through ethics to evidence-informed decision, produces better outcomes than enthusiasm alone.

1.9 Best Practices, Current Issues, and Common Pitfalls

- Best Practice: Treat research as a governed system spanning the whole life cycle, not a single act performed by a lone investigator.

- Best Practice: Justify research investment by naming the level, learner, institution, or system, at which it will create value.
- Emerging Issue: Open science, data privacy regulation, and artificial intelligence are reshaping research management and demand new professional judgment.
- Common Pitfall: Treating research as a technical activity to be delegated entirely, rather than a leadership responsibility to be governed.
- Common Pitfall: Acting on enthusiastic but unmanaged evidence, skipping the design, ethics, and validation the life cycle requires.
- Common Pitfall: Producing rigorous research that is never translated into decisions, so its value is lost.

1.10 Summary and Key Takeaways

Research management is the systematic planning, resourcing, safeguarding, and directing of research so that it produces trustworthy and useful results within an institution's constraints. It emerged as science became organized and accountable, and it draws on project management, research ethics, and evidence-based policy. Managed educational research creates value at the levels of the learner, the institution, and the system. The educational manager's distinctive position, commissioning and governing rather than conducting research, makes this a leadership discipline exercised in judgment. Chapter 2 now turns to the planning and governance that begin every well-managed study.

KEY TAKEAWAYS

- Research management governs inquiry across its whole life cycle, from question to dissemination.
- It draws on project management, research ethics, and evidence-based policy.

- Managed educational research creates value at the learner, institution, and system levels.
- The educational manager commissions and governs research; this makes it a leadership discipline.

1.11 Key Terms, Reflection, and Discussion

Research Management. Research Life Cycle. Evidence-Based Practice. Research Governance. Educational Manager. Basic Education Research Agenda. Data-Driven Decision-Making.

- Reflection: In your own institution, who currently performs the functions of research management, and are they governed as a coherent system or handled piecemeal?
- Discussion: The educational manager usually commissions rather than conducts research. How does this vantage point change the competencies research management requires?

1.12 Activity and Research Management Plan, Step 1

RESEARCH MANAGEMENT PLAN, STEP 1

Identify a real problem or decision in your institution that research could inform (for example, whether to adopt a program, how to address a persistent gap, or which of two approaches works better). Write a one-paragraph description of the problem, name the level, learner, institution, or system, at which better evidence would create value, and state why the decision matters. This becomes the foundation of the Research Management Plan you will develop across the book.

1.13 References

- Creswell, J. W., & Creswell, J. D. (2018). Research design: Qualitative, quantitative, and mixed methods approaches (5th ed.). SAGE.
- UNESCO. (2023). Guidance for generative AI in education and research. UNESCO.
- Department of Education. Basic Education Research Agenda. Republic of the Philippines.

End of Chapter 1. Continue to Chapter 2: Planning and Governing Research

PLANNING AND GOVERNING RESEARCH

The Blueprint and the Safeguards

"It is cheaper to correct a study on paper than in the field, and the absence of a plan is the single most common reason that well-intentioned research collapses."

2.0 Chapter Overview

This chapter develops two responsibilities that begin every well-managed study: planning it, so that its purpose, design, resources, ethics, and timeline are coherent and feasible before it begins, and governing its data and evidence, so that the study is lawful, ethical, and credible. A research plan is to a study what a blueprint is to a building. This chapter presents a framework for the research plan and then turns to the quality, privacy, and ethical governance of the evidence a study produces, laying the groundwork that the rest of the book builds upon.

2.1 Learning Outcomes

- LO 2.1 Explain why research planning is the foundation of a feasible, credible study.
- LO 2.2 Apply a framework to draft, review, or critique a research plan.
- LO 2.3 Explain the manager's obligations for data quality, privacy, and the ethics of evidence.

2.2 Introduction

Research planning is the deliberate structuring of a study before it begins, so that its purpose, design, resources, ethics, and timeline are coherent and feasible. A plan is to a study what a blueprint is to a building: it is cheaper to correct on paper than in the field, and its absence is the single most common reason that well-intentioned educational research collapses. Effective planning converts a vague aspiration into a set of decisions that a panel can evaluate, a budget officer can cost, and an ethics board can clear.

Planning is inseparable from governance. The same plan that specifies what will be studied must also specify how participants and their data will be protected, because in education those participants are frequently learners, and the data are frequently sensitive records. This chapter therefore treats planning and governance together: the framework that makes a study feasible, and the safeguards that make it lawful, ethical, and trustworthy. Both are the manager's responsibility, and both begin before a single datum is collected.

2.3 Historical Background

The formalization of research planning grew alongside the professionalization of grant administration in the mid-twentieth century, as funders came to require detailed proposals before committing resources. The proposal, with its problem statement, objectives, methodology, budget, and timeline, became the standard instrument for planning, reviewing, and approving research. Its discipline, forcing a researcher to think through the whole study in advance, proved valuable far beyond the securing of funds.

The governance of research data has a more recent and more urgent history. The abuses of human participants documented in the twentieth century gave rise to formal ethics review, and the digital era's capacity to collect and process personal data at scale gave rise to data privacy regulation. In the Philippines, the Data Privacy Act of 2012 institutionalized obligations that now directly bear on any study handling learner records, making data governance a legal as well as an ethical responsibility, one that competent planning must anticipate from the outset.

2.4 Definitions

KEY TERMS

Research Plan: The deliberate structuring of a study before it begins, specifying purpose, design, resources, ethics, and timeline.

Research Proposal: The formal document that presents a research plan for evaluation, funding, or ethics clearance.

Data Management Plan: A specification of how data will be collected, stored, secured, retained, and eventually disposed of.

Data Privacy Act of 2012: Republic Act No. 10173, which regulates the collection, processing, and storage of personal data in the Philippines.

> **Ethics of Evidence:** The obligation to produce, handle, and report data honestly and to protect those from whom it is gathered.

2.5 Core Concepts of Planning and Governance

2.5.1 A Framework for the Research Plan

While formats vary, a complete educational research plan answers a consistent set of questions, and the framework below can be used to draft, review, or critique any proposal. It asks why the study matters and what precisely it will investigate; what design and methods fit the question; who will participate and how they will be selected; how participants and their data will be protected; what resources and timeline the study requires; and how the findings will be analyzed and used. A plan that answers these questions coherently is feasible; a plan that leaves any of them vague is a study waiting to fail.

Figure 2.1. The components of a complete research plan. A coherent plan answers each question before the study begins.

2.5.2 Data Quality and the Ethics of Evidence

A plan is only as good as the evidence it produces, and the quality of that evidence depends on decisions made during planning. The manager guards data quality by piloting instruments, training data collectors, monitoring completeness, and documenting every decision, so that

limitations can be reported honestly rather than discovered too late. Underlying these practices is the ethics of evidence: the obligation to produce and report data honestly, neither fabricating what was not found nor concealing what was. Evidence gathered carelessly or reported selectively is not merely weak; it is a breach of the trust that makes research worth doing.

2.5.3 Privacy and Data Governance

Data must be managed as a sensitive asset across its whole life cycle. A data management plan specifies how data will be collected, stored, secured, retained, and eventually disposed of. Under the Data Privacy Act of 2012, personal data, especially that of minors, must be collected with a lawful basis and with consent, kept only as long as necessary, secured against unauthorized access, and processed transparently. Practical safeguards include anonymizing or pseudonymizing records, restricting access, encrypting sensitive files, and never entering identifiable data into public tools. Good data governance is not bureaucratic overhead; it is the precondition of both legal compliance and credible evidence, and it must be planned from the start, not added at the end.

2.6 Table 2.1, The Research Plan Framework

Component	Question it answers	Manager's checkpoint
Problem and questions	Why does this study matter, and what will it investigate?	Is it aligned with institutional priorities and precisely framed?
Design and methods	How will the question be answered?	Does the method fit the question and is it feasible?
Participants and sampling	Who will take part, and how are they chosen?	Is the sample appropriate and ethically recruited?
Ethics and data protection	How are participants and data protected?	Is there consent, clearance, and a data management plan?
Resources and timeline	What is needed, and by when?	Is the study affordable and schedulable?
Analysis and use	How will findings be produced and applied?	Is the analysis planned and the use intended?

Table 2.1. A framework for drafting, reviewing, or critiquing a research plan.

2.7 Planning as Risk Reduction

The deepest value of planning is that it moves the correction of errors from the field, where they are expensive and sometimes fatal, to the page, where they are cheap. A sampling flaw caught in a plan is a sentence rewritten; the same flaw discovered after data collection may invalidate the whole study. An ethics gap caught in a plan is a consent form added; the same gap discovered later may halt the research entirely. This is why experienced managers treat the plan not as a bureaucratic hurdle but as the study's most valuable risk-reduction tool, and why the discipline of planning, thinking the whole study through before beginning it, repays every hour it costs.

2.8 Philippine Context and Case Study

PHILIPPINE CONTEXT

Data governance in Philippine educational research is anchored in the Data Privacy Act of 2012 (Republic Act No. 10173), overseen by the National Privacy Commission, which is directly relevant whenever a study handles learner records. Ethics review is conducted through accredited committees under the National Ethical Guidelines issued by the Philippine Health Research Ethics Board. For the educational manager, planning a study now means planning its compliance: securing ethics clearance before data collection, establishing a lawful basis and consent for personal data, and protecting the records of minors with particular care.

CASE STUDY

Illustrative composite case.

A graduate researcher planned a study of at-risk pupils that required access to attendance, grade, and disciplinary records. In an earlier draft, the plan treated data handling as an afterthought, assuming records could simply be requested. Revising the plan around the Data Privacy Act, the researcher specified a lawful basis, obtained guardian consent and pupil assent, pseudonymized the records, restricted access to the research team, and set a retention-and-disposal schedule. The revision added a week to

> the planning but prevented a fatal problem: without it, the ethics committee would have withheld clearance, and the study could not have proceeded. The case shows planning and governance as inseparable, and both as the manager's responsibility from the outset.

2.9 Best Practices, Current Issues, and Common Pitfalls

- Best Practice: Plan the whole study before beginning, using a framework that answers every question a panel, budget officer, or ethics board will ask.
- Best Practice: Write a data management plan specifying collection, storage, security, retention, and disposal, especially for the records of minors.
- Best Practice: Secure ethics clearance and a lawful basis for personal data before any data collection begins.
- Common Pitfall: Treating the plan as a bureaucratic formality rather than the study's most valuable risk-reduction tool.
- Common Pitfall: Leaving data protection to be arranged after data collection, when it must be planned from the start.
- Common Pitfall: Reporting only favorable evidence, breaching the ethics of evidence that makes research trustworthy.

2.10 Summary and Key Takeaways

Research planning structures a study before it begins so that its purpose, design, resources, ethics, and timeline are coherent and feasible, and it is the manager's most valuable tool for reducing risk. A framework of consistent questions can be used to draft, review, or critique any plan. Inseparable from planning is the governance of evidence: guarding data quality, honoring

the ethics of evidence, and protecting personal data under the Data Privacy Act. Both planning and governance are the manager's responsibility, and both begin before data collection. Chapter 3 now turns to the precise formulation of research questions and objectives.

KEY TAKEAWAYS

- A research plan is to a study what a blueprint is to a building; its absence is the leading cause of collapse.
- A consistent framework of questions can be drafted, reviewed, or critiqued for any research plan.
- The ethics of evidence requires producing and reporting data honestly.
- Data governance under the Data Privacy Act must be planned from the start, not added at the end.

2.11 Key Terms, Reflection, and Discussion

Research Plan. Research Proposal. Data Management Plan. Data Privacy Act of 2012. Ethics of Evidence. Lawful Basis. Pseudonymization. Ethics Clearance.

- Reflection: For the problem you identified in Step 1, what data would a study need, and what would protecting that data require under the Data Privacy Act?
- Discussion: Planning moves the correction of errors from the field to the page. Why do researchers so often underinvest in planning despite this clear advantage?

2.12 Activity and Research Management Plan, Step 2

RESEARCH MANAGEMENT PLAN, STEP 2

Draft the outline of a research plan for the problem you identified in Step 1, using the framework in Table 2.1: state the problem and what the study will investigate, sketch a design, describe who would participate, and, importantly, note what data the study needs and how you would protect it under the Data Privacy Act. Identify at this stage any ethics clearance the study would require.

2.13 Chapter Self-Check

CHAPTER SELF-CHECK

1. A research plan is best compared to:

a) A finished study b) A blueprint for a building c) A literature review d) A final report

2. The single most common reason well-intentioned research collapses is:

a) Too much data b) The absence of a plan c) Excessive funding d) Too many participants

3. In the Philippines, personal data in research is regulated by:

a) The Intellectual Property Code b) The Data Privacy Act of 2012 c) The Belmont Report d) The K to 12 law

4. The ethics of evidence requires that data be:

a) Reported only when favorable b) Produced and reported honestly c) Kept secret d) Collected without consent

5. Data protection in a study should be:

a) Added after data collection b) Planned from the start c) Left to the ethics board alone d) Ignored for minors

2.14 References

- National Privacy Commission. Data Privacy Act of 2012 (Republic Act No. 10173) and its implementing rules. Republic of the Philippines.
- Creswell, J. W., & Creswell, J. D. (2018). Research design: Qualitative, quantitative, and mixed methods approaches (5th ed.). SAGE.
- Philippine Health Research Ethics Board. National ethical guidelines for health and health-related research.

End of Chapter 2. Continue to Chapter 3: Formulating Research Questions and Objectives

FORMULATING RESEARCH QUESTIONS AND OBJECTIVES

From a Broad Concern to an Answerable Question

"The narrowed question is not a loss of ambition. It is what makes the larger concern finally addressable."

3.0 Chapter Overview

This chapter closes Part I by developing the skill on which every study depends: formulating a research question that is precise, answerable, and worth answering, and translating it into aligned objectives. You will learn how a broad concern is narrowed into a workable question, the qualities that distinguish a strong question, the FINER and PICO tools for testing one, the types of questions and the designs they imply, and how to write SMART objectives that align with the question. A well-formed question is the foundation of a well-managed study; a flawed one dooms everything built upon it.

3.1 Learning Outcomes

- LO 3.1 Narrow a broad problem into a focused, answerable research question.
- LO 3.2 Evaluate a research question using recognized criteria and the FINER and PICO tools.
- LO 3.3 Write aligned, SMART objectives that operationalize a research question.

3.2 Introduction

A research problem is the gap, difficulty, or tension in knowledge or practice that motivates a study. A research question is a specific, answerable question that the study will address within that problem. A research objective is a statement of what the study will do to answer the question. The three form a chain: the problem justifies the question, and the objectives operationalize it. Getting this chain right is the most consequential early act of research

management, because a design built on a vague or misaligned question cannot be rescued by careful execution later.

The movement from problem to question is one of progressive narrowing. A broad concern, such as declining literacy, is refined by asking: literacy among whom, measured how, in what setting, and compared to what. Each answer trims the territory until a single, workable question remains. This is disciplined work, not a loss of ambition; the narrowed question is what makes the larger concern finally addressable. This chapter develops the tools that make this narrowing rigorous rather than arbitrary.

3.3 Historical Background

The emphasis on the research question as the pivot of a study reflects a maturing of research methodology over the twentieth century. Earlier accounts of research often began with the method or the data; the modern consensus, reflected in virtually every graduate methods text, is that the question comes first and governs everything that follows. Design, sampling, instruments, and analysis are all chosen to serve the question, so a poorly formed question misdirects every subsequent decision.

The tools for testing questions have their own lineages. The FINER criteria emerged from clinical and health research as a checklist for whether a question is worth pursuing. The PICO framework arose in evidence-based medicine as a way to structure answerable clinical questions, and it has since been adopted across the social and educational sciences for comparative and intervention questions. Their migration into education reflects the field's growing methodological rigor and its borrowing of disciplined tools from adjacent research traditions.

3.4 Definitions

KEY TERMS

Research Problem: The gap, difficulty, or tension in knowledge or practice that motivates a study.

Research Question: A specific, answerable question that a study will address within a research problem.

Research Objective: A statement of what a study will do to answer its research question.

FINER Criteria: A test of whether a question is Feasible, Interesting, Novel, Ethical, and Relevant.

PICO / PICOT: A framework specifying Population, Intervention, Comparison, Outcome, and (in PICOT) Time, for comparative questions.

SMART Objectives: Objectives that are Specific, Measurable, Achievable, Relevant, and Time-bound.

3.5 Core Concepts of Question Formulation

3.5.1 From Problem to Question

The movement from a broad problem to a workable question proceeds by progressive narrowing, each step trimming the territory until a single answerable question remains. A strong question shares recognizable qualities: it is focused on a single problem, researchable using accessible data and methods, feasible within available time and resources, specific enough to be clearly answerable, complex enough to require analysis rather than a simple yes or no, and relevant to the discipline and to practice. A question that fails any one of these tests should be revised before a design is built upon it.

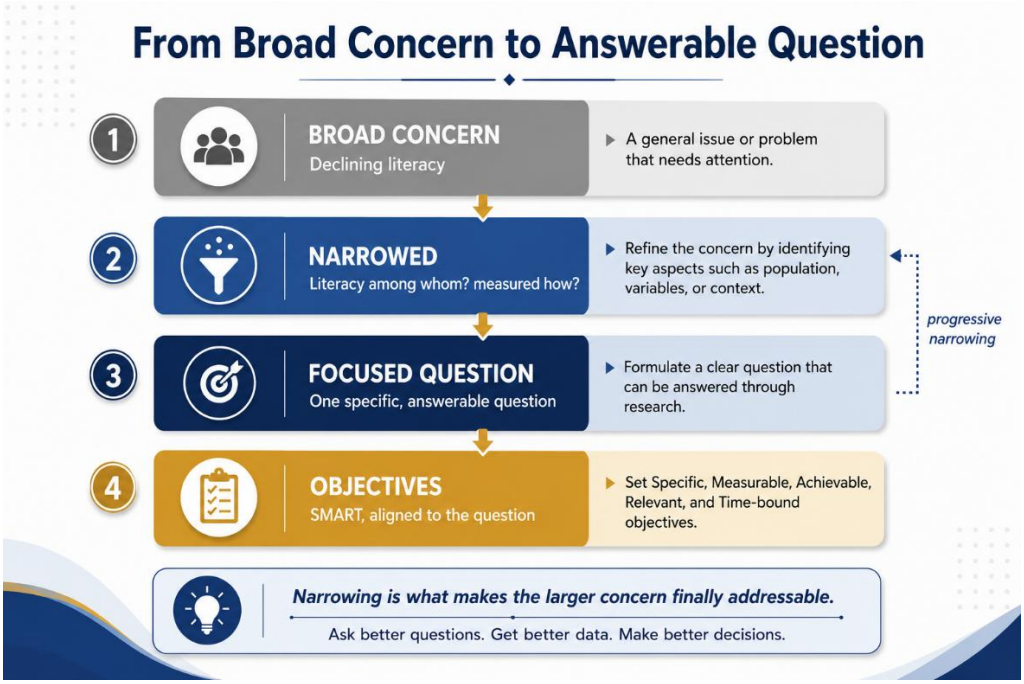

Figure 3.1. Progressive narrowing turns a broad concern into a focused, answerable research question, which objectives then operationalize.

3.5.2 Tools for Testing a Question: FINER and PICO

Two established tools help researchers test and sharpen a question. The FINER criteria ask whether a question is Feasible, Interesting, Novel, Ethical, and Relevant: feasibility concerns data, participants, time, and expertise; interest and novelty concern whether the answer advances knowledge; ethics concerns the welfare of participants; and relevance concerns the value of the answer to the field. The PICO framework, and its extension PICOT, is especially useful for comparative and intervention questions. It prompts the researcher to specify the Population or problem, the Intervention or exposure, the Comparison, the Outcome, and, in PICOT, the Time frame. Framing a question in PICO forces the precision that panels demand and methods require.

3.5.3 Types of Questions and Aligned Objectives

Questions differ by the aim they serve, and the type chosen shapes the design that follows. Descriptive questions ask what is happening or what characteristics exist; comparative questions ask whether groups differ; relationship questions ask whether variables move together; causal questions ask whether one factor produces a change in another, and demand the most rigorous designs; and exploratory questions, common in qualitative work, ask how or why a phenomenon unfolds. Once the question is set, objectives translate it into concrete actions. Strong objectives are SMART and come in two layers: a general objective mirroring the main question and specific objectives that break that aim into discrete tasks. Alignment is the test of quality: every specific objective should map to part of a question, and every question should be served by an objective.

3.6 Table 3.1, Qualities of a Strong Question

Quality	The question is...	Warning sign
Focused	Centered on one problem, not several	Contains multiple unrelated aims
Researchable	Answerable with obtainable data	Requires data that cannot be accessed
Feasible	Achievable within time and budget	Would need years or resources you lack

Quality	The question is...	Warning sign
Specific	Precise about who, what, and where	Uses vague terms with no boundaries
Complex	Requires analysis and evidence	Answerable by a single fact or yes/no
Relevant	Matters to theory and practice	The answer would change nothing

Table 3.1. Qualities of a strong research question and its common warning signs.

3.7 The PICOT Framework and Question Types

The PICOT framework makes the abstractions of question-testing concrete. For an educational intervention question, it specifies the Population (for example, Grade 4 pupils reading below level in a district), the Intervention (a twelve-week guided oral reading program), the Comparison (business-as-usual silent reading), the Outcome (reading comprehension scores), and the Time (one academic semester). A question framed with this precision is ready for design; a question that cannot be so framed usually needs further narrowing. Matching the question type to the study's aim, descriptive to survey, causal to experimental, exploratory to qualitative, is a mark of methodological literacy that Chapter 5 develops fully. Table 3.2 summarizes the PICOT elements with an educational illustration.

Element	Prompt	Educational illustration
Population	Who is studied?	Grade 4 pupils reading below level in District X
Intervention	What is applied?	A twelve-week guided oral reading program
Comparison	Against what?	Business-as-usual silent reading
Outcome	What is measured?	Reading comprehension scores
Time	Over what period?	One academic semester

Table 3.2. The PICOT framework applied to an educational intervention question.

3.8 Philippine Context and Case Study

PHILIPPINE CONTEXT

Well-formed research questions are the gateway to the Philippine research funding and publication system. The Department of Education's Basic Education Research Fund and the research committees of divisions and universities evaluate proposals substantially on the clarity and answerability of their questions. A vague or overbroad question is among the most common reasons Filipino graduate proposals are returned for revision, while a precisely framed, well-aligned question signals the methodological literacy that panels reward. Mastering question formulation is therefore a direct and practical professional advantage.

CASE STUDY

Illustrative composite case.

A graduate student proposed to study why students in her division were underperforming, a question so broad that no design could answer it. Guided through progressive narrowing, she asked underperforming in what, among whom, compared to what, and over what period, and arrived at a focused, PICOT-framed question about whether a specific numeracy intervention improved the mathematics scores of Grade 7 pupils in three schools over one semester, relative to comparable schools. The narrowed question was immediately researchable, and her objectives aligned cleanly with it. The case illustrates that narrowing is not a retreat from an important concern but the very act that makes it addressable.

3.9 Best Practices, Current Issues, and Common Pitfalls

- Best Practice: Narrow a broad concern progressively until a single focused, answerable question remains.

- Best Practice: Test every question against recognized criteria and, for comparative questions, frame it with PICOT.
- Best Practice: Write SMART objectives that align precisely with the question, each objective serving part of it.
- Common Pitfall: Posing an overbroad question that no design can answer, then blaming the method.
- Common Pitfall: Writing objectives that do not map to the question, or a question that no objective addresses.
- Common Pitfall: Choosing a question type that mismatches the study's aim, misdirecting the design that follows.

3.10 Summary and Key Takeaways

A research problem justifies a research question, which operationalizes objectives; getting this chain right is the most consequential early act of research management. A broad concern is progressively narrowed into a focused, answerable question, tested against criteria such as focus, researchability, feasibility, specificity, complexity, and relevance, and sharpened with the FINER and PICO tools. Question type, shape, and SMART objectives must align precisely with the question. This closes Part I; Part II now turns to designing the study, beginning with the IMRAD format that structures the research article.

KEY TAKEAWAYS

- Problem, question, and objectives form a chain; the problem justifies the question, which objectives operationalize.
- A broad concern is narrowed progressively into a focused, answerable question.

- FINER and PICO test and sharpen a question; PICOT suits comparative and intervention questions.
- SMART objectives must align precisely with the question, each serving part of it.

3.11 Key Terms, Reflection, and Discussion

Research Problem. Research Question. Research Objective. FINER Criteria. PICO / PICOT. SMART Objectives. Progressive Narrowing. Alignment. Question Type.

- Reflection: Take the problem from your Research Management Plan and narrow it into one focused, answerable question. Which quality in Table 3.1 was hardest to satisfy?
- Discussion: Narrowing a question can feel like abandoning a larger concern. How would you explain to a stakeholder that the narrowed question actually serves the larger concern best?

3.12 Activity and Research Management Plan, Step 3

RESEARCH MANAGEMENT PLAN, STEP 3

Formulate the central research question for your plan by progressively narrowing the problem from Step 1. Test it against the qualities in Table 3.1 and, if it is comparative or interventional, frame it with PICOT. Then write a general objective and two or three aligned, specific, SMART objectives, confirming that each objective maps to part of your question.

3.13 Chapter Self-Check

CHAPTER SELF-CHECK

1. The chain that underlies a study runs from:

a) Method to data to question b) Problem to question to objectives c) Objectives to problem to method d) Data to objectives to problem

2. The FINER criteria stand for Feasible, Interesting, Novel, Ethical, and:

a) Rigorous b) Relevant c) Reliable d) Replicable

3. PICO is especially useful for questions that are:

a) Purely descriptive b) Comparative or interventional c) Historical d) Theoretical only

4. A causal question is best matched with which design?

a) Survey b) Experimental or strong quasi-experimental c) Phenomenology d) Case study

5. SMART objectives must above all be:

a) Numerous b) Aligned with the question c) Written last d) Purely qualitative

3.14 References

- Creswell, J. W., & Creswell, J. D. (2018). Research design: Qualitative, quantitative, and mixed methods approaches (5th ed.). SAGE.
- Hulley, S. B., Cummings, S. R., Browner, W. S., Grady, D. G., & Newman, T. B. (2013). Designing clinical research (4th ed.). Lippincott Williams & Wilkins.
- Doran, G. T. (1981). There's a S.M.A.R.T. way to write management's goals and objectives. Management Review, 70(11), 35 to 36.

End of Chapter 3. Continue to Chapter 4: The IMRAD Format

PART II

DESIGNING THE STUDY

Part II turns from framing a study to designing it. It presents IMRAD, the standard architecture of the research article and a diagnostic for evaluating one; develops the methodological reasoning by which a design is matched to a question; and grounds all design in the ethics and integrity that must govern it, including the new demands of AI-assisted research.

THE IMRAD FORMAT

The Architecture of the Research Article

"Another competent researcher, reading only the Methods, should be able to repeat the study. Vagueness there is not a stylistic lapse but a threat to credibility."

4.0 Chapter Overview

Part II turns from framing a study to designing and structuring it, beginning with IMRAD, the standard architecture of the research article. IMRAD, Introduction, Methods, Results, and Discussion, is more than a format; it is a disciplined way of thinking about what a study must communicate and in what order. This chapter examines each of the four movements, the title and abstract that bracket them, and the cardinal rule that governs each section, so that a manager can both write and critically evaluate a research article.

4.1 Learning Outcomes

- LO 4.1 Explain the architecture of IMRAD and the role of the title and abstract.
- LO 4.2 Describe the purpose and cardinal rule of each IMRAD section.
- LO 4.3 Evaluate a research article for adherence to the IMRAD discipline.

4.2 Introduction

The overwhelming majority of research articles in education and the sciences follow the IMRAD structure: Introduction, Methods, Results, and Discussion. Its near-universality is not an accident of convention but a reflection of the logic of inquiry itself. A study must establish why it was undertaken and what it asked, describe how it was conducted, report what it found, and interpret what those findings mean. IMRAD arranges these four movements in the order a reader needs them, and it disciplines the writer to keep each in its place.

For the research manager, IMRAD is doubly useful. As a writer or supervisor of writers, it provides the template for a credible manuscript. As a reader and evaluator of research, it

provides a diagnostic: a study whose Introduction never arrives at a question, whose Methods cannot be reproduced, whose Results smuggle in interpretation, or whose Discussion overreaches. These violations reveal its weaknesses through their violations of the IMRAD discipline. This chapter treats IMRAD as both a construction guide and an evaluation tool.

4.3 Historical Background

The IMRAD structure emerged gradually over the twentieth century and became the dominant format for scientific articles by the second half of the century. Before its consolidation, research reports followed varied and often idiosyncratic structures, making them harder to write, review, and compare. As the volume of scientific literature grew, the standardized architecture of IMRAD offered efficiency to everyone in the system: writers knew what to include, reviewers knew where to look, and readers could navigate any article by its familiar landmarks.

IMRAD's spread into educational research reflects the field's alignment with the broader norms of scientific communication and its increasing emphasis on rigor and reproducibility. While qualitative and mixed-methods studies sometimes adapt the structure, the underlying logic, situate the question, describe the method, report the findings, and interpret the meaning, remains the organizing principle of credible research reporting across paradigms.

4.4 Definitions

KEY TERMS

IMRAD: The standard research-article structure: Introduction, Methods, Results, and Discussion.

Abstract: A standalone paragraph, typically 150 to 250 words, compressing a study's purpose, method, key results, and conclusion.

Reproducibility: The capacity of another competent researcher to repeat a study from its Methods section.

Result vs. Interpretation: The separation of what was found (Results) from what it means (Discussion).

Overreach: Claiming more in the Discussion than the evidence supports.

4.5 Core Concepts of IMRAD

4.5.1 The Architecture and Its Brackets

The IMRAD article is bracketed by two elements that are not part of the acronym but are indispensable: the title and abstract at the front, and the references at the back. The title names the study precisely; the abstract, typically 150 to 250 words, compresses the whole study into a single paragraph covering purpose, method, key results, and conclusion. Many readers read only the abstract, so it must stand alone. The body then proceeds through the four movements, each answering a distinct question and each governed by a cardinal rule.

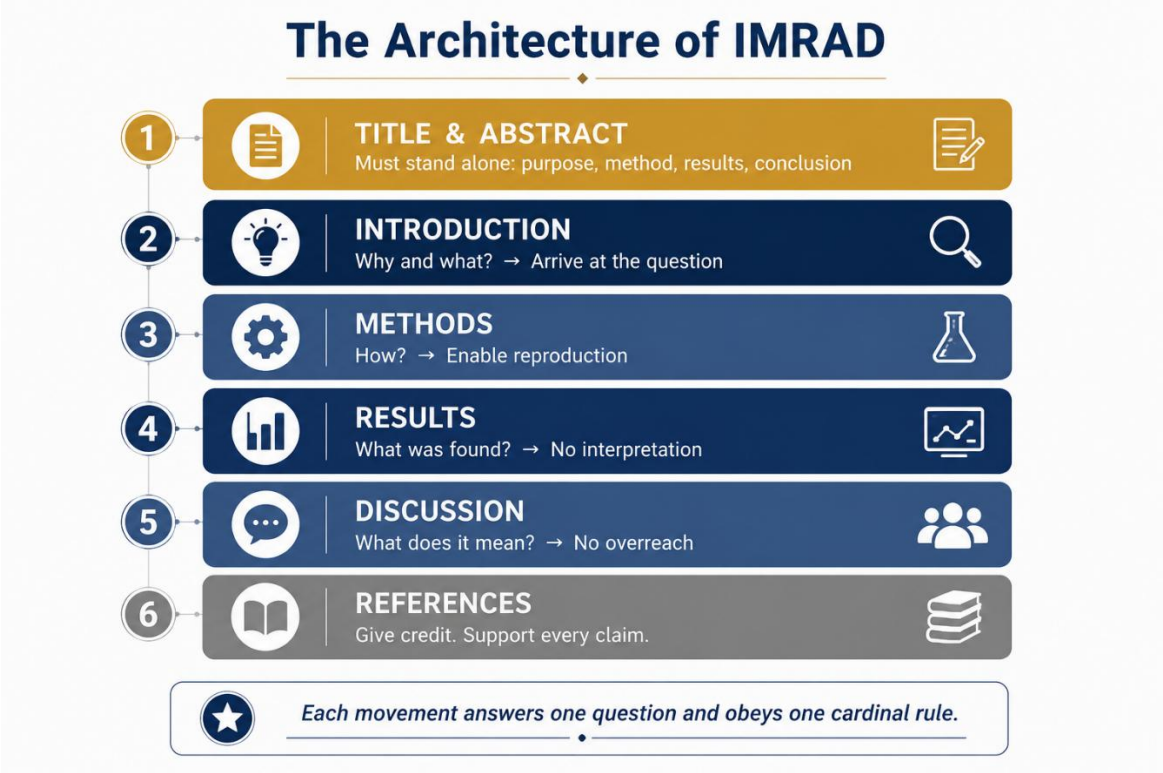

Figure 4.1. The architecture of IMRAD, bracketed by the title and abstract at the front and the references at the back.

4.5.2 Introduction and Methods

The Introduction moves from the general problem to the specific study. It establishes the importance of the topic, reviews just enough prior work to highlight the gap the study addresses, states the research questions or hypotheses, and declares the study's purpose. It should not review the entire literature exhaustively, nor report results. A common flaw is an Introduction that meanders through background without ever naming the gap or the question; a disciplined Introduction always arrives, by its final paragraph, at a precise statement of what the study set out to answer. The Methods section is the guarantor of reproducibility: it describes

the design, the participants and how they were selected, the instruments and how their validity and reliability were established, the procedure, the analysis plan, and the ethical safeguards. The standard is simple and demanding: another competent researcher, reading only the Methods, should be able to repeat the study.

4.5.3 Results and Discussion

The Results section reports findings and only findings, presenting data in a logical order, usually following the sequence of the research questions, and using tables and figures to convey patterns efficiently. The cardinal rule is the separation of result from interpretation: a Results section states that scores rose by a certain margin and that the difference was statistically significant; it does not yet claim that the program caused the rise or that the finding is important. The Discussion then interprets the results and returns the study to the wider world: it restates key findings in relation to the questions, compares them with prior studies, explains unexpected outcomes, draws out implications, and honestly acknowledges limitations. The most frequent failure of a Discussion is overreach, claiming more than the evidence supports, a failure a careful manager and a careful reviewer will both refuse to accept.

4.6 Table 4.1, The Four Movements of IMRAD

Section	Answers	Cardinal rule
Introduction	Why and what?	Arrive at the question
Methods	How?	Enable reproduction
Results	What was found?	No interpretation
Discussion	What does it mean?	No overreach

Table 4.1. The four movements of IMRAD at a glance.

4.7 The Reproducibility Standard

Of all the IMRAD disciplines, reproducibility deserves special emphasis because it is where credibility is most often won or lost. A Methods section must specify the design and why it fits the question, the population and sampling method and sample size and inclusion criteria, the instruments with evidence of their validity and reliability, the step-by-step

procedure for data collection, the analysis techniques and software, and the ethical approvals and safeguards. The test is exacting: could another competent researcher, given only this section, repeat the study and expect comparable results? Vagueness here is not a stylistic lapse but a threat to the study's credibility, because claims that cannot be scrutinized cannot be trusted. A manager reviewing a manuscript should read the Methods first with exactly this question in mind.

Methods element	What must it specify?
Design	The overall approach and why it fits the question
Participants	Population, sampling method, sample size, and inclusion criteria
Instruments	Tools used, with evidence of validity and reliability
Procedure	Step-by-step data collection, replicable by others
Analysis	Statistical or qualitative techniques and software
Ethics	Approval, consent, assent, privacy, and data handling

Table 4.2. The reproducibility checklist for an educational Methods section.

4.8 Philippine Context and Case Study

PHILIPPINE CONTEXT

Filipino graduate students and educational researchers are expected to master IMRAD as the standard structure for theses, dissertations, and journal articles, and Philippine journals and thesis committees evaluate manuscripts against its discipline. A frequent reason Filipino manuscript are returned for revision is an Introduction that never names the gap, a Methods section too vague to reproduce, or a Discussion that overreaches beyond the evidence. Command of IMRAD is therefore a direct requirement for graduate completion and for publication in the indexed journals that Philippine universities increasingly require.

CASE STUDY

Illustrative composite case.

A thesis committee returned a manuscript whose Results section repeatedly explained why the findings mattered and what caused them, mingling interpretation with reporting. The student had violated the cardinal rule of the Results section, and the effect was that reviewers could not separate what the study found from what the author believed. Revising to report findings plainly in Results and to move all interpretation to the Discussion immediately clarified the manuscript and satisfied the committee. The case illustrates that the IMRAD disciplines are not arbitrary conventions but safeguards that enable readers to judge a study on the basis of its evidence.

4.9 Best Practices, Current Issues, and Common Pitfalls

- Best Practice: Write an abstract that stands alone, covering purpose, method, key results, and conclusion in 150 to 250 words.
- Best Practice: Make the Introduction arrive, by its final paragraph, at a precise statement of the question.
- Best Practice: Write Methods so that another researcher could reproduce the study from them alone.
- Common Pitfall: An Introduction that meanders through the background without ever naming the gap or question.
- Common Pitfall: Mingling interpretation into the Results section, violating the separation of result from meaning.
- Common Pitfall: A Discussion that overreaches, claiming more than the evidence supports.

4.10 Summary and Key Takeaways

IMRAD, Introduction, Methods, Results, and Discussion, is the standard architecture of the research article, bracketed by the title and abstract at the front and references at the back. Each movement answers a distinct question and is governed by a cardinal rule: the Introduction must arrive at the question, the Methods must enable reproduction, the Results must not interpret, and the Discussion must not overreach. Reproducibility is where credibility is most often won or lost. IMRAD serves the manager as both a construction guide and an evaluation tool. Chapter 5 now turns to selecting the research methodology that the Methods section will describe.

KEY TAKEAWAYS

- IMRAD structures the research article into Introduction, Methods, Results, and Discussion.
- The abstract must stand alone; the Introduction must arrive at the question.
- Methods must enable reproduction; Results must not interpret; Discussion must not overreach.
- IMRAD is both a guide for writing and a diagnostic for evaluating research.

4.11 Key Terms, Reflection, and Discussion

IMRAD. Abstract. Reproducibility. Result vs. Interpretation. Overreach. Introduction. Methods. Results. Discussion. Cardinal Rule.

- Reflection: Take a research article in your field and test its Methods against the reproducibility checklist in Table 4.2. Could you repeat the study from it?
- Discussion: Why is the separation of result from interpretation, keeping Results free of meaning, so important to a reader's ability to judge a study?

4.12 Activity and Research Management Plan, Step 4

RESEARCH MANAGEMENT PLAN, STEP 4

Draft an IMRAD outline for the study in your Research Management Plan. Write a one-sentence purpose for the Introduction that arrives at your question from Step 3, list the elements your Methods section must specify (using Table 4.2), note what your Results would report without interpretation, and state what the Discussion would interpret. This outline becomes the skeleton of your eventual manuscript.

4.13 Chapter Self-Check

CHAPTER SELF-CHECK

1. IMRAD stands for Introduction, Methods, Results, and:

a) Data b) Discussion c) Design d) Dissemination

2. The abstract must be able to:

a) Replace the Methods b) Stand alone c) Include all references d) Interpret the results

3. The cardinal rule of the Methods section is to:

a) Interpret findings b) Enable reproduction c) Review all literature d) State the conclusion

4. The Results section must not:

a) Report findings b) Use tables c) Interpret the findings d) Follow the question order

5. The most frequent failure of a Discussion is:

a) Too few references b) Overreach beyond the evidence c) Reporting results d) Naming the gap

4.14 References

- American Psychological Association. (2020). Publication manual of the American Psychological Association (7th ed.). APA.
- Day, R. A., & Gastel, B. (2016). How to write and publish a scientific paper (8th ed.). Greenwood.
- Creswell, J. W., & Creswell, J. D. (2018). Research design: Qualitative, quantitative, and mixed methods approaches (5th ed.). SAGE.

End of Chapter 4. Continue to Chapter 5: Selecting Research Methodologies

SELECTING RESEARCH METHODOLOGIES

Matching Design to Question

"None is superior in the abstract. Superiority is defined only in relation to a question."

5.0 Chapter Overview

This chapter develops the heart of methodological reasoning: choosing a research design that fits the question. You will learn the three broad traditions, quantitative, qualitative, and mixed-methods, and the specific designs within them, from surveys and experiments to case studies and phenomenology. The organizing principle throughout is that no methodology is superior in the abstract; a design is strong only in relation to the question it is asked to answer. A closer look at descriptive research design, widely used in education, provides a grounding for the discussion.

5.1 Learning Outcomes

- LO 5.1 Distinguish the quantitative, qualitative, and mixed-methods traditions.
- LO 5.2 Match common research designs to the kinds of questions they best answer.
- LO 5.3 Explain the purpose, benefits, and limits of descriptive research design.

5.2 Introduction

Once a question is formulated, the researcher must choose how to answer it, and this choice of methodology is the pivot on which a study's validity turns. Research methodologies fall into three broad traditions. Quantitative research measures variables numerically and analyzes them statistically to describe, compare, relate to, or explain them, prizing objectivity, generalizability, and replicability. Qualitative research explores meaning, experience, and process through words and observation, prizing depth, context, and the participant's perspective. Mixed-methods research deliberately combines the two, using their complementary strengths to answer questions that neither could address alone.

The cardinal principle of this chapter is that none of these traditions is superior in the abstract; superiority is defined only in relation to a question. A question about how common a practice is calls for measurement; a question about why teachers resist a reform calls for understanding; a question with both dimensions calls for their integration. Matching the design to the question is the mark of methodological literacy, and it is a competency the research manager must possess to commission and evaluate studies effectively.

5.3 Historical Background

The quantitative and qualitative traditions developed from different philosophical roots. The quantitative tradition traces to the positivist conviction that social phenomena can be measured and explained much as natural phenomena are, and it borrowed the experimental and statistical methods of the natural sciences. The qualitative tradition arose partly in reaction, insisting that human meaning and experience require interpretive methods attentive to context and to the participant's own understanding.

For much of the twentieth century, these traditions were held apart, and their advocates sometimes treated the divide as a matter of principle rather than of fit. The rise of mixed-methods research from the late twentieth century onward reflected a more pragmatic consensus: that the choice of method should be driven by the question rather than by allegiance to a paradigm, and that many important educational questions are answered best by combining measurement with understanding. This chapter adopts a pragmatic, question-driven stance.

5.4 Definitions

KEY TERMS

Quantitative Research: Research that measures variables numerically and analyzes them statistically to describe, compare, relate, or explain.

Qualitative Research: Research that explores meaning, experience, and process through words and observation.

Mixed-Methods Research: Research that deliberately combines quantitative and qualitative approaches to answer a question that neither could alone.

Research Design: The specific plan of a study, such as a survey, an experimental study, or a case study, that fits a kind of question.

Descriptive Design: A design that describes a population, situation, or phenomenon accurately without manipulating variables.

5.5 Core Concepts of Methodology

5.5.1 The Three Traditions

The quantitative tradition works with numbers, scores, and counts, asks how much, how many, and whether, samples larger and often randomly, analyzes statistically, and prizes generalizability. The qualitative tradition works with words, images, and observations, asks how, why, and in what way, samples more purposively, analyzes thematically and interpretively, and prizes depth and context. Mixed methods integrates both. None is inherently better; each answers different questions well, and the researcher's task is to match the tradition to the question rather than to a preference.

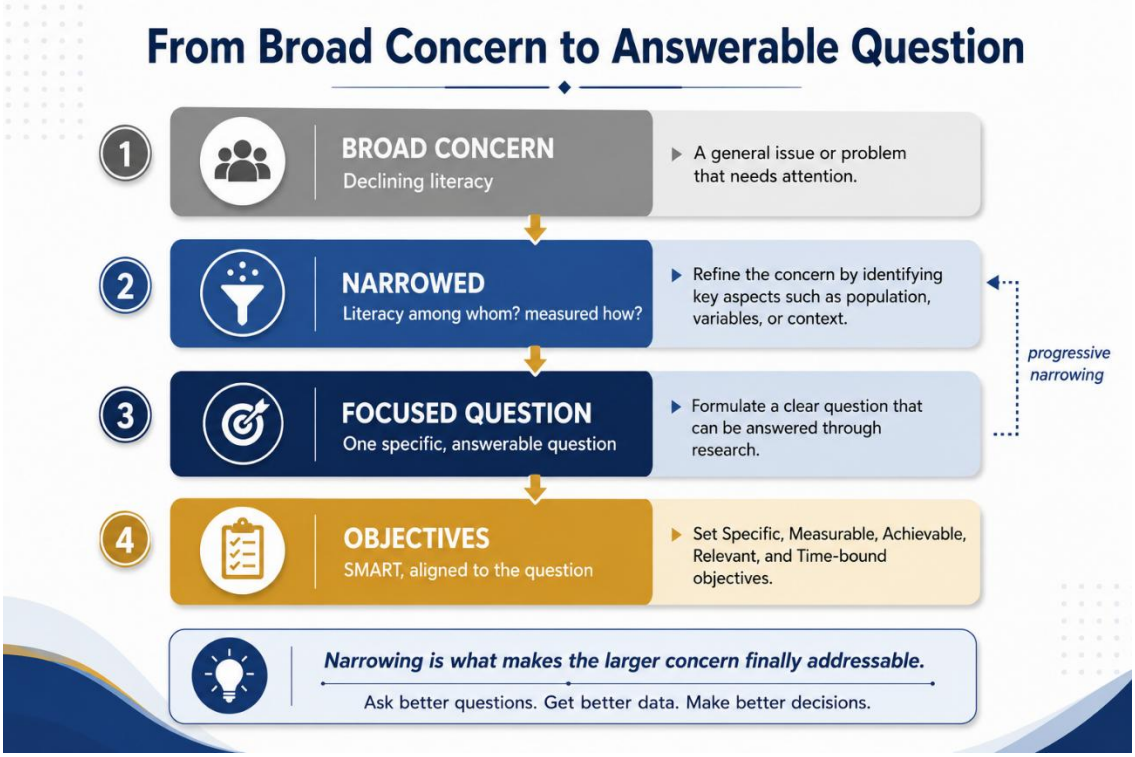

Figure 5.1. Matching design to question. Each design answers a characteristic kind of question within its tradition.

5.5.2 Matching Design to Question

Within each tradition sit specific designs, each suited to a kind of question, and choosing among them is the heart of methodological reasoning. Descriptive and survey designs answer

questions about what exists and how common it is. Correlational designs answer whether variables are associated. Experimental and quasi-experimental designs assess whether an intervention causes an effect, with randomization in experiments providing the strongest causal claim. Case studies examine a bounded system in depth; phenomenology explores lived experience; grounded theory builds theory from data; and ethnography studies culture and practice in a setting. The question, not fashion or familiarity, should determine the choice.

5.5.3 A Closer Look at Descriptive Design

Descriptive research design is one of the most straightforward and widely used approaches in education. It aims to describe a population, situation, or phenomenon accurately and systematically, answering what, where, when, and how questions rather than why. It does not manipulate variables; it observes and records them as they naturally occur. Descriptive designs are applicable when a researcher needs a clear picture of the current state of affairs, such as the prevalence of a practice or the profile of a group, and they frequently serve as the foundation for later comparative or explanatory work. Their benefits include feasibility, the ability to study many variables simultaneously, and their usefulness for guiding policy, though they cannot, by themselves, establish causation.

5.6 Table 5.1, Quantitative vs. Qualitative

Dimension	Quantitative	Qualitative
Purpose	Measure, compare, explain	Understand meaning and experience
Data	Numbers, scores, counts	Words, images, observations
Question words	How much, how many, whether	How, why, in what way
Sampling	Larger, often random	Smaller, purposive
Analysis	Statistical	Thematic, interpretive
Strength	Generalizability	Depth and context

Table 5.1. Contrasting the quantitative and qualitative traditions. Mixed methods integrates both.

5.7 A Map of Common Designs

The designs available to a researcher can be arranged as a map linking each to the questions it best answers, and consulting this map is the disciplined alternative to defaulting to a familiar method. The choice has consequences that ripple through the entire study: a causal question answered with a descriptive design will produce a description that cannot support the causal claim the question sought, while an exploratory question forced into a survey will lose the depth it required. Table 5.2 maps common designs to the questions they best answer, spanning the traditions from quantitative measurement to qualitative understanding.

Design	Best for questions about...	Tradition
Descriptive / survey	What exists, how common, what characteristics	Quantitative
Correlational	Whether variables are associated	Quantitative
Experimental	Whether an intervention causes an effect	Quantitative
Quasi-experimental	Causal effects without full randomization	Quantitative
Case study	A bounded system in depth	Qual / mixed
Phenomenology	The lived experience of a phenomenon	Qualitative
Grounded theory	Building theory from data	Qualitative
Ethnography	Culture and practice in a setting	Qualitative

Table 5.2. A map of common research designs and the questions they best answer.

5.8 Philippine Context and Case Study

PHILIPPINE CONTEXT

Descriptive and survey designs dominate Philippine educational research, particularly at the graduate level, because they are feasible within the time and resource constraints of working teacher-researchers and address many important questions about the current state of practice in Philippine schools. Yet the prevalence of descriptive designs also carries a caution the manager must heed: a descriptive study cannot

establish causation, so program-effectiveness claims require the comparative or experimental designs that fewer studies adopt. Matching design to question thus has direct consequences for the credibility of the evidence base on which Philippine education draws.

CASE STUDY

Illustrative composite case.

A division wished to know whether a new teaching approach improved learning, and a researcher proposed a descriptive survey of teachers' opinions of the approach. The design mismatch was serious: a survey of opinions could describe attitudes but could never establish whether the approach caused improved learning, which was the actual question. Redesigning the study as a quasi-experiment comparing classes that used the approach with comparable classes that did not gave the division the causal evidence it needed. The case illustrates the chapter's central lesson: the question determines the design, and a mismatch produces evidence that cannot answer the question.

5.9 Best Practices, Current Issues, and Common Pitfalls

- Best Practice: Choose a methodology by matching it to the question, not by preference or familiarity.
- Best Practice: Use experimental or strong quasi-experimental designs when the question is genuinely causal.
- Best Practice: Consider mixed methods when a question has both a measurement and a meaning dimension.
- Common Pitfall: Answering a causal question with a descriptive design, producing evidence that cannot support the claim.

- Common Pitfall: Defaulting to a familiar design regardless of the question it is meant to answer.
- Common Pitfall: Treating one tradition as inherently superior rather than as suited to particular questions.

5.10 Summary and Key Takeaways

Research methodologies fall into three traditions: quantitative measurement, qualitative understanding, and mixed-methods integration, none superior in the abstract. Within each sit specific designs, and matching design to question is the heart of methodological reasoning: descriptive and survey designs describe, correlational designs relate, experimental designs establish cause, and qualitative designs explore meaning. Descriptive design, dominant in education, describes accurately but cannot establish causation. Chapter 6 now turns to the ethics and integrity that must govern whichever methodology is chosen.

KEY TAKEAWAYS

- The three traditions, quantitative, qualitative, and mixed, suit different questions; none is superior in the abstract.
- Matching design to question is the heart of methodological reasoning.
- Experimental designs establish causation; descriptive designs cannot.
- A design mismatch produces evidence that cannot answer the question asked.

5.11 Key Terms, Reflection, and Discussion

Quantitative Research. Qualitative Research. Mixed-Methods Research. Research Design. Descriptive Design. Correlational Design. Experimental Design. Case Study. Phenomenology.

- Reflection: Which design best fits the question in your Research Management Plan, and why? What would each alternative design fail to capture?
- Discussion: Descriptive designs dominate educational research despite being unable to establish causation. What are the consequences of this pattern for the evidence base?

5.12 Activity and Research Management Plan, Step 5

RESEARCH MANAGEMENT PLAN, STEP 5

Select and justify the research design for your plan. Using Table 5.2, identify which design best fits your question from Step 3, state the tradition it belongs to, and explain in a short paragraph why it fits and what an alternative design would fail to capture. If your question is causal, confirm that your chosen design can support a causal claim.

5.13 Chapter Self-Check

CHAPTER SELF-CHECK

1. Which tradition prizes depth, context, and the participant's perspective?

a) Quantitative b) Qualitative c) Experimental d) Correlational

2. A question about whether an intervention causes an effect is best answered by:

a) A survey b) An experimental design c) Phenomenology d) Ethnography

3. Descriptive research design:

a) Establishes causation b) Manipulates variables c) Describes without manipulating variables d) Requires randomization

4. The superiority of a methodology is defined:

a) In the abstract b) Only in relation to a question c) By its tradition d) By sample size alone

5. Mixed-methods research is chosen when a question has:

> a) Only a numeric dimension b) Both measurement and meaning dimensions c) No clear focus d) Only a qualitative dimension

5.14 References

- Creswell, J. W., & Creswell, J. D. (2018). Research design: Qualitative, quantitative, and mixed methods approaches (5th ed.). SAGE.
- Creswell, J. W., & Plano Clark, V. L. (2017). Designing and conducting mixed methods research (3rd ed.). SAGE.
- Yin, R. K. (2018). Case study research and applications: Design and methods (6th ed.). SAGE.

End of Chapter 5. Continue to Chapter 6: Research Ethics and Integrity

RESEARCH ETHICS AND INTEGRITY

Principles, Governance, and the Ethics of AI-Assisted Research

"Artificial intelligence may assist; it may not replace judgment, verification, or responsibility. The human researcher remains the author and the accountable party."

6.0 Chapter Overview

This chapter closes Part II with the ethics and integrity that must govern any research design. You will learn the three foundational principles, respect for persons, beneficence, and justice, from which the everyday obligations of consent, confidentiality, and voluntariness flow, and the Philippine legal framework that institutionalizes them. The chapter then addresses a pressing contemporary challenge: the ethics of AI-assisted research and writing, where fabricated sources, data leakage, and the erosion of authorship demand new professional judgment from every research manager.

6.1 Learning Outcomes

- LO 6.1 Explain the three foundational principles of research ethics and the obligations that flow from them.
- LO 6.2 Describe the Philippine legal and governance framework for research ethics and data privacy.
- LO 6.3 Govern the risks of AI-assisted research and writing, including fabricated sources and data leakage.

6.2 Introduction

Research ethics is not a constraint imposed on inquiry from outside; it is a condition of inquiry's legitimacy. Because educational research so often involves learners, many of them minors, and handles sensitive records, the ethical obligations of the researcher are unusually

weighty, and they fall squarely within the manager's responsibility to govern. This chapter grounds those obligations in three foundational principles and traces how the Philippine legal framework institutionalizes them across ethics review, data privacy, and intellectual property.

The chapter then turns to a challenge that did not exist a few years ago. Generative artificial intelligence has rapidly entered academic writing, and with it a set of ethical risks that every research manager must now govern: the fabrication of plausible but nonexistent sources, the leakage of confidential data into public tools, and the erosion of human oversight and authorship. The consistent theme is that the human researcher remains the author and the accountable party. Artificial intelligence may assist; it may not replace judgment, verification, or responsibility.

6.3 Historical Background

Modern research ethics arose from the recognition of grave abuses of human participants in the twentieth century, which prompted a series of codes and frameworks establishing the primacy of participant welfare. The Belmont framework distilled the consensus into three principles, respect for persons, beneficence, and justice, that continue to underpin ethics review worldwide. From these principles flow the everyday obligations of informed consent, confidentiality, voluntariness, and the right to withdraw, now embedded in the review processes of virtually every research institution.

The ethics of AI-assisted research is by contrast a very recent development, its concerns emerging only as generative tools became widely available. In 2023, UNESCO published the first global guidance on generative artificial intelligence in education and research, cautioning that these tools can generate fluent but false content and urging institutions to regulate use, build capacity, and require transparency. This guidance reframes artificial intelligence as a governed instrument that requires policy, disclosure, and verification, and marks the beginning of an ethical conversation that research managers will help shape for years to come.

6.4 Definitions

KEY TERMS

Respect for Persons: Treating individuals as autonomous agents and protecting those with diminished autonomy, expressed through informed consent.

Beneficence: Maximizing the benefits of research and minimizing its harms.

Justice: The fair distribution of the burdens and benefits of research, so no group is exploited or excluded unfairly.

Informed Consent: A participant's voluntary agreement to take part, given with full understanding; for minors, guardian consent with the child's assent.

Research Integrity: Honesty and accountability in producing, handling, and reporting research, including the responsible use of AI.

6.5 Core Concepts of Ethics and Integrity

6.5.1 The Three Foundational Principles

Research ethics rests on three foundational principles, first articulated in the Belmont framework and echoed worldwide. Respect for persons requires treating individuals as autonomous agents and protecting those with diminished autonomy, expressed most concretely through informed consent for adults and, for minors, guardian consent with the child's assent. Beneficence requires maximizing benefits and minimizing harms. Justice requires the fair distribution of the burdens and benefits of research, so that no group is exploited or excluded unfairly. From these principles flow the everyday obligations of consent, confidentiality, voluntariness, and the right to withdraw.

Figure 6.1. The three foundational principles of research ethics and the everyday obligations that flow from them.

6.5.2 The Philippine Governance Framework

In the Philippines, these principles are institutionalized. The National Ethical Guidelines for Health and Health-Related Research, issued by the Philippine Health Research Ethics Board, govern ethics review through accredited ethics committees. The Data Privacy Act of 2012 (Republic Act No. 10173) regulates the collection, processing, and storage of personal data, overseen by the National Privacy Commission, and it is directly relevant whenever a study handles learner records. The Intellectual Property Code (Republic Act No. 8293) protects the rights attached to research outputs and obliges researchers to respect the intellectual property of others, making proper attribution both a scholarly and a legal duty. The framework also foregrounds gender responsiveness, the obligation to design and conduct research that is sensitive to gender and does not reproduce inequity.

6.5.3 The Ethics of AI-Assisted Research

Generative artificial intelligence introduces ethical risks the research manager must now govern. The most serious is the risk of inaccurate or fabricated sources: these systems generate fluent text by prediction, not by consulting a library, and can produce flawless citations that refer to nonexistent studies. A researcher who transfers such a citation without verification introduces a fabrication into the scholarly record, a serious breach of integrity regardless of

intent. A second risk is data leakage: entering confidential or personal data, participant transcripts, unpublished results, and identifiable records into a public tool may expose them beyond the researcher's control and violate the Data Privacy Act. A third is the erosion of human oversight and authorship, as text that is generated rather than written, and accepted rather than verified, can carry errors, bias, and misrepresentation a diligent author would have caught. The human researcher remains the author and the accountable party.

6.6 Table 6.1, The Ethics and Governance Framework

Instrument	Scope	Manager's obligation
Belmont principles	Respect, beneficence, justice	Design consent, minimize harm, ensure fairness
PHREB guidelines	Ethics review of research	Secure ethics clearance before data collection
RA 10173 (Data Privacy)	Personal data processing	Lawful basis, consent, security, minimal data
RA 8293 (IP Code)	Intellectual property	Attribute sources; protect and respect outputs
Gender responsiveness	Equity in research	Design and report without reproducing inequity

Table 6.1. The instruments of research ethics governance and the manager's obligations.

6.7 Governing AI in Research

Governing artificial intelligence in research does not mean prohibiting it but disciplining its use. Every source suggested by a generative tool must be verified against the original before it enters a manuscript, because a plausible citation may refer to a work that does not exist. Confidential and personal data must never be entered into public tools, since doing so may breach the Data Privacy Act and expose participants. And the researcher must remain the author in fact and not merely in name, verifying every claim and taking responsibility for every word. These safeguards, verification, data protection, and retained authorship, convert artificial intelligence from a hazard into a governed instrument. Table 6.2 sets the risks against their safeguards.

AI risk	What can go wrong	The safeguard
Fabricated citations	Plausible references to nonexistent works	Verify every source against the original
Data leakage	Confidential data exposed via a public tool	Never enter identifiable or confidential data
Erosion of authorship	Unverified, generated text carries errors and bias	Retain human oversight; verify every claim

Table 6.2. The risks of AI-assisted research and the safeguards that govern them.

6.8 Philippine Context and Case Study

PHILIPPINE CONTEXT

Philippine educational research operates within a well-defined ethics and privacy framework: ethics clearance from accredited committees before data collection, compliance with the Data Privacy Act of 2012 for any handling of learner records, and respect for the Intellectual Property Code in the use and protection of research outputs. The rapid adoption of generative AI tools among Filipino graduate students has made the ethics of AI-assisted research an urgent practical concern, with fabricated citations and the entry of participant data into public tools posing real risks to integrity and privacy that managers and supervisors must now actively govern.

CASE STUDY

Illustrative composite case.

A graduate student, pressed for time, used a generative AI tool to draft a literature review and submitted it with the citations it generated. A supervisor checking the references discovered that several referred to articles that did not exist, fabricated by the tool. The student had not intended to deceive, but had introduced fabricated sources into the scholarly record, a serious breach regardless of intent. The episode taught a governance lesson now central to research management: AI may assist, but every source it suggests must be verified against the original, and the researcher remains accountable for every citation in the work.

6.9 Best Practices, Current Issues, and Common Pitfalls

- Best Practice: Secure ethics clearance before data collection and design consent around respect, beneficence, and justice.
- Best Practice: Verify every AI-suggested source against the original before it enters a manuscript.
- Best Practice: Never enter confidential or personal data into public AI tools, protecting participants under the Data Privacy Act.
- Common Pitfall: Transferring an AI-generated citation without verification, introducing a fabrication into the record.
- Common Pitfall: Entering participant transcripts or identifiable records into a public tool, risking a privacy breach.
- Common Pitfall: Treating AI-generated text as authored rather than verifying every claim and retaining accountability.

6.10 Summary and Key Takeaways

Research ethics rests on respect for persons, beneficence, and justice, from which flow the obligations of consent, confidentiality, and voluntariness. In the Philippines, these principles are institutionalized through PHREB ethics review, the Data Privacy Act, the Intellectual Property Code, and the requirement of gender responsiveness. Generative artificial intelligence introduces new risks, fabricated sources, data leakage, and the erosion of authorship, which the manager must govern through verification, data protection, and retained accountability. AI may assist but not replace the researcher's judgment. This closes Part II; Part III now turns to generating and validating evidence, beginning with data collection.

KEY TAKEAWAYS

- Respect for persons, beneficence, and justice are the three foundational principles of research ethics.
- Philippine governance institutionalizes these through PHREB, the Data Privacy Act, and the IP Code.
- AI can fabricate plausible but nonexistent sources; every source must be verified.
- The human researcher remains the author and the accountable party; AI assists but does not replace judgment.

6.11 Key Terms, Reflection, and Discussion

Respect for Persons. Beneficence. Justice. Informed Consent. Research Integrity. Data Privacy Act. Intellectual Property Code. Gender Responsiveness. Fabrication. Data Leakage.

- Reflection: What ethics clearance and consent would your Research Management Plan require, and how would you handle any use of AI tools in it?
- Discussion: AI tools can produce fabricated citations that look flawless. What institutional safeguards would you put in place to prevent them from entering student work?

6.12 Activity and Research Management Plan, Step 6

RESEARCH MANAGEMENT PLAN, STEP 6

Write the ethics section of your plan. Specify how you will honor respect for persons (consent and, for minors, assent), beneficence, and justice; identify the ethics clearance required; state how you will comply with the Data Privacy Act; and, if you

will use AI tools at any stage, state the safeguards you will apply, especially source verification and data protection.

6.13 Chapter Self-Check

CHAPTER SELF-CHECK

1. The three foundational principles of research ethics are respect for persons, beneficence, and:

a) Efficiency b) Justice c) Novelty d) Feasibility

2. For research involving minors, consent requires:

a) Only the minor's agreement b) Guardian consent with the child's assent c) No consent d) The school's approval only

3. Personal data in Philippine research is governed by:

a) RA 8293 b) RA 10173 c) The Belmont Report d) PHREB alone

4. The most serious risk of AI-assisted writing is:

a) Slow output b) Fabricated, nonexistent sources c) Formatting errors d) Excessive length

5. In AI-assisted research, the accountable party is:

a) The AI tool b) The human researcher c) The journal d) The software vendor

6.14 References

- National Commission for the Protection of Human Subjects. (1979). The Belmont Report. U.S. Department of Health.
- National Privacy Commission. Data Privacy Act of 2012 (Republic Act No. 10173). Republic of the Philippines.

- UNESCO. (2023). Guidance for generative AI in education and research. UNESCO.

End of Chapter 6. Continue to Chapter 7: Managing Data Collection

PART III

GENERATING AND VALIDATING EVIDENCE

Part III concerns the evidence itself: how data are collected and governed, how they are analyzed into findings, how the validity and reliability of those findings are established, and how data validation and research integrity safeguard the credibility of everything a study claims. Rigor here is shown in the quality of the work, not merely documented afterward.

MANAGING DATA COLLECTION

Gathering Trustworthy Evidence

"Effective data collection begins not with a questionnaire but with three decisions: what you need, where it comes from, and how you will gather it."

7.0 Chapter Overview

Part III turns to the generation and validation of evidence, beginning with data collection. This chapter develops the planning that precedes collection, the principal methods, surveys, interviews, observations, focus groups, and documents, and how to match each to a research need. It also examines sampling and the governance of data as sensitive assets throughout their life cycles. Data collection is where a plan meets the world, and the decisions made here determine whether the evidence a study produces is trustworthy or flawed.

7.1 Learning Outcomes

- LO 7.1 Plan data collection by defining goals, identifying sources, and choosing methods.
- LO 7.2 Match data collection methods to research needs, weighing their strengths and limits.
- LO 7.3 Explain sampling approaches and the governance of data under the Data Privacy Act.

7.2 Introduction

Effective data collection begins not with a questionnaire but with three decisions. First, define your goals: clarify who will use the data and what information would be most useful, since the data collected must be able to answer the research question and inform the intended decision. Second, identify your data sources: determine where the needed data will come from,

distinguishing primary data collected firsthand from secondary data already gathered by others. Third, choose your method, matching the collection technique to the goals, the source, and the constraints.

These three decisions, made before any instrument is drafted, are what separate purposeful data collection from aimless number accumulation. A study that collects data it cannot use, or fails to collect data it needs, has usually skipped this planning. The research manager's role is to ensure that collection is deliberate: that every datum gathered serves the question, that the sources are appropriate, and that the methods fit both the evidence sought and the constraints of the setting.

7.3 Historical Background

The methods of data collection in social and educational research matured over the twentieth century, as survey methodology, interview techniques, and systematic observation each developed its own bodies of knowledge for gathering data effectively. The survey, in particular, became a highly refined instrument, with established principles for item wording, scaling, and administration, precisely because careless survey design produced misleading data that appeared authoritative.

The governance of data as a protected asset is a more recent development, driven by the digital era's capacity to collect, store, and process personal information at scale, as well as by the privacy regulations that followed. What was once a matter of informal custody, keeping records in a locked cabinet, has become a formal obligation with legal force, requiring a lawful basis, consent, security, retention limits, and eventual disposal. In the Philippines, the Data Privacy Act of 2012 gave these obligations statutory force, making data governance an integral part of data collection management.

7.4 Definitions

KEY TERMS

Primary Data: Data collected firsthand for the current study, offering control, relevance, and timeliness.

Secondary Data: Data already collected by others, efficient and often large-scale, but not always a precise fit.

Probability Sampling: Sampling in which every member of the population has a known chance of selection, supporting generalization.

Non-probability sampling: such as purposive or convenience sampling, is suited to qualitative depth but not to statistical generalization.

Data Management Plan: A specification of how data will be collected, stored, secured, retained, and disposed of.

7.5 Core Concepts of Data Collection

7.5.1 Planning and Sources

Primary data are gathered through methods such as surveys, interviews, focus groups, and observations, allowing the researcher to control the collection process and ensure data are accurate, relevant, and up to date. Secondary data, drawn from existing records, reports, or databases, are efficient and can provide scale, but they were collected for other purposes and may not align precisely with the study's needs. A common and powerful strategy is to combine the two, using secondary data for context and primary data for the specific evidence a question requires. The choice between these sources and a combination of these sources is a planning decision, made before collection begins.

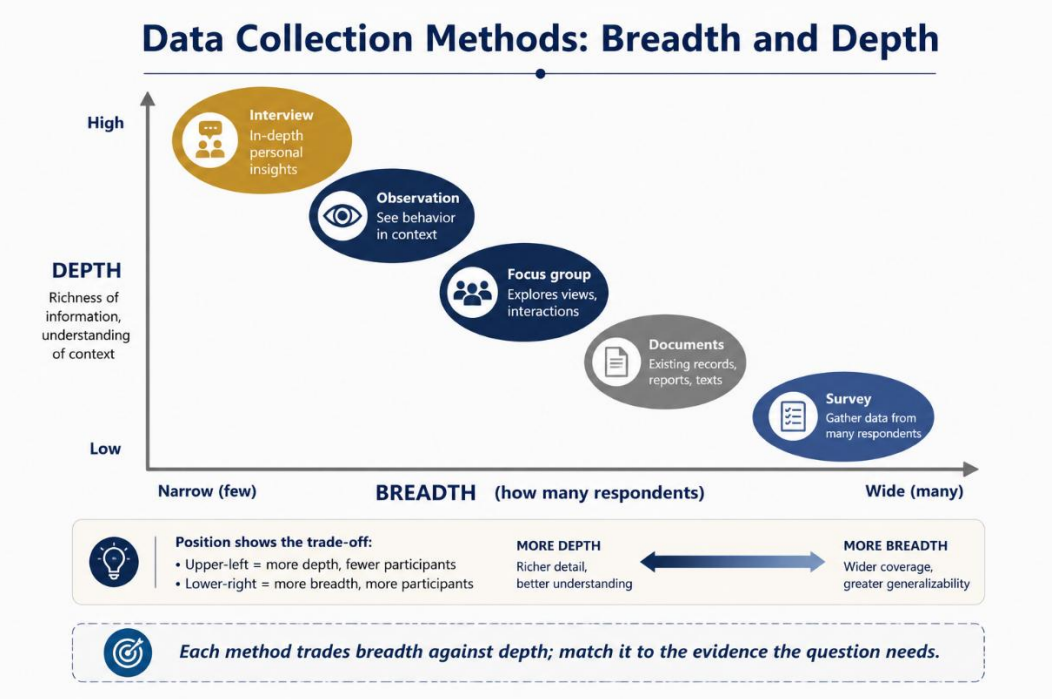

Figure 7.1. Matching data collection methods to research needs. Each method trades breadth against depth in a characteristic way.

7.5.2 Methods of Collection

Each collection method has characteristic strengths and weaknesses, and choosing well means deliberately trading among them. Surveys efficiently and comparably gather data from many respondents, but risk shallow responses and low response rates. Interviews yield rich, detailed data and allow probing, but are time-intensive and feasible only in small numbers. Observation records behavior as it occurs, capturing what people do rather than what they say, but is subject to observer effects. Focus groups surface shared and divergent views through interaction, but risk domination by strong voices. Documents and existing records provide unobtrusive, efficient data, but were created for other purposes and may be incomplete. The method must be matched to the evidence required by the question.

7.5.3 Sampling and Data Governance

Who provides the data matters as much as how it is collected. Probability sampling, in which every member of the population has a known chance of selection, supports generalization and underpins most quantitative work. Non-probability sampling, such as purposive or convenience sampling, is appropriate for qualitative depth but does not support statistical generalization. Throughout the collection, the manager guards data quality by piloting instruments, training data collectors, monitoring completeness, and documenting every decision. Data must also be governed as a sensitive asset: under the Data Privacy Act, personal data, especially that of minors, must be collected with a lawful basis and consent, kept only as long as necessary, secured, and processed transparently. Good data governance is the precondition of both legal compliance and credible evidence.

7.6 Table 7.1, Data Collection Methods

Method	Best for	Key advantage	Key limitation
Survey	Breadth across many respondents	Reach and comparability	Shallow, low response rates
Interview	Depth in meaning and reasoning	Rich, flexible	Time-intensive, small N
Observation	Actual behavior in context	Direct evidence	Observer effects

Method	Best for	Key advantage	Key limitation
Focus group	Shared and divergent views	Interactive richness	Dominant-voice bias
Documents	Existing records and texts	Unobtrusive, efficient	Incomplete, off-purpose

Table 7.1. Matching data collection methods to research needs.

7.7 Primary and Secondary Data

The distinction between primary and secondary data is one a manager constantly weighs, because it shapes cost, relevance, and timeliness. Primary data, collected firsthand, offer control and precise relevance to the question but are costly and time-consuming to gather. Secondary data, already collected by others, are efficient and often large-scale but may not fit the question exactly, as they were gathered for other purposes. Studies often combine both, drawing on secondary data for background and context while collecting primary data for the specific evidence the question demands. Table 7.2 summarizes the trade-off.

Data type	Definition	Strength	Caution
Primary data	Collected firsthand for this study	Control, relevance, timeliness	Costly and time-consuming
Secondary data	Already collected by others	Efficient, often large-scale	May not fit the question exactly

Table 7.2. Primary and secondary data. Studies often combine both.

7.8 Philippine Context and Case Study

PHILIPPINE CONTEXT

Philippine educational researchers draw on rich secondary data sources, including the Department of Education's Learner Information System, division and school records, and national assessment results, alongside primary data collected through surveys and interviews. The Data Privacy Act of 2012 governs the handling of all such data, with particular stringency for the records of minors, so a manager planning data collection must establish a lawful basis, secure consent, and protect the data throughout

its life cycle. Combining efficient secondary data with targeted primary collection is a common and effective strategy in the resource-constrained Philippine research setting.

CASE STUDY

Illustrative composite case.

A researcher studying a reading intervention collected posttest data enthusiastically but drew her sample by convenience, surveying whichever pupils were present and willing, and later found she could not generalize her findings because the sample was not representative of the population. The failure was one of sampling, not analysis: no statistical technique could repair a sample that systematically excluded the very pupils most affected. Redesigning with probability sampling and piloting the instrument before full collection produced data that supported the generalization the study needed. The case shows that decisions made during collection, especially about who provides the data, determine what the evidence can later support.

7.9 Best Practices, Current Issues, and Common Pitfalls

- Best Practice: Make three planning decisions before drafting any instrument: define goals, identify sources, and choose methods.
- Best Practice: Match the collection method to the evidence the question requires, weighing breadth against depth.
- Best Practice: Pilot instruments, train collectors, and document every decision to guard data quality.
- Common Pitfall: Drawing a convenience sample where generalization is needed, a flaw no analysis can repair.

- Common Pitfall: Collecting data that cannot answer the question, or failing to collect data that the question needs.
- Common Pitfall: Neglecting data governance, handling personal data without a lawful basis or adequate security.

7.10 Summary and Key Takeaways

Data collection begins with three planning decisions: defining goals, identifying sources, and choosing methods. Primary data offer control and relevance; secondary data offer efficiency and scale; many studies combine both. Each method, survey, interview, observation, focus group, document, trades breadth against depth. Sampling determines what findings can support: probability sampling enables generalization, and non-probability sampling suits qualitative depth. Data must be governed as a sensitive asset under the Data Privacy Act. Chapter 8 now turns to analyzing the data collected.

KEY TAKEAWAYS

- Data collection begins with defining goals, identifying sources, and choosing methods.
- Each method trades breadth against depth; match the method to the evidence needed.
- Probability sampling enables generalization; non-probability sampling suits qualitative depth.
- Data must be governed as a sensitive asset under the Data Privacy Act, especially for minors.

7.11 Key Terms, Reflection, and Discussion

Primary Data. Secondary Data. Probability Sampling. Non-Probability Sampling. Data Management Plan. Survey. Interview. Observation. Focus Group. Piloting.

- Reflection: What data will your Research Management Plan need, and which methods and sources would gather it best? What sampling approach fits your design?
- Discussion: Convenience sampling is common because it is easy, yet it undermines generalization. When, if ever, is convenience sampling defensible?

7.12 Activity and Research Management Plan, Step 7

RESEARCH MANAGEMENT PLAN, STEP 7

Design the data collection for your plan. Specify what data you need, whether primary or secondary or both, which methods you will use (from Table 7.1), and your sampling approach, justifying whether it supports generalization or qualitative depth. Add a brief data management note covering storage, security, and protection under the Data Privacy Act.

7.13 Chapter Self-Check

CHAPTER SELF-CHECK

1. Effective data collection begins with:

a) Drafting a questionnaire b) Three decisions: goals, sources, methods c) Analyzing data d) Writing the report

2. Data collected firsthand for the current study is:

a) Secondary data b) Primary data c) Tertiary data d) Meta-data

3. Which sampling approach supports statistical generalization?

a) Convenience b) Purposive c) Probability d) Snowball

4. Which method best captures actual behavior rather than reported behavior?

a) Survey b) Observation c) Document review d) Interview

5. A convenience sample where generalization is needed is a flaw that:

a) Analysis can repair b) No analysis can repair c) Improves validity d) Increases the sample size

7.14 References

- Fowler, F. J. (2013). Survey research methods (5th ed.). SAGE.
- Patton, M. Q. (2015). Qualitative research and evaluation methods (4th ed.). SAGE.
- National Privacy Commission. Data Privacy Act of 2012 (Republic Act No. 10173). Republic of the Philippines.

End of Chapter 7. Continue to Chapter 8: Analyzing Research Data

ANALYZING RESEARCH DATA

Turning Data into Findings

"A statistical package will compute any test it is asked to, correct or not. Competence with a tool is no substitute for understanding the analysis it executes."

8.0 Chapter Overview

This chapter develops the analysis that converts data into findings. You will learn the two broad families of quantitative analysis, descriptive and inferential statistics, and how the choice of technique depends on the question, the level of measurement, and the assumptions the data satisfy. You will also learn the logic of qualitative analysis, thematic and content analysis, whose rigor comes from a systematic procedure rather than sample size. The chapter closes with tools for analysis and the caution that no tool can substitute for understanding.

8.1 Learning Outcomes

- LO 8.1 Distinguish descriptive from inferential statistics and match technique to aim and data.
- LO 8.2 Explain the logic and procedure of qualitative analysis.
- LO 8.3 Select appropriate tools for quantitative and qualitative analysis.

8.2 Introduction

Analysis converts data into findings, and it is divided into two broad families. Quantitative analysis uses numbers, employing descriptive statistics to summarize and portray data and inferential statistics to test hypotheses and support inferences from a sample to a population. Qualitative analysis uses words and images to interpret meaning, proceeding through familiarization, coding, and theme development. Both families share a common demand: analysis must be appropriate to the data and the question, or its results, however precisely computed, will be substantively meaningless.

This chapter is not a statistics course, and it does not attempt to teach the computation of every technique. Its aim is the manager's aim: to understand which kind of analysis suits which kind of question and data, so that analysis can be planned, commissioned, and evaluated wisely. The most sophisticated statistical software will faithfully compute a test whose assumptions the data violate, producing numbers that mislead. Understanding, not computation, is what makes analysis trustworthy, and it is this understanding that this chapter seeks to build.

8.3 Historical Background

Statistical analysis developed over the nineteenth and twentieth centuries into a rigorous discipline, with the tools of descriptive summary and inferential testing becoming standard equipment for empirical research. The spread of statistical software from the late twentieth century onward democratized access to these techniques, letting researchers who were not statisticians run analyses that once required specialist expertise. This democratization was a genuine advance, but it carried a risk: that techniques would be applied without understanding their proper use.

Qualitative analysis followed its own path, developing systematic procedures, including coding, thematic analysis, and content analysis, that gave interpretive research a rigor comparable to, though different from, that of statistical analysis. The rise of dedicated qualitative software supported the management of large textual datasets, but here, too, the tool organizes rather than interprets. Across both traditions, the historical lesson is the same: the power of analytic tools grew faster than the understanding needed to use them well, making the manager's grasp of what analysis requires more important, not less.

8.4 Definitions

KEY TERMS

Descriptive Statistics: Techniques such as means, medians, standard deviations, and frequencies that summarize and portray data.

Inferential Statistics: Techniques such as t-tests, ANOVA, correlation, and regression that test hypotheses and support inference to a population.

Level of Measurement: Whether data are nominal, ordinal, interval, or ratio, which determines the appropriate analysis.

Thematic Analysis: A qualitative approach that identifies, organizes, and interprets patterns of meaning across a dataset.

Content Analysis: A qualitative approach that systematically categorizes and, where useful, counts features of text.

8.5 Core Concepts of Data Analysis

8.5.1 Quantitative Analysis

Quantitative analysis works with numbers in two families. Descriptive statistics, means, medians, standard deviations, frequencies, and percentages, summarize and portray the data. Inferential statistics, such as t-tests, analysis of variance, correlation, chi-square, and regression, test hypotheses and support inferences from a sample to a population. Choosing the correct test depends on the research question, the level of measurement (nominal, ordinal, interval, or ratio, and the assumptions the data satisfy. Using a test whose assumptions are violated, or applying a test for interval data to nominal data, produces results that are technically computed but substantively meaningless.

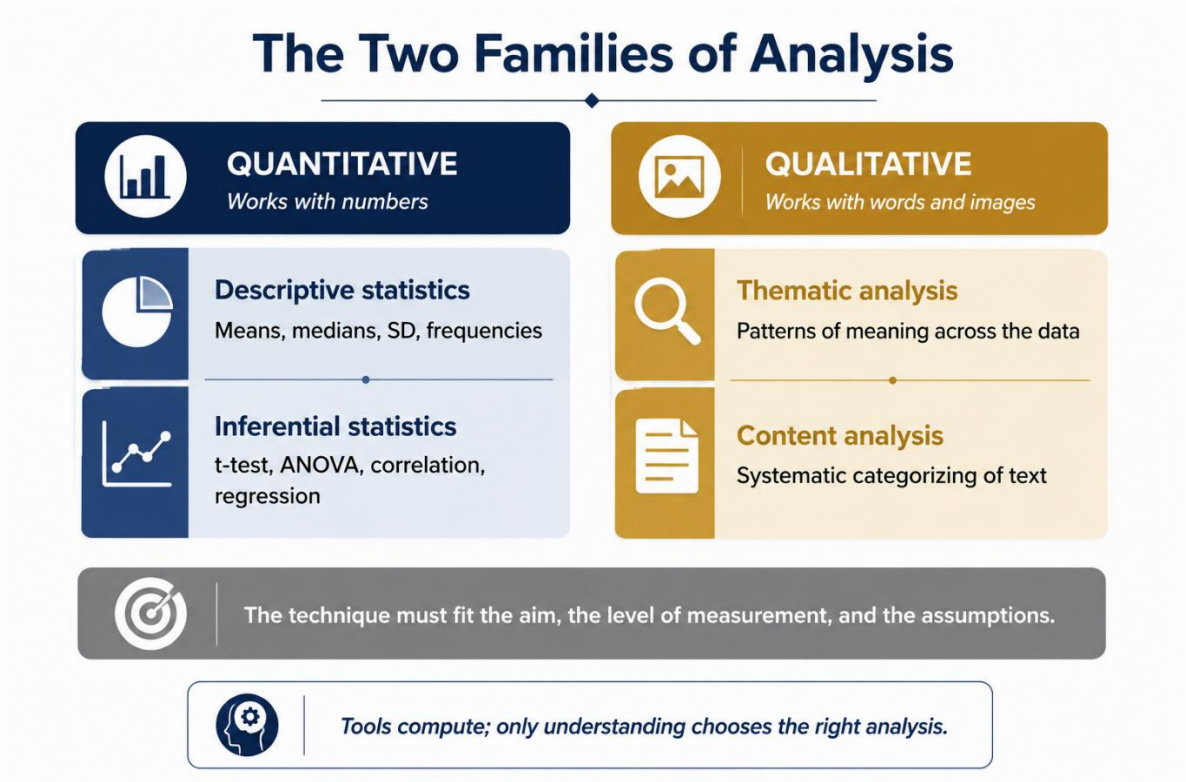

Figure 8.1. The two families of analysis. Quantitative analysis summarizes and infers; qualitative analysis interprets meaning.

8.5.2 Qualitative Analysis

Qualitative analysis works with words and images to interpret meaning. Thematic analysis identifies, organizes, and interprets patterns of meaning across a dataset and is among the most widely used approaches; content analysis systematically categorizes and, where useful, counts features of text. Qualitative analysis proceeds through familiarization, coding, and the development of themes, and its rigor comes not from sample size but from systematic procedure, an audit trail, and the analyst's disciplined engagement with the data. The trustworthiness of qualitative analysis, fully developed in Chapter 9, rests on the quality of the process rather than on numerical measures.

8.5.3 Tools and Their Limits

The right tool depends on the analysis. For quantitative work, spreadsheets handle descriptive statistics and simple tests, while dedicated packages such as SPSS, JASP, and R handle the full range of inferential techniques. For qualitative work, packages such as NVivo, ATLAS.ti, and Dedoose support coding, retrieval, and the management of large textual datasets. But tools accelerate analysis; they do not perform interpretation. A statistical package will compute any test it is asked to, correct or not, and a coding tool will organize the codes the analyst supplies, but cannot decide what they mean. Competence with a tool is therefore no substitute for understanding the analysis it executes.

8.6 Table 8.1, Matching Technique to Aim

Aim	Data situation	Common technique
Summarize one variable	Any level	Descriptive statistics
Compare two groups	Interval outcome	Independent t-test
Compare 3+ groups	Interval outcome	Analysis of variance
Relate two variables	Interval/ordinal	Correlation
Association of categories	Nominal	Chi-square
Predict an outcome	Interval outcome	Regression

Table 8.1. A first guide to matching analytic technique to aim and data. The choice of test must respect the level of measurement.

8.7 The Primacy of Understanding

The recurring theme of this chapter is that understanding governs analysis, and tools merely execute it. The level of measurement, whether a variable is a category, a rank, or a true number, dictates which techniques are valid, and a test applied to the wrong level of measurement produces a number without meaning. The assumptions of a test, about the distribution of the data, the independence of observations, the equality of variances, must be checked before the test is trusted. And in qualitative analysis, the codes and themes are the analyst's interpretive work, which no software can perform. A research manager who commissions or evaluates analysis must therefore ask not merely whether a technique was run, but whether it was the right technique for the data and question, and whether its assumptions held.

8.8 Philippine Context and Case Study

PHILIPPINE CONTEXT

Philippine graduate researchers increasingly have access to powerful analytic tools, from spreadsheets and SPSS to the free JASP and R environments for quantitative work and NVivo or ATLAS.ti for qualitative work. Yet access to tools has outpaced the statistical understanding needed to use them well, and a common weakness in Filipino theses is the application of a test whose assumptions the data violate, or the use of an interval-data technique on ordinal or nominal data. Building genuine analytic understanding, not merely tool familiarity, is therefore a priority for Philippine research capacity and a responsibility supervisors and managers share.

CASE STUDY

Illustrative composite case.

A student compared three teaching groups by running a series of t-tests between each pair, obtaining several comparisons, and reporting the significant ones. A reviewer noted that comparing three groups with repeated t-tests increases the risk of a false positive, and that analysis of variance was the appropriate technique for three groups

with an interval outcome. The software had faithfully computed every requested t-test, but the analysis was incorrect because the technique did not align with the aim and the data. Rerunning the comparison with ANOVA gave a valid result. The case illustrates the chapter's central caution: the tool computes, but only understanding chooses the right analysis.

8.9 Best Practices, Current Issues, and Common Pitfalls

- Best Practice: Choose the analytic technique by matching it to the aim, the level of measurement, and the data's assumptions.
- Best Practice: Check a test's assumptions before trusting its results.
- Best Practice: Treat qualitative rigor as a matter of systematic procedure and audit trail, not sample size.
- Common Pitfall: Applying a test whose assumptions the data violate, producing a precise but meaningless result.
- Common Pitfall: Using an interval-data technique on ordinal or nominal data.
- Common Pitfall: Mistaking tool competence for analytic understanding, letting the software's output stand unexamined.

8.10 Summary and Key Takeaways

Analysis converts data into findings through two families: quantitative analysis, using descriptive statistics to summarize and inferential statistics to infer, and qualitative analysis, using thematic and content analysis to interpret meaning. The correct technique depends on the aim, the level of measurement, and the data's assumptions; the wrong technique produces meaningless results. Qualitative rigor rests on systematic procedure, not sample size. Tools

execute analysis but cannot understand it. Chapter 9 now turns to ensuring the validity and reliability of the findings analysis produced.

KEY TAKEAWAYS

- Descriptive statistics summarize; inferential statistics test hypotheses and infer to a population.
- The correct technique depends on the aim, the level of measurement, and the data's assumptions.
- Qualitative rigor comes from systematic procedure and audit trail, not sample size.
- Tools execute analysis but cannot substitute for understanding it.

8.11 Key Terms, Reflection, and Discussion

Descriptive Statistics. Inferential Statistics. Level of Measurement. Thematic Analysis. Content Analysis. t-test. ANOVA. Correlation. Regression. Coding.

- Reflection: What analysis will your Research Management Plan require, and what level of measurement will your key variables have? Which technique fits?
- Discussion: Statistical software will run any test it is asked to. What safeguards can a manager put in place to prevent the misuse of powerful but easily misapplied tools?

8.12 Activity and Research Management Plan, Step 8

RESEARCH MANAGEMENT PLAN, STEP 8

Plan the analysis for your study. For each research question or objective, state whether the analysis is quantitative or qualitative, name the level of measurement of the

key variables (for quantitative), select an appropriate technique using Table 8.1, and name the tool you would use. For any qualitative analysis, describe the coding and theme-development procedure you would follow.

8.13 Chapter Self-Check

CHAPTER SELF-CHECK

1. Means, medians, and standard deviations are examples of:

a) Inferential statistics b) Descriptive statistics c) Qualitative codes d) Sampling methods

2. Comparing three or more groups on an interval outcome calls for:

a) Repeated t-tests b) Analysis of variance c) Chi-square d) Correlation

3. The choice of statistical test must respect the:

a) Sample's location b) Level of measurement c) Researcher's preference d) Journal's format

4. Qualitative rigor comes primarily from:

a) Large sample size b) Systematic procedure and audit trail c) Statistical significance d) The software used

5. A statistical tool will:

a) Choose the correct test b) Compute any test asked, correct or not c) Interpret the meaning d) Design the study

8.14 References

- Field, A. (2018). Discovering statistics using IBM SPSS statistics (5th ed.). SAGE.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. Qualitative Research in Psychology, 3(2), 77 to 101.

- Creswell, J. W., & Creswell, J. D. (2018). Research design: Qualitative, quantitative, and mixed methods approaches (5th ed.). SAGE.

End of Chapter 8. Continue to Chapter 9: Ensuring Validity and Reliability

ENSURING VALIDITY AND RELIABILITY

The Consistency and Accuracy of Evidence

"Reliability is necessary for validity but not sufficient. A measure must be consistent before it can be accurate, but consistency alone does not guarantee accuracy."

9.0 Chapter Overview

This chapter examines the qualities that make evidence trustworthy: reliability, the consistency of a measure, and validity, its accuracy, and the soundness of the inferences drawn from it. You will learn the forms of validity, the recurring threats to internal and external validity that a sound study must anticipate, and the parallel concept of trustworthiness by which qualitative research establishes rigor. The chapter closes with verification, the reclaiming of rigor as the researcher's ongoing responsibility during the study rather than a matter judged only afterward.

9.1 Learning Outcomes

- LO 9.1 Distinguish reliability from validity and explain their relationship.
- LO 9.2 Identify common threats to internal and external validity and their safeguards.
- LO 9.3 Explain trustworthiness in qualitative research and the strategy of verification.

9.2 Introduction

Reliability refers to the consistency of a measure. A reliable instrument produces stable, repeatable results: administered twice under the same conditions, it yields the same scores; scored by two raters, it yields the same judgments. Validity refers to the accuracy of a measure and the soundness of the inferences drawn from it. A valid instrument measures the construct it claims to measure, and a valid study supports the conclusions it draws. Reliability is necessary for validity but not sufficient: a measure must be consistent before it can be accurate, but consistency alone does not guarantee accuracy.

These twin qualities are the manager's assurance that a study's evidence can be trusted. A study may be beautifully designed and carefully executed, yet if its measures are unreliable or its inferences invalid, its findings are worthless or, worse, misleading. This chapter equips the manager to interrogate the reliability and validity of a study's evidence, to recognize the threats that undermine them, and to understand how rigor is established in both quantitative and qualitative traditions.

9.3 Historical Background

The concepts of validity and reliability were developed and refined within the quantitative, psychometric tradition over the twentieth century, as researchers sought to establish that their instruments measured what they claimed and did so consistently. A long tradition of methodological work cataloged the recurring threats to validity, the alternative explanations that a well-designed study must rule out, giving researchers a checklist against which to design and critique studies.

As qualitative research matured, scholars questioned whether the quantitative vocabulary of validity and reliability fit interpretive work that sought depth of meaning rather than numerical generalization. In an influential response, Guba and Lincoln proposed trustworthiness as the overarching criterion of rigor in qualitative research, articulated through four components paralleling the quantitative concepts. Later, Morse and colleagues advanced a pointed critique of how rigor was often handled, arguing for verification strategies embedded in the research process itself, a debate this chapter carries forward.

9.4 Definitions

KEY TERMS

Reliability: The consistency of a measure: stable, repeatable results across administrations and raters.

Validity: The accuracy of a measure and the soundness of the inferences drawn from it.

Internal Validity: Whether a study establishes a genuine causal relationship, free of alternative explanations.

External Validity: Whether findings generalize beyond the specific sample, setting, and time of the study.

Trustworthiness: The overarching criterion of rigor in qualitative research, comprising credibility, transferability, dependability, and confirmability.

9.5 Core Concepts of Validity and Reliability

9.5.1 The Two Qualities and Forms of Validity

Reliability concerns consistency, and validity concerns accuracy, and both are required. Within validity, several forms are commonly distinguished. Construct validity concerns whether an instrument truly captures the abstract concept it targets, such as motivation or reading comprehension. Internal validity concerns whether a study establishes a genuine causal relationship, free of alternative explanations. External validity concerns whether findings generalize beyond the specific sample and setting. Each is a different way for a study to fall short, and each calls for its own safeguards. A measure can be perfectly reliable yet invalid, consistently measuring the wrong thing, which is why reliability, though necessary, is never sufficient.

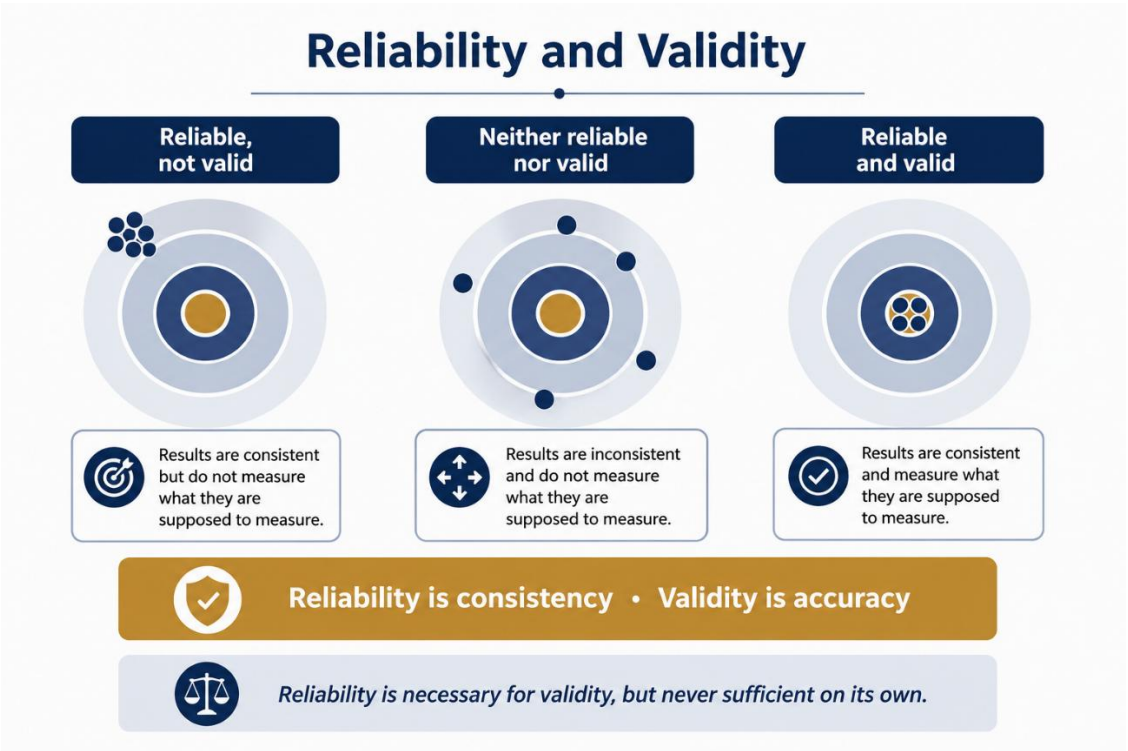

Figure 9.1. Reliability concerns consistency; validity concerns accuracy. A measure must be reliable to be valid, but reliability alone is not enough.

9.5.2 Threats to Validity

Internal validity is the extent to which a study can attribute an observed effect to the intervention rather than to some other cause, and a long tradition has cataloged the recurring threats: history, maturation, testing, instrumentation, regression to the mean, selection bias, attrition, experimenter expectancy, and diffusion of treatment. Understanding these threats is essential for both designing sound studies and critically reading those of others. External validity concerns generalization, whether a finding holds beyond the particular participants, setting, and time. Internal and external validity often stand in tension: tightly controlled studies that maximize internal validity may be so artificial that their findings do not transfer, while natural-setting studies high in external validity may include confounds that weaken causal claims. Good design balances the two according to purpose, and honest reporting acknowledges whichever was sacrificed.

9.5.3 Trustworthiness and Verification

Qualitative research pursues credible knowledge through a different logic. Guba and Lincoln proposed trustworthiness, articulated through credibility (paralleling internal validity), transferability (external validity), dependability (reliability), and confirmability (objectivity). These are supported by techniques such as audit trails, member checks, peer debriefing, negative case analysis, and thick description. But Morse and colleagues argued that this framework had inadvertently shifted responsibility for rigor from the researcher during the study to the reader afterward, judging rigor by the presence of an audit trail rather than the soundness of decisions. Their alternative reclaims rigor as the researcher's ongoing responsibility, embedded through self-correcting verification strategies that catch and correct errors as the study proceeds, before they become fixed in the analysis.

9.6 Table 9.1, Threats to Internal Validity

Threat	What it means
History	External events during the study, not the intervention, cause the change
Maturation	Participants naturally change over time, independent of any treatment
Testing	Taking a pretest itself affects posttest performance

Threat	What it means
Instrumentation	Changes in the tool, procedure, or observers produce differences
Regression to the mean	Extreme pretest scores drift toward average on retest
Selection bias	Non-random assignment introduces pre-existing differences
Attrition	Uneven dropout distorts the sample and results
Diffusion of treatment	The control group adopts the intervention, shrinking the effect

Table 9.1. Common threats to internal validity. A credible study anticipates and controls for these.

9.7 Trustworthiness and Its Criteria

The four criteria of trustworthiness give qualitative research a vocabulary of rigor suited to its interpretive aims, each paralleling a quantitative concept while respecting the difference in logic. Credibility asks whether the findings are believable and true to participants' realities; transferability asks the degree to which findings apply to other contexts; dependability asks whether the research process is consistent and traceable; and confirmability asks whether findings are grounded in the data rather than the researcher's bias. Verification strategies, described by Morse and colleagues, embed rigor in the process itself: investigator responsiveness, methodological coherence, sampling adequacy and saturation, concurrent collection and analysis, and continual theoretical development. The practical wisdom for graduate researchers is significant: working with limited time, they do better to verify a few core concepts thoroughly than to spread themselves thin, leaving other aspects explicitly hypothetical.

Criterion	Qualitative meaning	Quantitative parallel
Credibility	Findings believable and true to participants' realities	Internal validity
Transferability	The degree to which findings apply to other contexts	External validity
Dependability	Consistency and traceability of the research process	Reliability

Criterion	Qualitative meaning	Quantitative parallel
Confirmability	Findings grounded in the data, not the researcher's bias	Objectivity

Table 9.2. The four criteria of trustworthiness (Lincoln and Guba) and their quantitative parallels.

9.8 Philippine Context and Case Study

PHILIPPINE CONTEXT

Philippine thesis committees and journal reviewers scrutinize validity and reliability closely, expecting quantitative studies to report the reliability of their instruments and to address threats to internal and external validity, and qualitative studies to establish trustworthiness through documented credibility, transferability, dependability, and confirmability. A frequent weakness in Filipino graduate research is the assertion of rigor without evidence, claiming an instrument is reliable without reporting a reliability coefficient, or claiming trustworthiness by merely naming techniques rather than demonstrating them, exactly the shift of responsibility Morse and colleagues warned against.

CASE STUDY

Illustrative composite case.

A study reported a large improvement in test scores after an intervention, but a reviewer noted that the pupils had been selected because they scored lowest on the pretest, so some of the apparent gain was regression to the mean, the statistical tendency of extreme scores to drift toward average on retest, rather than a true effect of the intervention. The threat to internal validity was not anticipated, and it inflated the study's claims. Adding a comparable comparison group, also selected for low pretest scores, isolated the intervention's genuine effect. The case shows why anticipating threats to validity during design, not discovering them during review, is central to producing trustworthy evidence.

9.9 Best Practices, Current Issues, and Common Pitfalls

- Best Practice: Establish and report the reliability of instruments before relying on their results.
- Best Practice: Anticipate threats to internal and external validity during design, not during review.
- Best Practice: Build qualitative rigor into the process through verification, not merely into the report afterward.
- Common Pitfall: Assuming a reliable measure is therefore valid, when it may consistently measure the wrong thing.
- Common Pitfall: Overlooking a threat such as regression to the mean, selection bias, or history that inflates an apparent effect.
- Common Pitfall: Claiming trustworthiness by naming techniques rather than demonstrating them in the work.

9.10 Summary and Key Takeaways

Reliability is the consistency of a measure, and validity is its accuracy; reliability is necessary for validity but not sufficient in itself. Internal validity concerns genuine causation, external validity concerns generalization, and the two often stand in tension. A long tradition catalogs the threats a sound study must anticipate. Qualitative research establishes rigor through trustworthiness, credibility, transferability, dependability, and confirmability, best secured by verification embedded in the process. Chapter 10 now turns to data validation and the research integrity that underlies trustworthy evidence.

KEY TAKEAWAYS

- Reliability concerns consistency; validity concerns accuracy; both are required.
- Internal validity concerns causation, external validity generalization, and they often trade off.
- A sound study anticipates threats such as history, selection bias, and regression to the mean.
- Qualitative rigor rests on trustworthiness, best secured by verification during the study.

9.11 Key Terms, Reflection, and Discussion

Reliability. Validity. Construct Validity. Internal Validity. External Validity. Trustworthiness. Credibility. Transferability. Verification. Regression to the Mean.

- Reflection: What threats to validity does your Research Management Plan face, and how would you design against them? How would you establish reliability or trustworthiness?
- Discussion: Morse and colleagues argued that rigor should be the researcher's responsibility during the study, not the reader's afterward. What changes when rigor is treated this way?

9.12 Activity and Research Management Plan, Step 9

RESEARCH MANAGEMENT PLAN, STEP 9

Address validity and reliability in your plan. For a quantitative study, state how you will establish instrument reliability and identify the two or three threats to internal or external validity most relevant to your design, with a safeguard for each. For a qualitative study, state how you will establish trustworthiness through specific verification strategies embedded in the process.

9.13 Chapter Self-Check

CHAPTER SELF-CHECK

1. Reliability refers to a measure's:

a) Accuracy b) Consistency c) Length d) Cost

2. The relationship between reliability and validity is that reliability is:

a) Sufficient for validity b) Necessary but not sufficient for validity c) Unrelated to validity d) The same as validity

3. The tendency of extreme pretest scores to drift toward average on retest is:

a) Maturation b) Regression to the mean c) Attrition d) Diffusion

4. In qualitative research, dependability parallels the quantitative concept of:

a) Internal validity b) Reliability c) External validity d) Objectivity

5. Verification strategies aim to embed rigor:

a) In the report afterward b) In the research process itself c) In the software d) In the sample size

9.14 References

- Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). Experimental and quasi-experimental designs for generalized causal inference. Houghton Mifflin.

- Lincoln, Y. S., & Guba, E. G. (1985). Naturalistic inquiry. SAGE.
- Morse, J. M., Barrett, M., Mayan, M., Olson, K., & Spiers, J. (2002). Verification strategies for establishing reliability and validity in qualitative research. International Journal of Qualitative Methods, 1(2), 13 to 22.

End of Chapter 9. Continue to Chapter 10: Data Validation and Research Integrity

DATA VALIDATION AND RESEARCH INTEGRITY

Safeguarding the Credibility of Evidence

"An audit trail documents decisions without assessing their soundness. Rigor shows in the quality of the work itself."

10.0 Chapter Overview

This chapter closes Part III by drawing together the threads of rigor into the practices of data validation and research integrity. Data validation is the set of checks that confirm data are accurate, complete, and consistent before they are analyzed; research integrity is the broader commitment to honesty and accountability that makes evidence credible. Building on the validity and trustworthiness of Chapter 9, this chapter examines how a manager safeguards the credibility of evidence from collection through analysis, and why integrity is the foundation on which all trustworthy research rests.

10.1 Learning Outcomes

- LO 10.1 Explain data validation and its role in safeguarding evidence.
- LO 10.2 Describe the practices that build integrity into the research process.
- LO 10.3 Explain why rigor shows in the quality of the work, not merely in documentation.

10.2 Introduction

Data validation is the process of checking that data are accurate, complete, and consistent before they are used, catching errors of entry, missing values, and inconsistencies that would otherwise corrupt the analysis. It is an unglamorous but essential discipline, because analysis performed on flawed data produces flawed findings, no matter how sophisticated the technique. Research integrity is the wider commitment within which data validation sits: the honesty and

accountability in producing, handling, and reporting research that makes its evidence worthy of trust.

This chapter builds on the discussion of rigor in Chapter 9 by focusing on the practical and ethical safeguards that protect the credibility of evidence. It takes seriously the critique advanced by Morse and colleagues, that rigor can be reduced to the mere production of documentation, an audit trail that records decisions without assessing their soundness, and it insists instead that genuine rigor shows in the quality of the work itself. For the research manager, safeguarding integrity is not a final checkpoint but a continuous responsibility woven through every stage.

10.3 Historical Background

Concern with research integrity intensified as high-profile cases of misconduct, fabrication, falsification, and plagiarism damaged public trust in science and prompted institutions to establish formal standards and offices for research integrity. These developments made explicit what had long been implicit: that the value of research depends entirely on the honesty of those who produce it, and that a single fabrication can poison a body of literature and the decisions built upon it.

The practice of data validation has its own history in the quality-control traditions of statistics and information systems, where checking data for accuracy and consistency before use became standard. As educational research grew more data-intensive, these practices migrated into the field, and the digital handling of data enabled both new errors and new safeguards. The convergence of integrity concerns and data-validation practices reflects a shared recognition that the credibility of evidence must be actively protected rather than assumed.

10.4 Definitions

KEY TERMS

Data Validation: Checking that data are accurate, complete, and consistent before they are analyzed.

Research Integrity: Honesty and accountability in producing, handling, and reporting research.

Fabrication: The invention of data or results that were never obtained.

Falsification: The manipulation or misrepresentation of materials, data, or results.

Audit Trail: A documented record of research decisions, which records but does not by itself assess their soundness.

10.5 Core Concepts of Validation and Integrity

10.5.1 Data Validation

Data validation confirms that the data are fit for analysis. It includes checking for entry errors, out-of-range values, missing data, duplicate records, and inconsistencies between related fields, and it is performed before any analysis, since errors caught early are cheap to correct while errors carried into analysis corrupt the findings. Practical validation includes range checks that flag impossible values, consistency checks that detect contradictory entries, and completeness checks that identify missing data. For a manager, insisting on documented data validation before analysis is a basic safeguard of the credibility of the evidence a study will produce.

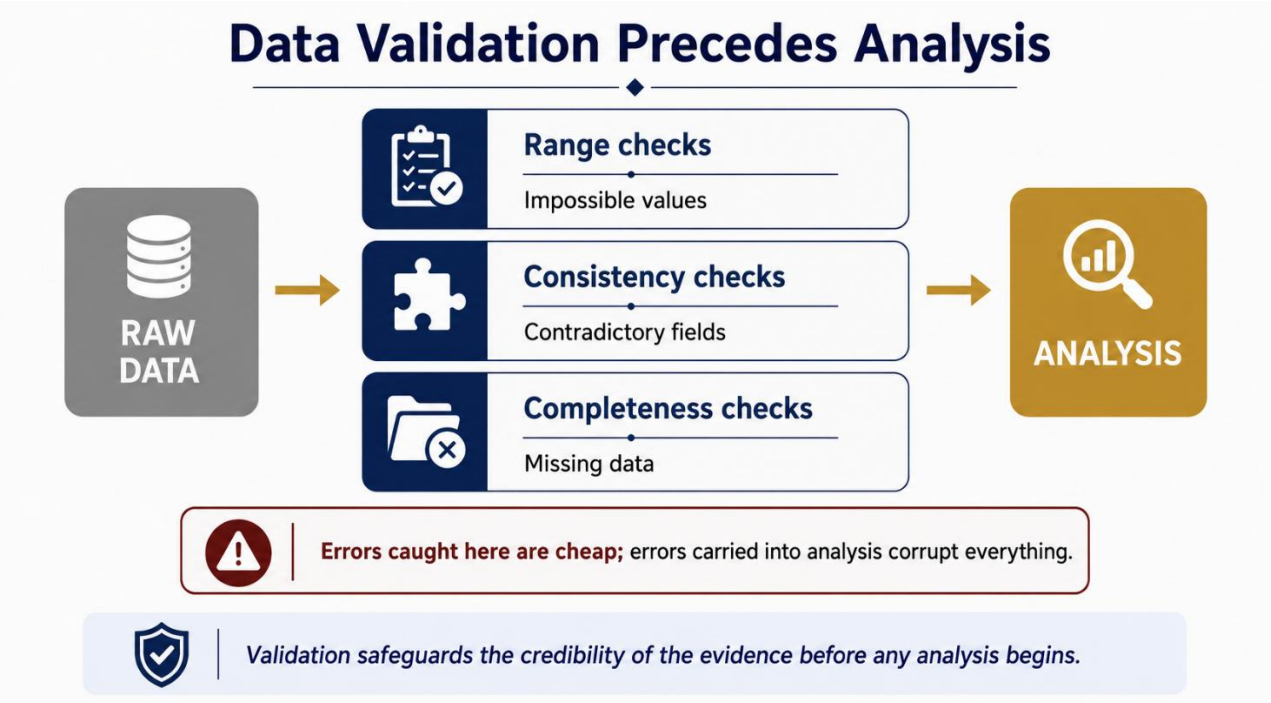

Figure 10.1. Data validation checks accuracy, completeness, and consistency before analysis, safeguarding the credibility of the evidence.

10.5.2 Research Integrity

Research integrity is the honesty and accountability that make evidence trustworthy, and its gravest breaches are fabrication, the invention of data never obtained, and falsification, the manipulation or misrepresentation of data or results. Both mislead everyone who relies on the research and corrupt the scholarly record. Integrity also encompasses honest reporting of limitations, proper attribution of others' work, the responsible use of AI as discussed in Chapter 6, and the refusal to report only favorable findings. For the educational manager, whose evidence informs decisions about learners, integrity is not an abstract virtue but the foundation of every legitimate use to which research is put.

10.5.3 Rigor in the Work, Not the Documentation

Morse and colleagues warned that the trustworthiness framework had inadvertently shifted rigor from the researcher's ongoing responsibility to artifacts judged afterward, so that rigor came to be assessed by the presence of an audit trail or the report that member checks were conducted, as if these guaranteed quality. But an audit trail documents decisions without assessing their soundness, and member checks, often misapplied, can even threaten validity when researchers adjust findings to match participant expectations rather than the data. The deeper lesson is that genuine rigor shows in the quality of the work itself: a strong study is intricate and elegant, deeply analytical yet accessible, and its rigor is demonstrated, not merely documented. The manager should look past the checklist of techniques to the soundness of the work they were meant to secure.

10.6 Table 10.1, Validation and Integrity Safeguards

Safeguard	What it checks or ensures	When it acts
Range checks	Values fall within possible limits	Before analysis
Consistency checks	Related fields do not contradict	Before analysis
Completeness checks	Missing data are identified	Before analysis
Honest reporting	Limitations and all findings disclosed	At reporting
Proper attribution	Others' work is credited	Throughout

Table 10.1. Safeguards that protect the credibility of evidence.

10.7 Integrity as a Continuous Responsibility

The unifying idea of this chapter, and of Part III as a whole, is that the credibility of evidence must be actively and continuously protected rather than assumed or asserted at the end. Data validation occurs before analysis; verification occurs during the study; honest reporting occurs at dissemination; and integrity threads through them all. None of these can be reduced to a document produced after the fact, because the soundness they secure is a property of the work, not of the paperwork about it. For the research manager, this means building integrity into the culture and processes of research from the outset, so that trustworthy evidence is the natural product of how the work is done, not a claim appended afterward.

10.8 Philippine Context and Case Study

PHILIPPINE CONTEXT

Philippine universities and research institutions have strengthened their research integrity frameworks, establishing policies on misconduct, plagiarism-detection requirements, and ethics oversight, in response to both local concerns and international expectations for research quality. For the educational manager, data validation and integrity are practical necessities and ethical obligations, since evidence that informs decisions about Filipino learners must be credible and withstand scrutiny from committees, funders, and the communities the research serves. Building integrity into the research process is thus a direct contribution to the trustworthiness of the national evidence base.

CASE STUDY

Illustrative composite case.

A research team preparing to analyze survey data ran validation checks first and discovered a block of records with impossible values, ages entered as three digits, scores above the maximum possible, that traced to a data-entry error during encoding. Because they validated before analyzing, they corrected the errors at the source; had they analyzed first, the corrupted records would have distorted every result. The episode,

> unglamorous but decisive, illustrates the chapter's core point: safeguarding the credibility of evidence is continuous work performed before and throughout analysis, and it is the quality of that work, not a document describing it, that makes the resulting evidence trustworthy.

10.9 Best Practices, Current Issues, and Common Pitfalls

- Best Practice: Validate data for accuracy, completeness, and consistency before any analysis.
- Best Practice: Build integrity into the research process continuously, not as a final checkpoint.
- Best Practice: Demonstrate rigor in the quality of the work, not merely in documentation of technique.
- Common Pitfall: Analyzing data before validating it, letting entry errors and inconsistencies corrupt the findings.
- Common Pitfall: Treating an audit trail or a named technique as proof of rigor, rather than as a record to be judged.
- Common Pitfall: Reporting only favorable findings or omitting limitations, breaching research integrity.

10.10 Summary and Key Takeaways

Data validation checks that data are accurate, complete, and consistent before analysis, since errors carried into analysis corrupt the findings. Research integrity, honesty, and accountability in producing and reporting research are the foundation of credible evidence, and

its gravest breaches are fabrication and falsification. Rigor is demonstrated in the quality of the work, not merely documented in an audit trail. Safeguarding credibility is continuous, acting before, during, and after analysis. This closes Part III; Part IV now turns to communicating and translating research, beginning with dissemination.

KEY TAKEAWAYS

- Data validation checks accuracy, completeness, and consistency before analysis.
- Research integrity is the foundation of credible evidence; fabrication and falsification are its gravest breaches.
- An audit trail documents decisions but does not by itself assess their soundness.
- Rigor shows in the quality of the work, and safeguarding credibility is continuous.

10.11 Key Terms, Reflection, and Discussion

Data Validation. Research Integrity. Fabrication. Falsification. Audit Trail. Range Check. Consistency Check. Completeness Check. Honest Reporting.

- Reflection: What data validation checks would your Research Management Plan require before analysis? How would you build integrity into your process?
- Discussion: An audit trail documents decisions without assessing them. How can a manager tell genuine rigor from its mere documentation?

10.12 Activity and Research Management Plan, Step 10

RESEARCH MANAGEMENT PLAN, STEP 10

Add a data validation and integrity plan to your Research Management Plan. Specify the validation checks you would perform before analysis (range, consistency, completeness), state how you will ensure honest reporting of all findings and limitations, and describe one practice you will use to build integrity into the process rather than assert it afterward.

10.13 Chapter Self-Check

CHAPTER SELF-CHECK

1. Data validation should be performed:

a) After analysis b) Before analysis c) Only at publication d) Never

2. The invention of data never obtained is:

a) Falsification b) Fabrication c) Plagiarism d) Validation

3. An audit trail:

a) Guarantees rigor b) Documents decisions without assessing their soundness c) Replaces analysis d) Ensures validity

4. A range check flags:

a) Missing data b) Impossible values c) Contradictory fields d) Duplicate records

5. Genuine rigor is shown in:

a) The documentation alone b) The quality of the work itself c) The number of techniques named d) The sample size

10.14 References

- Morse, J. M., Barrett, M., Mayan, M., Olson, K., & Spiers, J. (2002). Verification strategies for establishing reliability and validity in qualitative research. International Journal of Qualitative Methods, 1(2), 13 to 22.
- Resnik, D. B. (2018). The ethics of research with human subjects. Springer.
- National Academies of Sciences, Engineering, and Medicine. (2017). Fostering integrity in research. National Academies Press.

End of Chapter 10. Continue to Chapter 11: Disseminating Research Findings

PART IV

COMMUNICATING AND TRANSLATING RESEARCH

Part IV addresses the stage at which research finally earns its value. It develops the channels of dissemination, from conference talks and posters to science communication for non-experts; the strategy and integrity of publication; and the knowledge translation that closes the structural gap between what research shows and what policy and practice actually do.

DISSEMINATING RESEARCH FINDINGS

Oral Presentations, Posters, and Science Communication

"Research that is not communicated cannot be used, and research that is communicated badly is misunderstood or ignored."

11.0 Chapter Overview

Part IV turns from producing evidence to communicating and translating it. This chapter develops the principal channels of dissemination: oral presentations, poster sessions, and the demanding skill of science communication for non-experts. Each channel reaches a different audience and calls for different craft, and a manager who commands all three can move the study's findings into the hands of the people who can use them. Dissemination is not an appendix to research; it is the stage at which research finally earns its value.

11.1 Learning Outcomes

- LO 11.1 Deliver an effective oral presentation of research findings.
- LO 11.2 Design and present research through a poster session.
- LO 11.3 Communicate research findings clearly to non-expert audiences.

11.2 Introduction

Oral presentations are a central feature of scientific conferences, where researchers share recent findings and receive feedback from peers. The process typically begins with a call for submissions months in advance; researchers submit an abstract, which is reviewed before acceptance. Though conference review is generally less rigorous than journal review, presenting offers valuable exposure, particularly for students, at the university, regional, and national levels. Poster sessions offer another route, distinguished by their direct, one-to-one interaction with attendees.

Beyond the community of peers lies a wider and more demanding audience. Communicating research to people outside one's field, to policymakers, practitioners, and the public, is a distinct skill that graduate programs often neglect, emphasizing communication with peers through manuscripts and conference talks while offering little training in public communication. Yet for the educational manager, whose findings must reach superintendents, teachers, and communities, this is precisely the skill that determines whether evidence changes anything. This chapter develops all three channels.

11.3 Historical Background

The scientific conference, with its papers and its audience of peers, emerged as science professionalized, and communities of specialists formed who needed to exchange findings faster than journals allowed. The poster session is a later innovation, developed as conferences grew too large for every accepted submission to be given a speaking slot, and it evolved its own distinctive culture of browsing, conversation, and informal exchange that many researchers find more useful than formal talks.

Science communication for non-experts has the shortest history and the sharpest recent growth. As public policy came to depend more heavily on research and public trust in science became a concern, the ability to explain findings clearly to non-specialists moved from an optional talent to a recognized professional competency. Training in it remains uneven, which is precisely why deliberate attention to it, as in this chapter, repays the effort so well.

11.4 Definitions

KEY TERMS

Dissemination: The communication of research findings to the audiences who can use or evaluate them.

Oral Presentation: A spoken presentation of a study at a conference or seminar, usually following the manuscript's structure.

Poster Session: A conference format in which researchers display their work visually and discuss it one-to-one with attendees.

Science Communication: The translation of research findings for audiences outside the researcher's field.

> **Call for Submissions:** A conference's invitation for abstracts, typically issued months in advance and reviewed before acceptance.

11.5 Core Concepts of Dissemination

11.5.1 The Oral Presentation

An oral presentation is flexible in form but usually follows the structure of the manuscript itself: an introduction establishing background and significance, a methods section describing design and analysis, a results section presenting key findings, and a discussion interpreting them and pointing to implications. Delivery matters as much as structure. Reading from a script tends toward monotony; the effective presenter knows the study well enough to speak naturally, using an outline or note cards and letting visual aids serve as prompts. Nervousness is nearly universal and manageable, and rehearsal, familiarity with the material, and deliberate pacing convert anxiety into focus.

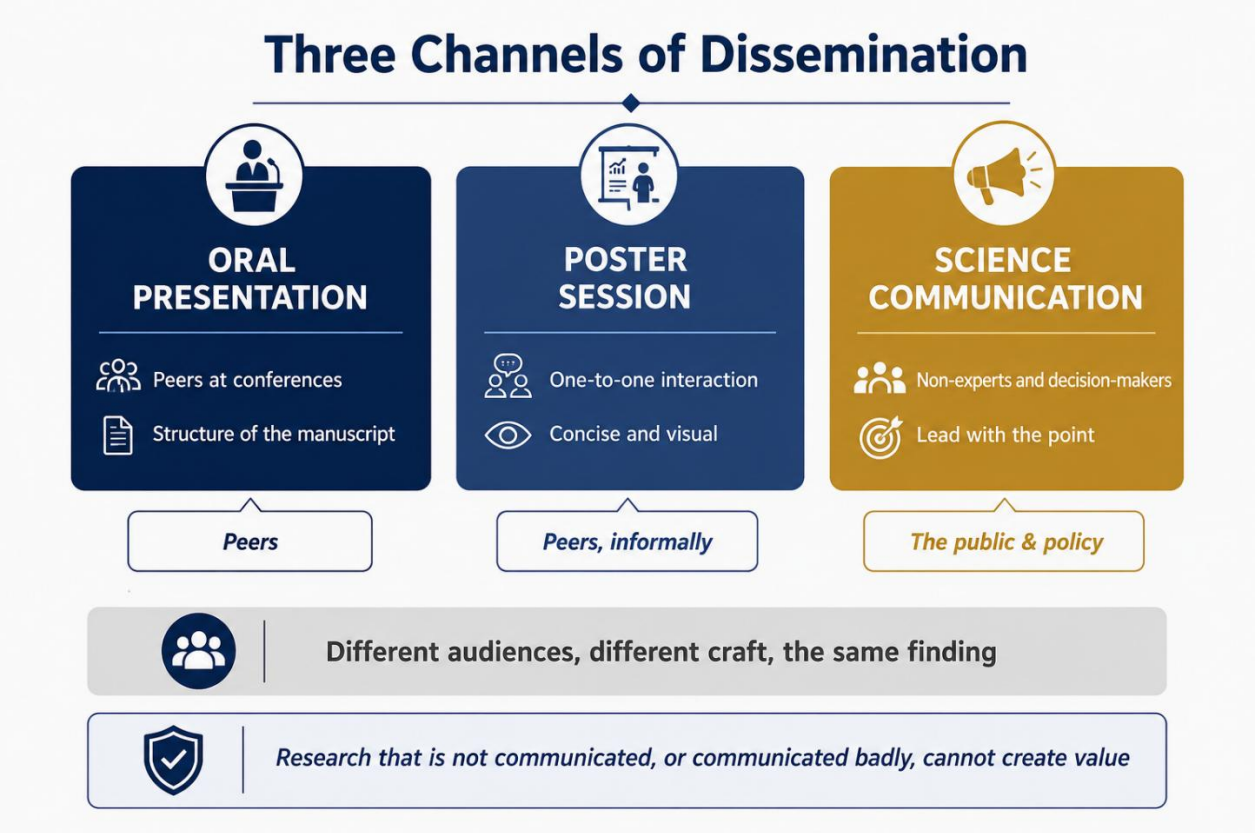

Figure 11.1. Three channels of dissemination, each reaching a different audience and calling for a different craft.

11.5.2 The Poster Session

Poster sessions are common at conferences and typically last about an hour, with many posters displayed in a shared space that attendees browse at their own pace. Their distinctive advantage is direct interaction: the researcher stands beside the work and discusses it one-to-one, an intimacy that formal talks rarely allow and that often yields the most useful feedback and connections. A research poster generally carries an abstract, introduction, methods, results, and discussion, arranged for quick comprehension. Because space is limited, text must be concise and information largely visual, with a title readable from a distance, prominent author names, large fonts, and a logical left-to-right flow. During the session, at least one researcher should remain with the poster, introduce themselves to attendees, offer a brief summary, and invite discussion. A proactive presenter multiplies the impact of the poster.

11.5.3 Science Communication for Non-Experts

Communicating research to people outside one's field is a distinct and demanding skill that graduate programs often neglect. Yet the ability to translate complex findings for the general public, policymakers, and community stakeholders is increasingly essential and can be learned. Its principles are consistent: lead with the point, opening with the main finding and its significance rather than a lengthy background; tell stories rather than only reciting data, framing findings as a narrative and highlighting human impact over statistics; avoid jargon, replacing technical vocabulary with plain language; and use visuals to convey meaning that words alone convey slowly. The test of good science communication is not whether the speaker was precise but whether the listener understood.

11.6 Table 11.1, Best Practices for Oral Presentations

Element	Best practice
Visual aids	Use minimal, impactful text; ensure legibility from a distance; reveal points progressively
Delivery	Make eye contact, avoid reading, pace for comprehension, and minimize filler words
Preparation	Rehearse multiple times to build confidence and manage nervousness

Element	Best practice
Backup	Keep printed or offline copies, since technology is not always reliable
Energy	Deliver with enthusiasm; engagement carries the content

Table 11.1. Best practices for oral presentations.

11.7 Principles of Science Communication

The move from addressing peers to addressing the public is not about simplification but about reframing. A peer wants to know the method and the effect size; a superintendent wants to know what to do and why it matters; a parent wants to know what it means for a child. The same finding must therefore be told differently to each, without distortion but with a different entry point and a different emphasis. This is why leading with the point, telling the human story, avoiding jargon, and using visuals are not concessions to a less capable audience but the disciplines of a communicator who has understood what a particular audience needs. Table 11.2 sets out the principles.

Principle	What it means in practice
Lead with the point	Open with the main finding and its significance, not a lengthy background
Tell stories, not just data	Frame findings as a narrative and highlight human impact over statistics
Avoid jargon	Replace technical vocabulary with plain, concrete language
Use visuals	Let figures and images carry meaning that words convey slowly
Know the audience	Tailor the entry point and emphasis to what this audience needs to decide

Table 11.2. Principles of communicating research to non-expert audiences.

11.8 Philippine Context and Case Study

PHILIPPINE CONTEXT

Philippine educational researchers present at university research fora, regional conferences, and national gatherings convened by the Department of Education, the Commission on Higher Education, and professional associations, and graduate programs increasingly require conference presentations as milestones. Beyond the academic circuit, Filipino educational managers must communicate findings to division superintendents, school heads, teachers, and local government units, audiences that are decision-makers rather than specialists. The capacity to translate research for these audiences, without distorting it, is what determines whether Philippine educational research actually reaches practice.

CASE STUDY

Illustrative composite case.

A researcher presented a rigorous study of a reading intervention to a division leadership meeting, opening with fifteen minutes of literature review and methodology before reaching her findings. The superintendents, who needed to decide whether to fund the program, had disengaged well before she reached that point. Invited to present again, she opened instead with the finding and its implications: that the program raised reading scores where teachers were trained but not elsewhere, and then presented the evidence supporting it. The second presentation changed a funding decision. The case shows that dissemination is not a lesser skill appended to research, but the stage at which research either creates value or fails to.

11.9 Best Practices, Current Issues, and Common Pitfalls

- Best Practice: Know the study well enough to speak naturally, using visuals as prompts rather than reading a script.

- Best Practice: Stand with your poster, introduce yourself to attendees, and invite discussion; a proactive presenter multiplies their impact.
- Best Practice: For non-expert audiences, lead with the finding and its significance, not with background.
- Common Pitfall: Reading a presentation from a script, producing monotony, and losing the audience.
- Common Pitfall: Crowding a poster with text when space demands concision and visual communication.
- Common Pitfall: Addressing decision-makers as though they were peers, burying the point beneath methodology.

11.10 Summary and Key Takeaways

Dissemination moves the study's findings to people who can use them through three principal channels. Oral presentations follow the manuscript's structure but depend on natural delivery and rehearsal. Poster sessions trade formality for direct, one-to-one interaction, rewarding concise, visual design and a proactive presenter. Science communication for non-experts, the skill graduate programs most neglect, requires leading with the point, telling the human story, avoiding jargon, and knowing the audience. Chapter 12 now turns to publication and the integrity that dissemination demands.

KEY TAKEAWAYS

- Oral presentations follow the manuscript's structure; natural delivery and rehearsal matter as much as content.
- Poster sessions reward concise visual design and a proactive presenter who invites discussion.

- Science communication for non-experts leads with the point and tells the human story.
- Research that is not communicated, or is communicated badly, cannot create value.

11.11 Key Terms, Reflection, and Discussion

Dissemination. Oral Presentation. Poster Session. Science Communication. Call for Submissions. Abstract. Visual Aids. Plain Language.

- Reflection: Which audiences must your Research Management Plan reach, and which channel suits each? How would your message differ between peers and decision-makers?
- Discussion: Graduate programs train researchers to address peers but rarely to address the public. What does this gap cost the field, and how should it be closed?

11.12 Activity and Research Management Plan, Step 11

RESEARCH MANAGEMENT PLAN, STEP 11

Plan the dissemination of your study. Identify the audiences your findings must reach, select an appropriate channel for each (oral presentation, poster, or a non-expert format), and draft the opening two sentences you would use for a non-expert decision-maker, leading with the finding and its significance rather than the background.

11.13 Chapter Self-Check

CHAPTER SELF-CHECK

1. An oral presentation usually follows the structure of:

a) The literature review b) The manuscript itself c) The budget d) The consent form

2. The distinctive advantage of a poster session is:

a) Formality b) Direct one-to-one interaction c) Longer speaking time d) Stricter review

3. When communicating with non-experts, you should:

a) Open with a lengthy background b) Lead with the main finding and its significance c) Use technical jargon d) Avoid all visuals

4. The most common flaw in presenting to decision-makers is:

a) Too many visuals b) Burying the point beneath methodology c) Speaking too naturally d) Being too brief

5. Nervousness in presenting is best managed by:

a) Reading from a script b) Rehearsal and familiarity with the material c) Avoiding eye contact d) Speaking quickly

11.14 References

- Alley, M. (2013). The craft of scientific presentations (2nd ed.). Springer.
- Baron, N. (2010). Escape from the ivory tower: A guide to making your science matter. Island Press.
- American Psychological Association. (2020). Publication manual of the American Psychological Association (7th ed.). APA.

End of Chapter 11. Continue to Chapter 12: Publication and Research Integrity

PUBLICATION AND RESEARCH INTEGRITY

Journal Selection and Honesty at the Point of Publication

"The moment of publication is where misconduct does its damage, because it is where research enters the record on which others rely."

12.0 Chapter Overview

This chapter develops the publication of research: how to select a suitable journal, how to prepare a submission that respects reviewers' time, and the integrity that publication demands. Choosing the right journal is one of the most consequential decisions in the publication process, and submitting to the wrong one is among the most common reasons for rejection. The chapter then examines the grave breaches of falsification and fabrication, whose damage is done precisely at the moment research enters the permanent record.

12.1 Learning Outcomes

- LO 12.1 Select a suitable journal using a systematic strategy.
- LO 12.2 Prepare a submission that meets a journal's requirements and professional standards.
- LO 12.3 Explain falsification and fabrication and the integrity that publication demands.

12.2 Introduction

Choosing the right journal is one of the most consequential decisions in the publication process, and submitting to the wrong journal is among the most common reasons for rejection. Ideally, the choice is made before writing, so the manuscript can be tailored to the journal's scope, format, and word limits and can demonstrate its relevance to the journal's ongoing conversation. A manuscript that is excellent but misaddressed will be rejected as surely as a weak one, and the months lost to a mismatched submission are among the costliest avoidable errors in a research career.

Publication also carries an ethical weight equal to its practical one, because the moment of publication is where misconduct does its damage. Two grave breaches are falsification, the manipulation or misrepresentation of materials, data, or results to fit a hypothesis, and fabrication, the invention of data or results that were never obtained. Both mislead funders, employers, fellow researchers, and the public, and both corrupt the record on which future work and future decisions will rest. Integrity is therefore not a final formality of publication but its precondition.

12.3 Historical Background

The scholarly journal, with its system of peer review, developed over centuries into the primary mechanism for vetting research claims and entering them into the permanent record. Peer review is imperfect, but it institutionalizes the principle that a claim must survive expert scrutiny before it is accepted, and the proliferation of specialized journals gives researchers both a wider choice of venues and the new problem of choosing among them wisely.

The formalization of research misconduct as a category, with fabrication, falsification, and plagiarism as its defining breaches, followed a series of damaging cases that demonstrated how a single dishonest publication could mislead a field for years. Institutions responded with integrity offices, misconduct policies, and explicit standards. The rise of predatory journals, which publish for a fee without genuine review, created a parallel modern hazard, making the disciplined evaluation of a journal's legitimacy a necessary skill rather than an optional caution.

12.4 Definitions

KEY TERMS

Journal Selection: The systematic choice of a publication venue matched to a manuscript's scope, audience, and quality.

Peer Review: The evaluation of a manuscript by expert reviewers before a journal accepts it.

Falsification: The manipulation or misrepresentation of materials, data, or results to fit a hypothesis.

Fabrication: The invention of data or results that were never obtained.

Submission Checklist: The set of requirements, formatting, disclosures, and declarations that a manuscript must satisfy before submission.

12.5 Core Concepts of Publication

12.5.1 Selecting a Journal

Journal selection proceeds by a systematic strategy rather than by guesswork. Build a shortlist by reviewing journals you already read, scanning the reference lists of work in your area, and browsing publisher catalogs by subject. Seek guidance from colleagues, supervisors, and librarians about which journals they respect and recommend for your topic. Watch for special-issue calls for papers that target your theme and may improve acceptance odds. Use reputable journal-matching tools by pasting your abstract to generate candidate journals. Finally, check indexing, scope, audience, and legitimacy before committing, since a mismatched or illegitimate venue can waste months and damage a record.

Figure 12.1. The publication pathway, from journal selection through submission and review to the permanent record.

12.5.2 Preparing the Submission

Once a journal is chosen, careful preparation raises the odds of acceptance. A submission checklist covers the title and complete author information; thorough proofreading for grammar and spelling; adherence to the journal's formatting and file requirements; clear, well-labeled figures and tables that complement rather than repeat the text; logical flow and consistent style; accurate and consistent citation; a conflict-of-interest statement; an ethical-compliance declaration for studies with human participants; and a cover letter summarizing the

contribution. Attention to these details signals professionalism and respect for the reviewers' time, and their neglect signals the opposite before a reviewer has read a single argument.

12.5.3 Integrity in Dissemination

Dissemination carries an ethical weight equal to its practical one, because the moment of publication is where misconduct does its damage. Falsification is the manipulation or misrepresentation of materials, data, or results to fit a hypothesis; fabrication is the invention of data or results that were never obtained. Both mislead funders, employers, fellow researchers, and the public. Their damage compounds, because published work becomes the foundation of later studies and of decisions affecting real learners, so a single fabrication can distort a field and the practice built upon it. Integrity at publication also requires honest reporting of limitations, disclosure of conflicts, proper attribution, and the refusal to report only favorable results.

12.6 Table 12.1, Selecting a Suitable Journal

Step	What to do
Build a shortlist	Review journals you read, scan reference lists, and browse publisher catalogs by subject
Seek guidance	Ask colleagues, supervisors, and librarians which journals they respect for your topic
Watch for calls	Look for special-issue calls that target your theme and may improve acceptance odds
Use suggester tools	Paste your abstract into a reputable journal-matching tool to generate candidates
Check indexing and fit	Confirm scope, audience, indexing, and legitimacy before committing

Table 12.1. Steps to selecting a suitable journal.

12.7 The Weight of the Permanent Record

What distinguishes publication from every earlier stage of research is permanence. A flawed analysis caught before submission is corrected; a flawed analysis published becomes part of the literature, cited by others, built upon, and used to justify decisions long after its

author has moved on. This is why integrity at the point of publication carries a weight the earlier stages do not: the safeguards of design, ethics, validation, and honest reporting all converge here, at the moment the work enters the record. For the educational manager, whose published evidence may shape programs affecting thousands of learners, the responsibility is correspondingly grave, and it is discharged not by a final check but by the integrity built into every prior stage of the work.

12.8 Philippine Context and Case Study

PHILIPPINE CONTEXT

Philippine universities increasingly require publication in indexed journals for faculty promotion and graduate completion, creating strong incentives to publish and, in turn, heightened exposure to predatory journals that publish for a fee without genuine peer review. Filipino researchers must therefore evaluate a journal's legitimacy, indexing, and review process before submitting, since publication in a predatory venue wastes both fees and findings and can damage a professional record. Researchers facing access or financial barriers can draw on support programs that provide free or discounted access to literature and publishing guidance.

CASE STUDY

Illustrative composite case.

A faculty member under pressure to publish submitted a sound manuscript to a journal that promised acceptance within two weeks for a fee. It was published without review in a venue not indexed by any university her university recognized, and the work, genuinely good, was effectively lost: uncited, unfindable, and ineligible for the promotion credit she had sought. A systematic journal selection, checking indexing, scope, and the legitimacy of the review process, would have directed the same manuscript to a venue where it would have counted. The case illustrates that journal selection is not an administrative afterthought but a decision that determines whether good research reaches the record at all.

12.9 Best Practices, Current Issues, and Common Pitfalls

- Best Practice: Choose the journal before writing, so the manuscript can be tailored to its scope, format, and conventions.
- Best Practice: Verify a journal's indexing, scope, and review process before submitting, guarding against predatory venues.
- Best Practice: Complete a full submission checklist, including conflict-of-interest and ethical-compliance declarations.
- Common Pitfall: Submitting to a mismatched journal, the most common avoidable cause of rejection.
- Common Pitfall: Publishing in a predatory venue that offers rapid acceptance for a fee without genuine review.
- Common Pitfall: Falsifying or fabricating data, whose damage compounds because published work becomes the foundation of later work.

12.10 Summary and Key Takeaways

Journal selection, ideally made before writing, is among the most consequential publication decisions, and it proceeds systematically: build a shortlist, seek guidance, watch for calls, use suggester tools, and verify indexing and legitimacy. Careful submission preparation signals professionalism and respects reviewers' time. Publication carries grave ethical weight because it enters research into the permanent record: falsification and fabrication mislead everyone who relies on the work and corrupt the foundation of later research and decisions. Chapter 13 now turns to engaging stakeholders and translating evidence into policy.

KEY TAKEAWAYS

- Choose the journal before writing; a mismatched submission is a leading cause of rejection.
- Verify indexing, scope, and review process to guard against predatory journals.
- Falsification manipulates data; fabrication invents it; both corrupt the permanent record.
- Integrity at publication is discharged by the integrity built into every prior stage.

12.11 Key Terms, Reflection, and Discussion

Journal Selection. Peer Review. Falsification. Fabrication. Submission Checklist. Predatory Journal. Indexing. Conflict of Interest. Permanent Record.

- Reflection: Which journals would suit the study in your Research Management Plan, and how would you verify their legitimacy and fit?
- Discussion: Pressure to publish can push researchers toward predatory venues or, at worst, toward misconduct. How should institutions design incentives that reward integrity rather than mere output?

12.12 Activity and Research Management Plan, Step 12

RESEARCH MANAGEMENT PLAN, STEP 12

Build a publication plan. Using Table 12.1, shortlist two or three journals suited to your study, noting for each its scope, audience, and indexing, and verifying that its review process is genuine. Then draft a submission checklist for your eventual

manuscript, including the ethical-compliance and conflict-of-interest declarations your study would require.

12.13 Chapter Self-Check

CHAPTER SELF-CHECK

1. The journal should ideally be chosen:

a) After the manuscript is finished b) Before writing c) After the first rejection d) By the reviewers

2. Among the most common reasons for rejection is:

a) Too many figures b) Submitting to the wrong journal c) A short abstract d) Using APA style

3. The invention of data never obtained is:

a) Falsification b) Fabrication c) Peer review d) Indexing

4. A predatory journal typically:

a) Conducts rigorous review b) Publishes for a fee without genuine review c) Is highly indexed d) Rejects most submissions

5. Misconduct does its greatest damage at publication because:

a) Reviewers are careless b) Published work enters the record others build upon c) Journals are expensive d) Abstracts are short

12.14 References

- Committee on Publication Ethics. Core practices. COPE.
- National Academies of Sciences, Engineering, and Medicine. (2017). Fostering integrity in research. National Academies Press.

- American Psychological Association. (2020). Publication manual of the American Psychological Association (7th ed.). APA.

End of Chapter 12. Continue to Chapter 13: Engaging Stakeholders and Informing Policy

ENGAGING STAKEHOLDERS AND INFORMING POLICY

Closing the Research-to-Practice Gap

"The gap between what research shows and what policy does is not bad faith on either side. It locates the problem in the relationship, not in either party."

13.0 Chapter Overview

This chapter closes Part IV by translating research into policy and practice. It begins by diagnosing the research-to-practice gap, not as a failure of good faith but as a structural mismatch of incentives and timelines, and then develops the means of closing it: partnerships between researchers and policymakers, the README checklist of communication methods, the STEP tool for choosing among them, and the honest evaluation of whether research actually achieved impact. Translation is not the final step of dissemination; it is an active, planned process that begins early.

13.1 Learning Outcomes

- LO 13.1 Explain the structural causes of the research-to-practice gap.
- LO 13.2 Apply the README checklist and the STEP tool to plan translation strategically.
- LO 13.3 Evaluate the impact of research on policy and practice honestly.

13.2 Introduction

The gap between what research shows and what policy and practice do is not a sign of bad faith on either side; it arises from structural differences. Researchers are rewarded for publication, novelty, and methodological rigor, and they work on timelines set by studies and journals. Policymakers are rewarded for timely, workable decisions, and they work on timelines set by budgets, elections, and crises. Evidence that arrives too late, in too technical a

form, or without clear implications for action tends not to be used, however sound it may be. Recognizing these differing incentives is the first step toward closing the gap, because it locates the problem in the relationship rather than in either party.

Knowledge translation is the field that directly addresses this gap. It encompasses the strategies that move research into action: involving end users in the research itself, communicating through diverse and accessible channels, building stakeholders' capacity to engage with evidence, and tailoring findings for multiple audiences. Its premise is that translation is not a passive, final step in dissemination but an active, planned process that begins early and continues throughout a study's life. This chapter equips the manager with the tools to plan it.

13.3 Historical Background

The recognition of a research-to-practice gap emerged as evidence-based policy became an explicit aspiration, and its practitioners discovered how rarely evidence actually drove decisions. Studies of research use found that the barrier was seldom hostility to evidence and often a mismatch of timing, form, and relationship: the right finding arriving at the wrong moment, in a form no decision-maker could act on, from a researcher no decision-maker knew.

Knowledge translation developed as a distinct field in response, first in health and later across the social sciences and education, formalizing the strategies that move findings into use. Structured tools followed, including checklists of communication methods and frameworks for choosing among them, reflecting a maturing understanding that translation is a competency to be planned and taught rather than a hope to be entertained. The partnership models documented in recent scholarship represent the most ambitious response: building lasting relationships between those who produce evidence and those who use it.

13.4 Definitions

KEY TERMS

Research-to-Practice Gap: The structural mismatch between what research produces and what policy and practice can use.

Knowledge Translation: The active, planned process of moving research findings into policy and practice.

README Checklist: A framework of nine communication methods, each suited to particular audiences and goals.

STEP Tool: Strategic Translation and Engagement Planning, which selects a method based on the complexity of information and the level of interaction.

Research Impact: The demonstrable influence of research on policy, practice, and outcomes.

13.5 Core Concepts of Translation

13.5.1 Partnerships Between Researchers and Policymakers

One of the most effective ways to close the gap is to build lasting partnerships between those who produce evidence and those who use it. Structured collaborations enable mutual learning, ensure that relevant evidence reaches decision-makers at the right moment, and foster the trust that encourages continued use of research. Documented initiatives illustrate the range of forms such partnerships take, from research consortia sharing outcomes through a common knowledge bank to government offices connecting agencies with academic experts to funder networks coordinating learning to institutional grant programs supporting faculty partnerships with local decision-makers. Such collaborations remain relatively uncommon, held back by funding constraints, staffing limits, and the difficulty of coordinating groups with different incentives. The sustained lesson is that partnership is an investment requiring long-term commitment, but it is the surest route to research that is both relevant and used.

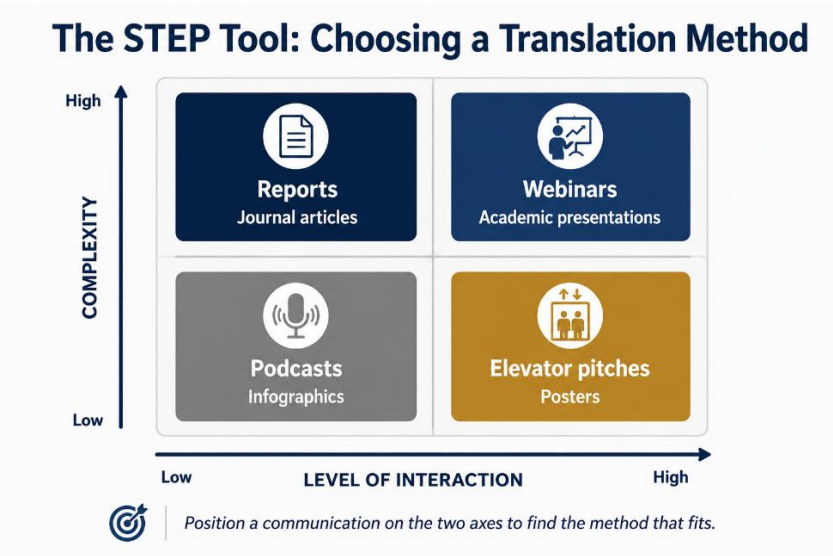

Figure 13.1. The STEP tool selects a communication method by two dimensions: the complexity of the information and the level of interaction required.

13.5.2 The README Checklist and the STEP Tool

To make translation systematic, researchers have developed structured tools. The README checklist offers a framework for communicating findings through nine distinct methods, each suited to particular audiences and goals: research reports, posters, industry and practice presentations, academic presentations, peer-reviewed articles, elevator pitches, podcasts, webinars, and infographics. The researcher first identifies the target audience and the primary communication goal, then selects the medium that best serves them. Where the README checklist lists options, the Strategic Translation and Engagement Planning (STEP) tool helps choose among them, guiding selection along two dimensions: the complexity of the information to be communicated and the level of interaction or engagement needed with the audience. Highly complex information requiring little back-and-forth suits reports and journal articles; complex information that benefits from discussion suits webinars and academic presentations; simple information that needs little interaction suits podcasts and infographics; and simple information that thrives on engagement suits elevator pitches and posters.

13.5.3 Evaluating Research Impact

Translation is not complete until its effect can be judged. Evaluating the impact of research on policy and practice is difficult because influence is often indirect, delayed, and mingled with many other factors, yet it matters both for accountability and for learning what works. Impact can be traced through several signs: whether findings were cited in policy documents, whether programs were adopted or changed, whether practitioners report using the evidence, and whether learners' outcomes improved. None of these alone proves influence, but together they build a credible picture. For the educational manager, evaluating impact is also a discipline of humility and honesty: not every study changes practice, and claiming impact that did not occur is its own kind of distortion. The productive stance is to plan for impact from the start and then honestly assess what the research actually achieved.

13.6 Table 13.1, Forms of Research-Policy Partnership

Partnership form	How it works
Research consortium	A network of academic experts collaborates with practitioners and shares outcomes through a common knowledge bank

Partnership form	How it works
Office of Strategic Partnerships	A government unit connects public agencies with academic and philanthropic experts to build evidence-based policy capacity
Funder network	Philanthropic and public funders coordinate learning across sectors on what makes research-policy partnerships effective
Institutional grant program	Funding supports university departments so faculty can partner with local decision-makers on shared problems

Table 13.1. Documented forms of research-policy partnership.

13.7 The README Checklist of Communication Methods

The nine methods of the README checklist span the full range from the most formal to the most accessible, and a translation plan typically draws on several rather than defaulting to the journal article alone. Research reports are the most formal, structured, and complete. Posters give concise visual summaries. Practice presentations reach practitioners, and academic presentations reach peers. Peer-reviewed articles carry expert scrutiny. Elevator pitches engage stakeholders briefly and compellingly. Podcasts offer accessible conversation, webinars offer interactive online discussion, and infographics distill complexity into visual storytelling. Used in conjunction with the STEP tool, which positions each method by complexity and interaction, the checklist helps a researcher plan dissemination strategically, ensuring that findings reach and genuinely engage the right audience.

Method	Character and use
Research reports	The most formal method, structured with clarity and completeness
Posters	Concise, visual summaries, often paired with a brief talk
Practice presentations	Talks to practitioners to promote evidence-based practice
Academic presentations	Conference and seminar talks with proper citation and visuals
Peer-reviewed articles	Formal, expert-reviewed publications following reporting guidelines

Method	Character and use
Elevator pitches	Brief, compelling summaries to engage stakeholders
Podcasts and webinars	Accessible audio and interactive online presentation
Infographics	Visual storytelling that distills complex findings

Table 13.2. The README checklist of communication methods.

13.8 Philippine Context and Case Study

PHILIPPINE CONTEXT

The research-to-practice gap is acutely felt in Philippine education, where a growing body of teacher-led and university research coexists with policy decisions that often proceed without it. The Department of Education's Basic Education Research Agenda explicitly seeks to close this gap by aligning research with policy priorities, and division research committees provide a structural link between researchers and decision-makers. For the Filipino educational manager, who frequently sits on both sides of the gap, as both a producer and a user of evidence, the tools of knowledge translation are directly and immediately applicable.

CASE STUDY

Illustrative composite case.

A division commissioned an evaluation of a numeracy program and received a rigorous ninety-page report six months after the budget decision it was meant to inform had already been made. The evidence was sound and entirely unused. Planning translation from the start would have changed the outcome: an early briefing of preliminary findings, a one-page infographic for the budget committee, and a short presentation timed to the decision would have delivered the same evidence when it could still act. The case illustrates the chapter's central insight: the gap is structural, a mismatch of timing and form, and closing it requires planning translation as deliberately as the study itself.

13.9 Best Practices, Current Issues, and Common Pitfalls

- Best Practice: Plan translation from the start, involving end users and timing evidence to the decisions it must inform.
- Best Practice: Use the README checklist and the STEP tool to select methods strategically rather than defaulting to the article.
- Best Practice: Build lasting partnerships with decision-makers, the surest route to research that is both relevant and used.
- Common Pitfall: Treating translation as a passive final step rather than an active process beginning early.
- Common Pitfall: Delivering evidence too late, too technically, or without clear implications for action.
- Common Pitfall: Claiming impact that did not occur, a distortion as serious as any other misreporting.

13.10 Summary and Key Takeaways

The research-to-practice gap arises from structural differences in incentives and timelines, not bad faith, and locating it in the relationship is the first step to closing it. Knowledge translation moves evidence into action through partnerships, the README checklist of nine communication methods, and the STEP tool, which selects among them based on information complexity and level of interaction. Impact must then be evaluated honestly, since claiming influence that did not occur is its own distortion. This closes Part IV; Part V now turns to leading the research enterprise through its challenges.

KEY TAKEAWAYS

- The research-to-practice gap is structural, a mismatch of incentives and timelines, not bad faith.
- Translation is an active, planned process beginning early, not a passive final step.
- The README checklist lists communication methods; the STEP tool selects among them.
- Impact must be evaluated honestly; claiming impact that did not occur is a distortion.

13.11 Key Terms, Reflection, and Discussion

Research-to-Practice Gap. Knowledge Translation. README Checklist. STEP Tool. Research Impact. Partnership. Infographic. Elevator Pitch. End User.

- Reflection: Who must act on the findings of your Research Management Plan, and what would they need, in what form and by when, to actually use them?
- Discussion: Researchers and policymakers are rewarded for different things on different timelines. What institutional changes would best align their incentives?

13.12 Activity and Research Management Plan, Step 13

RESEARCH MANAGEMENT PLAN, STEP 13

Build a translation plan. Identify the decision-makers who must act on your findings and the decision timeline they work to. Using the STEP tool's two dimensions, complexity of information and level of interaction, select two communication methods

from the README checklist that fit your audiences, and state how you would evaluate whether your research actually influenced policy or practice.

13.13 Chapter Self-Check

CHAPTER SELF-CHECK

1. The research-to-practice gap arises primarily from:

a) Bad faith by policymakers b) Structural differences in incentives and timelines c) Weak methodology d) Lack of funding alone

2. Knowledge translation is best understood as:

a) A passive final step b) An active process beginning early c) A type of statistical analysis d) A journal requirement

3. The STEP tool selects a method by the complexity of information and:

a) Cost b) Level of interaction needed c) Author seniority d) Journal indexing

4. Simple information needing little interaction best suits:

a) A journal article b) Podcasts and infographics c) A webinar d) A full research report

5. Claiming research impact that did not occur is:

a) Acceptable advocacy b) A distortion c) Required by funders d) Good translation

13.14 References

- Nutley, S. M., Walter, I., & Davies, H. T. O. (2007). Using evidence: How research can inform public services. Policy Press.

- Graham, I. D., Logan, J., Harrison, M. B., Straus, S. E., Tetroe, J., Caswell, W., & Robinson, N. (2006). Lost in knowledge translation. Journal of Continuing Education in the Health Professions, 26(1), 13 to 24.
- Department of Education. Basic Education Research Agenda. Republic of the Philippines.

End of Chapter 13. Continue to Chapter 14: Managing Research Challenges

PART V

LEADING THE RESEARCH ENTERPRISE

Part V brings the book to a close. It examines the characteristic risks that attend each stage of research and the safeguards that prevent them, develops the structured problem-solving that a manager deploys when difficulties arise, and asks the reader to assemble the fourteen steps of the cumulative Research Management Plan into a single coherent whole.

MANAGING RESEARCH CHALLENGES

Anticipating Risk, Solving Problems, and Completing the Work

"At each step, the manager asks what could go wrong and what safeguard prevents it, addressing challenges proactively rather than reactively."

14.0 Chapter Overview

This capstone chapter draws the whole book together. It examines the risks that attend each stage of the research process and the safeguards that prevent them; develops a structured approach to problem-solving with practical strategies a manager can deploy; identifies the essential skills that make those strategies work; and closes with the completion of the research article. It then asks you to assemble the fourteen steps of your Research Management Plan into a single, coherent whole, the culminating demonstration that you can manage research from first question to final use.

14.1 Learning Outcomes

- LO 14.1 Identify the characteristic risks of each research stage and their safeguards.
- LO 14.2 Apply structured problem-solving strategies to research challenges.
- LO 14.3 Integrate all fourteen steps into a complete Research Management Plan.

14.2 Introduction

Many research problems can be anticipated by examining a project stage by stage, since each stage carries characteristic risks. Working through the process deliberately, a manager can spot weaknesses early, when they are cheap to fix, rather than late, when they may be fatal. The value of this stage-by-stage discipline is that it converts a vague sense of worry into a concrete checklist: at each step, the manager asks what could go wrong and what safeguard prevents it, addressing challenges proactively rather than reactively.

When problems do arise, as they will, structured problem-solving offers a disciplined response. Problem-solving strategies are systematic methods that guide resolution through defined techniques and frameworks, and all sound strategies share fundamental phases: identifying the problem, analyzing it, and implementing a solution. What they hold in common is structure, and a strong strategy is always tailored to the team, the organization, and the nature of the issue. This chapter equips the manager to anticipate, to respond, and finally to complete the work.

14.3 Historical Background

The application of risk management to research borrows from the project management tradition, where the systematic identification of risks, their likelihood, their impact, and their mitigation became standard practice for complex undertakings. Applied to research, this discipline converts the accumulated wisdom about how studies fail into an actionable checklist rather than a set of cautionary tales, covering the question, the sources, the methods, the analysis, the review, and the communication.

Structured problem-solving likewise draws on a body of practice developed largely outside the academy, in design, management, and organizational development, and imported into research management as its value became evident. Approaches such as facilitated workshops, time-boxed design sprints, and the deliberate decomposition of large problems into smaller ones offer the research manager a repertoire far richer than the improvisation that too often substitutes for method when a study encounters trouble.

14.4 Definitions

KEY TERMS

Research Risk: A characteristic way a study can fail at a given stage of the research process.

Safeguard: A deliberate practice that prevents or mitigates a research risk.

Problem-Solving Strategy: A systematic method that guides the resolution of a problem through defined techniques and frameworks.

Design Sprint: time-boxed cycle that rapidly designs, prototypes, and tests solutions across a cross-functional team.

Breaking Problems Down: Decomposing a large challenge into smaller, manageable, high-impact tasks.

14.5 Core Concepts of Managing Challenges

14.5.1 Risks Across the Research Stages

Each stage of research carries characteristic risks. An unclear or overbroad question breeds confusion and unreliable findings, and the safeguard is to refine the topic and pose a precise, answerable question. Unreliable sources compromise validity and raise ethical or legal concerns, and the safeguard is to evaluate credibility, accuracy, relevance, and timeliness. Inappropriate methods yield invalid results, and the safeguard is to choose methods that fit the question and justify the choice. Flawed analysis produces misleading conclusions, and the safeguard is to use reliable techniques and present results transparently. A biased or shallow review breeds overconfidence, and the safeguard is peer review and honest acknowledgment of constraints. Poorly conveyed research is misinterpreted or ignored, and the safeguard is to tailor communication to the audience.

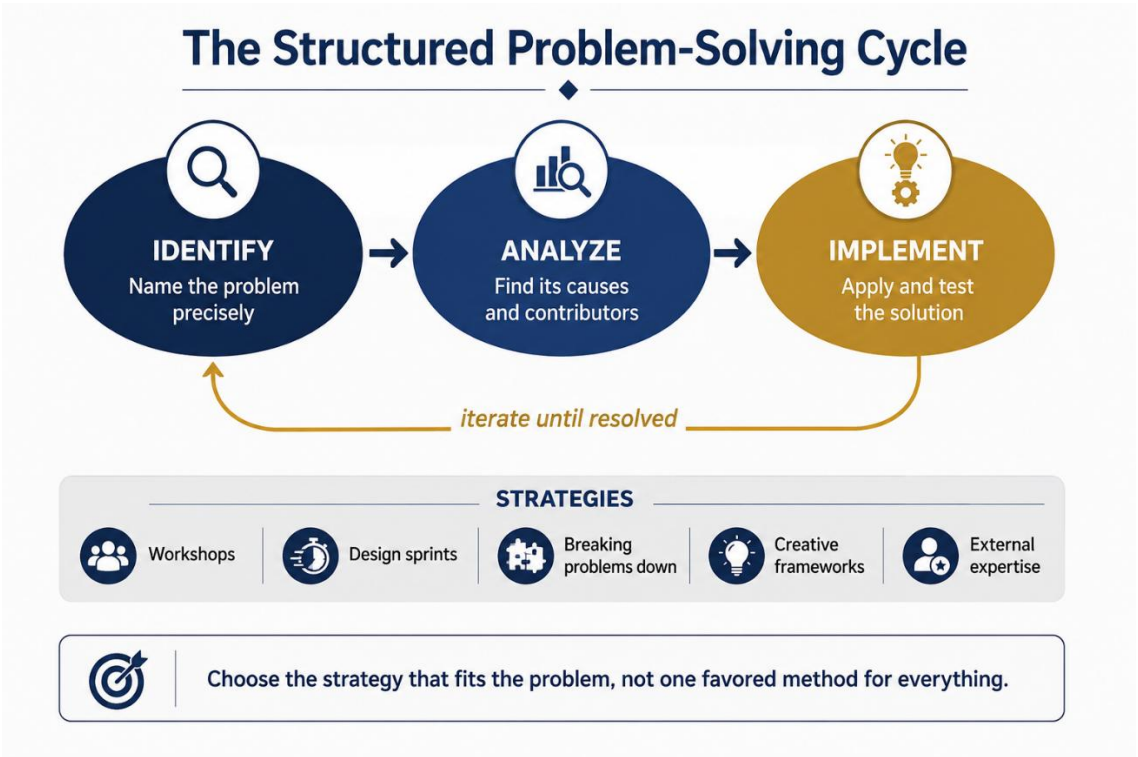

Figure 14.1. The structured problem-solving cycle: identify the problem, analyze it, and implement a solution tailored to the team and the issue.

14.5.2 Structured Problem-Solving

Problem-solving strategies are systematic methods that guide resolution through defined techniques, actions, and frameworks. Which strategy fits depends on whether the problem is broad, such as improving a program overall, or specific, such as fixing one step in a process. All sound strategies share fundamental phases: identifying the problem, analyzing it, and implementing a solution, but they differ in execution: some invest heavily in identifying the problem beforehand, others compress every phase into a single intensive session. What they hold in common is structure. The practical strategies available include facilitated problem-solving workshops, time-boxed design sprints, breaking problems down into smaller high-impact tasks, creative frameworks that unlock fresh perspectives, and seeking external expertise. The manager's skill lies in choosing the right one for the problem at hand rather than applying a single favored method to every situation.

14.5.3 Essential Skills and Completing the Work

Strategies provide the process, but skills provide the capability to run them: analytical thinking to break a problem into parts, creativity to see alternatives, communication to align a team, decisiveness to choose under uncertainty, and resilience to persist when a first solution fails. Two strategies deserve particular emphasis. Design sprints apply design-thinking principles in a structured sequence of inspiration and rapid prototyping, letting a team break a complex challenge into manageable tasks and test solutions quickly; they suit large problems needing measurable outcomes and fast action. Breaking problems down is often the wisest first move: rather than confronting a vast problem such as student attrition all at once, a team addresses smaller, high-impact contributors first, building momentum and confidence, which makes it especially valuable for teams new to structured problem-solving. Finally, the work must be completed: the research article finished, the findings communicated, and the evidence delivered to those who can use it.

14.6 Table 14.1, Risks and Safeguards by Stage

Stage	Risk if neglected	Safeguard
Define the question	An unclear question breeds confusion and unreliable findings	Refine the topic and pose a precise, answerable question

Stage	Risk if neglected	Safeguard
Assess data sources	Unreliable sources compromise validity and raise legal concerns	Evaluate credibility, accuracy, relevance, and timeliness
Select methods	Inappropriate methods yield invalid or misleading results	Choose methods that fit the question and justify the choice
Conduct analysis	Flawed analysis produces misleading conclusions	Use reliable techniques and present results transparently
Review and evaluate	A biased or shallow review breeds overconfidence	Invite peer review and acknowledge constraints honestly
Communicate findings	Poorly conveyed research is misinterpreted or ignored	Tailor to the audience and invite discussion

Table 14.1. Risks and safeguards across the research stages.

14.7 Practical Problem-Solving Strategies

The repertoire of practical strategies gives a manager options matched to circumstances rather than a single method applied indiscriminately. Facilitated workshops channel a team's own expertise through a structured framework, building in-house capability. Design sprints compress design, prototyping, and testing into a time-boxed cycle, aligning teams and quickly testing solutions to large challenges. Breaking problems down decomposes an overwhelming challenge into smaller, high-impact tasks, which suits teams new to structured problem-solving. Creative frameworks unlock fresh perspectives when a problem needs a shift in thinking. And seeking external expertise involves drawing on mentors, advisory groups, or consultants when a challenge exceeds the team's internal knowledge. Table 14.2 sets out each strategy and the situations it suits.

Strategy	What it is	Best for
Problem-solving workshops	Structured sessions channeling a team's expertise through a facilitated framework	Customizing solutions and building in-house capability
Design sprints	Time-boxed cycles that design, prototype, and test solutions rapidly	Aligning teams and testing solutions to large challenges quickly
Breaking problems down	Decomposing a large challenge into smaller, high-impact tasks	Overwhelming problems and teams new to structured problem-solving

Strategy	What it is	Best for
Creative frameworks	Method kits and techniques that unlock fresh perspectives	Problems needing a shift in thinking or broad participation
Seeking external expertise	Drawing on mentors, advisory groups, or consultants	Challenges beyond the team's internal expertise

Table 14.2. Problem-solving strategies and the situations they suit.

14.8 Philippine Context and Case Study

PHILIPPINE CONTEXT

Philippine educational researchers, many of them working teachers and administrators carrying full loads, face acute versions of every risk this chapter catalogs: limited time, constrained budgets, restricted access to data and literature, and few opportunities for methodological consultation. These constraints make anticipatory risk management especially valuable, since a Filipino researcher can rarely afford to discover a fatal flaw at the last minute. Breaking problems down, seeking mentorship from more experienced colleagues, and drawing on division research committees are practical strategies well matched to the Philippine setting, where resourcefulness must substitute for resources.

CASE STUDY

Illustrative composite case.

A graduate researcher, overwhelmed by a dissertation on student attrition, was unable to make progress for months, paralyzed by the size of the problem. Advised to break the problem down, she identified the highest-impact contributor she could actually study, absenteeism in a single grade level in three schools, and made rapid progress on a focused, answerable question that nonetheless spoke to the larger concern. She then sought mentorship on her analysis, which helped her catch a methodological error early. The case draws together the whole book: a well-formed question, a fitting method, anticipated risks, and a structured response to difficulty, which together turn an impossible problem into completed, usable research.

14.9 Best Practices, Current Issues, and Common Pitfalls

- Best Practice: Work through the research stages deliberately, asking at each stage what could go wrong and what safeguards prevent it.
- Best Practice: Choose the problem-solving strategy that fits the problem rather than applying one favored method to everything.
- Best Practice: Break overwhelming problems into smaller, high-impact tasks to build momentum and confidence.
- Common Pitfall: Addressing challenges reactively, discovering fatal flaws late when they are expensive or impossible to fix.
- Common Pitfall: Applying a single favored problem-solving method regardless of the nature of the problem.
- Common Pitfall: Being paralyzed by the scale of a problem rather than decomposing it into what can actually be studied.

14.10 Summary and Key Takeaways

Each research stage carries characteristic risks, and working through them deliberately converts vague worry into a concrete checklist of safeguards. When problems arise, structured problem-solving offers a disciplined response through workshops, design sprints, decomposition, creative frameworks, and external expertise, chosen to fit the problem. Essential skills of analysis, creativity, communication, and resilience make these strategies work. This chapter completes the book: from the governance of inquiry in Chapter 1, through question, design, ethics, evidence, validation, dissemination, and translation, to the completion of the work here.

KEY TAKEAWAYS

- Each research stage carries characteristic risks with corresponding safeguards.
- Anticipating risks early is cheap; discovering them late may be fatal.
- Structured problem-solving strategies must be chosen to fit the problem at hand.
- Breaking a large problem down is often the wisest first move.

14.11 Key Terms, Reflection, and Discussion

Research Risk. Safeguard. Problem-Solving Strategy. Design Sprint. Breaking Problems Down. Creative Framework. External Expertise. Resilience. Structured Problem-Solving.

- Reflection: Looking across your whole Research Management Plan, which stage carries the greatest risk, and what safeguard will you put in place?
- Discussion: Filipino researchers often work under severe constraints of time and resources. Which problem-solving strategies are best suited to that reality, and why?

14.12 Capstone: Completing the Research Management Plan, Step 14

RESEARCH MANAGEMENT PLAN, STEP 14 (CAPSTONE)

Assemble the fourteen steps into a single, coherent Research Management Plan. It should present, in order: the problem and its significance (Step 1); the plan framework and data protection (Step 2); the research question and SMART objectives (Step 3); the IMRAD outline (Step 4); the justified research design (Step 5); the ethics section, including any AI safeguards (Step 6); the data collection and sampling design (Step 7); the analysis plan (Step 8); the validity, reliability, or trustworthiness strategy (Step 9);

the data validation and integrity plan (Step 10); the dissemination plan (Step 11); the publication plan (Step 12); the translation plan (Step 13); and, finally, a risk register naming the principal risks at each stage with the safeguard for each (Step 14). Review the whole for coherence: every part should serve the question, and no stage should be left ungoverned. Prepare a brief presentation of the plan for your peers, leading with the problem and the decision your research would inform.

14.13 Chapter Self-Check

CHAPTER SELF-CHECK

1. The value of stage-by-stage risk analysis is that it:

a) Guarantees success b) Converts vague worry into a concrete checklist c) Eliminates all risk d) Replaces methodology

2. All sound problem-solving strategies share the phases of:

a) Funding, staffing, reporting b) Identifying, analyzing, implementing c) Writing, editing, publishing d) Sampling, testing, concluding

3. A time-boxed cycle that designs, prototypes, and tests solutions rapidly is a:

a) Workshop b) Design sprint c) Literature review d) Focus group

4. For a team overwhelmed by a vast problem, the wisest first move is often to:

a) Seek funding b) Break the problem down c) Change the question entirely d) Wait for clarity

5. Risks discovered late in a study are typically:

a) Cheap to fix b) Expensive or impossible to fix c) Irrelevant d) Automatically corrected

14.14 References

- Project Management Institute. (2021). A guide to the project management body of knowledge (7th ed.). PMI.
- Brown, T. (2009). Change by design: How design thinking transforms organizations and inspires innovation. Harper Business.
- Creswell, J. W., & Creswell, J. D. (2018). Research design: Qualitative, quantitative, and mixed methods approaches (5th ed.). SAGE.

End of Chapter 14. End of the book. Complete your Research Management Plan.

List of Abbreviations

Acronym	Meaning
AI	Artificial Intelligence
ANOVA	Analysis of Variance
CHED	Commission on Higher Education
CO	Course Outcome
DepEd	Department of Education
DOST	Department of Science and Technology
FINER	Feasible, Interesting, Novel, Ethical, Relevant
IMRAD	Introduction, Methods, Results, and Discussion
LO	Learning Outcome
NPC	National Privacy Commission
PHREB	Philippine Health Research Ethics Board
PICO / PICOT	Population, Intervention, Comparison, Outcome, and Time
RA	Republic Act
README	A checklist of nine research communication methods
SMART	Specific, Measurable, Achievable, Relevant, Time-bound
STEP	Strategic Translation and Engagement Planning

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List of Tables

Glossary

The following terms are introduced and defined throughout the fourteen chapters of this book. Each entry lists the chapter in which the term is first defined; refer to that chapter's Definitions section for full context.

Research Management *(Ch. 1)* The systematic planning, organizing, resourcing, safeguarding, and directing of research so it produces trustworthy, useful results.

Research Life Cycle *(Ch. 1)* The framing of a study as a sequence of managed stages rather than a single act.

Evidence-Based Practice *(Ch. 1)* The use of the best available research evidence, alongside professional judgment, to guide educational decisions.

Research Plan *(Ch. 2)* The deliberate structuring of a study before it begins, specifying purpose, design, resources, ethics, and timeline.

Data Management Plan *(Ch. 2)* A specification of how data will be collected, stored, secured, retained, and disposed of.

Data Privacy Act of 2012 *(Ch. 2)* Republic Act No. 10173, regulating the collection, processing, and storage of personal data in the Philippines.

Research Problem *(Ch. 3)* The gap, difficulty, or tension in knowledge or practice that motivates a study.

Research Question *(Ch. 3)* A specific, answerable question that a study will address within a research problem.

FINER Criteria *(Ch. 3)* A test of whether a question is Feasible, Interesting, Novel, Ethical, and Relevant.

PICO / PICOT *(Ch. 3)* A framework specifying Population, Intervention, Comparison, Outcome, and Time.

SMART Objectives *(Ch. 3)* Objectives that are Specific, Measurable, Achievable, Relevant, and Time-bound.

IMRAD *(Ch. 4)* The standard research-article structure: Introduction, Methods, Results, and Discussion.

Reproducibility *(Ch. 4)* The capacity of another competent researcher to repeat a study from its Methods section.

Quantitative Research *(Ch. 5)* Research that measures variables numerically and analyzes them statistically.

Qualitative Research *(Ch. 5)* Research that explores meaning, experience, and process through words and observation.

Mixed-Methods Research *(Ch. 5)* Research combining quantitative and qualitative approaches to answer what neither could alone.

Descriptive Design *(Ch. 5)* A design that describes a population or phenomenon accurately without manipulating variables.

Respect for Persons *(Ch. 6)* Treating individuals as autonomous agents and protecting those with diminished autonomy.

Beneficence *(Ch. 6)* Maximizing the benefits of research and minimizing its harms.

Justice *(Ch. 6)* The fair distribution of the burdens and benefits of research.

Informed Consent *(Ch. 6)* Voluntary agreement to participate, given with full understanding; for minors, guardian consent with the child's assent.

Primary Data *(Ch. 7)* Data collected firsthand for the current study.

Secondary Data *(Ch. 7)* Data already collected by others, efficient but not always a precise fit.

Probability Sampling *(Ch. 7)* Sampling in which every population member has a known chance of selection, supporting generalization.

Descriptive Statistics *(Ch. 8)* Techniques such as means and frequencies that summarize and portray data.

Inferential Statistics *(Ch. 8)* Techniques such as t-tests and regression that test hypotheses and support inference to a population.

Level of Measurement *(Ch. 8)* Whether data are nominal, ordinal, interval, or ratio, which determines the appropriate analysis.

Thematic Analysis *(Ch. 8)* A qualitative approach identifying and interpreting patterns of meaning across a dataset.

Reliability *(Ch. 9)* The consistency of a measure: stable, repeatable results.

Validity *(Ch. 9)* The accuracy of a measure and the soundness of the inferences drawn from it.

Internal Validity *(Ch. 9)* Whether a study establishes genuine causation, free of alternative explanations.

External Validity *(Ch. 9)* Whether findings generalize beyond the specific sample, setting, and time.

Trustworthiness *(Ch. 9)* The criterion of rigor in qualitative research: credibility, transferability, dependability, confirmability.

Data Validation *(Ch. 10)* Checking that data are accurate, complete, and consistent before analysis.

Research Integrity *(Ch. 10)* Honesty and accountability in producing, handling, and reporting research.

Fabrication *(Ch. 10)* The invention of data or results that were never obtained.

Falsification *(Ch. 12)* The manipulation or misrepresentation of materials, data, or results.

Dissemination *(Ch. 11)* The communication of research findings to the audiences who can use or evaluate them.

Science Communication *(Ch. 11)* The translation of research findings for audiences outside the researcher's field.

Journal Selection *(Ch. 12)* The systematic choice of a publication venue matched to a manuscript's scope and quality.

Research-to-Practice Gap *(Ch. 13)* The structural mismatch between what research produces and what policy and practice can use.

Knowledge Translation *(Ch. 13)* The active, planned process of moving research findings into policy and practice.

README Checklist *(Ch. 13)* A framework of nine communication methods, each suited to particular audiences and goals.

STEP Tool *(Ch. 13)* Strategic Translation and Engagement Planning, selecting a method by complexity and interaction.

Research Risk *(Ch. 14)* A characteristic way a study can fail at a given stage of the research process.

Design Sprint *(Ch. 14)* A time-boxed cycle that rapidly designs, prototypes, and tests solutions.

Appendix A: The Complete Research Management Plan Worksheet Packet

This appendix consolidates the fourteen steps of the cumulative Research Management Plan into a single running worksheet. Distributed at the start of the term, it lets a student carry one real institutional problem from first framing to a complete, defensible plan, completing one step as each chapter is studied.

Step 1 (Ch. 1): Identify a real institutional problem research could inform; name the level (learner, institution, system) at which better evidence would create value.

Step 2 (Ch. 2): Draft the research plan outline using the plan framework; note what data are needed and how they would be protected under the Data Privacy Act.

Step 3 (Ch. 3): Formulate the central research question by progressive narrowing; test it against the quality criteria and write aligned, SMART objectives.

Step 4 (Ch. 4): Draft an IMRAD outline: the purpose arriving at the question, the Methods elements, what Results would report, and what the Discussion would interpret.

Step 5 (Ch. 5): Select and justify the research design, stating its tradition, why it fits the question, and what an alternative would fail to capture.

Step 6 (Ch. 6): Write the ethics section: consent and assent, ethics clearance, Data Privacy Act compliance, and any AI safeguards.

Step 7 (Ch. 7): Design data collection: the data needed, primary or secondary, the methods, the sampling approach, and a brief data management note.

Step 8 (Ch. 8): Plan the analysis: for each question, the technique, the level of measurement, the tool, and, for qualitative work, the coding procedure.

Step 9 (Ch. 9): Address validity and reliability, or trustworthiness: how each will be established, and the principal threats with a safeguard for each.

Step 10 (Ch. 10): Add a data validation and integrity plan: the checks performed before analysis and the practices ensuring honest reporting.

Step 11 (Ch. 11): Plan dissemination: the audiences, the channel for each, and an opening leading with the finding for a non-expert decision-maker.

Step 12 (Ch. 12): Build a publication plan: two or three suitable, legitimate journals with their scope and indexing, plus a submission checklist.

Step 13 (Ch. 13): Build a translation plan: the decision-makers, their timeline, two methods selected via the STEP tool, and how impact would be evaluated.

Step 14 (Ch. 14): Assemble all steps into a single coherent Research Management Plan, adding a risk register naming the principal risk and safeguard at each stage; prepare a brief presentation.

Appendix B: The Philippine Legal and Ethical Framework

This appendix consolidates the legal instruments, ethical standards, and institutional frameworks referenced throughout the book into a single quick reference for the Philippine educational researcher.

Instrument or body	Scope	The manager's obligation
Belmont principles	Respect for persons, beneficence, justice	Design consent, minimize harm, ensure fairness
PHREB guidelines	Ethics review through accredited committees	Secure ethics clearance before data collection
RA 10173 (Data Privacy Act)	Collection and processing of personal data	Lawful basis, consent, security, minimal data, retention limits
National Privacy Commission	Oversight of data privacy compliance	Comply with issuances; protect the records of minors
RA 8293 (IP Code)	Intellectual property in research outputs	Attribute sources; protect and respect outputs
Gender responsiveness	Equity in research design and reporting	Design and report without reproducing inequity
DepEd Basic Education Research Agenda	National priorities for basic education research	Align studies with agenda; access the Research Fund
CHED and DOST	Higher education and science research capacity	Align with national development priorities

Table B.1. The Philippine legal and ethical framework for educational research.

Appendix C: Index of Key Concepts and Course Outcome Alignment

This appendix indexes the major concepts introduced throughout the book, and maps the book's five Parts to the three course outcomes of Prof. Ed TVL 110.

Concept	Defined In
Research management and the research life cycle	Chapter 1
Research planning, data governance, and privacy	Chapter 2
Research questions, FINER, PICO, SMART objectives	Chapter 3
IMRAD and reproducibility	Chapter 4
Research traditions and matching design to question	Chapter 5
Research ethics, Belmont, and AI-assisted research	Chapter 6
Data collection methods and sampling	Chapter 7
Descriptive, inferential, and qualitative analysis	Chapter 8
Validity, reliability, trustworthiness, verification	Chapter 9
Data validation and research integrity	Chapter 10
Oral presentations, posters, science communication	Chapter 11
Journal selection and integrity in publication	Chapter 12
Knowledge translation, README, and the STEP tool	Chapter 13
Research risks and structured problem-solving	Chapter 14

Table C.1. Index of key concepts and the chapter in which each is defined.

Course Outcome	Description	Primary Parts/Chapters
CO1	Understand and plan research management in educational settings	Parts I, II (Ch. 1 to 5)
CO2	Apply research principles, methods, and analysis	Parts II, III (Ch. 4 to 10)
CO3	Conduct and complete research with ethics and data privacy, and translate it into use	Parts II, IV, V (Ch. 6, 11 to 14)

Table C.2. Alignment of the book's Parts with the three course outcomes.

Appendix D: Suggested Course Calendar

The following calendar maps one chapter to one instructional week and is suitable for the 54-hour, 3-unit Prof. Ed TVL 110 course. Institutions may instead pace chapters per Part, aligning the five Parts with the midterm and final examination points indicated in the course learning plan.

Week	Chapter	Milestone
Week 1	Chapter 1: Introduction to Research Management	Research Management Plan Step 1 due
Week 2	Chapter 2: Planning and Governing Research	Research Management Plan Step 2 due
Week 3	Chapter 3: Formulating Research Questions and Objectives	Research Management Plan Step 3 due
Week 4	Chapter 4: The IMRAD Format	Research Management Plan Step 4 due
Week 5	Chapter 5: Selecting Research Methodologies	Research Management Plan Step 5 due
Week 6	Chapter 6: Research Ethics and Integrity	Research Management Plan Step 6 due
Week 7	Chapter 7: Managing Data Collection	Research Management Plan Step 7 due
Week 8	Chapter 8: Analyzing Research Data	Research Management Plan Step 8 due
Week 9	Chapter 9: Ensuring Validity and Reliability	Research Management Plan Step 9 due
Week 10	Chapter 10: Data Validation and Research Integrity	Research Management Plan Step 10 due
Week 11	Chapter 11: Disseminating Research Findings	Research Management Plan Step 11 due
Week 12	Chapter 12: Publication and Research Integrity	Research Management Plan Step 12 due
Week 13	Chapter 13: Engaging Stakeholders and Informing Policy	Research Management Plan Step 13 due
Week 14	Chapter 14: Managing Research Challenges	Research Management Plan Step 14 due

Table D.1. Suggested 14-week course calendar.

Suggested Further Reading

Students seeking deeper treatment of specific topics covered in this book may consult the following works, each cited within the relevant chapter:

Creswell, J. W., & Creswell, J. D. (2018). Research design: Qualitative, quantitative, and mixed methods approaches (5th ed.). SAGE. The standard graduate treatment of design across the three traditions.

Lincoln, Y. S., & Guba, E. G. (1985). Naturalistic inquiry. SAGE. The origin of the trustworthiness framework for qualitative rigor.

Morse, J. M., Barrett, M., Mayan, M., Olson, K., & Spiers, J. (2002). Verification strategies for establishing reliability and validity in qualitative research. International Journal of Qualitative Methods, 1(2), 13 to 22.

Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). Experimental and quasi-experimental designs for generalized causal inference. Houghton Mifflin. The definitive catalog of threats to validity.

Nutley, S. M., Walter, I., & Davies, H. T. O. (2007). Using evidence: How research can inform public services. Policy Press. On the research-to-practice gap and knowledge translation.

UNESCO. (2023). Guidance for generative AI in education and research. UNESCO. The first global guidance on AI in research and education.

Notes on Sources: The references listed in each chapter are foundational works in research methodology, ethics, and knowledge translation. Before final publication, all citations will undergo a full accuracy audit against APA 7th edition standards, as noted in the Preface.

About the Author

Dr. Ventayen, is an educator, researcher, academic editor, and international relations coordinator with extensive experience in teacher education, graduate instruction, research management, and community development. She serves as an Associate Professor IV and faculty member of the College of Teacher Education at Pangasinan State University. She also serves as Coordinator for International Relations and Research Coordinator of the Pangasinan State University Open University Systems.

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Her research interests include teacher education, educational management, flexible and digital learning, educational technology, curriculum development, artificial intelligence in education, sentiment analysis, teachers' workload and well-being, internationalization, and technology and livelihood education. Her scholarly works include studies on virtual learning environments, the use of technological tools in instructional delivery, workplace stress and depression among educators, student feedback, and emerging approaches to teaching and learning. Her publications and academic contributions may be accessed through her Google Scholar profile at https://scholar.google.com/citations?hl=en&user=9cxrLoAAAAAJ.

Beyond teaching and research, Dr. Orlanda-Ventayen is involved in international academic collaboration, scholarly editing, research fellowships, and innovation-driven extension initiatives. She has contributed to projects such as the First Handloom Weaving Innovation Hub and the Bamboo Textile Fiber Innovation Hub, which connect academic research, livelihood education, textile innovation, and community development. As an educator, researcher, project proponent, and author, she remains committed to developing research-informed, sustainable, and outcomes-based learning resources that prepare competent, ethical, innovative, and globally responsive educators.