



RESEARCH METHODS

IN ENGLISH LANGUAGE TEACHING



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In English Language Teaching**

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FOREWORD

RESEARCH METHODS IN ENGLISH LANGUAGE TEACHING

Research methodology in English Language Teaching is a compulsory course acquired by students to accomplish their studies at university. This book introduces research methods, population and subject selection, research instruments, data collection, and analysis, guiding the students to comprehend what and how to do their research project. It also provides systematic procedures to report valid and reliable results.

Based on the observation, students of the English Education Department at Universitas Borneo Tarakan are discouraged in their studies due to insufficient enthusiasm, inadequate reading sources, and incomprehensible reading analysis. Consequently, they require overtime to complete their study journey. Students must read the proper research method books to answer their research questions to accelerate their study. This reference is expected to offer autonomous learning, develop effective and efficient knowledge, and accommodate students' needs and learning styles. Moreover, it supports lecturers in creating student activities in the classroom.

This book can stimulate lecturers to improve their writing ability and intellectuality. Besides, it enables them to accelerate their academic performance and contribute to raising the institution's accreditation level as the lecturers' writing experience strengthens their teaching, community service, and research. This activity also promises to facilitate a sustainable collaboration with other colleagues and scholars concerning English Language Teaching research methods.

Tarakan, 13 November 2023



Prof. Dr. Adri Patton, M. Si
Rector
Universitas Borneo Tarakan

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COURSE DESCRIPTION

RESEARCH METHODS IN

ENGLISH LANGUAGE TEACHING

Course Description

The objective of this course is to provide students with both academic and practical training in research methodology. Students gain familiarity with the procedures used in educational research in general and English Language Teaching (ELT) research in particular in this course. It examines two areas of English Language Teaching (ELT) research: theory-oriented, like ELT-related concerns, and practice-oriented, such mixed-methods, quantitative, and qualitative research.

Course Learning Achievement

The students are expected to be able to comprehend educational research procedures in general and English Language Teaching (ELT) research in particular.

Sub-Subjects of Learning Subjects

1. Students will be able to analyze the concepts of educational research.

Sub-competences:

- a. List and briefly describe the major steps involved in conducting a research study.
- b. Describe the differences between quantitative and qualitative research.
- c. Briefly define and state the major characteristics of these research approaches: action, descriptive, correlational, causal-comparative, experimental, narrative, and ethnographic.
- d. For each research approach in Objective 3, briefly describe two appropriate research studies.

- e. Given a published article, identify and state the problem or topic chosen to study, the procedures employed to conduct the study, the method of analyzing collected data, and the major conclusion of the study.
2. Students will be able to select and define a research topics.

Sub-competences:

- a. Make a list of at least three educational topics on which you would be interested in conducting a research study.
 - b. Select one of the topics and identify 10 to 15 complete references (source works) that directly relate to the selected problem. The references should include a variety of source types (e.g., books, articles, Internet reports, etc.).
 - c. Distinguish between quantitative and qualitative methods of starting a research study.
 - d. Formulate a testable or descriptive hypothesis for research problem.
3. Students will be able to prepare and evaluate a research plan.

Sub-competences:

- a. Describe the use of a research plan when conducting educational research.
 - b. Briefly describe three general considerations involved in conducting and reporting educational research.
 - c. Describe two major pieces of legislation affecting educational research.
 - d. Briefly describe each of the components of a quantitative research plan.
 - e. Briefly describe each of the components of a qualitative research plan.
 - f. Briefly describe two major ways in which a research plan can be evaluated.
4. Students will be able to select a sample.

Sub-competences:

- a. Identify and describe four random sampling techniques.

- b. Select a random sample using a table of random numbers.
 - c. Identify three variables that can be stratified.
 - d. Select stratified samples, cluster samples, and systematic samples.
 - e. Identify and describe three nonrandom sampling techniques.
 - f. Identify and briefly describe two major sources of sample bias.
 - g. Describe quantitative and qualitative sampling strategies.
5. Students will be able to select and measure research instruments.

Sub-competences:

- a. State the links or relationships among a construct, a variable, and an operationalized variable.
 - b. Describe different types of variables: nominal, ordinal, interval, and ratio; categorical and quantitative; dependent and independent.
 - c. Explain various testing terms: standardized test, assessment, measurement, selection, supply, performance assessment, raw score, norm- and criterion-referenced scoring.
 - d. Describe the purposes of various types of tests: achievement, aptitude, attitude, interest, value, personality, projective, non-projective, and self-report.
 - e. Describe various scales used to collect data for cognitive and affective variables.
 - f. Describe the purposes of and ways to determine content, criterion-related, construct, and consequential validity.
 - g. Define or describe standard error of measurement.
 - h. State a strategy for test selection.
 - i. Identify and briefly describe three sources of test information.
6. Students will be able to explain a descriptive research.

Sub-competences:

- a. Briefly state the purpose of descriptive research.
- b. List the major steps involved in designing and conducting a descriptive research study.

- c. Briefly describe the main types of self-report research.
 - d. List and briefly describe the steps involved in conducting a questionnaire study.
 - e. Identify and briefly describe four major differences between an interview study and a questionnaire study.
7. Students will be able to explain a correlational research.

Sub-competences:

- a. Briefly state the purpose of correlational research.
 - b. List and briefly describe the major steps involved in basic correlational research.
 - c. Describe the size and direction of values associated with the correlation coefficient.
 - d. Describe how the size of a correlation coefficient affects its interpretation with respect to (1) statistical significance, (2) its use in prediction, and (3) its use as an index of validity and reliability.
 - e. State two major purposes of relationship studies.
 - f. Identify and briefly describe the steps involved in conducting a relationship study.
 - g. Briefly describe four different types of correlation and the nature of the variables they are used to correlate.
 - h. Identify and briefly describe two factors that may contribute to an inaccurate estimate of relationship.
 - i. Briefly define or describe predictor variables and criterion variables.
 - j. State purposes of prediction studies.
 - k. State the major difference between data collection procedures in a prediction study and a relationship study.
8. Students will be able to explain a causal-comparative research.

Sub-competences:

- a. Briefly state the purpose of causal-comparative research.
- b. State the major differences between causal-comparative and correlational research.

- c. State one major way in which causal-comparative and experimental research are the same and one major way in which they are different.
 - d. Diagram and describe the basic causal-comparative design.
 - e. Identify and describe three types of control procedures that can be used in causal-comparative study.
 - f. Explain why the results of causal-comparative studies must be interpreted very cautiously.
9. Students will be able to explain an experimental research.

Sub-competences:

- a. Briefly state the purpose of experimental research.
 - b. List the basic steps involved in conducting an experiment.
 - c. Explain the purpose of control.
 - d. Briefly define or describe internal validity and external validity.
 - e. Identify and briefly describe eight major threats to the internal validity of an experiment.
 - f. Identify and briefly describe six major threats to the external validity of an experiment.
 - g. Briefly discuss the purpose of experimental design.
 - h. Identify and briefly describe five ways to control extraneous variables.
 - i. For each of the pre-experimental, true experimental, and quasi-experimental group designs; (1) draw a diagram, (2) list the steps involved in its application, and (3) identify major problems of validity.
 - j. Briefly define and describe the purpose of a factorial design.
10. Students will be able to explain a narrative research.

Sub-competences:

- a. Briefly state the definition and purpose of narrative research.
- b. Describe the narrative research process.
- c. Describe the different types of narrative research.
- d. Describe the key characteristics of narrative research designs.

e. Describe narrative research techniques.

11. Students will be able to explain an ethnographic research.

Sub-competences:

- a. Briefly define and state the purpose of ethnographic research.
- b. Describe the ethnographic research process.
- c. Identify and describe the different types of ethnographic research.
- d. Describe the key characteristics of ethnographic designs.
- e. Describe ethnographic research techniques.

12. Students will be able to explain a case study research.

Sub-competences:

- a. Briefly state the definition and purpose of case study research.
- b. Describe the case study research design
- c. Explain how sample is selected in case study
- d. Briefly describe how multiple case study is conducted and analyzed

13. Students will be able to explain research and development.

Sub-competences:

- a. Define R&D.
- b. Distinguish between R&D designs.
- c. Describe strategies for data collection techniques in R&D.
- d. Describe strategies for conducting R&D data analysis.

14. Students will be able to explain an action research.

Sub-competences:

- a. State a definition of action research.
- b. Describe the purposes of action research.
- c. Describe the processes of action research.

- d. Identify the four basic steps in conducting action research.
- e. Describe the key characteristics of action research.

Identify common data collection sources and strategies used to carry out action research in schools.

CHAPTER 1

INTRODUCTION TO EDUCATIONAL RESEARCH

This chapter focuses on:

- List and briefly describe the major steps involved in conducting a research study.
- Describe the differences between quantitative and qualitative research.
- Briefly define and state the major characteristics of these research approaches: action, descriptive, correlational, causal-comparative, experimental, narrative, and ethnographic.
- For each research approach in Objective 3, briefly describe two appropriate research studies.
- Given a published article, identify and state the problem or topic chosen to study, the procedures employed to conduct the study, the method of analyzing collected data, and the major conclusion of the study.

A. Conducting Research Study

Research is a unique and methodical examination which carried out to expand knowledge and understanding of the unknown and to establish facts and principles. It entails the invention of concepts, the production of fresh information that produces fresh and enhanced insights, and the development of novel substances, apparatuses, products, and procedures. It should be capable of generating information that is sufficiently pertinent to add to, synthesize, or integrate prior knowledge.

It is possible that the word "research" came from the old French verb "recherchier," which meant "to search again." It implies that the preceding search was not thorough and complete, necessitating another search. In actuality, the term "research" refers to a scientific process of obtaining previously untapped knowledge with the goals of establishing facts, resolving issues, and making decisions. Through systematic and orderly data gathering, organization, and

analysis, research is a scientific strategy to addressing a research issue, resolving a research problem, or producing new knowledge that may be applied to decision-making.

Research is deemed scientific if it is founded on empirical and quantifiable evidence that is subject to predetermined principles of reasoning, consists of methodical observations, measurements, and experiments, relies on the use of scientific methods and the fostering of curiosity, offers scientific knowledge and theories for the explanation of nature, enables practical applications, and ensures adequate analysis of data using strict statistical techniques.

B. Comparing Quantitative and Qualitative Research

In general, quantitative research tests hypotheses to understand the causal or correlational link between variables, whereas qualitative research uses interviews and observation to understand a phenomenon in its real-world setting. Both research approaches have merit, albeit some study topics are more suited to one than the other. The researchers will be able to conduct an informed critique and analysis of any articles they read, however, because they will be aware of the various benefits, drawbacks, and influencing factors for each approach if they are aware of the distinctions between qualitative and quantitative research.

The key distinctions between qualitative and quantitative research are shown in the table below.

Table 1. Comparing Quantitative and Qualitative

	Qualitative	Quantitative
Keywords	Complexity, contextual, inductive logic, discovery, exploration	Experiment, random assignment, independent/dependent variable, causal/correlational, validity, deductive logic
Purpose	Understand a phenomenon	Discover causal relationships or describe a phenomenon
Sample	Purposive sample, small	Random sample, large
Data	Focus groups, interviews, field observation	Tests, surveys, questionnaires
Methods/Design	Phenomenological, grounded theory, ethnographic, case study, historical/narrative research, participatory research, clinical research	Experimental, quasi-experimental, descriptive, methodological, exploratory, comparative, correlational, developmental (cross-sectional, longitudinal/prospective/cohort, retrospective/ex post facto/case control)

C. Major Characteristics of Research Approaches

The following are some desired qualities of research, keeping in mind that research in every field of inquiry is performed to give information to support decision-making in its specific area:

1. Priority issues should be the emphasis of the research.
2. The investigation ought to be methodical. It emphasizes the use of an organized methodology by researchers.
3. The research need to make sense. The scientific researcher cannot make much headway in any subject without manipulating concepts logically.
4. Reductive research is required. To avoid other researchers from conducting the same research twice, the results of one study should be made available to them.
5. The study ought to be repeatable. This states that there should be room to confirm earlier research findings in fresh settings and environments with new individuals or at a different period.

6. The research need to be productive. One of the benefits of research is that it might generate a lot of new questions as a result of one question being answered.
7. The research ought to focus on solutions. In other words, it should be focused on finding solutions to apply its conclusions.
8. An integrated interdisciplinary strategy should be used in the research, meaning that methods from multiple disciplines are required.
9. All parties involved in the research, from policymakers to community people, should be included at every stage of the investigation.
10. The research must have a comparably straightforward design, be timely, and be time-bound.
11. The research must be as economically sound as it can be.
12. The findings of the study should be presented in ways that are most beneficial to administrators, decision-makers, company managers, or people of the community.

There are two primary methods for conducting research. The first is the fundamental strategy or basic research, which mostly applies to academic study. Many consider this to be essential or pure research. The study conducted using the second strategy is referred to by a variety of names, including applied research, action research, operations research, and contract research. Additionally, evaluative research, the third category of study, is crucial in many applications. Each of these strategies has a different goal that affects how each research method is used. Last but not least, extensive research calls for precautions.

Basic Research

The development of theories or the pursuit of truth are the main goals of basic research. Basic research is important because of this characteristic. With this basic knowledge, researchers "design studies that can test, refine, modify, or develop theories." Not to build or invent something, but rather to increase human

understanding, is the primary goal of basic research. The findings that come from fundamental research don't have any immediately apparent commercial value. The term "basic" denotes the way in which basic research establishes the theoretical framework for practical research. This research strategy is crucial for fostering the growth of knowledge. It addresses issues that the researcher finds to be stimulating and difficult cognitively. It focuses on debunking or defending notions that apply to a society that is evolving.

Applied Research

Applied research is the pursuit of knowledge that can be immediately put to use in practice. By testing hypotheses in particular contexts, applied research tries to determine the application of theory and principles. Researchers in this area look for quick fixes to issues affecting society, business, or other industrial organizations. The method is significantly more beneficial because it looks for data that will directly affect practice. Nobody can forecast what will happen in the future with enough accuracy from basic study. Even if we merely applied research, our spears would still improve. Applying research to social action is motivated by its demands. It seeks to discover a workable solution to the society's current issue while making the best use of the resources at hand. The goal of applied research is to find solutions to particular problems that are connected to action, performance, or policy demands.

Evaluative Research

Evaluating events like social and organizational programs or interventions is the focus of evaluation research. Such studies often focus on whether the response—such as a new legislative initiative or organizational change—achieved its intended objectives. One group that receives the treatment (the new initiative) and a control group that does not may make up a common assessment design. Such studies are typically quasi-experimental since it is sometimes impractical or unethical to randomly assign research participants to two groups. Examining the impact of the program activities in retrospect or cross-sectionally can be accomplished through the use of evaluative research. This study aims to evaluate

the implemented activities and their immediate impacts, as well as the influence of a program and the effectiveness of the intervention.

Precaution in Research

A researcher must take the appropriate precautions to make sure that the study he or she is undertaking is pertinent, timely, efficient, accurate, and ethical. This is true whether the researcher is conducting applied research, basic research, or research of any other kind. If the research foresees the types of information that decision-makers, scientists, or policymakers will need, it is deemed relevant. Research that is timely is finished in time to affect decisions. When research is carried out to the highest standard for the least amount of money and within the parameters of the research setting, it is efficient. When the interpretation of the data can explain both the consistencies and the inconsistencies in the data, the research is regarded as accurate or legitimate. When research can foster trust, exercise caution, uphold norms, and respect the rights of those who participate in the research process, it is ethical.

D. Research Article Analysis

Scan the following QR code to access the example of research article analysis.



QR Code Example of Research Article Analysis

The article title is Post Pandemic Impact: E-Learning Crack-Up and English Learning quality. Focus on abstract to find out the summary of the research and after that analyze detail information about the burning issue, research methodology, findings and discussion and also the conclusion.

E. Individual Task

Answer the following questions based on your understanding after reading the material from this chapter!

1. What do you understand about research?
2. What are basic differences between quantitative research and qualitative research?
3. What are some desired qualities of research?
4. How can you distinguish between basic research and applied research?
5. Why do we conduct evaluative research?

CHAPTER 2

SELECTING AND DEFINING RESEARCH TOPICS

This chapter focuses on:

- Make a list of at least three educational topics on which you would be interested in conducting a research study.
- Select one of the topics and identify 10 to 15 complete references (source works) that directly relate to the selected problem. The references should include a variety of source types (e.g., books, articles, Internet reports, etc.).
- Distinguish between quantitative and qualitative methods of starting a research study.
- Formulate a testable or descriptive hypothesis for research problem.

A. Educational Topics

Every society's foundation is education, and in order to advance knowledge, educational research must take precedence. The general development of pedagogy, learning programs, and policy design depend heavily on educational research. Since educational research covers a wide range of subject areas, it depends on a variety of academic disciplines. As a result, the research's conclusions are multi-dimensional and subject to limitations based on the traits of the participants and the research environment.

A sort of systematic investigation known as educational research uses empirical techniques to address problems in education. It uses exacting and well-defined scientific procedures to collect and evaluate data for problem-solving and the progress of knowledge. The main goal of educational research is to increase the body of knowledge by offering solutions to various pedagogical issues while enhancing methods for teaching and learning. Additionally, questions about student motivation, development, and classroom management are of interest to scholars in education.

In all areas of study, educational research is essential to the advancement of knowledge. It offers solutions to real-world educational problems by applying scientific principles. Policy reformulation depends on the results of educational research, particularly applied research. Educational research enhances learning, knowledge, skills, and understanding for the researcher as well as other parties involved in this study approach. By providing with information to aid in teaching and leading more strategically and effectively, educational research enhances techniques of both teaching and learning. Students can better apply their knowledge in real-world settings with the aid of educational research.

Descriptive research, correlational research, and experimental research are the three basic categories into which educational research can be divided.

Descriptive Educational Research

In this kind of educational research, the researcher only aims to gather information regarding the current state of affairs. Determining the situation and qualities of the research topic that is being understudied forms the basis of descriptive research. Descriptive research can be referred to as an observational research method since it places a strong emphasis on the "what" of the circumstance. The researchers use quantitative research techniques such as surveys and questionnaires to acquire the necessary data for descriptive educational research.

Descriptive educational research is frequently the initial step in addressing a particular issue. Examples of descriptive research include the following:

1. A reading course that can assist you in determining students' literacy levels.
2. A review of students' performance in class.
3. A study to compile information on pupils' preferences and areas of interest.

It can be seen from these instances that the researchers need not simulate the research subjects' natural surroundings; instead, he or she can just observe

them as they go about their daily lives. Additionally, the researcher is not interested in establishing a causal connection between the study's variables.

Correlation Educational Research

This kind of educational research aims to provide light on the statistical correlation between two study variables. When conducting correlational research, the researcher examines two variables with the goal of finding a link between them. Research on correlations may be neutral, harmful, or nonexistent. An increase in variable A causes an increase in variable B, while an increase in variable A causes a drop in variable B is known as a negative correlation.

The correlation is nonexistent if a change in one of the variables does not result in a subsequent change in the other. Additionally, there is no requirement for external conditioning in correlational educational research because the variables' natural environments do not need to be changed.

Correlational studies in education include the following examples:

1. Study to ascertain the link between student behavior and academic performance.
2. An investigation on the connection between students' social abilities and their academic behavior.

Experimental Educational Research

A research strategy known as experimental educational research aims to determine the cause-and-effect relationship between two factors in the study setting. It uses quantitative research techniques to establish the links between the variables under study and their causes and effects. Two groups are commonly used in experimental educational research: the control group and the experimental group. While the control group is left in its natural state, the researcher makes certain changes to the experimental group, such as altering the environment or adding a catalyst.

The addition of these catalysts enables the researcher to identify the experiment's causal factor(s). The creation of a hypothesis is at the heart of experimental educational research, therefore the total research design depends on statistical analysis to support or refute this hypothesis.

Examples of Educational Experimental Research

1. A study to identify the most effective teaching and learning strategies in a classroom.
2. An investigation at how extracurricular activities impact education.

Fundamental, applied, and action research are the three categories into which educational research can be divided according to usefulness. Gaining new knowledge is the main goal of fundamental research, which also aims to offer insights into the study's variables. Fundamental research doesn't address any particular issues.

Applied research is a research strategy that, as its name suggests, aims to address particular issues. Findings from applied research are helpful in addressing real-world issues in the field of education, such as enhancing teaching strategies, changing curricula, and streamlining pedagogy.

Action research is designed to address current issues unique to a context, such as the educational difficulties in a nearby elementary school. Action research aims to answer broad or all-encompassing problems in the educational field and to propose solutions that are applicable in this situation.

B. Identification of Research Topic

A research topic is a particular subject or area of interest that the researcher want to thoroughly analyze or explore. A research project is guided by an overarching theme or question, which also aids in directing the research efforts toward a certain goal.

The purpose of a research topic is to identify a specific area of inquiry that the researcher wants to explore and investigate. A research topic is typically a broad area of interest that requires further exploration and refinement through the research process. It provides a clear focus and direction for the research project, and helps to define the research questions and objectives. A well-defined research topic also helps to ensure that the research is relevant and useful, and can contribute to the existing body of knowledge in the field. Ultimately, the purpose of a research topic is to generate new insights, knowledge, and understanding about a particular phenomenon, issue, or problem.

Researcher personal interests should be one of the top considerations when selecting a study topic. This is due to the fact that the researcher will have to devote a lot of time to researching and writing about the subject, so the researcher must be genuinely enthusiastic about it. Make a list of suitable study subjects based on interests, pastimes, or areas of specialization to get started. The researchers may also think about the subjects that stood out in readings or the courses that the researchers have enjoyed the most.

The researchers need to be aware of the existing literature before choosing a study topic. The researchers can detect knowledge gaps, discrepancies in results, or open-ended questions that you can further investigate by conducting a preliminary assessment of the literature already published in the subject. Reading scholarly works, novels, and other pertinent sources in the profession will help in doing this. Take note of any themes or subjects that surface, and then use this knowledge to determine the direction of the research question.

Select a study area that is pertinent to the field of study and has the potential to further understanding. To choose topics that are both pertinent and fascinating, take into account the most recent developments and hot topics in industry. It is also more likely that the study will be published or presented at conferences if it is on a topic that is current and important.

Some traits of a clearly specified research topic are as follows:

1. **Relevance:** A research topic should address a current issue, problem, or knowledge gap and be significant to the field of study.
2. **Clarity of the research question:** A research topic should be sufficiently detailed to permit a focused investigation.
3. **Feasibility:** A study topic needs to be feasible in order for it to be carried out within the restrictions of available time, resources, and competence.
4. **Novelty:** A study topic should contribute to the corpus of knowledge by presenting fresh notions, theories, or ideas.
5. **Clarity:** Both the researcher and any possible readers of the research should be able to understand the research topic.
6. **Importance:** A research topic should be significant and have applications for the industry or society at large.
7. **Significance:** A study topic ought to be relevant and have the ability to produce fresh ideas and insights in the area.

A research topic often consists of a number of elements that aid in defining and clarifying the research project's subject matter. These elements consist of:

1. The main topic or inquiry that the research is trying to answer is represented by this research problem. It must have boundaries that clearly identify its scope and keep the research narrow.
2. **Background and context:** This section gives the research topic the relevant background knowledge and context. It justifies the significance, applicability, and timeliness of the study subject or question. A literature review that describes the prior investigation into the subject may also be included.
3. **Objectives or aims:** This section describes the precise objectives or goals that the study is trying to accomplish. It must be accurate, succinct, and pertinent to the study problem or subject.

4. **Methodology:** This section outlines the procedures and tools that will be utilized to gather and examine the data. It should include information on the sampling strategy, data collection methods, and statistical analyses in sufficient depth to give readers a clear picture of how the study will be carried out.
5. **Contribution or significance:** This section explains the importance or significance of the study topic. It should show how the study will advance the body of knowledge in the area and how practitioners, decision-makers, or society at large will gain from it.
6. **Limitation:** This section describes the research's restrictions, including any potential biases, presumptions, or limits. It should be open and truthful about any potential flaws in the research as well as how these issues will be resolved.
7. **Expected results or findings:** This section gives a summary of the research project's anticipated results or findings. It ought to be grounded in the goals and methodology of the study and feasible.

C. Starting Quantitative and Qualitative Research

The use of the phrases quantitative and qualitative procedures to denote general research approaches. Although they don't specifically address data collecting or analytic methodologies, they are helpful in choosing how to approach the research.

Starting Quantitative Research

On numbers, quantitative research is built. It might appeal to left-brain folks' logical tendencies. Consider percentages, statistics, population information, economic data, or any other uncontested sort of raw data. It's the fundamental aspect of research techniques. A quantitative question provides the researchers with a clear-cut, frequently numerical response. Quantitative responses could be expressed as follows:

1. If forced to work in the workplace full-time, 53% of millennials would resign from their position.
2. Last year, sales for holiday shopping were made from smartphones in a third of all cases.
3. Employer-sponsored training is difficult for 61% of workers to commit to.

The researchers could also conduct quantitative research to examine correlation between factors that aren't necessarily numbers, such as:

1. Flexible scheduling and increased staff retention
2. increased pay and more contentment at work
3. Lead's age and the marketing strategy.

Making forecasts, drawing conclusions from a bigger audience, and spotting trends in their behavior are all made easier by quantitative research techniques. It's likely that the researchers are conducting quantitative research if the researchers are using tangible or numerical factors and data.

Starting Qualitative Research

Language, concepts, beliefs, and trends are just a few examples of the non-numerical data that qualitative research uses. It shifts away from the raw statistics and concentrates on contentious issues. Here's another way to look at it: qualitative research uses observations, whereas quantitative research uses measurements. The researchers can go deeply into a subject, examine the interactions between variables, and look for potential patterns using qualitative questions. Qualitative research can be used to generate hypotheses, while quantitative research can be used to test them.

Qualitative research techniques can reveal individual, hard-to-quantify attitudes and behaviors that the researchers might not otherwise put a figure on. However, because it is so subjective, one researcher's interpretation of the data could be quite different from another's.

An example of a qualitative research question would be:

1. How do workers feel about working from home?
2. What problems does our intended audience have?
3. How are small business owners being impacted by the recession?

It can be seen that the solutions to these kinds of queries are not exact numbers. To find the participants' distinctive viewpoints, the researcher must sift through a wealth of information.

D. Formulating Hypothesis

The hypothesis is a statement that may be tested and predicts the outcome and the findings the researcher anticipates. The hypothesis gives a brief overview of the approach if any used to investigate a theory. There is a standard that theories must meet in order to be accepted in scientific inquiry. The research may be discarded by the community of psychologists if a hypothesis is ignored.

Hypotheses are used for the following reasons:

1. Describe the research, how it will be studied, and what results are anticipated.
2. Submit a response to the inquiry.

When conducting research, researchers first look into the subject matter that interests them. Researchers must determine a gap in the literature based on this. The researcher then formulates a research question that they will try to address in their investigation. The theory can be used to future data analysis. This includes determining the significance of statistical results and performing inferential tests like hypothesis testing.

In research, the hypothesis is crucial since it describes what and how a variable will be researched. In essence, the hypothesis states what will be examined and how it will be done. As researchers must adhere to a specific protocol when

conducting research, this is crucial because it shows that the researcher has carefully prepared how the research will be done.

Alternative Hypothesis

The relationship between the two variables under study (where one variable influences the other) is the alternate hypothesis. When the independent variable is changed, an experimental hypothesis predicts what change(s) will occur in the dependent variable. It claims that the results are significant in supporting the under investigation idea and that they are not the result of chance.

Null Hypothesis

According to the null hypothesis, there is no correlation between the two variables under investigation (neither variable affects the other). The manipulation of the independent variable won't result in any changes to the dependent variable. It claims that the findings are accidental and do not have any bearing on the hypothesis under investigation.

Directional Hypothesis

A directional (one-tailed) hypothesis makes a prediction about the type of relationship between the independent and dependent variables. It foretells the direction that the transformation will go. (For instance, bigger, smaller, less, more). For instance, adults are more likely than kids to recall words accurately.

Non Directional Hypothesis

The dependent variable will be affected by the independent variable, according to a non-directional (two-tailed) hypothesis, although the effect's direction is not defined. Just that there will be a difference is stated. For instance, the quantity of numbers that children and adults can accurately recall will differ.

E. Individual Task

Answer the following questions based on your understanding after reading the material from this chapter!

1. What are the three basic categories in educational research?
2. Mention some traits of a clearly specified research topic!
3. How to start quantitative research?
4. How to start qualitative research?
5. Why do we have to formulate hypothesis?
6. What are the difference among alternative hypothesis, null hypothesis, directional hypothesis, and non-directional hypothesis?

CHAPTER 3

PREPARING AND EVALUATING A RESEARCH PLAN

This chapter focuses on:

- Describe the use of a research plan when conducting educational research.
- Briefly describe three general considerations involved in conducting and reporting educational research.
- Describe two major pieces of legislation affecting educational research.
- Briefly describe each of the components of a quantitative research plan.
- Briefly describe each of the components of a qualitative research plan.
- Briefly describe two major ways in which a research plan can be evaluated.

A. Research Planning

A framework for the research strategy is provided by the research plan. The plan may be presented as a written outline, a narrative, a concept map, a timeline, or another format. This is a document that will evolve as the researchers carry out the investigation.

An outline of a research project plan

1. The research topic is introduced by the research conceptualization.
2. The research methodology should explain how the researchers plan to answer the research topic.
3. A methodical technique to finding, assessing, and analyzing the work (texts, exhibitions, critiques, etc.) related to the theme
4. Communication, which is directed at a specific audience and provides evidence of the research.

The ability to recognize specific research questions, issues, or possibilities that merit investigation is referred to as research conceptualization. The ability to conceive and develop an idea into something that can be researched is another aspect of research conceptualization, which also encompasses the abilities and disciplines that extend beyond the first stage of conception. The knowledge and abilities needed to choose and use the best procedures to complete the research assignment are referred to as research methodology. Methodology represents the total process as opposed to a specific style of operation. A method is a manner of accomplishing anything, particularly in accordance with a set and regular plan; it is also a mode of operation in any activity. Locating, assessing, and evaluating the published work and work-in-progress by academics, researchers, and practitioners on a certain topic is the goal of a literature review. The capacity to handle (or process) current sources is known as critical assessment and synthesis. It also includes familiarity with the person's current research context and literary sources. Communication is the process of construct a logical course of investigation, inform your target audience about your findings, and effectively communicate ideas through the use of visual media in presentations, writing, and exhibition development.

B. Considerations in Conducting and Reporting Educational Research

In order to better understand educational practices, educational research gathers and dissects data on them. It ought to be seen as a critical, reflective, and professional activity that uses strict processes for data collection, analysis, and problem-solving in order to progress knowledge. A problem or academic difficulty is often identified at the outset of educational study. Following that, all the data must be researched, and the information must then be examined to be understood. The procedure is completed with a report that includes the findings in a comprehensible format that can be used by both the research community and the educational sector.

Educational research involves procedures that must be followed in order to make the data it produces valuable and applicable.

1. ***Recognizing the issue.*** Finding the issue or creating a research topic is the first step in the process.
2. ***Establishing goals and hypotheses.*** The purpose for conducting the study is known as the objective, which must be stated clearly at the outset and be relevant to the issue at hand. The hypothesis, which is a statement of the research in the form of a question, aids the researcher in selecting the research method and the data to be gathered.
3. ***Deciding on a research methodology.*** There are numerous research methodologies, but selecting the most appropriate one for each situation depends on the goals and assumptions the researcher established in the preceding step.
4. ***Gathering the information.*** The data collection process is determined by the study methodology. Depending on the study approach, it may be an interview, focus group, or survey.
5. ***Evaluating and analyzing the data.*** Arranging and organizing the information gathered, then doing the required calculations. For everyone to understand the data, not just the researcher, it is essential that it be translated or interpreted correctly.
6. ***Writing a report.*** The researcher will come to a conclusion after data analysis and interpretation, a research outcome that can be shared with everyone. This will be accomplished through a report or thesis that contains all of the research-related data. It will contain a thorough breakdown of all the work he did and the outcomes of his research.

C. Legislation Affecting Educational Research

Research on education and pedagogy, which serves as a foundation for policies and practices in schools and the education system, is generally viewed as a field of public responsibility and is typically conducted in universities and other

public research institutions. However, a number of private entities have started sponsoring research into education and learning in recent years. Among the participants are both privately founded foundations and private organizations conducting research related to the creation of products. However, it can also result in restricted requirements for topics and methodologies, upsetting crucial balances in the field of educational research. The interaction between public and private funding and management can foster excellent research that combines new general knowledge with societal relevance.

One might conceptualize the effect of private money on educational research as a two-step process. First, the goals and requirements of the funders may have an impact on the research that is conducted, its problem definitions, and its methodological choices. Second, the dissemination and application of research findings may have an impact on educational policy and practice. It is important to recognize the many functions of educational research in relation to policy and practice before moving on to the second phase.

By generating new general information about education, learning, educational institutions, and educational policy, educational research, like other social research, has the potential to advance human understanding. In this capacity, research attempts to advance scientific understanding about education as a whole, whether in the form of conceptual frameworks or empirical knowledge. It does not address particular practical problems or develop solutions. Such studies are sometimes sparked by scientific conundrums, including the discrepancy between expected and observed learning patterns in a given situation.

Research in education supports current procedures and regulations. The maintenance role, which is similar to the innovation role in that it concentrates educational research on current practices, policies, and institutions, differs from innovation in that it legitimizes existing practices, policies, and institutions based on the presumption that they should be maintained and continued. The goal of research is to support and improve current practices by expanding our understanding of them and suggesting any necessary changes.

D. The Components of a Quantitative Research Plan

The Components of a Quantitative Research Plan are:

- Introduction. In this part, the researcher should explain the research background, research questions, the objectives of the research, scope and limitation of the research, significances of the research, and definition of key terms.
- Literature Review. In this part, the researcher should review theories and previous research. In this part, the researcher also need to explain the research framework.
- Methodology. In this part, the researcher should describe the research design which will be employed in this research such as; pre experimental, true experimental, quasi experimental, correlational research, etc. In this part, the researcher also need to explain the population and sample that will be used in this research, hypothesis of the research, explain the research instruments, data collection, and data analysis will be analyzed statistically such as; paired t-test, Pearson product moment correlation, Anova, etc.

E. The Components of a Qualitative Research Plan

The Components of a Qualitative Research Plan are:

- Introduction. In this part, the researcher should explain the research background, research questions, the objectives of the research, scope and limitation of the research, significances of the research, and definition of key terms.
- Literature Review. In this part, the researcher should review theories and previous research. In this part, the researcher also need to explain the research framework.

- **Methodology.** In this part, the researcher should describe the research design which will be employed in this research such as; descriptive design, phenomenological design, narrative design, case study design, grounded theories design, etc. In this part, the researcher also need to explain the research subjects or research participants that will be participated in this research, explain the research instruments, data collection, data analysis will be analyzed qualitatively through coding and thematic analysis, and trustworthiness of the data by conducting triangulation.

F. Evaluating a Research Plan

When reviewing a research plan (research proposal), the following aspects will be taken into account:

1. Does the research plan contextualize the proposed undertaking in a sufficient way?
2. Does the research plan (research proposal) cover a subject that relates to one of the major interests of this round?
3. Does the research plan (research proposal) clearly state the project's goals?
4. Does the research plan (research proposal) provide a well-explained justification for the study?
5. Is the methodology (design, participants, instruments, and procedures) described in detail in the research plan (research proposal)?
6. Are the methodology's specifics sufficiently well-defined to allow for an accurate evaluation of their worth?
7. Is it likely that the methodology will work (considering factors like participant availability, participant quantity, etc.)?
8. Are the research questions formulated precisely?
9. Is it conceivable that the needed help will be affordable and effective?

10. Have the researcher thought about ethical approval?
11. Is a thorough budget breakdown given?
12. Does the budget offer a good return on investment?
13. Does the project make a significant contribution to the language testing field?
14. Is it conceivable that the initiative will produce a paper of publishable quality (for a website or book chapter)?

G. Individual Task

Answer the following questions based on your understanding after reading the material from this chapter!

1. How to make a research plan?
2. What are the consideration in conducting and reporting educational research?
3. How can legislation affecting educational research?
4. What are the differences of quantitative research components and qualitative research components?
5. Why do we have to evaluate our research plan?

CHAPTER 4

SELECTING A SAMPLE

This chapter focuses on:

- Identify and describe four random sampling techniques.
- Select a random sample using a table of random numbers.
- Identify three variables that can be stratified.
- Select stratified samples, cluster samples, and systematic samples.
- Identify and describe three nonrandom sampling techniques.
- Identify and briefly describe two major sources of sample bias.
- Describe quantitative and qualitative sampling strategies.

A. Random Sampling Techniques

A crucial component of any research study is sampling. Choosing the appropriate sampling technique for your particular research question is crucial since it can make or break the validity of the study. In this article, we'll examine some of the most common sampling techniques in further detail and offer examples from the real world to show how they can be applied to collect accurate and trustworthy data.

Sampling is a technique for choosing certain individuals or a small portion of the population in order to draw conclusions about the population as a whole and estimate its characteristics. Researchers frequently utilize various sampling techniques in market research so they do not have to study the full community in order to gather useful information.

The process of selecting a sample of observations from a population in order to draw conclusions about the population is known as random sampling. The random sampling method makes use of a random selection in some way. With this methodology, everyone who qualifies can select a sample from the whole sample

space. It is an expensive and time-consuming approach. The benefit of probability sampling is that it guarantees that the sample will accurately reflect the population.

Simple Random Sampling

To select a sample, simple random sampling uses randomly generated numbers. A sample frame, which is a list or database of every person in a population, is what is first needed. Then, using Excel, for instance, randomly generate a number for each element, and collect the first n samples you need.

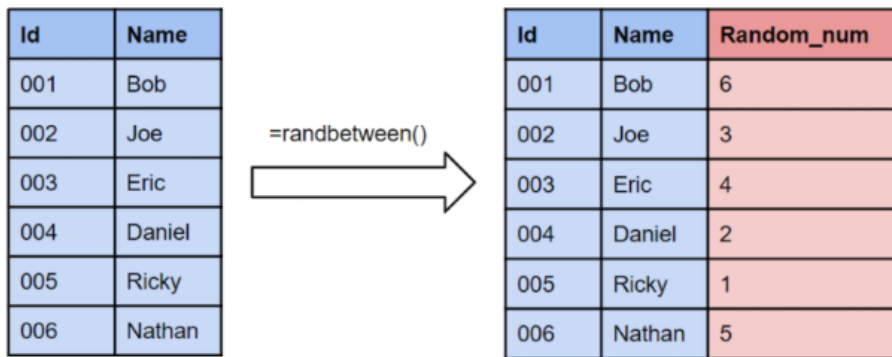


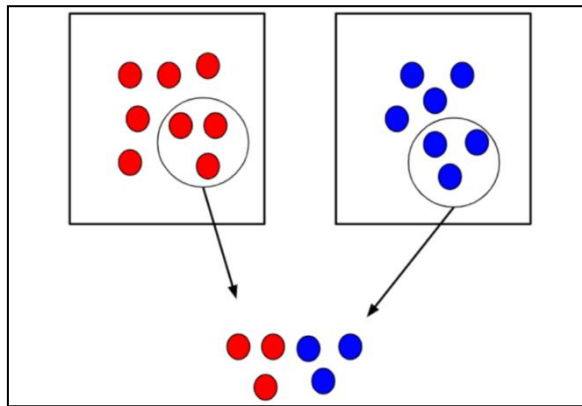
Image created by the author.

Picture 1. Simple Random Sampling

Source: <https://bultin.com/data-science/types-of-random-sampling>

Stratified Random Sampling

A population is divided into groups with related characteristics, and then each group is randomly sampled as part of stratified random sampling. This procedure guarantees that all population segments are fairly represented. Imagine, for the sake of illustration, that a survey is carried out at a school to ascertain general satisfaction. In this situation, stratified random sampling can fairly represent the views of the students in each academic department.

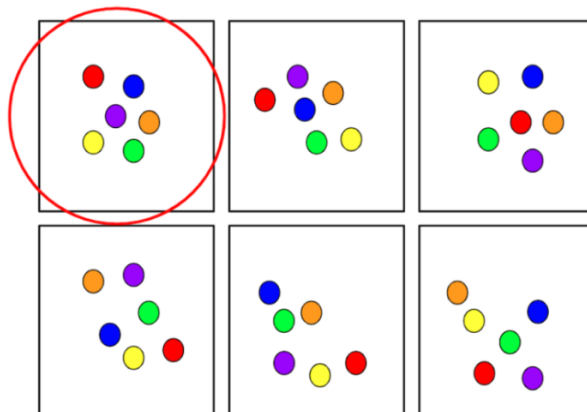


Picture 2. Stratified Random Sampling

Source: <https://bultin.com/data-science/types-of-random-sampling>

Clustered Random Sampling

The first step in cluster sampling is to segment the population into groups or clusters. Given that each cluster must be representative of the overall population, this differs from stratified sampling. Then, you choose a sample of clusters at random. For instance, if there were five separate eighth grade classes in a school, each one of them may be used as a sample under cluster random sampling.

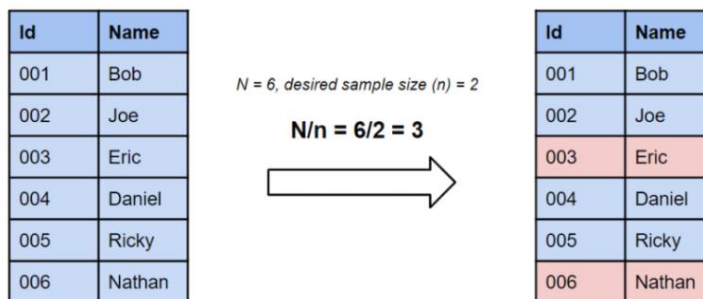


Picture 3. Clustered Random Sampling

Source: <https://bultin.com/data-science/types-of-random-sampling>

Systematic Random Sampling

A typical strategy is systematic random sampling, which involves sampling every k th element. If the researchers were doing surveys at a mall, for instance, the researchers may survey every 100th individual who enters. If the researchers have a sampling frame, the researchers may calculate the index number, k , by dividing the frame's size, N , by the desired sample size, n . Then, to generate the sample, the researchers would choose each of the frame's k th element. If the researchers desired a sample size of two this time using the identical charts as the first example, the researchers would select every third row in the sampling frame.



Picture 4. Systematic Random Sampling

Source: <https://bultin.com/data-science/types-of-random-sampling>

B. Selecting Random Sampling

The followings are 4 steps of selecting random sampling:

1. Define the population. Selecting the demographic for the study should be the first step. It's crucial to make sure the researchers have access to every single person in the population so the researchers can get information from everyone who is chosen for the sample.
2. Determine the sample size. The next step is to choose the size of the sample. Larger samples offer greater statistical confidence, but they also cost more and involve a lot more work. There are a number of possible approaches to

choosing the sample size, but one of the simplest is to use a formula with the desired confidence interval and confidence level, estimated population size, and standard deviation of whatever the researchers want to measure in the population.

3. Choose the sample at random. One of two methods—the lottery or random number method—can be used to accomplish this. By "drawing from a hat" or by using a computer program that simulates the same process, the researchers select the sample at random using the lottery method. The researchers assign a number to each person using the random number procedure. Then, the researchers choose a portion of the population at random using a random number generator or a table of random numbers.
4. Gather information from the sample. The last step is to gather data from the sample. Make sure every person chosen actually participates in the study in order to guarantee the authenticity of the results. The results may be skewed if some people decide not to participate or drop out for reasons related to the research question.

C. Identifying the Variables that Can be Stratified

Stratification is an ex-ante statistical strategy that makes sure that the final sample and treatment groups accurately reflect the population's sub-groups. In addition to guaranteeing representativeness, stratification enables researchers to divide data during analysis by subgroup. During the research design process, stratification occurs when the sample and treatment allocations are chosen.

The target population must first be split up into strata in order to stratify. The researchers can use subgroups that are particularly interested in analyzing or variables that the researchers think may have a substantial impact on the outcome variable to stratify the data. One or more factors may be used to stratify; as the number of variables rises, so do the number of strata.

D. Non Random Sampling Techniques

Non random sampling or Non-probability sampling is a sampling strategy where samples are chosen by the researcher based on their own assessment as opposed to by chance. It is a less strict approach. This sampling technique strongly relies on the researchers' knowledge. Researchers frequently utilize it for qualitative research because it is carried out through observation.

In contrast to probability sampling, non-probability sampling gives not every member of the population an equal opportunity of taking part in the study. There is a known probability that each person in the population will be chosen.

Convenience Sampling

In a non-probability sampling strategy called convenience sampling, samples from the population are only chosen if they are easily accessible to the researcher. Researchers chose these samples only out of convenience; they did not think to choose a sample that accurately reflects the total population.

Testing a sample that is representative of the population is preferable while conducting research. However, in certain studies, the population is too big to look at and take into account. Because of its speed, cost-effectiveness, and simplicity of sample availability, convenience sampling—the most popular non-probability sampling technique—is frequently used by researchers.

Consecutive Sampling

Convenience sampling is extremely similar to this non-probability sampling technique, with a small difference. Here, the researcher chooses one subject or a group from a sample, conducts research over time, evaluates the findings, and then switches to a different subject or group as necessary. The researcher can deal with a variety of themes and refine his or her research by gathering data that has important insights using the consecutive sampling technique.

Quota Sampling

Imagine that a researcher wishes to investigate the differences in career aspirations between male and female workers in a business. The population, also known as the organization, consists of 500 people. The researcher simply needs a sample, not the full population, to learn more about a population. Additionally, the researcher is particularly interested in certain population strata. Quota sampling can aid in this situation by classifying the population into groups or strata.

Judgmental or Purposive Sampling

In the judgmental sampling approach, the researcher's expertise and reputation are the only factors considered while choosing the samples. In other words, only those participants are chosen for the research study who the researchers believe suitable. Judgmental or purposeful sampling is not a scientific method of sampling, and it has the drawback that the results may be influenced by the researcher's preconceived ideas. Thus, there is a lot of ambiguity associated with this research methodology.

Snowball Sampling

When samples are hard to discover, snowball sampling aids researchers in finding them. When the sample size is small and not readily available, researchers adopt this method. This sample system operates similarly to the referral system. As soon as the researchers locate appropriate participants, he solicits their help in locating other suitable people to create a sample that is of a respectable size.

E. Identifying Sample Bias

When some members of a population are systematically more likely to be chosen in a sample than others, this is known as sampling bias. In the medical sciences, it is also known as ascertainment bias. Because sampling bias jeopardizes external validity, particularly population validity, it restricts the generalizability of

findings. In other words, results from skewed samples can only be extrapolated to populations with similar traits.

F. Quantitative and Qualitative Sampling Strategies

Random sampling strategies are used in quantitative research investigations. These methods make guarantee that every member of the population has an equal probability of being selected for the sample. This is crucial because the main objective of most quantitative research techniques is to extrapolate population-wide conclusions from the results of the sample.

When recruiting participants for qualitative research, there are a number of sample approaches you might utilize. Because they work well with almost all qualitative research designs, deliberate and convenience sampling are the two most used sampling strategies.

G. Individual Task

Answer the following questions based on your understanding after reading the material from this chapter!

1. What is sample in research?
2. Why is sample selection important in research?
3. What is random sampling in research?
4. What are the difference among simple, stratified, clustered and systematic random sampling?
5. What is non-random sampling in research?
6. Mention and explain types of non-random sampling in research!

CHAPTER 5

SELECTING AND MEASURING RESEARCH INSTRUMENTS

This chapter focus on:

- State the links or relationships among a construct, a variable, and an operationalized variable.
- Describe different types of variables: nominal, ordinal, interval, and ratio; categorical and quantitative; dependent and independent.
- Explain various testing terms: standardized test, assessment, measurement, selection, supply, performance assessment, raw score, norm- and criterion-referenced scoring.
- Describe the purposes of various types of tests: achievement, aptitude, attitude, interest, value, personality, projective, non-projective, and self-report.
- Describe various scales used to collect data for cognitive and affective variables.
- Describe the purposes of and ways to determine content, criterion-related, construct, and consequential validity.
- Define or describe standard error of measurement.
- State a strategy for test selection.
- Identify and briefly describe three sources of test information.

A. Research Variables

In the context of a research project, a variable is defined as a characteristic that has the capacity to change, often one that could affect or reflect a relationship or outcome. Potential variables include, for instance, the length of time it takes for something to happen, whether or not a study uses an object, or whether or not the sample contains a particular trait.

Independent and dependent variables are crucial in research since they provide the framework for a study to be carried out. Confounding variables,

controlled variables, superfluous variables, and moderator variables are some other sorts of variables that might be used in a study.

Dependent Variable

In an experiment, a dependent variable is one that is being measured and represents a result. This variable is not directly under the control of the researchers. Instead, they want to see how the dependent variable responds in various situations in order to understand more about the relationship between various variables.

The phrase "dependent variable" is the one that is used the most frequently, but other names for them include response variables, outcome variables, and left-side variables. These additional names help to clarify their meaning: A dependent variable displays the result by responding to changes in other variables.

Independent Variable

A controlled or otherwise manipulated variable is an independent variable in a study. A researcher will purposely alter one independent variable while observing to see if and how the dependent variable responds in order to establish the link between the independent and dependent variables.

B. Various Testing Terms

The purpose of hypothesis testing is to determine whether the findings of a research study are consistent with a particular theory that can be generalized to the public. It is a methodical process generated from the research topic. Additionally, it is a statistical test that is used to ascertain whether the population-at-large holds true to the hypothesis implied by the sample data. By using a random sample from the population of interest, the hypothesis is tested with the intention of drawing conclusions about that population. Additionally, in order to establish the connection between two data sets, the assumption is put to the test. In statistics, there are two different sorts of hypotheses.

a. Null Hypothesis

This is based on the supposition that the event won't happen or that there is no connection between the variables being compared. Unless it is rejected, a null hypothesis has no bearing on the study's findings. H_0 is the symbol used for the null hypothesis.

b. Alternative Hypothesis

The null hypothesis is logically opposed by the alternate hypothesis. Additionally, if the null hypothesis is rejected, the alternative hypothesis is accepted. H_1 or H_a is used as its symbol.

Researchers can divide the statistical hypothesis into two categories based on the population distribution.

1. Simple Hypothesis

An exact value for the parameter is given by a straightforward hypothesis.

2. Compound Hypothesis

A range of values is specified by a composite hypothesis.

There are two different sorts of statistical hypotheses, depending on the type of statistical testing used.

a. One-Tailed

The null hypothesis is rejected by the one-tailed test or directional test if the test sample falls within the critical region of the data. Accepting the alternative theory as a result. Additionally, this test's critical distribution region is one-sided, meaning the test sample is either higher than or less than a given value.

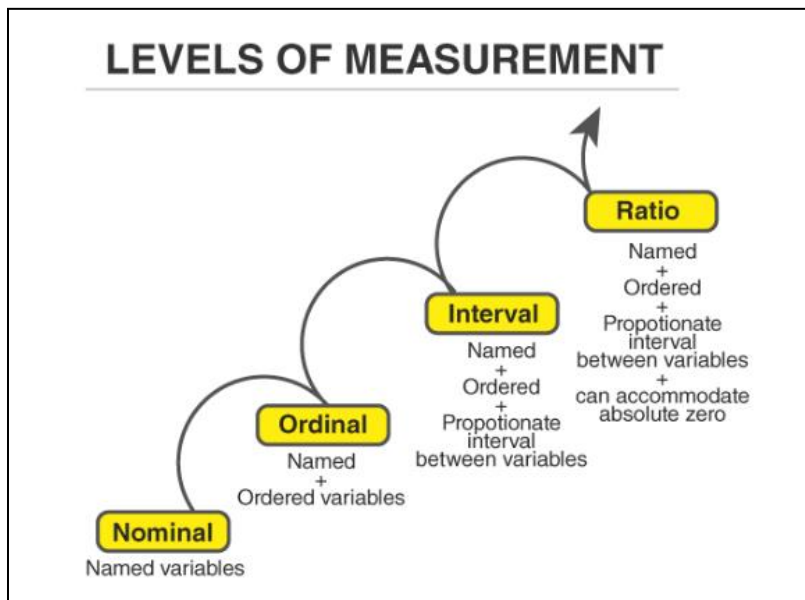
b. Two-Tailed

The two-tailed test, also known as a non-directional test, is used to determine whether the sample mean differs significantly from and from the population mean. The crucial distribution area in this instance has two sides. The

alternate hypothesis is accepted and the null hypothesis is disproved if the sample falls within the range.

C. Various Scales Used to Collect the Data

The variables or numbers are defined and categorized in statistics using various measuring scales. A scale is a tool or something that is used to gauge or quantify a situation or something else. Specific characteristics of each level of the measurement scale determine the diverse applications of statistical analysis. The type of measurement scale to be used for statistical measurement depends on the type of data being collected. There are various types of measurement scales. The nominal scale, ordinal scale, interval scale, and ratio scale are the four measurement scales that make up this set.



Picture 5. Levels of Measurements

Source: <https://byjus.com/maths/scales-of-measurement/>

Nominal Scale

The first level of measuring scales are called nominal scales, and they use numbers as "tags" or "labels" to categorize or identify various items. Usually, non-numeric variables or numbers without any meaning are dealt with by a nominal scale.

Features of the Nominal Scale

Two or more categories are assigned to a nominal scale variable. The response in this measurement method should correspond to one of the classifications. It is of high quality. Here, the objects are identified by their numbers. The attributes of the item are not defined by the integers. The only use of numbers on the nominal scale is for "counting."

Example:

The following is an illustration of a nominal scale measurement:

What gender are you?

M- Male

Female, F

Ordinal Scale

The second level of measurement, the ordinal scale, reports data's ordering and ranking without determining the degree of variance among them. Ordinal is a symbol for "order." Ordinal data is also referred to as categorical or qualitative data. It can be named, ranked, and categorized.

What the Ordinal Scale Looks Like

The ordinal scale displays the variables' relative order on the scale. It detects and describes a variable's magnitude. Ordinal scales provide the rankings of those variables along with the information provided by the nominal scale. The interval's characteristics are unknown. The surveyors can rapidly determine how well the identified sequence of variables is agreed upon.

Example:

School student rankings: first, second, third, etc.

Restaurant reviews

Considering how frequently things happen

Very frequently

Quite rarely

Never at all

Evaluating the level of accord

Absolutely agree

Agree

Neutral

Disagree

Absolutely disagree

Interval Scale

The third level of measurement scale is the interval scale. It is described as a quantitative measuring scale where a noticeable difference may be found between the two variables. In other words, the measurements are precise rather than relative, where the occurrence of zero is arbitrary.

Since it can quantify how different values differ from one another, the interval scale is quantitative. It enables the variables' means and medians to be calculated. Researchers can take the values between the variables and subtract them to see how the variables differ from one another. Since it makes it possible to assign any numerical values to any assessments, such as moods, calendar types, etc., the interval scale is the preferred scale in statistics.

Example:

Net Promoter Score (NPS), Bipolar Matrix, Table for Likert Scale

Ratio Scale

The fourth level of measuring scale, which is quantitative, is the ratio scale. A changeable measurement scale of this kind is used. It enables researchers to contrast intervals or differences. The ratio scale has a distinguishing quality. It has zero points' or the origin's character.

Ratio scale characteristics:

Absolute zero is a property of the ratio scale. Due to its zero-point feature, it lacks negative numbers. It offers exceptional chances for statistical analysis. The variables can be neatly multiplied, split, added, and subtracted. The ratio scale can be used to calculate the mean, median, and mode. Ratio scale has distinct and practical characteristics. One such feature is the ability to convert between different units, such as kilograms and calories or grams and calories.

Example:

Using a ratio scale, for instance:

Your weight in kg.

Not more than 55 kg

55 - 75 kg

76 - 85 kg

86 - 95 kg

Greater than 95 kg

D. Content, Criterion-related, Construct, and Consequential Validity

How precisely a method assesses something is shown by its validity. A method can be regarded as valid if it produces findings that closely match actual

values and measures what it is supposed to measure. Four primary categories of validity exist:

Construct Validity:

Does the test accurately reflect the concept it is meant to measure?

An idea or quality is said to as a construct when it can be measured by looking at other indicators that are linked to it but cannot be directly observed. Constructs might be personal traits, like intelligence, obesity, work satisfaction, or depression, or they can be more general notions that apply to institutions or social groupings, like gender equality, corporate social responsibility, or free speech.

Content Validity:

Is the test's content accurately indicative of what it is intended to measure?

Examining a test's content validity determines whether it is representative of the construct in its whole. A test, survey, or measuring method's content must include all pertinent aspects of the thing it seeks to measure in order to yield reliable findings. The validity is at risk and the research is probably biased by an omitted variable if any components of the measurement are absent (or if irrelevant aspects are included).

Face Validity:

Does the test's content seem appropriate for achieving its goals?

Face validity examines how appropriate a test's material appears to be at first glance. Although it is comparable to content validity, face validity is a less formal and objective evaluation. Face validity is sometimes regarded as the weakest type of validity because it is a subjective measure. However, it could be helpful when creating a method from scratch.

Criterion Validity:

Do the findings accurately reflect the specific outcome that they are intended to quantify?

A test's criterion validity measures how effectively it can forecast a specific result or how closely its results resemble those of other tests. A criterion variable, often known as a "gold standard" measurement, is a well-recognized, efficient, and universally accepted measurement. Finding criterion variables might be very challenging. The researchers compute the correlation between the measurement's findings and the criterion measurement's results to assess the criterion validity. If there is a strong association, the test is likely measuring what it is designed to assess.

E. Standard Error of Measurement

A measurement of how far measured test results deviate from a "true" result is called the standard error of measurement (SEm). Because it only affects one score and use the same measurement units as the test, the SEm is very significant to test takers. A confidence interval, or a range around the projected "true" score, is typically provided along with the SEm. The original test scores serve as the same unit of measurement. For instance, the SEm will be in points if the researchers measure in points, and in percentages if the researchers measure in percentages.

Formula:

$$SE_m = s\sqrt{1-R}$$

s: The measurements' standard deviation

R: A test's reliability coefficient

F. Strategy for Test Selection

The organization's test strategy includes a description of the most widely utilized testing methodology and procedures. Based on the demands of the organization and the project's requirements, the test manager should be able to select an appropriate testing approach.

Analytical strategy

Consider risk-based testing or testing that is based on requirements. After examining the test basis, including risks, requirements, etc., the testing team sets the testing circumstances to be addressed in this instance. In testing based on requirements, the test circumstances are therefore determined by analyzing the requirements. Then tests are created, implemented, and run in accordance with those specifications. Even the outcomes for the requirements are documented, including those that were tested and passed, those that were tested but failed, and those that were not fully tested, etc.

Model based strategy

In this method, the testing team selects a real-world or hypothetical scenario and models it, taking into consideration all relevant processes, inputs, outputs, and potential outcomes. Additionally, existing software, hardware, data rates, infrastructure, etc. are taken into account when developing the models. Let's think about the case of testing a mobile application. Models may be created to simulate incoming and outgoing traffic on mobile networks, the number of active/inactive users, predicted growth, etc. in order to carry out its performance assessment.

Methodical strategy

Here, test teams adhere to a set of test circumstances, a checklist, or a predetermined quality standard (like ISO25000). Standard check lists may be available for particular testing categories (such as security), application domains. For maintenance testing, for example, performing the tests just requires a checklist outlining key features, their characteristics, etc.

Standards compliant or Process compliant strategy

This method is well-exemplified by medical systems that adhere to FDA (Food and Drug Administration) guidelines in the US. Here, the testers create a testing team, develop test cases, and determine test conditions by according to the procedures or rules specified by the standards committee or panel of industry experts. When a project uses the Scrum Agile methodology, testers design the entire test strategy, beginning with designing test cases, conducting tests, reporting results, and other activities centered on each user story.

Reactive strategy

In this case, tests are created and put into practice only after the real software has been delivered. Therefore, testing is based on flaws discovered in the real system. Take into account a situation where exploratory testing is being applied. On the basis of the already-existing features and functionalities, test charters are created. Based on the outcomes of the testing performed by testers, these test charters are updated. Agile development initiatives can use exploratory testing as well.

Consultative strategy

In order to determine the scope of the test conditions, this testing method, as its name implies, consults with important stakeholders, just like user-directed testing. Consider a scenario where a web application's compatibility with potential

browsers needs to be checked. The owner of the program would then list the browsers and their versions in priority order. A list of connection types, operating systems, anti-malware programs, etc. that they want the application tested on may also be provided. Depending on the priority of the items in the provided lists, the testers may then utilize various strategies, such as testing pair-wise or equivalence splitting techniques.

Regression averse strategy

In this case, testing techniques concentrate on lowering the risk of regression for functional or non-functional product components. In keeping with our prior example of a web application, the testing team can develop test automation for both common and unique use cases if the program has to be checked for regression concerns. In order to perform the tests anytime the program is changed, they can also employ GUI-based automation tools. Any of the aforementioned methods can be used for testing projects; however, they are not all required. Two or more techniques may be integrated based on the needs of the product and the organization.

G. Sources of Test Information

It's crucial to think about the type of information you need before starting a search for information on tests and measurements. Are the researchers seeking for details on a certain exam or a tool that may be used to evaluate a certain skill or personality trait? Are the researchers seeking for an unpublished instrument (an experimental measure that might also appear in a journal) or a published instrument (supplied by a for-profit publisher)? Depending on the kind of information the researchers are looking for, the researchers will want to check different sources. This collection includes both basic reference sources that will be helpful in most situations and sites that offer details on more specialized areas of testing. There will also be recommendations for alternative sources that could be

used. For full-text scales and measurements, whole or in part, covering a range of subjects, such as children's well-being, life satisfaction, interpersonal relationships, sexuality, political attitudes, and religiosity.

H. Individual Task

Answer the following questions based on your understanding after reading the material from this chapter!

1. What is research variable?
2. What is the difference between dependent and independent variable?
3. What is hypothesis testing?
4. How to distinguish null hypothesis and alternative hypothesis?
5. What are scales which can be used to collect the data? Compare and contrast them!
6. How to assess research validity?
7. What are the strategies that can be used for test selection?

CHAPTER 6

DESCRIPTIVE RESEARCH

This chapter focus on:

- Briefly state the purpose of descriptive research.
- List the major steps involved in designing and conducting a descriptive research study.
- Briefly describe the main types of self-report research.
- List and briefly describe the steps involved in conducting a questionnaire study.
- Identify and briefly describe four major differences between an interview study and a questionnaire study.

A. Introduction to Descriptive Research

Exploratory research techniques include descriptive research. It allows for the exact and methodical description of a population, situation, or phenomenon by researchers. Descriptive research does not manipulate variables or test hypotheses; instead, it describes the traits of the group, circumstance, or phenomena being examined. Surveys, observational studies, and case studies can all be used to report this. The researchers can employ both quantitative and qualitative techniques to gather the data. Descriptive investigations frequently create new knowledge concepts and offer answers to pressing problems in addition to making observations and comparing, contrasting, and analyzing them. It always seeks to explain the circumstances surrounding an event, including when, when, how, and what the issue or phenomena is.

Quantitative

Given that it collects measurable data for statistical analysis of a population sample, descriptive research can also be quantitative. Surveys, polls, and

experiments can be used to find these figures, which can then be used to highlight patterns, linkages, and trends through time.

Qualitative

Qualitative research can also be descriptive research. It provides context and meaning for the data provided by quantitative descriptive research.

Researchers can identify the research problem and provide evidence for why things are the way they are using methodologies including focus groups, ethnographic studies, and interviews. It is more explanatory than exploratory or experimental research, which explains why.

B. Steps in Designing and Conducting a Descriptive Research

In descriptive studies, researchers engage in the following activities:

1. Identify and describe the issue;
2. Describe their aims and theories;
3. List the underlying presumptions that underlie their hypothesis and methods;
4. selecting pertinent topics and resources;
5. choose or create technologies for data collection;
6. Define the categories of data that are pertinent to the study's goals and capable of revealing important parallels, divergences, or correlations.
7. Clearly and precisely describe, analyze, and evaluate their data;
8. Draw important and worthwhile findings.

C. The Main Types of Self-report Research

In a self-report study, participants read the question and choose their own response to it without the help of a researcher or other participant. Any approach that involves asking a participant about their feelings, attitudes, opinions, etc. is a self-report method.

Questionnaire

A questionnaire is a type of research tool that asks a set of pertinent questions of respondents in order to gather information. These tests have an interview-style approach and either written or oral questions. Online, over the phone, on paper, or in person, questionnaires can be qualitative or quantitative and don't always need to be delivered with a researcher present. Open or closed questions can be found in questionnaires, and occasionally both types of questions are included. Responses to open-ended questions can be as detailed or as general as the respondent chooses. Respondents have a selection of predefined answers to pick from while answering closed questions. Because they provide a quick, effective, and affordable way to acquire a lot of data from huge sample sizes, questionnaires are a common research approach. These instruments work particularly well for gauging the attitudes, preferences, intentions, and behavior of the subjects. Researchers are able to collect both qualitative and quantitative data because to their usage of open and closed research questions, which produces results that are more thorough.

Interview

A qualitative research technique used to get first-hand information is an interview. It entails asking one or more individuals their thoughts on a business, a product, or a subject. Researchers can acquire specific data using this strategy that may not be accessible using other research methods. Structured, semi-structured, and unstructured interviews are the three main types utilized in research.

Structured Interview

In a structured interview, the same questions will be posed to each participant. The researcher predetermines the questions to be asked during the interview and uses a standardized approach to ensure that all participants are asked the same questions in the same order, increasing the internal dependability of research designs. The questions are not like a genuine discussion because they are frequently closed-ended.

Semi-structured Interview

Some of the questions in a semi-structured interview are predetermined. Based on the participants' prior responses, the researcher can offer questions ad hoc. Usually, open-ended and closed-ended questions are used in this interview. The advantages of both structured and unstructured interviews are combined.

Unstructured Interview

The questions are not predetermined in an unstructured interview. This kind of interview is more like a debate between the researcher and the subject, who usually takes the initiative. If the conversation veers off subject, the researcher may step in or redirect it. Since it cannot be duplicated, this is more untrustworthy; nonetheless, it is more natural and permits thorough examination of intriguing tangents.

Diaries

Diaries may be used by researchers to gather data. Because it depends on participants expressing their ideas, feelings, and behaviors, this is also a type of self-report design. Using a field diary or taking field notes can be an extremely efficient and useful data collection technique. A field diary or set of notes serves the function of documenting what occurs during research operations. It might help the researchers keep track of how and why the concepts changed throughout the course of the investigation. Many teachers make daily notes about their classes, which is, in many respects, a more concentrated and limited version of recording the day-to-

day activities of a class. A field diary or set of notes can act as a starting point for data analysis and interpretations as well as a record of thoughts and observations on the study. When researchers start writing about their project, a field journal or notes are often helpful since they enable them to use their own voice. Researchers can gain additional professional learning from the reflecting process that a diary offers. Depending on the research and the subject, the format and length of a field diary or notes will change; nonetheless, the main objective should be to make data gathering and analysis easier.

D. Steps in Conducting a Questionnaire Study

Without a well-designed questionnaire, no survey can be successful. Unfortunately, there is no theoretical foundation for questionnaire design that could help a marketing researcher create a perfect questionnaire. The researcher only has a comprehensive list of dos and don'ts to follow, which were developed from the experiences of other researchers in the past and present.

The design of a questionnaire will depend on whether the researcher wants to gather quantitative data (to test particular hypothesis that have already been generated) or qualitative data (to gain a deeper understanding of or generate hypotheses about a subject).

There are a few things to keep in mind when creating a questionnaire, though there are no hard-and-fast guidelines to follow:

- The study objectives should be met through a well-designed questionnaire.
- It should gather the most thorough and precise data attainable.
- A well-designed questionnaire should be prepared to allow for sound analysis and interpretation and should make it simple for respondents to provide the relevant information and the interviewer to record the response.

The creation of a questionnaire involves the following nine steps:

1. Determine the data that are needed.
2. Identify the intended audience.
3. Decide how will contact the intended audience.
4. Select the topic of the question.
5. Draft the question's formulation.
6. Arrange and arrange the questions in a meaningful manner.
7. Verify the questionnaire's length.
8. Test the questionnaire beforehand.
9. Create the final survey template.

E. Comparing an Interview Study and a Questionnaire Study

Important distinctions between a questionnaire and an interview

Data Collection Method

A questionnaire is used to gather data, and the respondents are mailed the questions in printed form or asked to fill out offline forms at some events. Contrarily, interviews involve face-to-face, telephone, or online contact with the candidates. Additionally, while most questionnaires are objective, interviews are subjective and call for candidates to provide thorough and insightful responses to the topics posed.

Complexity

Because it is less complex than an interview, a questionnaire has a set order of questions. Depending on the employment role, an interview may include a variety

of questions, including technical, behavioral, and skill-based questions. Depending on the candidate's responses, an interviewer can quickly move between different questions.

Cost

Because they take place in front of an interviewer, face-to-face interviews may be more expensive. The procedure of scheduling interviews and arranging for candidates' travel is expensive. Because the researcher needs less time to get the data, the questionnaire is less expensive. Companies can distribute questionnaires to a large number of people at once, and researchers can mail them. This enables relatively inexpensive coverage of large geographic areas and the collection of responses from a larger and more meaningful number of individuals.

The Capacity to Voice Opinions

When sending surveys to respondents, it is crucial to choose the questions carefully to prevent misunderstandings and confusion. Candidates frequently feel more comfortable expressing their opinions on contentious subjects while using questionnaires because the responder information can remain anonymous. A candidate may find it difficult to articulate their ideas on divisive subjects in an interviewer. Additionally, since a questionnaire requires written responses, the reader may interpret the answers differently, which could lead to confusion. As an oral communication, however, an interview allows a candidate to make their message obvious to the interviewer.

Time

A candidate has less time in an interview to answer and consider their words before speaking, and even the interviewer has less time to assess an applicant's abilities. Respondents have plenty of time to consider and put their answers down on a questionnaire. There is enough time for even the person scoring

the questionnaire to mark the responses. Additionally, depending on the position, some interviews can last up to an hour and others may only last ten minutes. The questionnaire, in contrast, might take less time to complete, particularly if it simply has multiple-choice questions.

Accuracy

Because they enable interviewers to ask targeted questions and get the needed information from candidates, interviews are an accurate approach for gathering data. Because this is a face-to-face conversation, interviewers can probe deeply to gather useful information for their study. Because there is no interviewer present and there is no option to obtain the needed information from the responder, questionnaires are less reliable.

F. Individual Task

Answer the following questions based on your understanding after reading the material from this chapter!

1. What do you understand about descriptive research?
2. What are the differences between quantitative descriptive research and qualitative descriptive research?
3. How to design and conduct a descriptive research?
4. How to distinguish questionnaire, interview and diaries in descriptive research?
5. What are the strengths and weaknesses of questionnaire study and interview study?

CHAPTER 7

CORRELATIONAL RESEARCH

This chapter focus on:

- Briefly state the purpose of correlational research.
- List and briefly describe the major steps involved in basic correlational research.
- Describe the size and direction of values associated with the correlation coefficient.
- Describe how the size of a correlation coefficient affects its interpretation with respect to (1) statistical significance, (2) its use in prediction, and (3) its use as an index of validity and reliability.
- State two major purposes of relationship studies.
- Identify and briefly describe the steps involved in conducting a relationship study.
- Briefly describe four different types of correlation and the nature of the variables they are used to correlate.
- Identify and briefly describe two factors that may contribute to an inaccurate estimate of relationship.
- Briefly define or describe predictor variables and criterion variables.
- State purposes of prediction studies.
- State the major difference between data collection procedures in a prediction study and a relationship study.

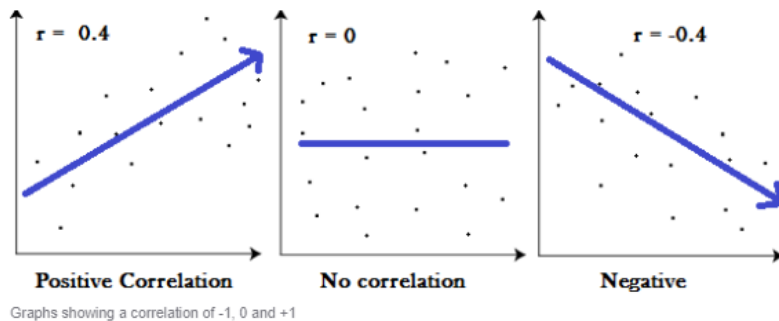
A. Introduction to Correlational Research

When using a correlational study design, no variables are within the researcher's direct control or manipulation. The degree and/or direction of the association between two (or more) variables is reflected in a correlation. A correlation may go in either a positive or negative direction.

1. Positive correlation, they both shift in the same direction. With an increase in another variable, the value of the first variable rises linearly. This suggests that

both variables have a similar relationship. In this instance, the correlation coefficient would be positive, or 1. Example: Weight grows along with height

2. Negative correlation, the variables shift in opposition to one another. The correlation coefficient would be negative if one variable's values decreased while another variable's values increased in that situation. Example: Increased coffee consumption reduces fatigue
3. Zero correlation, the variables do not relate to one another. There is still another instance when there is no clear relationship between the two variables. Example: Consumption of coffee does not have correlation with height.



Picture of Positive, Negative and Zero Correlation

Source: <https://www.statisticshowto.com/probability-and-statistics/correlation-coefficient-formula/>

B. Correlation Coefficient

A statistical concept known as the correlation coefficient aids in establishing a relationship between expected and actual values gained through statistical experimentation. The estimated correlation coefficient's value explains how well the expected and actual values match.

The value of the correlation coefficient is always between -1 and +1. A similar and identical relationship exists between the two variables if the correlation coefficient value is positive. Otherwise, it shows how different the two variables are

from one another. The Pearson correlation coefficient is the result of dividing the covariance of two variables by the sum of their standard deviations. Rho is typically used to represent it.

$$\rho(X,Y) = \text{cov}(X,Y) / \sigma_X \cdot \sigma_Y.$$

The covariance in this instance is denoted by the symbol cov. X's standard deviation equals Y's standard deviation, and vice versa. Means and expectations can be used to express the correlation coefficient given equation.

$$\rho(X,Y) = E \frac{(X - \mu_x)(Y - \mu_y)}{\sigma_x \cdot \sigma_y}$$

The means of μ_x and μ_y are, respectively, x and y , respectively. E stands for expectancy.

Karl Pearson's Correlation Coefficient

The collection of data that will be associated should closely resemble a normal distribution. The data points tend to lay closer to the mean if the data is regularly distributed. Greek word for 'able to disseminate' is 'homoscedastic. 'Equal variances' is what homoscedasticity refers to. The error term is the same for each independent variable value. If the error term differs between being lower for one set of independent variable values and greater for another, homoscedasticity is violated. A scatter plot can be used to visually check it. If the data points are evenly distributed along the line of greatest fit, the data is said to be homoscedastic.

Data are considered linear when there is a linear relationship between them. The data meets the requirement for linearity if the scatter plot's data points take the shape of a straight line. Continuous variables are those that have a range of possible values. The data set must include continuous variables for the Pearson correlation coefficient to be calculated. Spearman's rank correlation is a suitable measurement if one of the data sets is ordinal. The data points, also known as paired observations, must be in pairs. For each independent variable observation, there is a corresponding dependent variable.

The data must be free of outliers. The outliers can skew the correlation coefficient and make it unreliable if they are present. If a point is more than +3.29 or -3.29 standard deviations off the mean, it is regarded as an outlier. A scatter plot makes it simple to see what they are.

"r" stands for the linear correlation coefficient, which expresses how closely two variables are related. Given that it forecasts the relationship between two quantities, it is also known as a cross-correlation coefficient. Let's go on to computing the correlation coefficient statistically.

The correlation coefficient can be determined using the formula if the two variables being discussed are x and y.

$$r = \frac{n(\sum xy) - (\sum x)(\sum y)}{[n\sum x^2 - (\sum x)^2][n\sum y^2 - (\sum y)^2]}$$

Here,

n = Number of values or elements

$\sum x$ = Sum of 1st values list

$\sum y$ = Sum of 2nd values list

$\sum xy$ = Sum of the product of 1st and 2nd values

$\sum x^2$ = Sum of squares of 1st values

$\sum y^2$ = Sum of squares of 2nd values

C. Major Purposes of Relationship Studies

Correlational research is the best method for swiftly collecting data from real-world contexts. This enables the researchers to make externally valid generalizations about the results to situations in everyday life. There are a few circumstances in which correlational research is a good option.

1. To look into non-causal connections

Although the researchers don't expect to discover a causal connection between two variables, the researchers want to determine whether there is an association between them. Correlational analysis can shed light on intricate real-world linkages, assisting researchers in the creation of hypotheses and forecasts.

2. To investigate the links between the variables' causes

The researchers believe there is a causal relationship between two factors, but conducting experimental study in which one of the variables is altered is unfeasible, immoral, or prohibitively expensive. Research on correlations might offer preliminary cues or more evidence in support of theories on causal relationships.

3. To evaluate new measurement instruments

The researchers need to test the validity or reliability of the new instrument which the researchers built to measure the variable. To determine whether a tool regularly or accurately measures the notion it is intended to measure, correlational research might be utilized.

D. Steps in Conducting a Relationship Study

There are some steps in conducting a relationship study:

Step 1: Decide on the issue

The researchers can choose the topics based on what the study requires. There are three prevalent sorts of issues: Are the two variables connected in any way? How accurately does one variable predict another? What connections might there be between a wide range of variables and the predictions you can make?

Step 2: Choose a Sample

The sample must be properly chosen, and if necessary, randomly. There shouldn't be more than 30 people in sample.

Step 3: Gather Data

Correlational research employs a variety of data collection techniques. The following are the most popular techniques used to acquire data:

Surveys

The most popular approach for gathering data is surveys. Based on the participant responses chosen for the study, it aids in determining the relationship between variables. The surveys can be completed online, in person, or over the phone.

Naturalistic Observation

In the naturalistic observation method, the researchers must observe the participants in their natural settings in order to gather their data. The researchers may think of it as a form of field study. People can be seen and information gathered from them in a variety of public settings, including shops, malls, parks, and playgrounds. The research is not disclosed to the participants. However, the researchers must guarantee the participants' anonymity. Both qualitative and quantitative data are included.

Archives of Data

Data or information that has previously been created is referred to as archival data. If the current data meets the research needs, the researchers can use it in the study rather than gathering new data. The main sources of knowledge are typically prior studies, theories, records, documents, and transcripts. Retrospective research is another name for this kind of study.

Step 4: Evaluate the data

The findings can be in positive correlation, negative correlation, or zero correlation.

Step 5: Research report

In this step the researchers will create research report related the findings of the research.

E. Types of Correlation and its Variables

Based on the number of the variables

- Simple correlation. A straightforward correlation looks at the link between just two variables.
- Partial correlation. In partial correlation, the researchers take into account a number of variables, but the researchers concentrate on how they relate to one another and treat other variables as constants.
- Multiple correlation. The goal of multiple correlations is to investigate the relationship between three or more variables.

Based on the direction of change of variables

- Positive correlation. The two variables shift in a comparable manner.
- Negative correlation. Contrary changes are made to the two variables.
- Zero correlation. The two factors are not related to one another.

F. Factors Contribute Inaccurate Relationship

Illusory correlation is characterized as a cognitive bias in which a person's understanding of the connection between two variables is warped, leading to the creation of a false association. Examples of false correlation in daily life include the notion that some social groups are more violent than others or that certain lifestyle choices lead to specific illnesses. This tendency may seriously affect how decisions

are made and result in false causal assumptions. It is crucial to understand how this bias operates and take precautions to lessen its influence if we want to stop illusory correlation from affecting our decisions.

Context and Expectation

The perception of a connection between unconnected events or features can be influenced by preconceived ideas and expectations. For instance, anticipating two occurrences to be connected can skew how someone interprets the world and cause them to draw incorrect conclusions. Similar to how prior preconceptions about particular groups of people form one's knowledge of those people, context can likewise affect how one views the relationship between variables.

Stereotypes and Bias

Prejudice and discrimination can result from the tendency to see spurious relationships being amplified by preexisting assumptions and biases. An individual might, for instance, be more inclined to assume that criminal activity is more prevalent in specific racial or ethnic groups if they have a poor image of those groups, even if the evidence does not bear this up.

Media Influence

Through selective reporting, sensationalism, and the portrayal of fictitious relationships, the media contributes to the formation of illusory correlations.

G. Predictors Variables and Criterion Variables

Predictors Variables

Based on current circumstances, a predictor variable is used to forecast a future result. This variable also goes by the titles criteria variable and explanatory

variable. When trying to estimate or extrapolate a future event based on information that is known, predictor variables are crucial. They aid in foreseeing the unforeseen. Compared to more well-known forms of variables, such as independent and dependent variables, this variable type is unique. Let's dissect these many sorts in the parts that follow.

Criterion Variables

A dependent variable or a response variable is also known as a criterion variable. This is the variable that a statistical analysis predicts.

The words "predictor variable" and "criterion/outcome variable" are used to characterize the variables in correlational research. Predictor and criteria may be used, but their meanings differ from those in real studies. Since the independent variable is not changed in correlational research, and there is no assumption that the dependent variable "depends on" the independent variable simply that a link exists, correlational research cannot be used to infer causal relationships.

H. Prediction Studies

Creating an educated guess or estimation about a future event or outcome using the knowledge and data at hand is the process of creating a prediction. In order to predict what might happen in the future, it includes examining historical patterns and trends as well as the current environment. A study strategy known as a predictive correlational design seeks to forecast association rather than causality between variables. Utilizing statistical methods like simple regression and bivariate correlation, the prediction(s) are tested.

In predictive design, the researcher must unambiguously state that the aim of the investigation is to ascertain a variable's capacity for prediction. As a result, this design requires the researcher to have both a predictor variable and a criteria variable. This design is important in research that try to predict a particular

phenomenon as a result. Correlational research exhibits some noteworthy qualities as a result of these two designs. First, ratings from correlational study are typically presented. Scatter plots or matrices are two examples of this. Second, there are correlations between scores in correlational study. Form, strength, and direction are used to define these relationships. Third, correlational research examines a variety of factors.

I. Comparing Data Collection Procedure in a Prediction and a Relationship Study

Data collection procedure in a prediction study

Archives of Data

Data or information that has previously been created is referred to as archival data. If the current data meets the research needs, the researchers can use it in the study rather than gathering new data. The main sources of knowledge are typically prior studies, theories, records, documents, and transcripts. Retrospective research is another name for this kind of study.

Data collection procedure in a relationship study

Correlational research can be done in many different ways. The most typical data gathering techniques for this kind of research in the social and behavioral sciences include surveys, observations, and secondary data.

Survey

The researchers can measure the key variables in survey research using questionnaires. The researchers can conduct surveys in-person, over the phone, through the mail, or online. Surveys are a quick and flexible way to gather standardized data from a large number of respondents, but it's crucial to make sure the questions are framed objectively and capture the right insights.

Observation

A sort of field research known as naturalistic observation involves gathering information about a behavior or phenomena in its natural setting. This approach frequently entails writing down, tabulating, describing, and classifying acts and occurrences. While quantitative and qualitative components can coexist in a naturalistic observation, it is best to gather data that can be evaluated numerically (such as frequencies, durations, scales, and amounts) in order to determine correlation. Naturalistic observation enables the researchers to examine events that aren't repeatable in lab settings and makes it simple for the researchers to generalize the findings to real-world circumstances. However, data processing can be unpredictable and time-consuming, and researcher bias might skew the results.

Secondary Data

The researchers can use data that has already been obtained for a different purpose, such as official records, polls, or prior research, in place of collecting original data. Because secondary data collection is thorough, using it is quick and cheap. However, the researchers have no control over the validity or trustworthiness of the data gathering methods, thus the data may be erroneous, incomplete, or not totally relevant.

J. Individual Task

Answer the following questions based on your understanding after reading the material from this chapter!

1. What is correlational research?
2. What are the major purposes of correlational research?
3. How to use Karl Pearson's correlation?

4. What are the difference of types of correlation and its variables?
5. What is prediction study?
6. How to collect data in correlation research?

CHAPTER 8

CAUSAL COMPARATIVE RESEARCH

This chapter focus on:

- Briefly state the purpose of causal-comparative research.
- State the major differences between causal-comparative and correlational research.
- State one major way in which causal-comparative and experimental research are the same and one major way in which they are different.
- Diagram and describe the basic causal-comparative design.
- Identify and describe three types of control procedures that can be used in causal-comparative study.
- Explain why the results of causal-comparative studies must be interpreted very cautiously.

A. Introduction to Causal-comparative Research

A causative relationship between an independent variable and a dependent variable is sought after in causal-comparative research. Because the researchers do not have perfect control over the independent variable, the relationship between the independent variable and dependent variable is typically suggested rather than established. The Causal Comparative approach aims to identify the causes of events and circumstances. In other words, it determines the reasons why certain events happen or don't happen. This is accomplished by contrasting the conditions surrounding observable effects and identifying the variables present in both the situations where a certain effect happens and the situations where it does not. This approach is based on Mill's canon of agreement and disagreement, which says that the causes of every given observed effect can be determined by identifying the elements that are always present when the result is present and always absent when the result is absent.

When the independent variable has already occurred, as in a causal-comparative study, the relationship between the variables is examined, making the study descriptive rather than experimental. The researcher has no control over the independent variable because it has already been finished (for example, two reading techniques employed by a school), which is the variable for which the researcher wants to infer causality. In other words, the researcher is unable to choose the subjects or teachers, choose the method of implementation, or even confirm that the method is being used properly.

Sometimes the variable is either impractical to modify (such as gender) or inappropriate to manipulate (such as who smokes or how many cigarettes they smoke). Even so, the effects of potential causation are inferred from the measurements of the independent variable's link to one or more dependent variables, also referred to as "ex post facto" study. (Latin meaning "after the fact") because both the effect and the putative cause must be examined in retrospect since they have already happened. In this kind of research, researchers look for reasons for or effects of existing variations between or within groups of people. Especially in the behavioral sciences is used, this method will continue to be used in education because it is impossible, impractical, or unthinkable to manipulate factors like aptitude, intelligence, personality traits, cultural deprivation, teacher competence, and some factors that might pose an unacceptable threat to humans.

B. Comparing Causal Comparative and Correlational Research

There is a definite difference between causal and correlational research, despite the fact that some people think of both as having similar natures. Research is being done in the social and natural sciences for a variety of reasons. These studies examine the phenomenon's numerous dynamics. The goal of causal research is to determine the causes of the correlations between variables. On the other hand, correlational research aims to determine whether or not an association exists. Causal research can predict causation, whereas correlational research cannot. This is the main distinction between the two types of study. Let's look more

closely at the distinctions between causal and correlational studies through this article.

Research on causality seeks to pinpoint the relationships between variables. This emphasizes how it enables the researcher to identify the root cause of a certain variable. At instance, a researcher who investigates why there are less women in politics will look at factors like family obligations, the perception of women, risks associated with them, etc. to explain this scenario.

Prior to anticipating the causality in causal study, the researcher often assesses the effect each variable has. The variables must be carefully considered because, in most situations, a lack of control over the variables might result in inaccurate forecasts. For this reason, the majority of researchers alter the research setting. Conducting causal research may be exceedingly challenging, especially in the social sciences, since there are many environmental factors that can influence causation and go undiscovered. Let's now discuss correlational research.

The aim of correlational research is to find correlations between different variables. Correlational research cannot forecast causation, whereas causal research can find relationships, which is the main distinction between the two types of study. It is crucial to emphasize that the researcher makes an effort to understand both the associations between variables and the variables as separate entities. Another distinction between the two research methodologies is that in correlational research, no attempts are made to modify the variables by the researcher.

C. Similarities and Differences in Causal Comparative and Experimental Research

Comparing groups based on a specific metric in order to determine whether there is a causal connection between the variables is the aim of causal-comparative research. Experimental research seeks to prove causation by changing an independent variable and observing the results on a dependent variable.

- **Manipulation:** No factors are altered in causal-comparative research; rather, pre-existing groups are compared. In contrast, the independent variable is changed in experimental research by randomly assigning participants to distinct groups.
- **Control:** In causal-comparative research, the researcher has little control over the variables being assessed and is unable to randomly assign the groups being compared. In contrast, in an experimental study, the researcher can alter the variables under investigation and randomly place participants in various groups.
- **Time frame:** While experimental research is typically conducted prospectively, with participants randomly allocated to groups and the independent variable changing throughout the study, causal-comparative research is frequently conducted retrospectively, evaluating pre-existing groups.
- **Internal validity:** Experimental research is regarded to have a higher level of internal validity, making it easier to show a causal connection between the independent and dependent variables. Due to the possibility of confounding factors that are not controlled for affecting the results, causal-comparative research has a lower internal validity.

In conclusion, the objectives, variable manipulation, variable control, time frame, and level of validity of causal-comparative research and experimental research are different.

D. Basic Causal-comparative Design

When exploring research procedures, one comes across a number of strategies designed for certain inquiry. At its heart, causal comparative research refers to a method of conducting an investigation into the causes and effects of various factors, particularly when the researcher has no direct control over the active manipulation of the variables. This strategy explores existing variations

between or among groups to determine plausible explanations rather than modifying factors as in experimental research.

Causal comparative design has a wide range of implications for academia and research. Causal comparative research offers an alternate method for gaining insights in situations where experimental designs are either impractical or unethical. This method fills the gap between studies that are only observational and those that require precise control, giving researchers a useful tool to find potential causal connections in a variety of situations. Understanding these causal relationships will help researchers, decision-makers, and professionals develop more well-informed theories and conclusions, adding to the body of information we already have.

While not as old as some other research approaches, causal comparative analysis has deep origins in the effort to discover links without overt manipulation. When academics had to deal with causation issues, the approach took off in disciplines including sociology, psychology, and education. This approach gained popularity as the academic community came to understand the need of looking into the causes of naturally occurring group disparities.

The distinctive position Causal Comparative Research takes on causality without direct influence sets it apart from other techniques. The gold standard for determining causal linkages, experimental research deliberately manipulates independent variables to determine their impact on dependent variables. Cause-and-effect claims can be made with greater clarity in this controlled environment. Contrarily, observational studies, which are simply descriptive, avoid drawing any conclusions about the cause of events and instead concentrate on observing and comprehending patterns or occurrences as they naturally occur.

But Causal Comparative Research finds a home between these two approaches. By evaluating the differences that already exist between or across groups, it seeks to pinpoint plausible reasons. The study goes beyond a purely observational approach by attempting to understand the "why" underlying observed variations, even though it lacks the direct control of an experiment. This

gives researchers a flexible tool in their analytical toolbox and offers a distinctive blending of retrospective study with a drive for causality.

A distinctive set of characteristics set causal comparative research apart from other research approaches. Along with defining its operating dynamics, these traits also direct its prospective applications and insights. Researchers are better able to take use of the method's advantages and traverse its complexities by comprehending these fundamental characteristics.

Non Manipulation to Variables

The non-manipulation of variables is one of the core principles of causal comparative research. Researchers who adhere to this paradigm put more of an emphasis on analyzing groups as they naturally emerge than actively interfering or altering the environment. This implies that the focus shifts to the inherent distinctions across groups, which have already manifested. Such a non-interventionist strategy lowers the artificiality sometimes inherent in controlled trials and enables real-world applicability. Since the conditions aren't being changed by the researcher directly, this has the trade-off of being less certain about causal linkages. The aim of research is to identify probable causal elements or patterns that could otherwise go unnoticed in a more controlled situation by examining pre-existing conditions and group differences.

Retrospective in Nature

Causal comparative research is always looking backward. The goal of this approach is to uncover what might have led to the current discrepancies between groups, rather than creating conditions and forecasting future outcomes. This perspective is unique since it is backward-looking. Researchers can use historical information, prior occurrences, and well-established patterns to identify possible causal linkages. This approach offers important insights into historical causative elements, but it doesn't yield as clear causal results as prospective studies. In many

academic subjects, historical knowledge is essential. This retrospective nature offers a mechanism to explore historical causality and provides knowledge that can direct future research and decisions.

Focuses on existing group or intergroup distinctions

The study of existing differences is at the heart of causal comparative research. Researchers examine naturally occurring group differences rather than artificially forming discrete groups. These inequalities already in place can result from a wide range of elements, including cultural, environmental, socioeconomic, and even genetic ones. The objective is to determine if these discrepancies are merely coincidences or whether they can point to underlying causal linkages. The reliance on inherent distinctions has both advantages and disadvantages. Although it introduces potential confounding variables that researchers must be aware of when evaluating data, it ensures genuine application to real-world circumstances.

E. Control Procedures in Causal-comparative Study

Even when the independent variable is not altered, control procedures can be used to enhance the interpretation of the findings.

Design and Procedure

- The experimental and control groups more properly known as comparison groups are the two participant groups that the researcher chooses.
- Two ways in which groups can vary. One group has a quality that the other group does not. The feature is present in all groups, albeit in varying numbers or degrees.
- The causal-comparative procedure's definition and choice of the comparison groups are crucial steps. Since each group represents a separate population, the independent variable that distinguishes the groups must be precisely and operationally defined. Unlike experimental research, where

the random sample is drawn from a single community, causal-comparative research draws its sample randomly from two already-existing populations. With the exception of the independent variable, groups should be as similar as feasible, much like in experimental investigations.

- The two groups are more homogeneous in all respects except for the independent variable the more similar they are on such variables.

Control Procedures

- In a causal-comparative study, a lack of randomization, manipulation, and control are all examples of sources of weakness.
- The single greatest technique to try to achieve group equality is probably random assignment.
- The chance that the groups differ on some other significant characteristic (such as gender, experience, or age) in addition to the determined independent variable is a concern.

Matching

- Another method of control is matching.
- A researcher may use pair-wise matching of participants to control for a variable if they have found one that is likely to affect participant performance on the dependent variable.
- The researcher identifies a participant in the other group who scored on the control variable at or near the same level as each participant in the first group.
- A participant is removed from the study if they are unable to find a good match in either group.

- Regarding the found superfluous variable, the resulting matched groupings are same or fairly comparable.
- When the researcher tries to match participants on two or more variables at once, the issue gets worse.

F. Individual Task

Answer the following questions based on your understanding after reading the material from this chapter!

1. What do you understand about causal comparative design?
2. What are the characteristics of causal comparative design?
3. How to distinguish causal comparative design with correlational design?
4. What are the similarities and differences of causal comparative research and experimental research?
5. What do you understand about research procedures and control procedures in causal comparative research?

CHAPTER 9

EXPERIMENTAL RESEARCH

This chapter focus on:

- Briefly state the purpose of experimental research.
- List the basic steps involved in conducting an experiment.
- Explain the purpose of control.
- Briefly define or describe internal validity and external validity.
- Identify and briefly describe eight major threats to the internal validity of an experiment.
- Identify and briefly describe six major threats to the external validity of an experiment.
- Briefly discuss the purpose of experimental design.
- Identify and briefly describe five ways to control extraneous variables.
- For each of the pre-experimental, true experimental, and quasi-experimental group designs; (1) draw a diagram, (2) list the steps involved in its application, and (3) identify major problems of validity.
- Briefly define and describe the purpose of a factorial design.

A. Introduction to Experimental Research

Researchers employ an approach called experimental research in which they manipulate one variable while controlling the others. In this kind of research, the procedure, program, and therapy are also presented, and the outcome is noted. Experimentation is a common research design used in the sciences, including biology, medicine, physics, chemistry, sociology, and psychology. It is a group of study approaches that utilize controlled testing and modification to investigate accidental processes. It is necessary to alter one or more variables in order to ascertain the impact on a dependent variable. The test in research, one or more variables are manipulated while other variables are controlled and any changes are measured using a methodical, scientific manner.

The prediction of phenomena is the purpose of experimental inquiry. An experiment is typically designed to explain a certain type of causation. Because experimental research makes life better, society benefits from it. The act of controlling some variables and modifying others to see if the experiment's outcomes show that the manipulations were the direct cause of the desired result is known as experimental research. To ascertain how a concept, method, or process affects a result, experimental researchers test it out. Once an idea has been selected for "experimentation," participants are assigned to experience it (with some participants experiencing something different), and the researchers observe if the individuals who experienced the idea or practice outperformed the control group on some outcome.

Where is experimental research applied?

- Primacy of time in a causal connection.
- Coherence in the causal connection.
- The correlation is quite large.

Important Features of Experimental Research

These days, a few essential features aid in our comprehension and interpretation of experimental studies. Researchers conducting experiments divide people into groups or other units at random, to isolate the impact of the independent variable on the results, they offer control over unimportant variables. They physically alter one or more groups' treatment circumstances. After then, they assess the groups' results to see if the experimental treatment had an impact that differed from the non-experimental treatment. A statistical comparison of the groups is used to achieve this. In general, the experiment is designed to minimize risks to both internal and external validity.

B. Steps in Conducting Experimental Research

This is a reasonable flowchart for organizing and carrying out research.

Step 1: Choose a Subject.

This is a simple stage that is usually not difficult, unless the researchers are "required" to conduct research rather than starting it on your own. All that has to be done is choose a broad area of personal interest and then focus on a researchable subject.

Step 2: Determine the Research Issue.

Which particular issues, given the broad subject matter, are of interest? The researcher is frequently already aware of the issues. In others, it's definitely necessary to make a library visit to read background material and look over earlier research. The problem's significance to the field is one of the main concerns. It takes too much time and effort to conduct research on pointless issues that don't add to our current understanding.

Step 3: Look through the Literature.

Now that the problem and study topic have been determined, it is time to carry out a more thorough literature search. Finding pertinent research that has been done, as well as the designs, tools, and techniques used in those studies, are important. But most importantly, the results must be understood. Directions for (a) expanding or enhancing the body of current literature, (b) utilizing potential research orientations, and (c) addressing particular research problems will be given based on the review.

Step 4: Outline your research questions and/or hypotheses.

Probably the most important step in the planning process is this one. Once they are defined, the research questions or hypotheses serve as the foundation for organizing the design, materials, and data analysis of the study. This stage will specifically direct the researcher in determining whether an experimental design or another orientation is the optimal option.

Step 5: Choose the research design in step five.

The viability of an experimental design is the next thing to take into account. In the event that not, the investigator must contemplate substitute methodologies, acknowledging that the initial inquiry can become unanswerable therefore.

Step 6: Choose the Approaches.

The study's methods consist of (a) people, (b) materials and tools for gathering data, and (c) processes. The research questions and/or hypotheses must be the researcher's constant points of reference when identifying these elements. Starting with subjects or participants is a wonderful idea. How many and what kind of participants are needed for the research design?

C. Control Group in Experimental Research

Data from a control group and an experimental group are compared in an experiment. With one exception, these two groups should be identical. The experimental group and the control group differ in that the independent variable is altered for the experimental group while remaining constant for the control group. A test sample or the group subjected to an experimental process is known as an experimental group. The independent variable under test is changed for this group. Both the independent variable's values and its effect on the dependent variable are documented. Several experimental groups may be present at the same time in an

experiment. A control group is one that is kept apart from the other groups in the experiment so that the outcomes of the test of the independent variable are unaffected. This helps rule out other possible explanations for the experimental data and isolates the impact of the independent variable on the experiment.

Participants who do not receive any experimental therapy make up the control group. The control group functions as a comparative unit. In terms of age, gender, socioeconomic class, ethnicity, and other factors, the control group is as similar to the experimental group as is practical. The independent variable, which is assumed to be the source of the behavior under investigation, is not introduced to the control group, which is how the control and experimental groups differ from one another. In order to identify the independent variable and assess its effects, researchers will make a comparison between the individuals in the control group and the experimental group. A researcher cannot ascertain whether a given treatment actually affects an experimental group if there is no control group. Because they contribute to the internal validity of a study, control groups are essential to the scientific process.

Types of control groups

- **Positive control groups:** Here, researchers are interested in finding out more about the effects of treatment changes even when they already know that a particular treatment is effective. Here, the experimental group is given the variant so that researchers may better understand how it functions and compares to the control, while the control group receives the proven treatment.
- **Negative control group:** Participants in this kind of control group do not get any kind of treatment. After then, the experimental group can be contrasted with the control group, which saw no changes or outcomes.
- **Placebo control group:** Participants in this kind of control group are given a placebo, which they hope will have some sort of impact. Researchers can

investigate the effects of the placebo effect and compare the experimental treatment to the placebo treatment thanks to this control group.

- **Randomized control group:** In order to make sure that the members of the control group fairly represent the demographics of the general population, this kind of control group uses random selection.
- **Natural control group:** Situational considerations frequently play a role in the natural selection of this kind of control group. Researchers may, for instance, contrast individuals who have suffered from trauma brought on by conflict with those who have not. The control group would be those who have not suffered trauma connected to war.

D. Internal and External Validity

Internal Validity

When an experiment is internally valid, we can be positive that the study's outcome (maternal employment), which was caused by the independent variable (child care subsidies, for example). We can presume that the independent variable produced the observed outcomes when individuals are randomly assigned to treatment or control groups because the two groups shouldn't have differed from one another at the beginning of the trial. The treatment group and the control group should not have been different at the beginning of the study because research volunteers were randomly assigned to these groups.

When volunteers leave a study early or decline to participate, it may compromise the internal validity of the experiment. Differential attrition occurs when certain groups of people discontinue or decline to participate more frequently than groups with distinct characteristics.

External Validity

Another major difficulty in social science investigations is external validity. Generalizing experimental results to groups not included in the study can be extremely challenging. External validity is more likely to be present in studies where participants are chosen at random from the most representative and diverse communities. The outcomes of studies can be more easily generalized to different groups when random sampling procedures are used.

9.5. Ways to Control Extraneous Variables

Any variable that the researchers are not interested in researching but that can potentially have an impact on the dependent variable is considered an extraneous variable. For instance, we would be interested in seeing how a basketball player's average points per game are impacted by the amount of hours they train each week. However, the amount of time they spend stretching each week is an unrelated factor that might possibly have an impact on their points per game. We would need to ensure that we account for this unimportant variable to get accurate results about the impact of training hours on average points per game.

Types of Extraneous Variables

Situational Variables

These are environmental factors that may have an impact on a subject's behavior during an experiment. Some instances are:

- lighting circumstances
- Sounds
- visual disturbances
- The temperature

Experimenter Bias

This speaks to the ways in which an experimenter could unintentionally skew subjects' behavior. Examples include: Hinting to the desired behavior of participants using specific wording. When giving directions to others, use a positive or negative tone of voice.

Demand Characteristics

This refers to any hints found throughout the experiment that might reveal to participants the real aim of the study. Some instances are:

- Their environment.
- Their assessment of the circumstances as they stand.
- The actions of the researcher.

Participants Variables

This is a reference to the inherent variability among people and the manner in which this could impact the experiment's outcomes. Some instances are:

- A person's innate intelligence.
- A person's disposition that day.
- A person's physical capabilities.
- An individual's capacity for focus.

How to Control Extraneous Variables

Consistent Environment

Every participant should be able to take part in an experiment in precisely the same setting, including the same temperature, lighting, noise levels, and any

distractions. This should reduce the impact of demand characteristics and situational factors.

Experimental Design

Experimental bias should be reduced by creating an experiment in which participants are randomly assigned to treatment groups and researchers are blind to which participants are in which group.

Randomization

Any disparities in participant skill across groups should be fairly distributed since people are randomly assigned to treatments (such as high training volume vs. low training volume). As a result, the issue with participant variables ought to be reduced.

E. Comparing Pre Experimental, True Experimental, and Quasi Experimental

Pre Experimental

A study style known as pre-experimental design uses some fundamental experimental characteristics while excluding others. An experiment cannot be considered truly experimental because of this factor. This kind of design is frequently employed as an economical means of carrying out exploratory research. Pre-experimental designs get their name from the fact that they adhere to fundamental experimental procedures but omit a control group. Put differently, it is common practice to study a single group without comparing it to a comparable non-treatment group. The most straightforward type of study design is a pre-experiment. In a pre-experiment, one or more groups are watched after receiving a treatment or agent that is thought to bring about change.

One Shot Case Study Design

One group is examined at one particular moment following a course of therapy that is thought to have resulted in change. The thoroughly examined individual case is contrasted with other incidents that are only noticed, as well as with general expectations of how the case would have appeared had the therapy not taken place. There isn't a comparison or control group used. In a one-shot case study, we administer therapy X to a group and track the result, Y. Both a control group and a pre-test Y are absent. There is no foundation for group comparisons or pre- and post-test data. Used to measure a result following the implementation of an intervention; frequently used to measure the uptake of a new service or program. The intervention is given to one group. Information acquired at a certain moment following the intervention. Design flaw: fails to establish a cause-and-effect link between the intervention's results and outcome.

One Group Pretest Posttest Design

Two points of time are recorded for a single case: before the therapy and after the treatment. It is assumed that changes in the desired outcome are the outcome of the intervention or therapy. There isn't a comparison or control group used. One-group pre-test/post-test designs involve measuring Y both prior to and following treatment X. There are no group comparisons since there is no control group. Used to compare an outcome's changes before and after an intervention is put into place. The intervention is given to one group. Information acquired at least twice. Design flaw, the change is shown, but it does not take into consideration any events, maturation, or modified survey techniques that might take place in between the comparisons of static groups. Used to measure a result following the implementation of an intervention.

Static-Group Comparison

We have an experimental group and a control group in the static-group comparison, but no pre-test. Pre- and post-tests are not included, although group comparisons are permitted. One group that has received treatment and another that has not are contrasted. It is believed that the treatment had an impact on the disparities that were noticed between the two groups. Two non-randomly chosen groups—one receiving the intervention and the other not (control)—were allocated. Information acquired at a certain moment following the intervention. Design flaw, demonstrates that there has been change, but participant selection may have produced groups with different values for pertinent variables.

True Experimental

The random assignment of participants to research groups and their selection as participants are characteristics of true experimental designs. Additionally, the researcher has total control over the unimportant factors. As a result, it is safe to say that the change of the independent variable directly caused the effect on the dependent variable. True experimental designs are frequently regarded as the greatest kind of research designs because of these factors.

The most accurate experimental research design is said to be a true experiment. One kind of experimental design that is regarded as the most accurate kind of experimental study is a real experiment. This is so that a valid experiment can employ statistical analysis to confirm or deny a hypothesis. It's also believed that the only experimental design capable of proving cause and effect relationships is a true experiment.

True experimental designs come in a variety of forms, including the following:

Design of one-shot case studies

One group is examined at one particular moment following a course of therapy that is thought to have resulted in change. The thoroughly examined

individual case is contrasted with other incidents that are only noticed, as well as with general expectations of how the case would have appeared had the therapy not taken place. There isn't a comparison or control group used.

Comparison of static groups

One group that has received treatment and another that has not are contrasted. It is believed that the treatment had an impact on the disparities that were noticed between the two groups.

Post-test Only Design

In this design type, two groups—an experimental group and a control group—are randomly allocated. Prior to starting the treatment, neither group is pretested. The experimental group receives the treatment, and both groups take the post-test to evaluate the impact of the therapy or manipulation. When pretesting the subjects is not feasible, this kind of design is frequently used.

Only Pretest-Posttest Design

Once more, the subjects are randomized to be in the experimental or control groups. For the independent variable, pretests are given to both groups. The experimental group is administered the therapy, and both groups undergo a post-test to investigate the impact of adjusting the independent variable on the dependent variable.

Pretest-posttest in a single group

Two points of time are recorded for a single case: before the therapy and after the treatment. It is assumed that changes in the desired outcome are the outcome of the intervention or therapy. There isn't a comparison or control group used.

Solomon Four Group Design

Subjects are divided into four groups at random using the Solomon Four Group Design. There are two control groups and two experimental groups. There are just two pretested groupings. The treatment is administered to one unpretested group and one pretested group. The post-test will be given to all four groups. The post-test results show how the effects of the independent variable on the dependent variable are contrasted to the effects of the dependent variable as initially observed. This technique, which is meant to remove possible sources of error, is actually a combination of the first two techniques.

Factorial Design

In order to see how multiple independent variables (factors) affect the dependent variable, the researcher manipulates them all at once. With this strategy, multiple hypotheses can be tested in a single project.

Randomized Block Design

When there are potential variations in the experimental conditions as well as intrinsic differences among the subjects, this design is employed. The randomized block design may be used to provide some uniformity to each group if there are many experimental groups.

Crossover Design

In this design, participants are randomly assigned to different treatment orders and are exposed to many treatments. Subjects exposed to varying conditions share a high degree of resemblance, and the groups under comparison exhibit an equal distribution of features. Crossover designs are great research tools, but there's a worry that their experience with the first treatment may affect how they respond to the second treatment or condition. The subjects act as their own control groups in this kind of design.

Qualities of a genuine experiment

An accurate experimental design includes a control group as well as a way to gauge the changes in both groups. In this way, while trying to ascertain whether the treatment is indeed responsible for the change, we try to account for any confounding variables, or at least take their influence into account. It's common knowledge that the genuine experiment is the only research design that can accurately quantify the cause-and-effect relationship.

A true experiment has to satisfy three requirements.

- The experimental group and the control group
- Investigator-managed variable
- At random selection

The experimental group and the control group

A control group, or a subset of study participants who mimic the experimental group but do not receive the experimental treatment, is an essential component of legitimate investigations. You can compare the experimental outcomes to a dependable baseline set of data provided by the control group.

The group of research subjects receiving the experimental treatment is known as the experimental group. Although more than one experimental group may be used, true experiments must always include a control group and at least one experimental group.

Following design determination, four components of genuine experimental research need to be taken into account:

- **Manipulation:** The treatment or condition that will be administered to the experimental groups is the independent variable, which the researcher will consciously alter or manipulate. It is crucial to set explicit procedural rules for applying the treatment to verify that the alteration actually affects the dependent variable and to promote consistency.

- **Control:** Control is the process of preventing external variables from having an impact on the study's results. This guarantees that the manipulation of the independent variable is what led to the result. Thus, holding all other potential variables constant is an essential component of experimental design.
- **Random Assignment:** The assignment of participants to groups at random is a fundamental component of a proper experimental design. Each participant in the experiment should have an equal probability of being placed in any group. This further guarantees that the study's conclusion is the result of the independent variable's modification and is unaffected by the make-up of the test groups. There are numerous methods for assigning subjects at random, some of which are rather simple. These methods include flipping a coin, drawing names, using a random table, or employing computer-assisted random sequencing.
- **Random selection:** It's crucial to choose test subjects at random from a wider target population in addition to allocating them in groups at random. By doing this, it is ensured that the sample population accurately reflects the greater population's diversity in terms of socioeconomic status, race, IQ, and other factors.

Quasi Experimental

When using a classical design is challenging or inappropriate, researchers might test for causal linkages using quasi-experimental methods. Because they are modifications of the traditional experimental design, they are referred to be quasi. Compared to the traditional design, the researcher generally has less control over the independent variable.

Similar to experimental methods, quasi-experimental research designs also investigate causal hypotheses. Random assignment is by definition absent from a quasi-experimental approach. A comparison group that is as close to the treatment group as possible in terms of baseline (pre-intervention) characteristics is

identified using quasi-experimental techniques. A suitable comparison group can be created using a variety of methods, including propensity score matching (PSM) and regression discontinuity design (RDD).

Two Groups Post-test Only Design

With the exception of the groups' random assignment, this is exactly the same as the static group comparison. With the exception of a pretest, it possesses every component of a classical design. A pretest is necessary to confirm that the groups started with the same values of the dependent variable, but the random assignment lessens the possibility that the groups differed before to the treatment.

Interrupted Time Series

A single group is used in an interrupted time series design, and several pretest assessments are taken both before and after the therapy.

Equivalent Time series

Another one-group arrangement that spans a time period is called an analogous time series. It has a pretest, a treatment and posttest, another treatment and posttest, another treatment and posttest, and so on, in place of just one therapy.

Other Quasi Experimental Design

Proxy Pretest Design

A typical pre-post design is how the proxy pretest design appears. However, there is a significant distinction. In this design, the pretest is gathered subsequent to the program delivery. The pretest on recollection proxy would be a reasonable method to evaluate participants' reported change or gain.

Separate Pre Post Sample Design

The fundamental tenet of this design (and its variants) is that the participants in the pretest and the posttest are not the same.

Double Pretest Design

Two measures are included in the double pretest design before the program. As such, selection-maturation hazards are specifically controlled for in this design. The term "dry run" quasi-experimental design is also occasionally applied to this design since the double pretests mimic the outcomes of the null scenario.

Switching Replication Design

Regarding internal validity, the quasi-experimental design of Switching Replications is likewise excellent. Three waves of measurement and two groups make up the design. One group receives the program during the pretest phase of the design, after which both groups take a posttest. The original program group acts as the "control" group in the second design phase, while the original comparison group receives the program.

Nonequivalent Dependent Variables Design

One misleading design is the Nonequivalent Dependent Variables (NEDV) design. It is a very weak design in its most basic version in terms of internal validity. However, in its variants on pattern matching, it provides a totally new and very potent avenue for causal assessment.

Pattern Matching Nonequivalent Dependent Variables Design

Even though the two-variable NEDV design is quite poor, by including many outcome variables, we can significantly strengthen it. Many outcome variables and a hypothesis that indicates how much (from most to least) each variable will be impacted by the program are required for this variation. The internal validity of the Pattern Matching NEDV design can be rather strong, depending on the situation. Generally speaking, the more variables you have and the better your expected pattern fits the observed data, the stronger the design.

Regression Point Displacement Design

By contrasting the performance of a large number of comparison units with the performance of the single unit, the RPD design aims to improve the scenario when there is only one program unit. In community research, we would contrast the intervention community's pre-post outcomes with those of a sizable number of other communities.

F. Factorial Design

A statistical experimental design called a factorial design is used to look into how two or more independent variables, or factors, affect a dependent variable. Through the manipulation of characteristic values and subsequent measurements of the impact on the dependent variable, researchers are able to discern the distinct contributions of each element as well as their collective or interacting impacts.

These are useful when examining how different factors interact. They enable researchers to investigate how the levels of one element may affect the effects of another. This may offer insightful information about the underlying mechanics. It strengthens the effects that have been seen and aids in locating possible moderators or mediators of the link between the variables.

In a single experiment, factorial designs enable researchers to examine the effects of independent factors on a dependent variable. In addition to offering a more complex knowledge of the interactions between variables, this can save time and resources. Both the primary effects and the interactions between the independent variables can be found. This offers understanding of the distinct contributions of every variable and their interplay. A study's statistical power can be raised by adjusting several independent variables. This raises the possibility of finding significant effects.

In research, factorial designs are a reliable and popular type of experimental design. Factorial designs have their roots in the twentieth century. This was made possible by Ronald A. Fisher's work and the creation of analysis of variance (ANOVA). They are important because they give researchers the chance to look at how different factors affect a dependent variable in a controlled environment. Researchers can ascertain the distinct contributions of each ingredient as well as any potential interacting effects between them by varying the levels of the constituent parts. This data aids in the creation of interventions or therapies specific to the requirements or environment of a group.

It falls into a number of categories. Based on the quantity of levels and independent variables (factors) included in the study. Here are a few typical varieties of it:

- A 2x2 factorial design with two independent variables and two levels each is used. In psychology research, examining the relationship between two factors and behavior or outcome is common.
- A 3x3 factorial design is used, where three independent variables with three levels each are included. It can be very helpful in medical research and aids in examining how various factors affect behavior or results.
- A mixed factorial design manipulates one or more independent variables within subjects so that every participant experiences every possible level of the variable. Additionally, there must be at least one independent variable

(one that only affects one level of the variable for each participant) among the subjects.

- The nested factorial design, one independent variable that is in line with another independent variable is used. One independent variable in a research on depression treatment options might be the type of therapy (such as cognitive-behavioral therapy, psychoanalytic therapy, etc.), and a second independent variable could be the therapist giving the treatment.
- A fractional factorial design, only a small portion of possible levels of the independent variable combinations are tested. When resources are scarce or it would be impractical to attempt every combination, this can be helpful.

G. Individual Task

Answer the following questions based on your understanding after reading the material from this chapter!

1. What do you understand about experimental research?
2. What are the differences among pre-experimental, true experimental and quasi experimental design?
3. How to control extraneous variable?
4. How to compare and contrast experiment and control groups?
5. What are stages in conducting experimental research?
6. Explain the types of factorial design in experimental research!

CHAPTER 10

NARRATIVE RESEARCH

This chapter focus on:

- Briefly state the definition and purpose of narrative research.
- Describe the narrative research process.
- Describe the different types of narrative research.
- Describe the key characteristics of narrative research designs.
- Describe narrative research techniques.

A. Introduction to Narrative Research

Understanding people's tales about their experiences, identities, and beliefs more thoroughly is the purpose of narrative analysis. Researchers can find patterns and themes that offer insight on how people make sense of their lives and the world around them by examining the structure, substance, and context of these stories. Exploring the meanings people give to their experiences is the main goal of narrative analysis. In order to determine the underlying values, beliefs, and attitudes that define the story, it is necessary to analyze the various aspects of a story, including the storyline, characters, setting, and themes. Researchers can learn more about how people create their identities, comprehend their interactions with others, and make sense of the world by examining these components.

Using narrative analysis, it's possible to spot themes and patterns in various stories. This entails analyzing and comparing the narratives of various people or groups to find similarities and contrasts. Researchers can learn more about more general cultural and social issues like gender, race, and identity by examining these patterns and themes. In addition, interventions that address social and cultural issues can be developed using story analysis. Researchers can create interventions

that are suited to the particular requirements of certain people and groups by comprehending the tales that people tell about their experiences.

A potent tool for qualitative research is narrative analysis. The use of narrative research can reveal actions, emotions, and motives that aren't verbally conveyed. Additionally, it offers a wealth of linguistic information that could illuminate numerous facets of cultural or social phenomena. Researchers can obtain precise information about their subjects using narrative analysis that is not possible through other means. In qualitative research, narrative analysis reveals hidden impulses that are difficult to clearly observe. This is especially true when a researcher is studying a particular culture and has to peel back its numerous layers.

In narrative analysis, a type of qualitative research, the researcher concentrates on a particular subject and examines the information gathered through case studies, questionnaires, observations, or other methods of a similar nature. Following the writing of their findings, the researchers study and assess them. In order to undertake a narrative analysis, researchers need to be aware of the social, cultural, and historical context of their research subjects. This helps researchers understand what their subjects' narrations are trying to convey. In context-rich research, this is especially true because there are a lot of hidden layers of meaning that can only be discovered by having a thorough awareness of the society or environment.

Researchers need to learn as much as they can about their research topics before beginning narrative research. They conduct key informant interviews and gather copious quantities of text from them. They even draw on additional resources like published works and firsthand accounts. Researchers select a small number of cases from this extensive database that they believe are representative of the topic at hand and then thoroughly evaluate them. This method allows researchers to get a comprehensive understanding of the subject's life and activities. By enabling researchers to see how people interact with one another, it can demonstrate what drives people and give a greater understanding of the society that the subjects live in.

B. Narrative Research Process

During a narrative study, there are seven common steps that are taken. They are merely a guide for scholars to follow, even if they are listed in order of successive listing.

Step 1: Choose an issue or phenomenon to investigate.

Finding a problem or issue gives research a purpose and helps the researcher comprehend the social or personal experiences of a person or people.

Step 2: Pick one or more study participants.

Many narrative studies focus on just one person, but others might look at multiple people. Choose a person or people who have knowledge of the problem. Based on their backgrounds, carefully choose this person or people.

Step 3: Gather the participant's account.

Field texts also reveal details about the participant outside what they say verbally during conversations or interviews. Journal or diary entries, letters written by the individual, photos, memory boxes, and tales learned from friends or family members are a few examples.

Step 4: Retell the person's story or re-story.

In this process, the raw data is examined, key components are identified, these components are organized and sequenced, and finally, a story that recounts the individual's experiences is told. By placing the events in a logical order, re-story aids in the reader's comprehension of the narrative. The following are frequent components of stories: setting, characters, issues, actions, and resolution.

Step 5: Work together with the participant/storyteller.

The researcher collaborates with the storyteller throughout the narrative tale collection procedure to guarantee that the participant's experiences are appropriately described.

Step 6: Compose a narrative describing the experiences of the participant.

The researcher turns the participant's life experiences into a tale, which is typically the BIGGEST stage in narrative research. Readers may benefit from highlighting particular themes that surfaced throughout the tale and from include a section on the value of narrative research.

Step 7: Verify the veracity of the report

An accurate report is necessary to keep the tale alive. Talking to others and looking for evidence that contradicts the tale will preserve its veracity.

C. Different Types of Narrative Research

People use stories to express their experiences and give life meaning. These human narratives are gathered and studied by researchers across several disciplines as part of qualitative research. Oral histories, collections of individualized artifacts, tales, letters, autobiographical and biographical texts, and several other narrative data sources are examples of narratives in various forms.

In order to conduct a narrative analysis study, descriptions of events must be gathered, typically through observations and interviews. Use this strategy when the researchers want to create a tale by synthesizing descriptive data, a process known as "re-story." By describing how and why something occurs, the tale both demonstrates and communicates the research's findings. For instance, a researcher might employ this strategy to examine adolescent drug usage in the classroom, explain why it occurs, and demonstrate how a teacher addresses and resolves this issue.

An analysis of a narrative endeavor makes use of research to identify and state common knowledge-revealing themes. This method could be used, for instance, to examine the efficacy of particular learning contexts or uncover recurring themes related to teenage pregnancy. Collecting tales, analyzing them, and looking for motifs, patterns of behavior and descriptions, important words, and

emotional experiences that are shared by all the stories collected—is one tactic that might utilize. Theme: One-on-one instruction aids student learning more quickly than technology-based solutions, according to research.

Content Analysis

In this kind of narrative analysis, the narrative's material is examined to find themes, motifs, and other patterns. Themes or categories within the text may be identified using coding schemes, and researchers may then examine how these themes or categories relate to one another and to the broader story. Written texts, oral interviews, and visual media can all be studied through the application of content analysis.

Structural Analysis

The formal structure of a narrative, such as its plot, character development, and use of literary techniques, is the main focus of this kind of narrative analysis. Researchers may examine the protagonist-antagonist connection, the narrative arc, or the use of symbolism and metaphor. Understanding how a narrative is put together and how it impacts the reader or audience can be done with the help of structural analysis.

Discourse Analysis

This approach to narrative analysis focuses on a narrative's language and discourse, as well as the social and cultural setting in which it is set. The choice of particular words or phrases, the narrative's tone and style, or the ways in which social and cultural standards are reflected can all be the subject of research. Discourse analysis can be helpful for figuring out how bigger social and cultural systems impact narratives.

Phenomenological Analysis

This approach to narrative analysis focuses on the narrator's subjective experience and how they interpret and make sense of it. The language used to describe experiences, the emotions conveyed in the narrative, or the methods in which the narrator derives meaning from their experiences are all subject to analysis by researchers. It might be helpful to understand how people interpret their own lives and experiences through phenomenological analysis.

Critical Analysis

Examining a tale's political, social, and ideological ramifications as well as its underlying presumptions and beliefs are all part of this form of narrative research. Researchers may examine how a narrative challenges or subverts prevailing power structures, or how it reflects or maintains existing structures. Understanding how narratives influence social norms and cultural practices can be done with the help of critical analysis.

Auto Ethnography

This kind of narrative analysis examines cultural experiences and identity formation through personal narratives. Researchers may turn to their own personal narratives to investigate topics like race, gender, or sexual orientation and to comprehend how wider social and cultural systems impact individual experiences. Understanding how people negotiate and traverse various cultural identities can be aided by auto ethnography.

Thematic Analysis

Researchers may use a deductive approach, where they begin with a pre-existing theoretical framework, or an inductive approach, where themes are generated from the data itself. This method involves identifying themes or patterns

that emerge from the data, and then interpreting these themes in relation to the research question.

D. Key Characteristics of Narrative Research

Researchers who study narratives aim to comprehend the experiences of a person. The field texts that record the participant's story in his or her own words serve as the inquirer's primary source of information about the participant, with little help from the literature study. Following the gathering and analysis of data, the researcher works with the participant to verify the account and may incorporate his or her own personal experience into the final report.

The following are some essential traits of narrative analysis:

- Focus on tales and narratives: Narrative analysis examines oral and written stories and narratives to ascertain how they form and reflect the experiences and identities of the people who tell them.
- An emphasis on context is necessary because narrative analysis aims to comprehend the social and cultural contexts in which stories are created as well as the influences that shape them.
- Interpretive strategy: The goal of narrative analysis is to find themes and patterns in stories and narratives and to comprehend the significance that people and communities attribute to them.
- Iterative analysis: When conducting a narrative analysis, the researcher continually improves their comprehension of the narratives as they look at additional data.
- In order to comprehend the significance that individuals and groups ascribe to the narratives, narrative analysis pays special attention to the language and form of the stories, including the use of metaphor, imagery, and narrative structure.

- Reflexivity: When conducting a narrative analysis, the researcher must examine their own presuppositions and prejudices as well as how their positionality may affect how the narratives are interpreted.
- Approach taken from a qualitative perspective: Narrative analysis often requires in-depth examination of a small number of examples rather than extensive quantitative research.

E. Narrative Research Techniques

The objective of narrative analysis, a qualitative research methodology, is to obtain understanding of the meanings, experiences, and perspectives underlying the stories or narratives individuals share. Visual media, oral interviews, written texts, and other kinds of communication can all be subjected to narrative analysis. In narrative analysis, researchers often look at the language, themes, and symbols used by the storytellers as well as the structure, content, and context of the narratives they are examining. In addition, they might search for repeating themes or patterns in the stories and take into account the social and cultural contexts in which they are embedded.

The followings are the stages in conducting narrative research:

- Finding the research subject or topic of interest is the first step in the narrative analysis process. Researchers can seek to go deeper into a certain person's experience or investigate a specific social or cultural phenomena.
- Gather the narratives: Next, researchers gather the accounts or tales that they will examine. This may entail gathering written materials, conducting interviews, or examining visual materials.
- Narratives are transcribed and coded: After the narratives have been gathered, they are written down and coded to find themes, motifs, or other patterns. Either an existing coding scheme or one created particularly for the study may be employed by researchers.

- The narratives are then examined by the researchers, with an emphasis on the themes, motifs, and other patterns that have appeared as a result of the coding procedure. They may also examine the narratives' formal composition, the chosen language, and the social and cultural setting in which they are embedded.
- Analyze the results: The results of the narrative analysis are next interpreted by the researchers, who then make judgments on the meanings, experiences, and perspectives behind the narratives. They might utilize the information to create theories, offer suggestions, or guide future investigations.

F. Individual Task

Answer the following questions based on your understanding after reading the material from this chapter!

1. What is narrative research?
2. What is the purpose of narrative research?
3. What are types of narrative research?
4. How to conduct a narrative research?
5. What are the characteristics of narrative research?

CHAPTER 11

ETHNOGRAPHIC RESEARCH

This chapter focus on:

- Briefly define and state the purpose of ethnographic research.
- Describe the ethnographic research process.
- Identify and describe the different types of ethnographic research.
- Describe the key characteristics of ethnographic designs.
- Describe ethnographic research techniques.

A. Introduction to Ethnographic Research

Ethnography is a qualitative data gathering technique that is often used in the social and behavioral research sciences. Data are obtained through observations and interviews to find out how communities and individuals function. Ethnographers watch life as it is rather than trying to regulate it in a lab. Due of the unpredictability of life, ethnographers usually require assistance in summarizing their endeavors in a manner that the Board can find useful. An ethnographic study looks at how a group of individuals behave and communicate with one another. Making observations about individuals is more important than concentrating on intricate statistics and figures.

Researchers can still learn a lot about how to conduct ethnographic research even though researchers probably won't be traveling to any isolated islands any time soon, including:

- How crucial is context?
- Prioritizing the viewpoint of the research's subject
- Detailed knowledge of a group of individuals and their life Observation of a society from within

- Comprehensive and built on quality

An ethnographic research approach involves observing and/or interacting with study participants in their natural surroundings. Although anthropology popularized ethnography, it is employed in a variety of social disciplines. Ethnography is used to promote a designer's better understanding of the design challenge, including the relevant domain, audience(s), processes, goals, and context(s) of usage. These fields of study include usability, user-centered design, and service design. Getting "under the skin" of a design challenge (and all of its related concerns) is the goal of an ethnographic research conducted as part of a usability project. By achieving this, it is intended that a designer will be able to comprehend the issue completely and provide a much better solution.

Depending on the field, the size of the sample, and the research objective, ethnographic research may employ one or more research methods. The five primary methods of conducting ethnographic research are as Naturalism, participant observation, interviews, survey, and archive research.

Naturalism

The goal of naturalism, sometimes referred to as live and work ethnographic study, is to recognize and document behavioral patterns by watching research variables in their natural environment. It can involve observing the group in its natural environment and documenting their behaviors there. The earliest approach of ethnographic study, naturalism, may help the researcher and the variables establish a connection. When using this strategy, the researcher must reduce subject interference to obtain the most impartial findings. It is possible to observe naturally without being noticed. People are unaware that they are being observed when naturalistic observation is done covertly, but they are conscious when observation is done openly. The most precise and pertinent information is obtained when using the life and work technique and observing subjects in their natural

setting. Modern ethnographers steer clear of this approach since it is costly and time-consuming, particularly in the fields of health and education.

Participant Observation

The ethnographer actively engages with the research subjects while doing participant observation. This approach reflects both life and work. In contrast to live and naturalistic observation, participant observation involves the ethnographer actually being a part of the group. The researcher receives information that is exclusive to the group. There are both covert and overt participant observations. In the former, the ethnographer poses as a research subject. The ethnographer enters the group in an unmasked participant observation technique and identifies themselves as a researcher. Because it is reactive, this approach differs from hidden participant observation. Participant observation provides greater information to ethnographers. From the viewpoint of the participant, they have a greater understanding of the experiences and routines of the research subjects. This study strategy has limitations. First, the researcher's presence may have an impact on research subjects' behavior, particularly when undisguised participant observation is used. One more issue is research bias. Because of their interactions with the group, ethnographers could lose their objectivity, which could skew the outcomes of experiments.

Interviews

The most authentic study findings are those produced via ethnographic interviews, which combine in-depth observation with one-on-one conversations. In this design, while engaging in research-related activities, the ethnographer converses with the research team. Data on the objectives and behavior of the study group are gathered through this contextual inquiry. While observing the study team in its environment, the ethnographer may inquire about it. An informal, impromptu anthropological interview is typically the result of the researcher's interaction with the interview subjects. When the ethnographer engages with the research group to

understand their way of life, participant observation frequently leads to the ethnographic interview. The researcher can obtain the most pertinent and genuine information from the study group through an ethnographic interview, a two-way research method. Ethnographer-subject connections, however, can skew experimental results.

Survey

The subject is being studied using inductive research techniques such as ethnographic surveys. A research strategy called analytical induction use survey questions to evaluate theories. A survey will help the ethnographer gather information, analyze it, and come to unbiased findings. Analytic induction aims to pinpoint the root reasons of the study group's behaviors and offer convincing justifications. The researchers are suggested to use a variety of question styles to acquire the most pertinent results from your survey. Questions for ethnographic surveys frequently use Likert scales, are open-ended, multiple-choice questions, and are close-ended. High drop-out rates and survey response bias are significant disadvantages of this research approach. However, this method is quick and economical when used online and can provide important details about a research team.

Archive Research

Archival research is a qualitative ethnographic research technique that assesses previous studies, documents, and other sources pertaining to the research group to uncover pertinent data. This procedure is described as understanding. Instead than relying on physical presence, archival research uses ethnography to investigate related historical resources. All research variable data are analyzed. Archival research reduces experimental biases because the ethnographer does not interact with the subjects. For more precise results, the ethnographer might also make use of a sizable data set. Due to randomization, archival research may not accurately reflect the research group. Research findings may be impacted by biased archival data.

B. Ethnographic Research Process

It's just as crucial to comprehend the reasoning behind this type of research as it is the actual procedures. Similar to quantitative research, ethnographic research has a long history and a community of researchers who are always improving and creating useful and relevant study methodologies. Unfamiliar with the anthropological research tradition, educational researchers frequently equate this type of research with journalistic reporting and anecdotal or impressionistic story-telling. They anticipate that someone will enter a situation, take a few moments to look around, speak with a few people, and then make a report on his impressions. They postulate that anyone there may generate the same insights by recording their memories in writing. They doubt the validity of this research and worry about its objectivity. By outlining the real techniques, this section will try to close the significant gap between ethnographic and non-ethnographic researchers.

A variety of particular approaches are used in ethnography. You must choose which techniques to employ. This is dependent upon the evaluation issue, the context of the investigation, the accessibility of participants, and the materials. Document analysis is a type of research that may be used, such as reviewing all the board meeting minutes from a health service or starting with the organizational chart.

The researchers will immerse themselves in the investigational environment. It's crucial that they build trusting relationships with the organization or community. The researcher may locate informed sources who can serve as a conduit for comprehending and engaging with the community. The researcher could choose individuals to represent a variety of experiences. As the study progresses, the researcher's strategy to data gathering in ethnography can change, or data can be collected opportunistically. Flexible analysis is used to find themes and any gaps or unanswered problems that need more research. The researcher will frequently visit patients' homes, spend time in organizations, and sit in a clinic. Interacting with participants using digital ethnography may entail using a virtual

setting. The researcher observes activities and converses with participants, either informally during observations or more formally during scheduled interviews.

The researcher typically takes field notes. These are qualitative notes taken throughout or immediately following observations. They contain both factual data (times, dates, observed behaviors, participant comments), as well as the researcher's views and interpretations.

Since interpretive research like ethnography is possible to be biased. In an effort to combat this, researchers frequently make an effort to critically reflect on their own thinking and involvement, documenting it and working through any presumptions or challenges that arise (this is known as critical reflexivity). To double-check their conclusions, they frequently include other members of the review team. By discussing their interpretations with participants, they may be able to validate the results.

Reading and rereading the study materials while utilizing a constant comparison technique, where each finding is compared with earlier discoveries, is a common practice in data analysis. This is a method of making sense using the many sorts of gathered evidence. Frequently, it takes the shape of a theme analysis. The researchers can use an existing theory in the analysis, or the researchers might create a brand-new theory that enables to respond to the facts more quickly.

C. Different Types of Ethnographic Research

Depending on the study's focus and goals, there are many types of ethnographic research. Following are a few typical forms of ethnographic research:

Classic Ethnography

In order to do this kind of ethnographic study, a community or group must be observed and engaged with over an extended period of time. By becoming fully immersed in the community's daily life, the researcher hopes to gain an understanding of its culture, beliefs, customs, and social structure.

Auto Ethnography

In auto ethnography, the researcher draws on their own life experiences to learn more about a particular group of people or culture. Personal narratives, journals, or other kinds of self-reflection may be used by the researcher to examine how their own life experiences connect to the culture under study.

Participatory Action Research

In collaborative action research, the researcher identifies and addresses social issues impacting a community in conjunction with members of that community or group. The researcher wants to give the community members the tools they need to participate actively in the study and use the results to drive forward constructive change.

Virtual Ethnography

Virtual ethnography is the study of a certain community or culture through the use of online or digital media. The researcher may watch and communicate with the target audience through social media, online forums, or other digital platforms.

Critical Ethnography

The goal of critical ethnography is to highlight social and power disparities within a particular community or culture. The researcher may utilize what they see to challenge prevailing cultural narratives or to spot chances for social change.

D. Key Characteristics of Ethnographic Research

The following are essential characteristics of ethnographic research:

1. Rather than in a lab, subjects are studied in their natural environment
2. The study necessitates intimate, in-person communication between the researcher and the participants.
3. Results in a precise reflection of perspectives and actions
4. The inductive, participatory, and recurring collecting of unstructured material used in ethnography is analyzed to create theories about regional cultural practices.
5. The majority of data collection comes from fieldwork experiences.
6. It makes use of a variety of data collection techniques, including interviews, observations, and the examination of artifacts and visual materials.
7. All human behavior and beliefs are placed inside a sociopolitical and historical perspective by the investigation.
8. Results are interpreted via the prism of culture
9. Places a focus on examining the nature of specific social processes.
10. It only looks into a few cases, generally just one, but it does so thoroughly.
11. The explicit interpretation of the purpose and significance of human behavior is a step in the data analysis process. The description of themes includes interpretations that take place inside the context or group.
12. Researchers should consider their influence on the area and the local community.
13. Provides explanations for people's behaviors and actions that should be discovered through research into what individuals do and why they do it.

14. It also provides a non-researcher and non-person depiction of a person's life and behavior. Instead, the representation is based on the understanding and miscommunication between the subject and the researcher.
15. No description of anything can be produced by ethnographic study that is exclusive or definitive. Instead, it offers condensed descriptions that are necessary given the time constraints and unique situations.

E. Ethnographic Research Techniques

The followings are some ethnographic research techniques.

Observer Participation

This entails the researcher being there for the group being studied in daily activities and interactions, as well as direct observation. This method aids the researcher in developing a thorough grasp of the social dynamics, culture, and behavior of the group.

Interviews

Ethnographic researchers conduct interviews to learn more about the beliefs, values, and practices of the group. Interviews can be performed in a group environment or one-on-one and can be professional or informal.

Surveys

Surveys are a useful tool for gathering information on a range of subjects, including opinions about a certain topic or patterns of behavior. Surveys can be used by ethnographers to collect quantitative data in addition to qualitative data.

Analysis of Documents

Analyzing textual or visual materials created by the group under study, such as publications, images, or social media posts, is part of this process. Analysis of the documents might reveal information on the activities, beliefs, and values of the group.

Field Notes

Ethnographic researchers take thorough field notes of their interactions and observations of the population they are studying. These notes can be used to examine the data gathered as well as to help the researcher arrange their thoughts and observations.

The Focus Groups

Focus groups are a type of group interview that let the researcher collect data from several participants at once. Exploring common beliefs or experiences within the group under study can be done effectively using this method.

F. Individual Task

Answer the following questions based on your understanding after reading the material from this chapter!

1. What is ethnographic research?
2. What is the purpose of ethnographic research?
3. What are 5 primary methods in ethnographic research?
4. What are the characteristics of ethnographic research?
5. What are some ethnographic research techniques?

CHAPTER 12

CASE STUDY RESEARCH

This chapter focus on:

- Briefly state the definition and purpose of case study research.
- Describe the case study research design
- Explain how sample is selected in case study
- Briefly describe how multiple case study is conducted and analyzed

A. Introduction to Case Study Research

A case study is a comprehensive examination of one individual, family, or event. In order to look for patterns and causes of behavior, practically every aspect of the subject's life and background is examined in a case study. Numerous disciplines, including anthropology, political science, education, psychology, medicine, and the social work, can benefit from the utilization of case studies. A case study aims to learn as much as possible about a person or group so that the findings can be applied to a wide range of people. Unfortunately, case studies can involve a great deal of subjectivity, making it challenging to extrapolate findings to a wider audience.

A case study may offer advantages as well as disadvantages. Before determining whether this kind of study is suitable for their purposes, researchers must weigh these advantages and disadvantages.

One of a case study's biggest benefits is that it enables researchers to look at things that are frequently challenging or impossible to replicate in a lab. Other advantages of a case study include:

- enables researchers to gather a large amount of data
- Give researchers the chance to gather data on uncommon or rare cases

- allows for the development of ideas that can be tested in experimental research

On the detriment, here is a case study:

- not always applicable to the general population
- cannot prove causation and effect
- maybe lacking in scientific rigor
- can result in bias

If a phenomenon is novel or very recently found, researchers may decide to do a case study. The knowledge gathered from such research can assist the researchers in creating new concepts and research issues that may be investigated in the future. It's crucial to keep in mind, though, that case study findings cannot be utilized to establish causal links between different variables. Case studies, however, might be used to generate theories that are later tested in experimental research.

Case studies can take several different forms, which researchers may use:

- **Collective Case Study:** Studying a group of people is included in collective case studies. A community as a whole or a particular group of people may be the subject of a study. For instance, psychologists might investigate how a community's resource accessibility has impacted the residents' overall mental health.
- **Descriptive Case Study:** Start with a descriptive theory while doing a descriptive case study. The information acquired from the subjects' observations is then compared to the prevailing theory.
- **Explanatory case studies:** These are frequently employed in causal analysis. In other words, scientists are interested in examining elements that might be to blame for specific events.

- Exploratory case studies: These are occasionally used as an introduction to more extensive research. As a result, before formulating their study questions and hypotheses, researchers might acquire additional data.
- Instrumental Case Study: When a person or group enables researchers to comprehend more than what is initially obvious to viewers, this is known as an instrumental case study.
- Intrinsic Case Study: Case studies that are intrinsic are those in which the researcher has a personal stake in the outcome of the case. An intrinsic case study can aid in the creation of a psychological theory, as demonstrated by Jean Piaget's studies of his own children.

B. Steps in Conducting Case Study Research

The case study method requires a number of actions. To be aware

1. Establish and specify the research questions.
2. Choose examples, choose data collecting and analysis methods
3. Getting ready to collect data
4. Gathering information in the field
5. Analyze and judge the data.
6. Get the report ready.

These six steps are all that are required to finish the case study.

The first stage in conducting scientific research is to choose a clear research topic that will serve as the researcher's guide as they investigate a complex phenomenon or object. By posing questions regarding the issue or condition being researched and choosing a purpose for the study, the researcher determines the study's focus. In order to gather information that will help understand the case and

provide answers to the research questions, the investigator thoroughly investigates the subject of the study.

The selection of one or more real-world examples to explore in depth, as well as the methods and tools to be employed for data gathering, are all decisions made by the researcher during the research design phase. When employing many cases, each case is handled separately. The conclusions of each case can then be used as data that adds to the overall study, but each instance is still treated as a separate case.

The researcher must choose between cases that are unusual in some way and cases that are thought to be typical. The researcher can also choose cases to represent other geographical locations, different size characteristics, or other parameters. In order to focus on where to look for cases and data that will satisfy the objective of the study and address the raised research questions, it can be helpful to refer back to the study's purpose throughout the selection process. Choosing numerous or distinctive situations is an important factor.

Because case-study research generates a lot of data from various sources, systematic organization of the data is crucial to keep the researcher from becoming overwhelmed by the volume of data and from losing focus on the research's initial objectives and questions search. Prepaid planning helps with the orderly and recorded processing of big amounts of data. The researchers create databases to help with categorization, classification, storage, and retrieval of data for study.

In order to identify convergent lines of inquiry and patterns, the researcher must extensively and methodically gather and preserve multiple sources of material in formats that can be referenced. The case study subject is extensively examined by the researchers who then pinpoint causative elements linked to the observed phenomenon. As the study goes on, it could be essential to renegotiate the agreements with the study's subjects or add new questions to the interviews. Although case study research is adaptable, any changes are meticulously recorded.

C. Selecting Sample in Case Study Research

Case Study in making decisions about sample procedures, the number of case studies, and the analysis unit are all part of the sampling process.

A type of qualitative analysis is the case study. It is a highly common technique that entails meticulously and completely counting every single person, organization, neighborhood, etc. With this approach, the researcher thoroughly investigates it. Case studies use the single-case, multi-case, and snowball sampling frames.

Single Case Study

Single-case studies are studies that focus solely on a single unit. When additional sub-units are incorporated into the case that is being researched, complexity may then develop. As a result, selecting participants (units) for the study in a single-case design becomes much more difficult. However, due to the ease of the process, researchers would still favor selecting a single-case study with a single unit of analysis over other sampling methods.

Once a researcher has focused the study in a specific direction and the path of the study changes, issues could then occur. In the case of a one-unit analysis, taking into account other aspects of the study or learning new facts or viewpoints may have an impact on the design of the entire study. In such circumstances, the researcher may simply accept the new development and carry on with the study, or they may alter the sampling strategy and select more subjects with comparable features.

Multi Case Study

The method of choosing participants in research is based on several illuminating, interpreting, and comprehending goals. For the goal of choosing case studies, a variety of sampling strategies are used.

- Although handy, accidental, or haphazard sampling methods can be used, they rarely result in useful samples and are therefore rarely advised.
- A more effective alternative to random or accidental sampling is quota sampling. This approach is preferred for interviewing a group of individuals, each of whom has unique qualities.
- Quantitative investigations typically use stratified sampling. It can be applied to single-case designs in which participants with vastly dissimilar features are grouped together.
- In qualitative research, judgmental sampling is frequently used. For specialized or niche settings, individuals are sampled in this. The following are the three situations in which the judgmental sampling technique is useful: when choosing unusual situations that are truly instructive, researchers should, when choosing participants from specific demographics, and whenever researchers want to pinpoint a certain group of cases for in-depth analysis.

Instead of attempting to generalize the results, the goal is to thoroughly comprehend the unique circumstances. Generalization is not a problem; non-random selection of people is not possible.

Snow Ball

A researcher who like to choose participants for their research projects from a variety of stratified strata but who also wants to maintain an impartial stance during the selection process can employ the snowball or network techniques. It's crucial to use the phrase impartial. The researcher determines where, how, and why to roll the snowball. If a researcher wants to employ the method, they must first establish contact before their suggestions can be taken into consideration for further studies. And with each round, the size of this snowball grows, increasing the number of participants in the study.

D. Conducting and Analyzing Case Study Research

In order to establish connections between the search object and the findings with respect to the initial search questions, the researcher evaluates the raw data using a variety of interpretations. The researcher keeps an open mind to fresh opportunities and insights as they arise during the evaluation and analysis process.

The case study approach gives researchers the chance to triangulate data to reinforce the research's findings and conclusions by utilizing a variety of data collection and analysis methodologies. The analysis's strategies compel researchers to look beyond first impressions in order to increase the possibility that their conclusions are correct and trustworthy.

Examples of case studies provide you the freedom to purposefully arrange data in a variety of ways to reveal or generate novel concepts and search for incongruous facts to rule out the analysis. Researchers categorize, tabulate, and recombine data to address the initial hypotheses or objective of the study. They also conduct cross-checks of the facts and look for inconsistencies in the stories.

E. Individual Task

Answer the following questions based on your understanding after reading the material from this chapter!

1. What is case study research?
2. What are advantages and disadvantages of case study research?
3. What are six steps in conducting case study research?
4. How to select sample in case study research?
5. How to conduct and analyze case study research?

CHAPTER 13

RESEARCH AND DEVELOPMENT (R&D)

This chapter focus on:

- Define R&D.
- Distinguish between R&D designs.
- Describe strategies for data collection techniques in R&D.
- Describe strategies for conducting R&D data analysis.

A. Introduction to Research and Development (R&D)

In this age of fast change, education is experiencing many difficulties much like any other industry, group, or area of life. Development in the field of education is necessary to meet the difficulties, and research is the greatest way to do this. Activities in research and development can aid in the evolution of existing curricula, learning resources, teaching strategies, and assessment systems. Innovation is thus the result of study leading to development.

Research and development (R&D) is the process of developing a new product, new body of information about an existing process, or both. The new information generated by this methodical creative activity is then applied to the formulation of new materials or entirely new goods, as well as to the modification and enhancement of already existing ones.

The term "research and development" (R&D) refers to all investigative activities carried out by educational institutions with the goal of making a discovery that may result in the creation of new educational products or procedures, such as curricula or learning materials, or the enhancement of already existing ones.

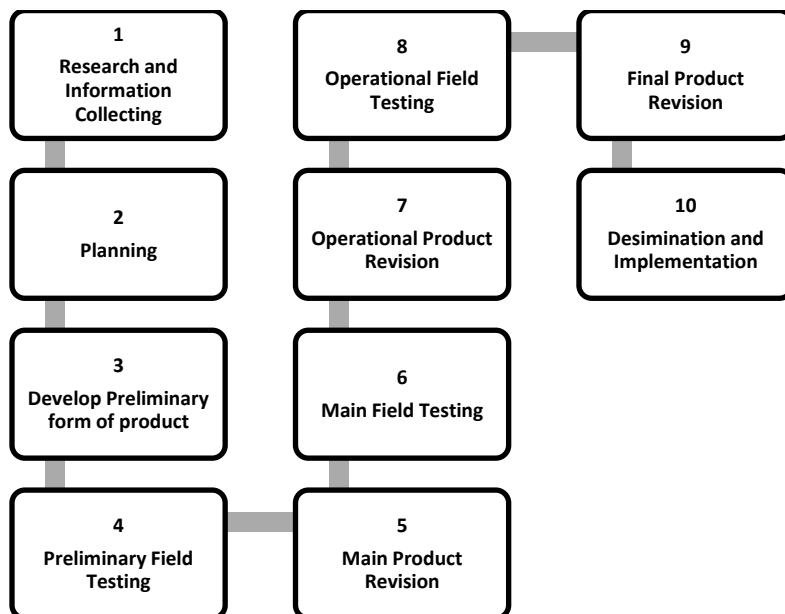
Any educational institution's success depends heavily on research and development. There are two main categories of research used in R & D. It systematically blends academic and applied research with the goal of solving

problems or developing fresh teaching materials. It entails conducting market and learner needs research, then creating new and improved goods and services to meet those requirements.

B. Steps in Conducting Research and Development (R&D)

Research and Development Borg and Gall

This development paradigm employs a waterfall path during the development stage. Borg & Gall 1983. The Borg and Gall development model has ten implementation steps, making the sets relatively long. These steps are: (1) research and data gathering; (2) planning; (3) product draft development; (4) field trials; (5) initial product refinement; (6) field trial; (7) perfecting the product of field test results; (8) field implementation test; (9) final product refinement; and dissemination and implementation. The graphic below illustrates the steps:



Process of Research and Development Model from Borg and Gall

The following sections provide a detailed description of each stage of this research's development.

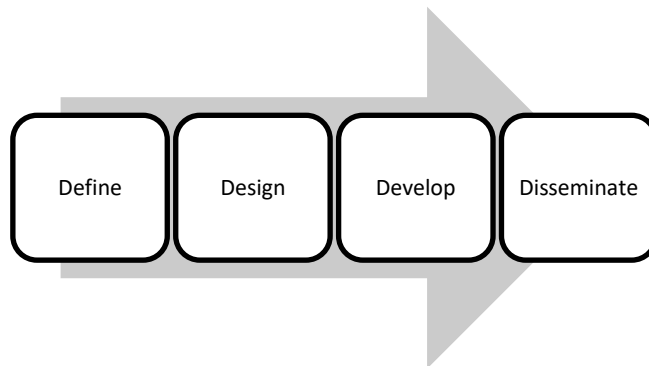
1. This process includes doing literature reviews on issues linked to the challenges under study and getting ready to create a research framework.
2. Planning include formulating the knowledge and abilities pertinent to the issue, deciding the goals to be met at each stage, and, if feasible or required, conducting a brief feasibility assessment.
3. Create an early version of the product that represents its starting condition for production. This step entails the creation of auxiliary elements, the creation of instructions and manuals, and the assessment of the viability of auxiliary tools.
4. Conducting limited-scale initial field trials as part of preliminary field testing. By including up to 6–12 subjects. In this step, data collecting and analysis may be carried out through observations, questionnaires, or interviews.
5. The primary product modification entails enhancing the original product created in response to the findings of the initial trial. The primary product (model) draft will most likely undergo this improvement more than time, in accordance with the findings of a smaller trial, in order to prepare it for wider testing.
6. All students will take the primary test, or major field testing.
7. Operational product revision entails making adjustments to the findings of a more thorough trial so that the generated product is already an operational model design that is prepared for validation.
8. Operational field testing, a phase in the validation process for the developed operational model
9. Final product revision entails making last-minute adjustments to the created model in order to create a finished (final) product.

10. The steps of dissemination and implementation are used to apply the generated product or concept in the real world.

Both benefits and drawbacks might be associated with the Borg and Gall development approach. The strengths of this model include its ability to create products with high validation values and its promotion of a continuous product innovation process; however, its weaknesses include the fact that it takes a while to complete because the process is difficult and expensive.

4D Development Model

Four stages of development make up the 4D Development Model. The first stage is Define, also known as the needs analysis stage, followed by Design, which involves creating a conceptual framework of models and teaching resources, and Develop, which is the third stage. The dissemination step, or implementation on research goals, follows the development stage, which entails validation testing or evaluating the viability of the media.



Process of 4D Development Model

1. Stage Definition (Defining)

The defining of development requirements is the first stage in the 4D model. This phase is, to put it simply, the needs analysis phase. In order to determine the

amount to which action is required during product development, the developer must consult the development requirements, assess the data, and gather information.

Analyzing prior research and literature studies can be done during the stage of defining or analyzing demands. According to (Thiagarajan, 1974), there are five actions that can be completed at the designated stage, including:

Preliminary Evaluation

To establish the fundamental issues with the learning process and provide the context for the need for development, the initial analysis is conducted. A preliminary analysis gives the researcher or developer a general overview of the information and possible solutions. This can aid in deciding on and choosing the learning materials that need to be created.

Learner Evaluation

A student analysis is a process used to pinpoint the traits of the students who will be the focus of the creation of learning materials. The traits in question have to do with intellectual prowess, cognitive growth, drive, and individual knowledge of subjects, media, formats, and languages.

Task Evaluation

The goal of task analysis is to pinpoint the talents that the researcher looked at before breaking them down into any other skill sets that might be required. The educator in this situation assesses the key tasks that they must master to ensure that students meet the required minimal competencies.

Concept Evaluation

Concept analysis is identifying the key ideas that need to be taught, organizing them in a hierarchy, and breaking down each idea into relevant and

irrelevant components. In addition to assessing the concepts that will be taught, concept analysis also organizes the stages that will be taken logically.

Defining Learning Objectives as Instructional Objectives

Learning objectives can be effective to summarize the findings of concept analysis and task analysis and ascertain the behavior of the study object.

2. Stage Design (Designing)

The 4D model's second stage is design. At this stage, four tasks must be completed: creating a criterion-referenced test (creating test standards), choosing a medium (media selection), choosing a format (format selection), and creating an initial design (first design).

Making Criteria-Referenced Tests

A step that joins the defining stage and the design stage is the creation of test standards. Based on the findings of the analysis of the specification of learning objectives and the analysis of students, test standards are created. A test grid for learning outcomes was created from this. The test is tailored to the students' cognitive capacities, and an evaluation guide that includes a scoring manual and a list of all the correct answers is used to score the test results.

Media Selection

In general, the selection of media is to choose educational tools that match the features of the subject matter. The choice of media is made in accordance with the findings of idea and task analyses, student user characteristics, and distribution strategies including numerous media types. The choice of media must be made with the goal of optimizing the utilization of instructional resources while generating instructional materials for the learning process.

Format Selection

The format chosen while creating learning tools tries to define the layout of learning media as well as the choice of techniques, tactics, and resources.

Initial Concept

The learning device's basic design, which must be completed before to the trial, is its general layout. This plan comprises a variety of structured learning exercises and the application of distinct learning styles using instructional strategies (Microteaching).

3. Stage Development (Developing)

The development of 4D model learning tools is the third stage. The stage of product development is called the development stage. This stage consists of two steps: developmental testing (development trials) and expert appraisal (expert assessment) with changes.

Expert Evaluation

The expert appraisal is a method for obtaining recommendations for significant improvement. By having experts evaluate learning tools, developing ideas for improvement, then revising the gadgets in accordance with their recommendations. Learning tools are anticipated to become more exact, effective, tried, and have high approaches after expert examination.

Testing during development (trial development)

Development trials were conducted to obtain direct feedback on the produced learning materials from students and observers in the form of responses,

reactions, and comments. Trials and revisions are repeated to find learning aids that are reliable and efficient.

4. Stage Dissemination (Disseminating)

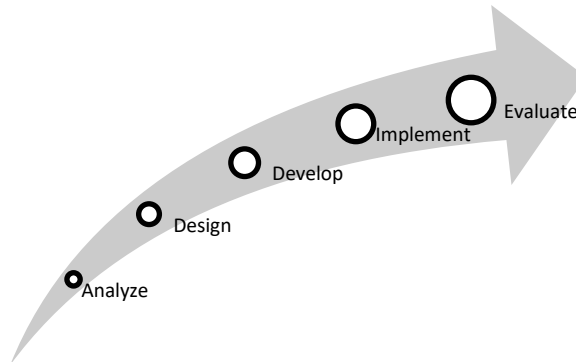
The dissemination stage is the final step in the creation of 4D model learning tools. The most crucial yet frequently ignored stages are the final packaging, dispersion, and adoption. The dissemination step is used to market the created product in order for people, groups, or systems to accept it. Selective packaging materials are required to obtain the proper form. The dissemination step is divided into three primary phases: validation testing, packaging, and diffusion and adoption.

The product that has been modified during the development stage is implemented on the actual target during the validation testing step. At this stage, measurements of goal attainment are also made with the intention of figuring out how effective the product that is being developed is. Additionally, after goals are executed, researchers and developers must monitor the outcomes and explain any unsuccessful solutions to prevent them from occurring again after the product is released. When a product is in the packaging, diffusion, and adoption stages, it is packaged by printing an application manual, which is then disseminated so that it can be assimilated, comprehended, and adopted by others in their class. User analysis, strategies, and themes, timing of dissemination, and choice of dissemination medium are all things that need to be taken into account when carrying out dissemination.

The 4D model's benefit is that it doesn't take a lot of time because the phases aren't overly complicated. The 4D model's flaw is that it only gets to the deployment stage; there is no evaluation step, where evaluation is supposed to gauge the product's quality after testing; product quality tests are conducted for outcomes both before and after utilizing the product.

ADDIE Model

A development model, known as the ADDIE model, was created by Dick et al. (2005). The model has five stages.



Process of ADDIE Model by Dick et al.

Analysis

The first step in the ADDIE development research methodology is to assess the demand for new product development (models, methods, media, and instructional materials) as well as the viability and prerequisites of product creation. A problem with an already-existing or-currently-applied product can spark the development of a new product. Because current or accessible items are no longer appropriate for target needs, learning environments, technology, student characteristics, and other factors, problems can and do arise.

Design

Designing the concepts and content of the product is the first step in the systematic process of design activities in the ADDIE development research model. For each component of the product, designs are written. The product's manufacturing process and implementation instructions are intended to be written in a straightforward and thorough manner. The product design is still conceptual at this point and will guide the development process moving forward.

Develop

Activities for the realization of already made product designs are included in development in the ADDIE development research model. A conceptual framework for putting a new product into use was created at the earlier stage. The conceptual foundation is subsequently translated into a finished, deployable product. Instruments to gauge product performance must also be created at this point. It is applied in the ADDIE research and development paradigm to get input on the product being created or produced. The researchers can get preliminary feedback (early evaluation) by posing queries about the objectives of product development. The product design that has been created is referred to in the application.

Implement

The ADDIE model's fourth phase, known as implementation, is when students actually receive the lessons and materials that have been created for them over the course of the first three phases. Because learning actually takes place during this stage, it is debatably the most crucial.

Evaluate

In the ADDIE model development research, the evaluation stage is used to gather user feedback so that adjustments can be made in response to the evaluation's findings or to needs that the product hasn't been able to satisfy. Evaluation's main objective is to gauge how well development objectives have been accomplished.

C. Data collection Techniques in Research and Development (R&D)

Document Analysis

Researchers often utilize document analysis as a qualitative research method. The procedure entails assessing both electronic and paper documents in order to evaluate, comprehend, and build upon the information they contain.

Observation

A technique for gathering information through observation of individuals, situations, or physical qualities as they are occurring naturally. Observations can be overt—the subjects are aware that they are being watched or covert the subjects are unaware that they are being monitored.

Observer participation

The researcher participates in the context or culture being studied. For a study to be successful, the researcher needs to be accepted as a member of the culture being studied.

Unmediated Observation

In order to avoid skewing the observations, the researcher tries to be as unobtrusive as possible; they are more impartial. Technology (such as video and audio recording) can be valuable.

Unreliable Observation

Results of an encounter, process, or behavior are monitored (for instance, gauging how much plate trash children leave in a school cafeteria to assess the acceptability of a novel food).

Interview

A qualitative research technique used to get first-hand information is an interview. It entails asking one or more individuals their thoughts on a business, a product, or a subject. Researchers can acquire specific data using this strategy that may not be accessible using other research methods.

Need Analysis

The knowledge and skills required to accomplish the aims and objectives of an organization are identified through a needs analysis. A technique called needs analysis aims to comprehend the nature of performance issues and find remedies. Information collection is the process of needs analysis. The methodical creation of curricula includes needs analysis, especially in the sphere of education.

D. Conducting and Analyzing Research and Development (R&D)

The research and development method, sometimes referred to as R&D (research and development), is a research technique used to identify, design, and build specific goods before testing their efficacy. Research is required to test the effectiveness of the product so that it can function in the larger community (CAR or experimental methods are used). Research is used in the nature of needs analysis to be able to produce certain products (survey or qualitative methods are used). The product can be used once it has undergone testing. Applied research is the process of putting items through experiments.

A strategy used to develop, specifically plan, formulate, validate, and revise an educational product, is research and development in the context of education (also known as educational research and development). R&D produces products that can be used immediately, unlike regular research, which simply generates suggestions for improvement. The educational products produced can take the form of specialized curricula for particular educational needs, teaching strategies,

educational media, textbooks, modules, educational staff competencies, evaluation systems, competency test models, classroom setups for particular learner models, models of production units, management models, employee development systems, payroll systems, and others.

The challenge and chosen study strategy affect data analysis in research and development (R&D). The research and development (R&D) model can be divided into three primary categories based on the many R&D models that have been mentioned: preliminary testing (hypothetical), development, and product trials.

E. Individual Task

Answer the following questions based on your understanding after reading the material from this chapter!

1. What do you understand about Research and Development?
2. What are steps in conducting Research and Development?
3. How to distinguish Research and Development Borg and Gall, 4D Model and ADDIE model?
4. What are data collection techniques in Research and Development?
5. How to analyze data in Research and Development?

CHAPTER 14

ACTION RESEARCH

This chapter focus on:

- State a definition of action research.
- Describe the purposes of action research.
- Describe the processes of action research.
- Identify the four basic steps in conducting action research.
- Describe the key characteristics of action research.
- Identify common data collection sources and strategies used to carry out action research in schools.

A. Introduction to Action Research

Research in education covers a wide range of subjects, including teaching and learning, curriculum and assessment, the cognitive and affective requirements of students, cultural and socioeconomic aspects of schools, and many other issues that are seen to be potentially useful in improving schools. In order to make wise decisions that ultimately impact the quality of education for their children, educational stakeholders rely on research. Therefore, the goal of educational research is to conduct methodical study to provide information on subjects important to students, teachers, administrators, schools, and other educational stakeholders. The methods used to conduct educational research in the classroom differ almost as much from issue to topic. The research methodology will be influenced by the setting, professional identity, and paradigm (a collection of assumptions and ideas that directs the enquiry). All of these will play a significant role in the ability to produce information relevant to the profession as an educator.

Education professionals and practitioners frequently employ action research, a method to educational research, to analyze and eventually improve their pedagogy and practice. In this sense, action research is a continuation of the self-

reflection and reflection that educators practice daily in the classroom. The classroom can be unpredictable and dynamic when students are actively involved in their education, requiring the teacher's constant attention. Because of these responsibilities, educators frequently can only reflect briefly and for the sake of formative assessment, adaptation, or adjustment. One way to more intentional, meaningful, and critical reflection that can be recorded and analyzed to enhance an educator's work is through action research.

Action Research's Goals

It is crucial to define the potential goals of action research in the classroom because it is one of several methods for doing educational research. This book focuses on the application of action research as a strategy to help educators pursue effective pedagogical practices by improving the caliber of teaching decisions and deeds, which will consequently improve student engagement and learning.

B. Steps in Conducting Action Research

When a person reflects on their experiences or activities, it is usually to better understand those experiences or the results of those actions in order to enhance future experiences and actions that are similar to those in question. This kind of reflection helps us learn more about these events and acts so that we can better control them in the future. Teachers in the classroom often gain new knowledge through the reflective process, which also influences how they teach.

Unfortunately, among the different sources of knowledge educators are expected to use in the classroom, the knowledge created by educators through the reflective process is not always given priority. In order to learn new information and make decisions in the classroom, teachers are supposed to rely on formal knowledge sources such as textbooks, content standards, teaching standards, district curricula, behavioral programs, etc. Despite the fact that these types of knowledge are significant, the reflective knowledge that teachers produce via their pedagogy is

an amalgam of different knowledge types used in the classroom. As a result, reflective knowledge is specifically generated through the application of a teacher's pedagogy in the classroom. The information created by educators can be formalized through action research so that it can be applied and shared across the teaching profession.

The goal of research is to generate knowledge, often knowledge about a particular concept, idea, phenomena, or topic. Knowledge about inquiry is produced through action research in relevant educational environments. Action research enables educators to learn by doing in order to advance personally or professionally. The action research process is unique in educational research due to its participatory element. There are numerous ways that the action research process might be modeled. Each model makes use of some of the following procedures:

1. Plan a change;
2. Implement the change by taking action;
3. Observe the transformation's course and effects;
4. Consider the procedure and results;
5. Act, watch, think again, and so on.



Picture . Basic Action Research

Source:

<https://kstatelibraries.pressbooks.pub/gradactionresearch/chapter/chapt1/>

There are numerous alternative models that add additional research process considerations to the fundamental action research method. Figure Action Research Model from Kemmis and McTaggart, for instance, shows an illustration of an action research spiral model put out by Kemmis and McTaggart (2004). The spiral model highlights the cyclical process that progresses past the original change strategy. The spiral model also places a strong emphasis on going back and updating the original plan in light of the initial cycle of research:

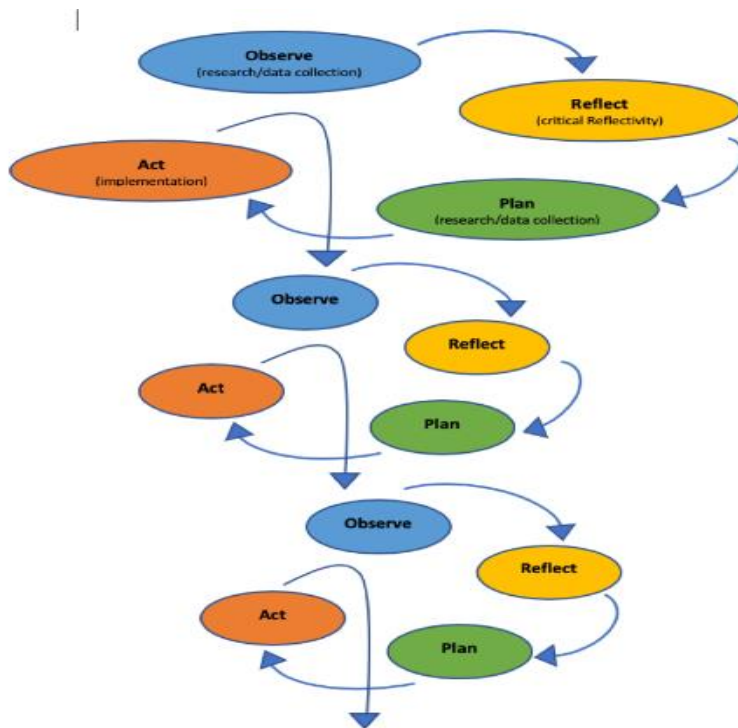


Picture . Action Research Model from Kemmis and McTaggart

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Other action research models restructure the process to highlight the distinctive ways that knowledge emerges during the reflection process. For instance, the model proposed by O'Leary (2004) acknowledges that research may take shape in the classroom when knowledge develops as a result of the teacher's observations. O'Leary emphasizes the necessity of action research being centered on situational understanding and action implementation, born naturally from current issues:

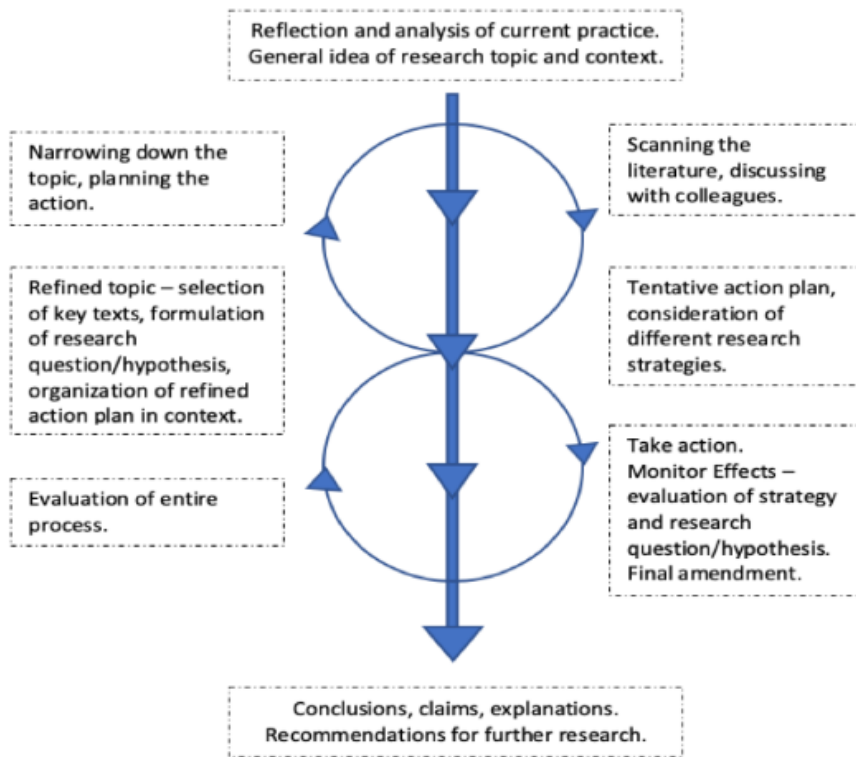


Picture . Action Research Model from O'Leary

Source:

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Finally, the action research process is described in a different way in Macintyre's (2000) paradigm. The initial reflections and conclusions serve as the benchmarks for directing the research process, according to Macintyre, who promotes a messier research process. Macintyre promotes flexibility in the planning, acting, and observing stages to enable the process to be naturalistic. Below is how we view the Macintyre process:



Picture . Action Research Model from Macintyre

Source:

<https://kstatelibraries.pressbooks.pub/gradactionresearch/chapter/chapt1/>

We advise the researchers to just use these models as broad guidelines for the process because we think it's crucial to put process flexibility first. As the researchers come to a deeper understanding of the students, the context, and the data, the process may resemble these models or it may depart from them.

C. Key Characteristics of Action Research

Action research is a method for enhancing instructional strategies. Its techniques include action, assessment, and reflection. A procedure of evidence gathering must be followed to modify practices. Participatory and collaborative,

action research. Individuals engage in it to achieve a common goal. Situation and setting are the basis of action research. Based on participant interpretations, action research creates reflection practices. Action and application are the sources of knowledge creation. Problem-solving can serve as the foundation of action research if the solution enhances practice. Since action research is iterative, it lends itself to a continuous process of reflection and modification. Plans are developed, implemented, updated, and then implemented. Findings from action research appear as the action progresses and is carried out, but they are not definitive or absolute and instead are ongoing.

D. Data Collection and Collecting Strategies in Action Research

Data gathering is an essential component of action research since it guides your decision-making. This step aims to accurately comprehend what is occurring in the classroom by utilizing a variety of data sources. A crucial choice to make at this point is selecting the data that is most pertinent to the problem being investigated and the best method to acquire it.

Action research can use a range of data sources and research techniques, depending on your objectives and research questions. You can use both qualitative and quantitative data, including words, photographs, and observations, as well as a combination of the two. Additionally, you can directly gather primary data or get secondary data from already published sources. Action research frequently uses surveys to collect quantitative or qualitative data from a large sample of participants, interviews to gather in-depth qualitative data from a smaller group, focus groups to gather qualitative data from a group with shared interests, observations to gather qualitative data from firsthand involvement in a situation, and documents to gather quantitative or qualitative data from existing sources.

E. Individual Task

Answer the following questions based on your understanding after reading the material from this chapter!

1. What is Action Research?
2. How to conduct Action Research?
3. How to distinguish Action Research model from Mc Taggart, O'Leary, and Macintyre?
4. What are key characteristics in Action Research?
5. How to collect data in Action Research?

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