People's Democratic Republic of Algeria
Ministry of Higher Education and Scientific Research
Faculty of Letters and Languages
Department of English Language

Master 1 Didactics of Foreign Languages

Research Methodology 1 & 2

A Pedagogical Manual for Master 1 Students

Specialty: *Didactics of Foreign Languages*

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Field: Letters and Foreign Languages

Department: English Language

Speciality: Didactics of Foreign Languages

Target Audience: Master 1

Teaching Unit: Methodological

Subject Title/Module: Research Methodology 1 & 2

Credits: 4 **Coefficient:** 2

Evaluation Method: continuous assessment (TD) 40%/Final Exam 60%

Duration: 15 Weeks (45h) per semester

Total number of hours per semester: 45h (course: 22h30 and TD 22h30)

Introduction

Research is not only a challenging task for EFL learners, but also an interesting feature of any degree course, as it gives learners a measure of control and autonomy over what they learn. It offers learners an opportunity to explore, clarify, pursue – or even discover – new insights into any subject or topic they are interested in. It requires a conductor's attention, that is, a process of inquiry and investigation that can help solve encountered problems and develop knowledge. Thereby, it is systematic, methodical, ethical, and is done for a purpose.

Among the most essential forms of research are the research projects that EFL learners submit as partial fulfilment of the master's degree requirement. They investigate a problem or phenomenon in two or three chapters, but the most commonly suggested option is two main chapters' extended essays, which can be written in one semester.

"Research Methodology 1 & 2" is a pedagogical manual for first-year master's students specialising in Didactics of Foreign Languages. It is an outgrowth of teaching research methodology and conducting academic research in the language sciences. Moreover, it fully complies with the standardised subject outline established by the CANEVA guidelines. In this regard, it aligns with the course content on research methodology, designed under the CANEVA framework and approved by the Ministry of Higher Education and Scientific Research.

- Incorporates theoretical, methodological, and practical tools for research project development, per ministerial standards.
- Builds on bachelor 's-level prerequisites while promoting individualised mastery.
- Ensures compliance with official LMD (Licence-Master-Doctorat) structures for Algerian higher education.

Reflections on our teaching experience in research methodology have led us to conclude that academic research is a difficult task that requires the development of many skills. The process of research accomplishment necessitates many competencies rather than instructions from teachers or supervisors. In fact, the assigned content of Research Methodology 1 & 2 is designed to develop key competencies, including.

- The ability to identify, select, and utilise theoretical frameworks for research project formulation.
- Proficiency in applying methodological tools to design and structure a research project autonomously.
- Skills in integrating practical research techniques, such as data collection and analysis, on an individual basis.

Henceforth, this pedagogical manual aims to provide an unpretentious approach to teaching students the main principles of research methodology by introducing a conceptual background, epistemological and theoretical foundations, research paradigms, approaches, and methods, and outlining some, but not all, key areas of research and research methodology. Accordingly, by the end of the second semester, students will be able to:

- Identify key theoretical tools and methodological frameworks essential for research project development.
- Comprehend how to individually appropriate and adapt theoretical, methodological, and practical elements to personal research needs.
- Analyse the structure and components required for elaborating a coherent research project.

This pedagogical manual covers both lecture content and tutorial work. It comprises 12 units; each unit first presents the theoretical material, then offers a

practical component with exercises or problem-solving tasks aligned with its learning objectives.

This pedagogical manual presents a brief introduction to research, followed by a unit on core concepts, including research problem, variable, and hypothesis. The third part is designed to acquaint students with the major branches of philosophy and the role of philosophy in educational research. The fourth unit, Research Paradigms, equips students with essential knowledge of the philosophical underpinnings of educational research. Unite Five provides a brief outline of different paradigms in educational research. It equips students with the philosophical underpinnings of three major paradigms: interpretivism, critical theory, and pragmatism. Research Ethics in Didactics are discussed in the sixth unit, which provides a brief outline of different research ethics. It equips students with the moral principles and rules that guide the planning, conduct, and reporting of research. Unit Seven highlights the three different research approaches, quantitative, qualitative, and mixed-methods, explains their characteristics, and cites their main types. The eighth unit equips students with the necessary skills to plan and conduct case study research. Action research—or participatory action research—is research initiated to solve an immediate problem. Unit nine provides some basic skills and knowledge about the nature and types of action research. The tenth part focuses on sampling and is intended to orient students on selecting a suitable sample for their research projects. The eleventh part highlights various research tools and aims to enable students to construct and administer them, including questionnaires, interviews, and observations. The last part covers data analysis. Indeed, data analysis has diverse facets depending on the research approach adopted. Thus, this part of the booklet is devoted to the process by which researchers organise, simplify, abstract, transform, and summarise the data they obtain.

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UNIT ONE: Introduction to Research

Unit 1 describes the concept of research, explains the objectives of research, cites the types of research, and explains the significance of reseach. It equips students with the basic knowledge, skills and outlook required to understand the nature of research.

Learning outcomes

After the completion of this unit, students will be able to:

- Define research
- Decide on research objectives
- Consider the types of research

Unit 1:	**An introduction to research**
Week	Topic
1	Definition of research Objectives of research
2	Types of Research Significance of Research

1) Definition of Research

In general, research is a systematic, scientific search for pertinent information on a specific topic. It can be considered an art of scientific inquiry. Creswell (2012) defines research as "a process of steps used to collect and analyse information to increase our understanding of a topic or issue" (p.3). At a general level, research is a careful process of inquiry aimed at discovering new facts in any branch of knowledge.

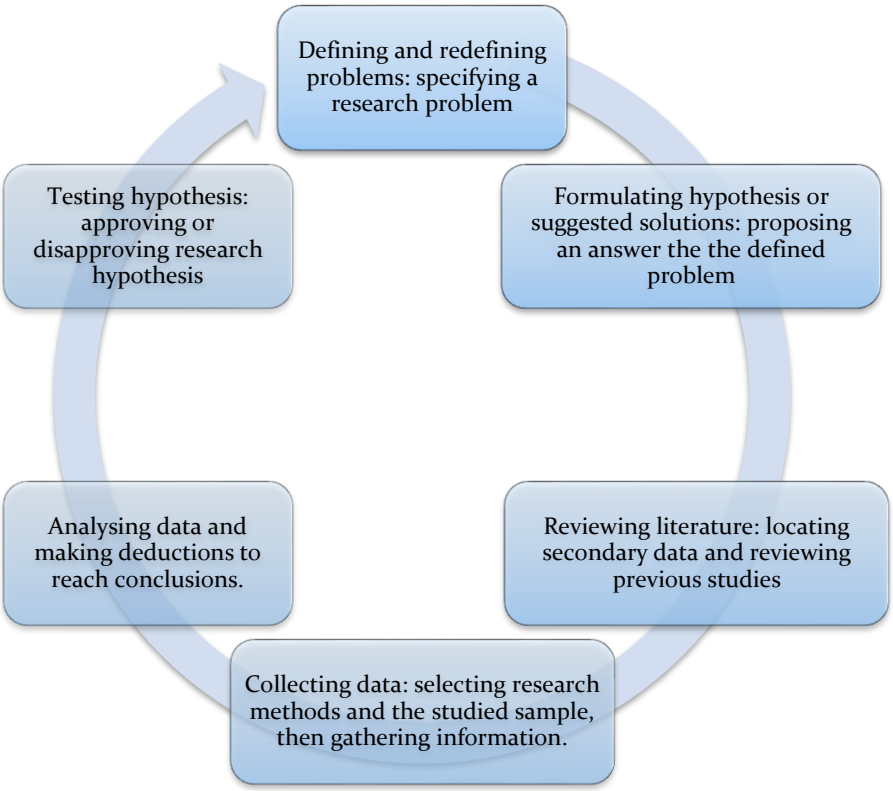
Research is the primary tool used across almost all areas of science to expand the frontiers of knowledge. By conducting research, researchers endeavour to reduce the complexity of problems, discover the relationships between apparently unrelated events, and ultimately improve the way they live.

However, regardless of its branch, all research begins with a fundamental problem or proposition about a specific phenomenon. For example, why do EFL learners prefer passive listening over holding responsibilities? Which modes of learning do EFL learners prefer? What types of assignments are most effective in increasing EFL learners' engagement? Each of these questions could be answered to some degree through well-designed research.

In fact, research is an academic activity that involves several steps. As shown in Figure 1, the research process consists of six main steps.

a) Defining and redefining problems.
b) Formulating hypotheses or suggested solutions.
c) Reviewing literature
d) Collecting, organizing, and evaluating data.
e) Making deductions and reaching conclusions.
f) Testing the hypothesis to determine whether they fit the reached conclusions.

Figure 1. *The Research Process Cycle*



In short, research can be regarded as a systematic, controlled, empirical, and critical investigation of hypothetical suggestions about the presumed relations among observed phenomena. This illustration likely includes the basic terms needed to define scientific research.

2) Objectives of Research

The objective of research is to find answers to questions through the application of scientific measures. The central purpose of research is to discover the reality that is unknown and has not yet been learned. Though each research study has its own specific goals, we may think of research objectives as falling into the following broad groupings:

a) Exploring new phenomena: research may be aimed at gaining familiarity with a phenomenon or at achieving new insights into it. In fact, studies with this aim in view are termed **Exploratory Research**.

b) Identifying or classifying the elements or characteristics of a particular subject. Research in this case aims to accurately portray the characteristics of a particular individual, situation, or group. In this manner, studies with this objective in view are recognized as **Descriptive Research.**

c) Analysing general issues to determine the frequency with which something occurs or with which it is associated with something else.

d) Testing the suggested hypothesis. Such studies are designed to test a hypothesis of a causal relationship between variables.

3) Types of Research

The basic types of research are as follows:

a. Descriptive Research: Descriptive research is conducted to identify and classify the elements or characteristics of the subject of interest. Descriptive studies are considered non-experimental and are designed to identify individuals, groups, associations, methods, and resources to describe, compare, match, categorise, scrutinise, and deduce the events and objects that define their respective fields of inquiry. Thus, this research type is concerned with investigating:

- Existing conditions or relationships
- Prevailing practices
- Held Beliefs, points of view, and attitudes.
- Subsequent effects
- Developing trends

To sum up, descriptive research aims to portray the current situation or conditions in a specific setting, that is, to document what exists at a precise moment in a given area.

b. Exploratory Research: Exploratory studies are conducted when limited or no previous research exists. The objective is to seek patterns, hypotheses, or propositions that can be tested and will form the basis for further

research. Accordingly, the primary purpose of exploratory research is to examine a phenomenon by gathering substantial data. This type of research is undertaken following a specific chronology: first, formulating hypotheses, then selecting data collection methods based on the research approach. After analysing the collected data, the research generated hypotheses that were tested based on the research conclusions. The exploratory research outcomes may then serve as a basis for further research or as a source of additional hypotheses.

c. Analytical Research: Analytical research often extends the Descriptive type of research to suggest or explain **why** or **how** something is happening. Henceforth, the analytical research attempts to describe and explain why a particular condition exists. Researchers who rely on this type generally investigate relationships between two or more variables to make inferences.

d. Predictive Research: The purpose of Predictive research is to speculate perceptively on future possibilities, based on close analysis of available evidence of cause and effect. Predictive research is concerned with investigating the present to understand its relation to the future. In this type, researchers strive to develop hypotheses that predict future outcomes. Hypothesis adequacy lies in its ability to predict a phenomenon or event successfully. If a hypothesis generates predictions supported by the data, it can be used to make predictions in other situations.

4) Significance of Research

The significance of the research is an important aspect of any research project, where the researcher explains why the study matters. It commonly denotes the research's general importance, value, and possible impact on knowledge, society, or practice.

The significance of research lies in its function to

- Filling knowledge gaps, where no or few studies exist. Researchers review previous studies, identify a gap, and then formulate research questions to address it. At this level, the research is significant in

addressing areas where current understanding is incomplete or absent in a field.

- Solving real-world problems. This function requires addressing problems or issues, such as reading anxiety, and searching for potential solutions. Through research, you can develop results that help to answer questions, and as you gather these results, you advance a profound understanding of the problems.
- Advancing knowledge in fields like education and didactics. Research in this case may be significant for building theories or generating data for future use.

All in all, to speculate about the significance of research, researchers discuss how a study contributes uniquely, such as by solving problems, filling a knowledge gap, challenging assumptions, or applying a theory to real-world problems (e.g., using basic research on learning to improve student outcomes). In your course context, as students of foreign language didactics, suppose that you decide to research how primary schoolchildren learn English as a foreign language. If you study how children develop communicative skills and past research has not examined this topic, your research addresses a knowledge gap.

Tutorial:

Exercise 1: Fill-in-the-Gap

1. Research objectives include _____ phenomena and _____ relationships.
2. To _____ a problem, we first describe it accurately before forming a _____.
3. An objective to gain _____ helps explore new ideas without prior assumptions.
4. _____ research tests if "more study time improves grades," while _____ research just maps current study habits.
5. Fill for prediction: "Weather apps _____ tomorrow's rain based on today's data."

Exercise 2: Reflective questions

- How might testing a hypothesis help solve a real problem, like improving study habits?

- Why is gaining familiarity with a topic important before deeper analysis?
- Compare describing vs explaining: Give a school-related scenario for each.
- How do objectives like *predicting outcomes* apply to your future career?

Exercise 3: Quiz

1. Which option best describes the general definition of research?

A	Collecting facts without any specific purpose.
B	Sharing personal opinions and experiences in a report.
C	A systematic and organised process of inquiry to answer questions or solve problems.
D	A one-time activity of browsing information on the internet.

2. In didactics, which description best captures the definition of research?

A	An informal collection of classroom narratives used only for personal reflection.
B	The simple replication of existing lesson plans without modification.
C	A systematic and reflective inquiry into teaching and learning aimed at generating shareable knowledge.
D	A one-time evaluation of students' test scores to judge teacher performance.

3. Which of the following is the main objective of basic (pure) research?

A	To immediately solve a specific practical problem.
B	To apply teaching methods more effectively.
C	To collect data for a school assignment only.
D	To generate new knowledge or theories without a direct focus on practical application.

4. Which statement best describes applied research?

A	It is always conducted in laboratories, not in real settings.
B	It focuses on immediate practical application to solve specific problems.
C	It only involves historical documents and past events.
D	It aims to test theories without regard to real-world use.

5. Which of the following is a key objective shared by most types of research?

A	To ignore previous studies and start from zero
B	To increase knowledge and understanding systematically.
C	To prove that the researcher is always right.
D	To intentionally confuse the reader.

6. Which example best illustrates descriptive research?

A	Designing a theory about how students might learn another language rather than their native language, with no data.
B	Testing whether a new teaching technique is better than an existing one using an experiment.
C	Manipulating variables in a classroom to establish cause-and-effect relationships.
D	Studying learners' preferences by conducting a survey to find out what features they like in an AI application.

7. Which type of research is mainly concerned with exploring a new or poorly understood problem to gain initial insights?

A	Exploratory research.
B	Analytical research.
C	Descriptive research.
D	Experimental research.

8. Why is research important in didactics education for future teachers?

A	Because it trains them to memorize existing theories without questioning them.
B	Because it helps them see teaching as a field that can be systematically investigated and improved through evidence.
C	Because it ensures they will always follow national curriculum guidelines without adaptation.
D	Because it focuses them solely on preparing students for standardised tests.

Project: Select *one* topic *only*, and then prepare a PowerPoint presentation.

Topic one: basic and applied research are among the various types of research. The primary aim of **Basic Research** is to improve knowledge generally, without any particular applied purpose in mind. **Applied Research** is designed from the start to apply its findings to a specific situation.

- In a PowerPoint presentation, highlight the key features of each research type.

Topic two: The primary aim of **Exploratory Research** is to gain initial familiarity with a phenomenon when little is known about it. **Explanatory Research** seeks to understand the 'why' behind relationships, often testing causal hypotheses.

- In a PowerPoint presentation, highlight the key features of each research objective.

UNIT TWO: Conceptual Background

Unit 2 introduces foundational elements of the research process, focusing on how to identify and define a research problem, formulate research questions and hypotheses, and understand the role of research variables. In addition, this unit explains the distinction between methodology and methods, helping Didactics students to recognize the difference between the two concepts.

Learning outcomes

After the completion of this unit, students will be able to:

- Identify and define research problems
- Raise research questions and formulate hypotheses
- Consider the types of research variables
- Distinguish between research methodology and research method.

Unit 1:	**Conceptual Background**
Week	Topic
3	Definition of research problem Research questions and hypotheses
4	Research variable Methodology Vs. method

1) Research Problem

As didactics students, you normally start a research study by identifying a topic to study, typically an issue or problem, in EFL education that needs to be resolved. By identifying a "problem," you limit the subject matter and focus attention on a specific aspect of study. Consider the following "problems," each of which merits research:

- Primary school pupils in Algeria face vocabulary deficiencies.
- Reliance on the mother tongue reduces pupils' opportunities to practice.

These needs, issues, or challenges arise out of an educational need expressed by teachers, schools, or parents. As researchers, you may refer to them as research problems.

In this sense, a research problem is a defined issue, a knowledge gap, or a practical challenge that a researcher intends to investigate and address. It is considered as the foundation of the whole research process. According to Creswell (2012, p. 59), "Research problems are the educational issues, controversies, or concerns that guide the need for conducting a study".The research problem typically directs the development of research objectives, guides the formulation of research questions and hypotheses, and designates the selection of suitable research methods.

From an educational standpoint, the study of research problems is significant for informing policymakers, helping teachers, assisting school officials in addressing practical problems, and affording researchers a profound understanding of the issue under study. From a research standpoint, identifying a problem in an investigation is imperative for laying the groundwork for the entire study. Without identifying the research problem, readers will not recognise the study's significance. Thus, a well-defined research problem provides

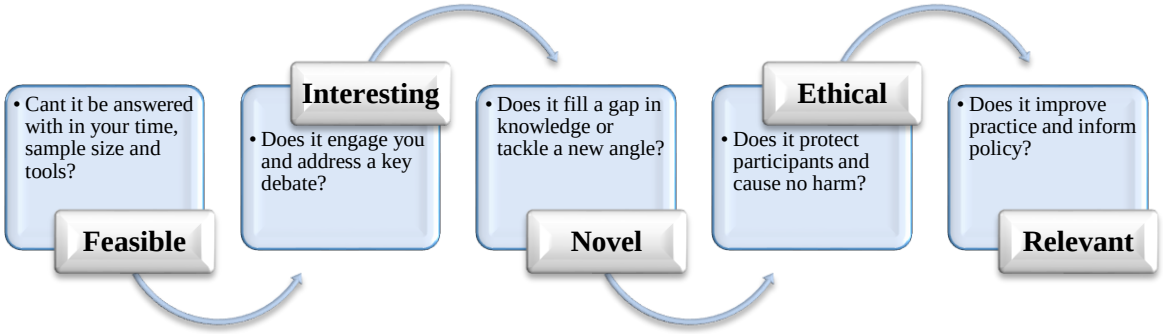
- Focus on the research study.
- Justification for the framed objectives.
- Value of the conducted study
- Attentive research design (methodology)

Importantly, the research problem is different from the research topic. The topic of the study refers to the subject matter it addresses—for instance, English vocabulary acquisition in primary schools. The research problem, on the other hand, represents a specific learning issue, concern, or controversy addressed in the research and narrows the topic. For the topic example, the problem might be a lack of vocabulary, due in part to limited exposure.

Researchers may rely on the FINER criteria to evaluate the relevance of their research questions:

- **Feasible**: verify access to data, participants, tools, and skills within your timeframe.
- **Interesting**: confirm it fills a knowledge gap; challenges assumptions; addresses key debates.
- **Novel**: builds on recent debates; extends prior research.
- **Ethical**: confirm it respects participants and conforms to values such as consent.
- **Relevant**: Advances knowledge; informs practices or policy.

Figure 2. *Evaluating Research Questions through the FINER Criteria*



To sum up, the design of a meaningful and relevant research project relies on identifying a clear research problem. Problem identification, indeed, is the first critical step in a research study. It illustrates the significance of the topic under study and situates the issue within a specific context. Researchers often state the research problem in the introduction section of a research report (e.g., an extended essay or a memoir) and express a rationale for its significance. Typically, the research problem is part of a written section called the "Problem statement". This section includes the topic, the problem, a justification for the problem (rationale), and the study's significance.

2) Research Questions and Hypotheses

A well-structured academic research begins with a guiding problem statement. However, the research problem should be investigated by raising research questions or framing hypotheses. Although both intend to guide a study, they differ in purpose, form, methodological implications, and expected outcomes. Therefore, it is necessary to understand when and how to use each appropriately to design a reliable, well-structured research work.

a) Research Question

Research questions are questions that narrow the purpose or problem statement into specific, focused questions that the researcher addresses in a study and seeks to answer (Creswell, 2012). Generally, a research question is a clear, focused, and concise interrogation/probe that directs an investigation.

Researchers develop research questions before selecting the methodology (i.e., the type of data required, the research methods). Research questions can be found in both quantitative and qualitative research, but are suitable for qualitative or mixed-methods studies to uncover insights. They are generally open-ended questions that explore "what," "how," or "why" (not answered with yes/no) and are closely aligned with research objectives.

For example: *"What factors influence students' motivation to access the Moodle Platform?"*

b) Hypothesis

Hypotheses are testable declarative statements typical of experimental/quantitative research, in which the researcher predicts or hypothesises the outcome of a relationship among elements, characteristics, or variables. In this sense, a research hypothesis is a tentative statement that presents a suggested answer or a solution to a problem. It provides a possible solution to a problem or a phenomenon that can be tested through empirical research.

Hypotheses, like research questions, aim to narrow the purpose or problem statement to specific predictions. These predictions can be either supported or disproved by research findings. Creswell (2012) asserts that these predictions are not simple guesses; rather, they stem from previous research findings and literature that reinforce expectations for what replications with new samples or sites may produce.

For example: *"Students who receive instruction on written production through generative AI are more likely to develop writing proficiency compared to those who do not."* This predicts an effect and includes independent and dependent variables.

3) Research Variable

A variable is a characteristic (e.g., gender or age), attribute (e.g., attitude toward the Moodle Platform), or factor (e.g., flipped classroom vs traditional teaching) that varies across individuals, settings, or organisations studied. It could be measured or observed. The term encompasses everything that can vary, from simple concepts such as age and gender to complex ones such as learning styles and students' outcomes. Variables often form the foundation for testing relationships, causes, and effects, as researchers are fascinated by whether one or more variables might affect another.

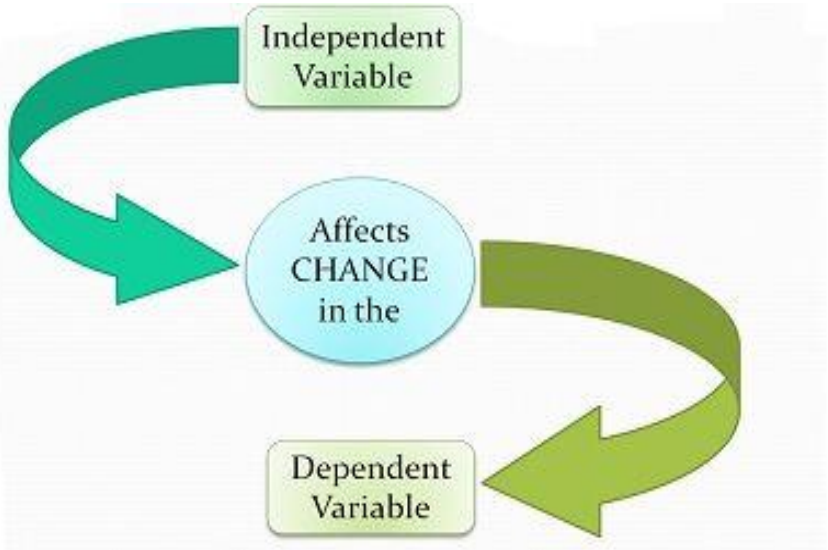
For example

Researchers in EFL education may seek to understand why certain students underperform on writing assessments. The variables (*lack of vocabulary* and *self-efficacy in written communication*) may influence learners' scores on the *writing* tests. In this sense, variables are fundamental concepts that researchers collect data on to address the purpose of their studies.

There are several types of variables in research. Throughout this subsection, we will focus our attention on the most commonly used types: Independent Variables vs Dependent Variables.

- **The independent variable** is the factor or trait manipulated or selected by the researcher as a potential cause or predictor (e.g., lack of vocabulary or self-efficacy in written communication) that may influence the dependent variable. These variables are considered "independent" because their variation does not depend on other variables within the study. Instead, they are the causes or stimuli that directly influence the outcomes being measured (Writing Scores).
- **The dependent variable** is the variable that will be measured or observed (writing test scores) to determine if it is affected by the presence of the independent variable. This variable is called "dependent" because its value depends on the variations of the independent variables. For example, a researcher in the EFL context might ask, "Does instructional strategy in written production affect academic writing achievement of master's students?" In this study, academic writing achievement would be the dependent variable, and instructional strategy would be the independent variable.

Figure 3. *Independent Variable vs. Independent Variable*



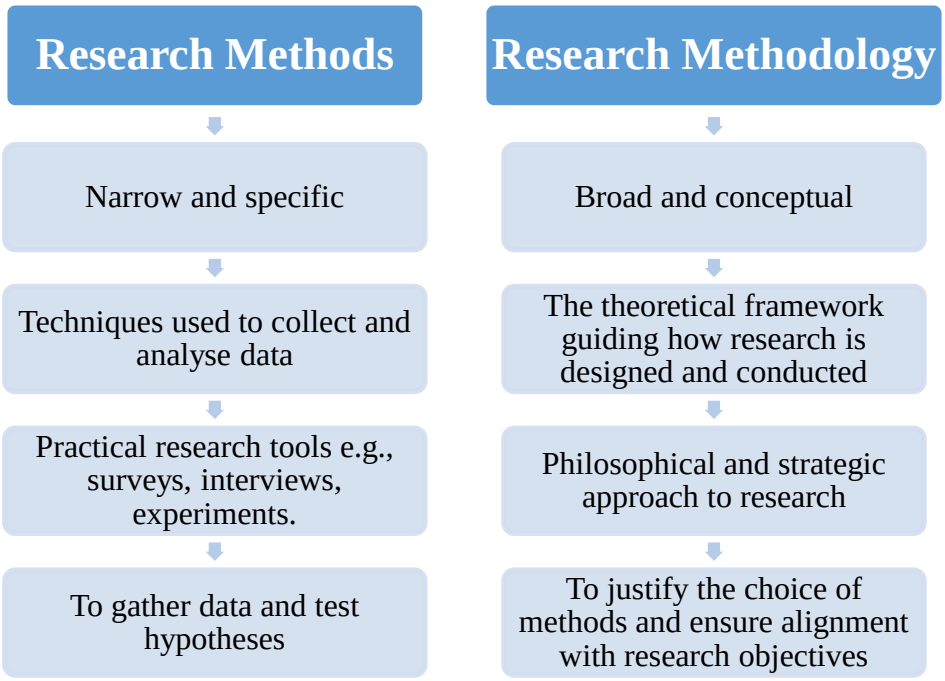
4) Methodology Vs. Methods

In academic research, the concepts of research methodology and research method are related components, but comparatively distinct. Methodology refers to the all-encompassing framework, while methods refer to practical tools or instruments.

- **Research methods:** refer to the specific methods or techniques used to conduct research. They are the tools researchers use to perform research, such as collecting and analysing data. These tools may include surveys, interviews, experiments, or observations. Ultimately, research methods include:
    - The methods that focus on collecting and describing data, such as questionnaires, interviews, and observation.
    - Techniques for data analysis (how to calculate the mean, the mode, the median, or the standard deviation)
    - Techniques to establish statistical relationships between variables.
- **Research methodology** is a broader term that refers to the overall strategy and framework of a research project. Research methodology relates to the theoretical and philosophical foundations of research. It encompasses the strategy, the philosophy, and the rationale that justify the selection of research methods. Henceforth, it guides the researcher in selecting appropriate research methods. It entails the general research design, data collection and analysis approaches, and sampling strategies.

Accordingly, we can say that research methodology involves many dimensions, and research methods constitute a part of it. Thus, the scope of research methodology is broader than that of research methods.

Figure 4. *Research Methodology vs Research Methods*



Tutorial:

Exercise 1: Turn the following broad topics into a clear, researchable PROBLEM.

- Smartphone use in EFL classes
- Grammar translation method
- Online speaking practice
- Motivation in large EFL classes

Exercise 2: Use your research problem from Exercise 1, create 3 questions + testable hypotheses.

Exercise 3: Use the topics in Exercise 1, then create scenarios where you label:

- Independent Variable (IV): What you change/test.
- Dependent Variable (DV): What you measure.

Exercise 4: Quiz

1) An EFL teacher notices that students rarely speak in English during pair work, even though they seem to understand grammar. She wants to turn this situation into a research problem. Which of the following best states a clear research problem?

A	Speaking is hard to teach, so it is difficult to make students talk in English.
B	There is a mismatch between students' grammatical knowledge and their oral participation in pair work activities.
C	Students need interesting speaking activities to motivate them to talk.
D	Students are shy and do not like speaking activities in class.

2) Which of the following sets of research questions is most appropriate for the previous research problem?

A	Why are students shy? 2 How can the teacher be more friendly?.
B	Do students like English as a subject? 2 Do they think English is important for their future?
C	What classroom rules does the teacher use? 2 How often does she correct grammar mistakes?
D	What factors do students report as influencing their willingness to speak during pair work? 2 How does the type of pair work task relate to the amount of English spoken by students?

3) A student researcher in EFL didactics writes the following hypothesis: "Using role-play activities will improve students' speaking fluency." What is the main weakness of this hypothesis?

A	It focuses on speaking, which is not an appropriate skill for EFL research.
B	It uses the future tense, which is not allowed in hypotheses.
C	It is too general and does not specify how "improve" or "speaking fluency" will be measured or in which context.
D	It is not testable because it mentions role-play activities.

4) In a study on the effect of role-play on speaking fluency in secondary EFL classrooms, which of the following best describes the independent and dependent variables?

A	Independent variable: students' age; dependent variable: their English level.
B	Independent variable: speaking fluency; dependent variable: use of role-play activities.
C	Independent variable: use or non-use of role-play activities; dependent variable: students' speaking fluency scores.
D	Independent variable: students' motivation level; dependent variable: the teacher's lesson plans.

5) Which statement best distinguishes "research methodology" from "research methods" in an EFL didactics study?

A	Research methodology and research methods mean the same thing and can always be used interchangeably.
B	Research methodology concerns grammar and vocabulary, while research methods concern speaking and listening.
C	Research methodology is used only in quantitative research, while research methods are used only in qualitative research.
D	Research methodology refers to the overall strategy, philosophical stance, and design of the study, while research methods are the specific tools and procedures used to collect and analyse data.

6) A student wants to investigate how a new vocabulary-learning app affects EFL learners' vocabulary size. Which of the following best formulates a directional hypothesis for this study?

A	Students who use the vocabulary learning app will have larger vocabulary size scores than those who do not after eight weeks of use.
B	The vocabulary learning app does not affect students' vocabulary size.
C	There is a difference in vocabulary size between students who use the app and those who do not.
D	Students have different attitudes toward using vocabulary learning apps in class.

7) A group of EFL didactics students is designing a small-scale quantitative study on the effect of extensive reading on vocabulary growth. Which of the following best demonstrates an appropriate alignment between research problem, research question, hypothesis, and variables?

A	Research problem: It is unclear whether extensive reading leads to measurable vocabulary growth in our 10th-grade EFL class. Research question: To what extent does a 10-week extensive reading program affect 10th graders' vocabulary size scores? Hypothesis: Students who participate in the 10-week extensive reading program will show higher vocabulary size gains than students who follow the regular program without extensive reading. Variables: independent – participation in an extensive reading program; dependent – vocabulary size scores.

B	Research problem: Students need to learn more vocabulary. Research question: Why is vocabulary important? Hypothesis: Vocabulary is the most important part of language. Variables: vocabulary, grammar, pronunciation.
C	Research problem: Reading is difficult. Research question: How long does it take to learn English? Hypothesis: Students who read more will speak better. Variables: reading and speaking.
D	Research problem: Students do not enjoy reading in English. Research question: How can teachers make reading more fun? Hypothesis: Fun reading activities will improve students' vocabulary. Variables: teacher personality, school facilities.

Project: use the topic of "speaking motivation in EFL higher education classrooms", then:

- Review 5-7 EFL articles on the topic.
- Identify a research problem (e.g., "Low speaking motivation in large EFL classes").
- Define variables (Independent Variable; Dependent Variable),
- Write 3 Research Questions + 1 hypothesis;
- Contrast methodology (quantitative research, mixed-methods) vs methods (pre/post-audio recordings, interviews).

UNIT THREE: Philosophy and Methodology

Unit 3 focuses on building students' understanding of philosophical foundations and their practical application to educational research. It introduces the concepts of philosophy and methodology, explains their interdependent relationship, outlines the role of philosophy in educational research, and explores ontology, epistemology, and axiology in relation to methodology.

Learning outcomes

After the completion of this unit, students will be able to:

- Define philosophy and methodology, and articulate their interdependent relationship in educational contexts.
- Analyse the role of philosophy in shaping educational research design.
- Explain ontology, epistemology, and axiology, and demonstrate their influence on methodological choices in research.

Unit 1:	**Conceptual Background**
Week	Topic
5	Philosophy and Methodology Major Branches of Philosophy
6	Role of Philosophy in Educational Research: Ontology, epistemology, axiology, and their relationship to methodology.

1) Philosophy and Methodology

Philosophy and methodology are foundational frameworks in educational research. The two spheres guide researchers' assumptions about reality, knowledge, and values. Acting as the mother of all disciplines, philosophy affords the theoretical underpinnings for methodology, determining how phenomena/problems are investigated in educational settings.

Research is a systematic inquiry that intends to fill a knowledge gap or solve problems, following several steps, including:

- Raising a research question: *What do I want to research or study?*
- Opting for a certain Methodology: *How shall I carry out the study?*
- Adopting a certain Paradigm: *Which worldview do I rely on to guide this study?*

In fact, when you reflect on your research question, decide on your methods, and select your paradigm, you are not just following procedures, but you are making philosophical choices. Henceforth, you will examine your own assumptions and decide how the world should be studied. In this sense, philosophy provides the underlying beliefs, assumptions, and paradigms that inform researchers' approaches to problems, data collection, and interpretation.

2) Major Branches of Philosophy

Broadly, philosophy is the study of fundamental questions about life, reality, and knowledge, such as what is true (knowledge), what is real (existence), and how we should live (values). It is the practice of thinking deeply about the essential ideas and values that shape our understanding of the world. Philosophy is divided into several branches that tackle fundamental questions about reality, knowledge, and values.

a) **Metaphysics**: the study of things beyond the physical, including the nature of reality, existence, objects, time, and space. It asks questions like "What really exists?", "What is the world made of?" "Do things like time, mind, or soul truly exist, and how?"

b) **Epistemology**: is the branch of philosophy that studies knowledge, belief, truth, and justification, that is to say, what knowledge is, how we get it, and its limits. It intends to answer the questions of "How do we know what we know? Is it through senses, reason, evidence, or belief?

c) **Ethics:** sometimes called value theory, is the branch of philosophy that deals with morality, right/wrong actions, and values, that is to say, what makes a behaviour right or wrong, good or bad. It inquires, "What should we do?" and "How should we live?" to guide actions and values.

d) **Logic**: is the branch of philosophy that focuses on clear thinking, right reasoning, and valid argumentation. Good logic sets rules for valid reasoning and allows distinguishing sound arguments, ones where the conclusion logically follows from true or acceptable premises (e.g., All even numbers are divisible by 2. 10 is even. Therefore, 10 is divisible by 2.), from flawed ones riddled with errors or fallacies (e.g., all birds can fly. Penguins are birds. Therefore, penguins can fly. Flawed: the first premise is not always true).

3) Role of Philosophy in Educational Research

Philosophy plays a foundational role in educational research. It shapes its paradigms, questions, and methods. Philosophy as a science provides the conceptual tools to define reality, knowledge, and inquiry in the field of education. It supports educational research through ontology (the nature of reality/what exists), epistemology (how knowledge is gained), value theory or ethics (what we consider important or ethical), and methodology (research approaches). In this sense, the researcher's philosophical stance (positivist, interpretive, or critical) influences what he studies, how he collects data, and how he interprets findings. For instance:

- Positivists view reality as objective and measurable, and they use quantitative methods such as surveys to achieve generalizable results.
- Interpretivists view reality as subjective and constructed, employing qualitative methods such as interviews to understand experiences.

Methodology, in this sense, applies philosophy by ensuring that every stage of the research is coherent, grounded in justification, and consistent with the researcher's assumptions about truth, knowledge, and the research process.

To conclude, methodology refers to the general frameworks, approaches, and methods that guide the research process from beginning to end. Put differently, it reflects the philosophical orientation that shapes the researcher's decision-making in generating knowledge.

4) Ontology, Epistemology, Axiology, and Their Relationship to Methodology.

Ontology, epistemology, and axiology are the three fundamental philosophical "layers" that shape how a researcher thinks about the world, knowledge, and values; methodology is the practical design that translates the researcher's beliefs into concrete research steps.

a) The role of ontology:

Ontology asks the question: What is reality like? It deals with whether reality is a single, objective world (realism) or multiple, socially constructed realities (relativism). It guides methodology by determining whether the researcher treats the object/variable of study as fixed and measurable (e.g., experiments) or as flexible and meaning-driven (e.g., interviews, narratives).

b) The role of epistemology

Epistemology asks the question: How can we know anything? It emphasizes the relationship between the knower and the known (i.e., the researcher and the phenomenon being studied). It deals with whether knowledge is discovered through observation, co-constructed through interaction, or reasonably "what works." Epistemology informs methodology by determining what counts as valid and evident (e.g., statistics vs. description) and how the researcher justifies his findings.

c) The role of axiology

Axiology asks the question: What role do values play in research? It concerns the researcher's values, ethical considerations, and the value of the research itself (e.g., rights, fairness, accuracy, usefulness). Axiology informs methodology by shaping topic choice, the stance toward participants, and how findings are framed (a neutral "objective" report vs a critically engaged stance).

Altogether, ontology, epistemology, and axiology set up the philosophical underpinning of a research study; methodology is the **bridge** that transforms these assumptions into a definite research design (e.g., qualitative, quantitative, mixed). A coherent design means the methodology (logic, strategies, and methods) fits the underlying view of reality, the way knowledge is produced, and the values the research serves.

Tutorial:

Exercise 1: Match each philosophical assumption to its methodological impact:

A. Ontology (reality)	1. Guides ethical considerations in participant consent.
B. Epistemology (knowledge)	2. Favors interviews for subjective experiences.
C. Axiology (values)	3. Leads to quantitative surveys (objective facts).

Answers: A-3, B-2, C-1.

Exercise 2: in pairs, construct a simple deductive argument using one branch:

- Metaphysics: "All learning requires consciousness..."
- Epistemology: "Students know math through practice..."
- Logic: "If exams test skills, then..."
- Ethics: "Teachers should prioritize..."

Sample example:

- Epistemology - "Knowledge comes from evidence. Experiments provide evidence. Thus, experiments build knowledge."

Exercise 3: reflective questions

- How has understanding ontology changed the way you view "truth"?

- Which major branch of philosophy (e.g., epistemology, ethics) resonates most with your research interests, and why?
- In what ways might your personal values (axiology) unconsciously shape the methodology you choose for a study?
- How does your research view of reality shape your methods?

Exercise 4: Quiz

1. Which question best illustrates an ontological concern in educational research?

A	How can we most accurately measure students' motivation to learn?
B	What ethical safeguards are needed when working with vulnerable student populations?
C	What kind of thing is a 'learning difficulty'—a fixed trait, a social label, or an interaction?
D	How should researchers interpret test score data from a large national sample?

2. In positivist educational research, which assumption about knowledge is most central?

A	Knowledge consists of objective facts about educational reality that can be discovered and verified.
B	Knowledge cannot be communicated across individuals, so research is ultimately useless.
C	Knowledge is purely a matter of personal belief and has no relation to evidence.
D	Knowledge is constructed through the negotiation of multiple perspectives in context.

3. Which statement best captures the role of philosophy in guiding educational research methodology?

A	Philosophy is mainly of historical interest and has little relevance to contemporary research design.

B	Knowledge cannot be communicated across individuals, so research is ultimately useless.
C	Philosophy clarifies assumptions about reality, knowledge, and values, which shape the choice and interpretation of research methods.
D	Philosophy offers abstract ideas, but methods are chosen independently of philosophical assumptions.

4. Which of the following best illustrates an axiological concern in educational research?

A	Debating whether classroom engagement can be directly observed or only inferred from behaviour
B	Arguing that research should prioritise improving equity and social justice in schools
C	Asking whether the concept of intelligence refers to a real trait or a social construction.
D	Choosing whether to conduct structured interviews or open-ended observations.

5. A researcher claims: "Classroom reality is too complex to be captured by numbers alone; understanding requires rich descriptions of participants' perspectives." This statement mainly reflects which philosophical stance?

A	A realist ontology combined with positivist epistemology.
B	A purely objectivist view of knowledge
C	A belief that educational research is impossible.
D	A constructivist or interpretivist epistemology

6. Which of the following questions is primarily epistemological in the context of educational research?

A	Should researchers aim to remain value-neutral when studying schools?
B	Is it ethically acceptable to observe classrooms without informing students?
C	What methods can provide trustworthy evidence about students' conceptual understanding?
D	Do learning styles exist as stable traits across contexts?

7. In educational research, which statement best captures the relationship between philosophy and methodology?

A	Philosophy provides the foundational assumptions that give coherence and justification to methodological choices.
B	Methodology determines philosophy, since researchers always adopt the philosophy that matches their chosen tools.
C	Philosophy matters only for theoretical studies, not for empirical educational research.
D	Methodology is completely independent of philosophy; researchers can select methods without any philosophical commitments.

8. A researcher designing a study on teacher beliefs asks: "What kind of beliefs are we studying, how can we know them, and what ethical responsibilities do we have toward participants?" Which trio of philosophical domains are they explicitly engaging?

A	Axiology, statistics, and data visualisation.
B	Epistemology, methodology, and statistics
C	Ontology, epistemology, and axiology
D	Ontology, methodology, and sampling

Project 1:

Outline epistemology's core question: How do we acquire valid knowledge? Contrast positivist (empirical, measurable) and interpretivist (subjective, contextual) approaches.

- Present a table comparing their use in educational surveys vs interviews, with one advantage and one disadvantage for each epistemological approach.

Project 2:

Trace major philosophy branches (metaphysics, epistemology, axiology, logic) to methodology.

- Argue: How does their interplay strengthen educational research?

UNIT FOUR: Research Paradigms

Unit 4: Research Paradigms equips students with essential knowledge of philosophical underpinnings in educational research. It defines key paradigms, delves into positivism and post-positivism with their assumptions, aims, designs, strengths, and limitations.

Learning outcomes

After the completion of this unit, students will be able to:

- Define research paradigms and distinguish positivism from post-positivism in educational contexts.
- Analyse assumptions, aims, typical designs (e.g., experiments, surveys), strengths, and limitations of each paradigm.
- Evaluate post-positivist critiques, including fallibilism, triangulation, and probabilistic truth, for robust research application.

Unit 4:	**Research Paradigms**
Week	Topic
7	Definition of Paradigm Positivism: assumptions, aims, typical designs (experiments, surveys), strengths, and limitations.
8	Post-positivism: critique of positivism, probabilistic truth, triangulation, fallibilism.

1) Definition of Paradigm

The American philosopher Thomas Kuhn (1962) was the first to use the term *'paradigm' to refer to* a philosophical way of thinking. The term describes essential philosophical assumptions that underpin and guide individuals' practice (Kuhn, 1970). Perera (2018), for instance, considers paradigms as viewpoints or ideologies. In this sense, the ways we act and react depend largely on our personal paradigms. The same is true for research: Creswell (2003) views paradigms as a series of agreements about how to understand problems, how we view the world, and thus how we conduct research.

To put it differently, Perera (2018) refers to research paradigms as clusters of assumptions and agreements shared by scientists about how problems are conceptualised and addressed. Accordingly, these paradigms encompass a set of beliefs or perspectives that guide our inquiries in a given research. In this vein, Willis (2007) defines the research paradigm as "a comprehensive belief system, worldview or framework that guides research and practice in a field" (p. 8).

In other words, paradigm is a core belief system or theoretical framework that includes suppositions about 1) ontology (the nature of reality, whether it is external or internal), 2) epistemology (the nature, type and sources of knowledge generation), 3) methodology (a disciplined approach to generate that knowledge), and 4) axiology (the ethical issues that need to be considered in research). It is the way we understand and inspect the world.

The researchers' personal paradigm may be identified in the way they answer fundamental questions such as the following:

- What should be believed about the nature of knowledge?
- What should be believed about the nature of "reality"?
- What beliefs and values do they hold about teaching, learning, and schools?
- What is the purpose of educational research?
- What is the objective of research, and for whom is the research being conducted?

To conduct reliable research, Myers and Avison (2002) recommended selecting an appropriate research paradigm. This is crucial because by choosing a definite paradigm, the researcher does not rely solely on his own philosophical understanding; instead, he adopts a position in relation to other possible paradigms. Influenced by the selected paradigm, the researcher selects a methodology or an approach to conducting the research (that is, the research design). Consequently, research paradigm and methodology affect the choice of research methods, sampling techniques, and data analysis procedures. This way, the research paradigm represents the theoretical perspective the researcher employs to examine the methodological aspects of the conducted research, including the selection of the data collection methods and data analysis techniques.

Research paradigms can be classified into positivism, interpretivism, post-positivism, Critical theory, and Pragmatism. The research paradigms of focus in this course are positivism and postpositivism.

2) Positivism

Assumptions

The Positivist paradigm denotes a worldview of research largely inspired by the scientific method of the natural sciences. It counts for experimentation, observation, and reasoning based on experience as the basis for understanding human behaviour, and thus as the most objective tools for developing knowledge and human understanding. In fact, the scientific method advocates experimentation as a means of exploring hypotheses and answering questions. It examines cause-and-effect relationships in nature.

Under this research paradigm, scientific methods can be applied to investigate human issues when they are considered as natural phenomena. Positivist thinkers (e.g., Comte, Durkheim) do argue that human society is governed by general, universal laws, as are any empirical and natural phenomena. The researcher uses scientific methods to study the human issues that are considered as natural phenomena. These methods entail formulating hypotheses, testing them using mathematical equations and calculations, and using deductive reasoning to draw conclusions. Positivism intends to offer explanations and make predictions based on quantitative results. The results of a specific

community may be generalizable to other communities. In this sense, positivistic research can reveal social and behavioural rules.

From a positivist stance, there is no difference between the research methods used in the natural sciences (such as physics or biology) and those used in the social sciences (such as psychology, education, or language studies). Edward Thorndike, for instance, is a positivist psychologist who formulated three rules, including the law of effect, exercise, and readiness, based on scientific experimentation.

Aims

Positivist methodology aims to measure, control, predict, construct laws or rules, and attribute causality (the interconnection between variables). Relying heavily on experimentation, researchers put forward hypotheses about the causal relation between phenomena/variables. Then they collect empirical data, analyse them statistically using the deductive approach, and present the results as a theory that clarifies the effect of the independent variable on the dependent variable.

Typical designs (experiments, surveys)

To collect data, positivist researchers use certain designs to answer research questions and formulate theories. These designs include experiments or quasi-experiments, standardised tests, and large or small-scale surveys that rely on closed-ended questionnaires. The quantitative data generated by these methods are then analysed using descriptive or inferential statistics.

Strengths and limitations

The positivist paradigm has strengths and weaknesses. Blaikie (2000) posits that it is suitable for objective, measurable, and testable results but is limited in the social and human fields that demand insights, meaning, and context into human experience. To sum it up, the strengths of positivism are as follows:

- It emphasises objectivity through standardised procedures, measurable evidence, and defined instruments, which can enhance the reliability and replicability of the results.

- It is a suitable paradigm for testing hypotheses, identifying cause-and-effect relationships, and generalizing research results.
- It offers a well-defined framework for research (variables, hypotheses, experimentation, large samples, and statistics) that makes the study design clear and transparent.
- It advances knowledge generation, as testable hypotheses can become recognised as scientific theories.

On the contrary, many scholars have criticised the positivist research paradigm (Richards, 2003). They stressed that objective, scientific methods may be appropriate for studying natural objects, but not necessarily for investigating social phenomena. In summary, the limitations of the positivist paradigm are as follows:

- It excludes works in scientific areas such as religion, literature, and philosophy.
- It oversimplifies complex social phenomena by transforming them into measurable variables.
- It denies that human behaviour is more difficult to control than natural phenomena.
- It gives little importance to participants' insights, intentions, and lived experiences, which are significant in social and educational inquiries.
- It overlooks qualitative and interpretive data needed to answer questions about processes, identities, or classroom dynamics.

3) Post-positivism:

The criticisms of the positivist paradigm led to the emergence of post-positivism. Post-positivism, indeed, sought to address the limitations of the positivist paradigm, which has been widely criticised by interpretivists and critical theorists (Richards, 2003). One prominent criticism of positivism is that the scientific methods, which are suitable for studying natural phenomena, may not be adequate for studying individuals or social phenomena (Richards, 2003). From another angle, Willis (2007) considers post-positivism as a modified scientific version of the positivist method. This version follows the same principles but adopts research processes and tools for the social

sciences that facilitate greater communication between the researcher and participants. Thus, it is a further enhanced paradigm that addresses the weaknesses of positivism.

Probabilistic truth

Post-positivism approves that reality exists, but is inherently imperfect. Truth, in this sense, is probable, provisional, not absolute, and open to revision. It alters the rigid assumptions of classical positivism, maintaining a more modest, critical, and flexible commitment to empirical inquiry. In terms of methodology, post-positivism employs data collection methods such as observations, case studies, and interviews, but without experimentation or the formulation of testable hypotheses.

This paradigm seeks truth through rigorous scientific methods. Simultaneously, post-positivism recognises that the collected data may be influenced by the researcher's perceptions, beliefs, and theoretical standpoint. Studies adopting this paradigm provide probabilistic and tentative rather than common and absolute justifications (results).

Critique of positivism

Guba (1990) states that while the positivist paradigm assumes that reality can be studied, captured, and defined, the post-positivist paradigm maintains that reality can be approximated rather than completely understood. Hence, the Post-positivist paradigm has provided an alternative worldview for much of the research on human behaviour in educational contexts.

Triangulation

Unlike firm positivism, post-positivists support the triangulation, or combination, of qualitative and quantitative data collection methods to explore the diversity of facts. Mixed-methods research involves collecting both quantitative and qualitative data. While quantitative methods yield numerical results and statistics, suitable for describing, predicting, explaining, and determining social patterns, qualitative methods, on the contrary, yield text-based data, which are subject to the researcher’s interpretation to understand social phenomena.

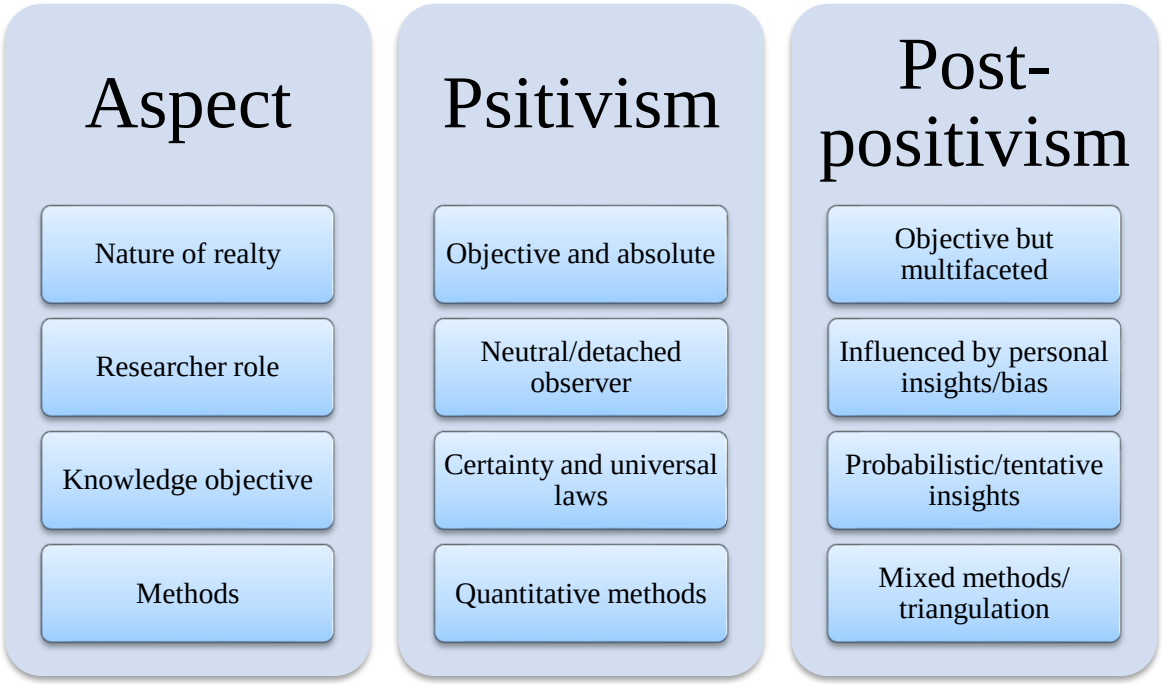
In fact, triangulation entails collecting data from different methods (observations, interviews, questionnaires, and surveys) and diverse sources (researchers, participants,

and scholars). Both quantitative and qualitative methods are considered appropriate; the choice of research methods depends on the question (problem) and context (setting), and on which method will yield the most reliable data.

Fallibilism

Fallibilism is a key characteristic of the post-positivist paradigm. This feature holds that truth is inherently partial and imperfect, and any belief can probably be erroneous. Thus, research results should be treated as tentative and open to elaboration as new evidence emerges.

Figure 5. Positivist Paradigm vs Post-Positivist Paradigm



In conclusion, post-positivism is a type of research grounded in positivist epistemology but modified in a reflexive way to encourage researchers to be open about their research limitations, evaluate their perspectives, and remain open to disconfirmation.

Tutorial:

Exercise 1: Complete the sentences with the correct word or phrase: positivism, post-positivism, objectivity, bias, reality, tentative, quantitative.

1) The ……. assumes that knowledge should be based on observable facts and measurement.

2) Positivism seeks ……. and tries to reduce the influence of the researcher.
3) In …… reality is seen as existing independently of the researcher, but it can only be known imperfectly.
4) Post-positivism recognises that all research may contain some degree of ……..
5) Knowledge in post-positivism is often considered …… rather than absolute.
6) Positivist research is commonly associated with …….. methods.
7) ……. accepts that the researcher cannot be completely detached from the research process.

Exercise 2: Match the concept in Column A with the correct description in Column B.

Column A	**Column B**
1. Positivism	A. Knowledge is provisional and influenced by human limitations.
2. Post-positivism	B. Reality can be studied through objective measurement.
3. Objectivity	C. The researcher tries to remain neutral and detached.
4. Bias	D. A factor that may influence the interpretation of results.
5. Quantitative research	E. Research based on numerical data and measurement.
6. Tentative knowledge	F. Knowledge that is not considered final or absolute.

Exercise 3: Answer the following in 2/4 sentences.

1. Why does positivism value objectivity in research?
2. What is the main weakness of positivism when studying human behaviour?
3. Why is post-positivism considered a more flexible paradigm?
4. How does post-positivism improve the interpretation of research results?
5. Which paradigm is more suitable for research involving numerical data, and why?
6. Which paradigm is better for understanding meaning and context?

Project 1:

Prepare an effective PPT presentation comparing and contrasting the positivistic and the post-positivistic paradigms, addressing the following aspects:

- The philosophical foundations
- The methodological approach
- The role of the research

Use the topic of 'The Effectiveness of Task-Based Learning (TBL)' to present a case for how a Positivist vs a Post-positivist researcher would evaluate the success of this Task-Based Learning.

Project 2:

Here are three research topics suitable for academic study

- The impact of AI-driven feedback on writing proficiency.
- Mobile learning applications and productive skill acquisition.
- Technology integration for teaching speaking.

- Prepare a PowerPoint presentation in which you choose one of the following topics and design a research study using either the positivist paradigm or the post-positivist paradigm.
- Your presentation should show how the selected paradigm shapes the research problem, objectives, questions, methods, and interpretation of findings.
- Your presentation should include:
    - The title of the study.
    - The chosen research paradigm: positivist or post-positivist.
    - The research problem.
    - The research objectives and/or hypotheses.
    - The participants and research setting.
    - The tools for data collection.
    - The type of data expected and how it will be analysed.
    - A short justification explaining why the chosen paradigm is appropriate for the topic.

UNIT Five: Educational and Didactic Research Paradigms

Unit 5: Educational and Didactic Research Paradigms provides a brief outline of different research paradigms. It equips students with the philosophical underpinnings of three major paradigms: interpretivism, critical theory, and pragmatism. It explains how paradigms influence the choice of research questions, participants, data, and analysis in language/didactic studies.

Learning outcomes

After the completion of this unit, students will be able to:

- Explore the main paradigms: interpretivism, critical theory, pragmatism, and their relevance in educational research.
- Locate their research into a paradigm and justify the choice of a certain paradigm.
- Identify how paradigms influence the choice of research questions, participants, data, and analysis in language/didactic studies.

Unit 5:	**Educational and Didactic Research Paradigms**
Week	Topic
9	Interpretivism Critical theory
10	Pragmatism The Impact of Paradigms on the Research Design

1. Main Paradigms in Educational/Didactic Research

Educational research is shaped by several paradigms that play pivotal roles in directing the inquiry process, the application of the research approach, and the overall selection of methodological procedures. Primary educational paradigms include interpretivism/constructivism, critical theory, and pragmatism. Each offers a different way to view reality, knowledge, and methodology.

1.1. Interpretivism/Constructivism

Interpretivism was a response to positivism, which emphasised the notion that an absolute reality exists independent of people's insights. Interpretivism holds that reality can also be attained through a deep interpretation of subjects. This paradigm is also called constructivism. It maintains that reality is based on individuals' personal experiences of the external world. Accordingly, there is no absolute way or a specific method to knowledge. Reality cannot be exactly known, as senses always mediate it. Interpretivist epistemology holds that knowledge of external reality is subjective and that external reality depends on each observer's beliefs, concepts, and life context. In this vein, Grix (2004) states "researchers are inextricably part of the social reality being researched, i.e. they are not 'detached' from the subject they are studying" (p.83).

Knowledge, in fact, is not independent of thinking or human reasoning. The interpretivists seek to extract their constructs from the field they search through an in-depth investigation of the studied phenomenon.

According to Crotty (1988), interpretivism considers reality as subjective, multiple, and socially constructed. This paradigm posits that knowledge and meaning are acts of interpretation; hence, it disproves the existence of an objective view of knowledge. It accesses reality through social constructions such as language, consciousness, and shared meanings.

In educational research, interpretivism focuses on interpreting the "lived experience" of learners and teachers. Reality, in this context, is socially constructed. Researchers adopting the interpretivist paradigm rely on qualitative methods (e.g., case studies, interviews, classroom observations) to understand and interpret the subjective meanings within a classroom. This methodology intends to understand social

phenomena in their context. The collected data is mostly verbal rather than numerical, and the approach to analysing it is inductive rather than deductive.

1.2. Critical theory

The critical paradigm, also known as the transformative paradigm, believes that inquiry is intertwined with social and political issues. The advocates of this paradigm argue that educational reality exists, but it is shaped by historical, cultural, religious, and social backgrounds that interact to create a social system. They also believe that research is intended to empower marginalised communities by scrutinising questions of social justice and equity. Accordingly, educational changes informed by critical theory typically seek to challenge existing measures and transform educational practices.

From an epistemological stance, the critical theory is subjective, holding that no object of study can be investigated without being influenced by the researcher's perspectives, beliefs and background. According to Patton (2002), the primary objective of critical educational research is to bring about social change in society rather than to explain or understand existing issues.

In education, critical research is concerned with issues such as power, justice, gender, class, language, access, and inclusion. It exceeds describing what happens in the classrooms by asking questions, such as

- *Why do some students find it easiest to succeed in the classroom, and why do others not?"*
- *Are the teaching methods or materials used in the classroom designed to benefit all the students or only a specific group?*
- *How can education reproduce or challenge social inequality?*

From a methodological standpoint, critical educational research uses qualitative and participatory methods such as action research, participant observation, and reflective journaling, in which the researcher actively participates in the teaching process to advocate for change, empowerment, or reform. In fact, action research aligns well with the critical paradigm to understand classroom realities and promote change. Using this research method, the teacher-researcher identifies a problem, plans an intervention,

implements it, observes the changes, and reflects on them. This makes the research cycle directly connected to improving teaching practice (Richards, 2003).

In foreign language education, critical studies might aim to explore whether shy students, girls, or low-level learners are given fewer opportunities to speak and participate in classroom discussions. The teacher-researcher would not only intend to describe this inequity, but also implement strategies (intervention) to make participation more equitable.

1.3. Pragmatism

The pragmatic ontological approach combines the features of both positivist and interpretivist paradigms to address complex educational challenges. Reality, in this position, can be both objective and subjective. Pragmatism advocates the "what works" principle, focusing largely on the specific research question rather than on the method of data collection or the philosophy underlying it. The pragmatic philosophy holds that researchers may use a single approach or a combination of approaches, or the one that proves most effective in practice. Hence, methods are chosen for their practical usefulness in addressing real-world issues, regardless of any philosophical or paradigmatic assumptions.

Unlike positivism and interpretivism, pragmatism is not aligned with any single system of philosophy. Pragmatics embraces both quantitative and qualitative designs to have a thorough understanding of the phenomenon under study. They argue that the raised research question is the central element to emphasise in the research process rather than the methods of data collection or the philosophy underlying the method. For that reason, it is acceptable to combine both quantitative and qualitative methods in a single study.

Hence, this research paradigm aligns with the mixed-methods philosophical paradigm (Creswell & Creswell, 2018). Educational researchers prefer pragmatism for its methodological flexibility, which allows them to choose methods, techniques, and procedures suited for the needs and purposes of the research. This paradigm is beneficial for applied educational research that requires diverse data sources capable of providing

wide-ranging insights into the usefulness of teaching methodology, policy implementation, and institutional development.

For instance, “the use of Mobile Applications to boost students’ engagement in EFL speaking classrooms” can be a research issue to investigate with a pragmatic perspective. To investigate this particular issue in English education, a researcher can collect:

- Quantitative data on how often students use mobile applications and their subsequent test scores. This method affords data to assess if the use of applications is associated with better grades.
- Qualitative data through focus group interviews to ask students how they feel about the application’s interface and whether it helps them engage in the classroom speaking activities. This method provides personalised insights into why they engage with it or do not.

Combining these findings makes a practical recommendation to advance knowledge in the field: “The Mobile applications are effective for vocabulary (quantitative data), but only if the user interface is redesigned to reduce student anxiety (qualitative insights).”

2. The Impact of Paradigms on the Research Design

Research paradigms serve as the "philosophical blueprint" for any study. They influence the choice of research questions, participants, data, and analysis in language/didactic studies. By defining the researcher's worldview (ontology) and their understanding of knowledge (epistemology), paradigms guide every decision made in the research process. The following table clearly summarises the influence of paradigms on research elements.

Figure 6. *Paradigms' Influence on Research Components*

Component	Positivism	Interpretivism	Critical Theory	Pragmatism
Research Questions	Focused on causality, frequency, and universal laws, e.g., Does X increase Y?	Focused on meaning, perception, and lived experience, e.g., How do students perceive X?	Focused on power, fairness, and structural change, e.g., How does X marginalise students?"*	Focused on practical outcomes, e.g., What works best to solve X?
Participants	Large, representative samples to ensure generalizability	Small, purposive groups selected for their specific experiences	Marginalised or specific groups directly affected by the power structure	Diverse groups chosen to provide practical insights from multiple angles
Type of data	Quantitative: numerical data, test scores, usage metrics.	Qualitative: interview transcripts, journals, observational notes.	Mixed/Reflecti ve: discourse, lived accounts, participatory reflections.	Mixed: a combination of quantitative and qualitative data.
Data Analysis	Statistical analysis, hypothesis testing, and correlation.	Thematic analysis, narrative inquiry.	Critical discourse analysis, reflection, and emancipatory evaluation.	Triangulation, synthesis of methods for problem-solving.

In language education research, the selected paradigm defines how the researcher interacts with the classroom environment. Choosing a specific paradigm ensures that the research is internally consistent.

Tutorial

Exercise 1: Complete the sentences using the following terms: interpretivism, critical theory, and pragmatism.

- …… focuses on uncovering power structures and advocating for equity within educational systems.
- ……. prioritises the usefulness of a research design, often mixing methods to address real-world challenges.
- …….. emphasises subjective meaning, deep context, and the idea that knowledge is co-constructed between the researcher and participants

Exercise 2: Evaluate the following statements, write either true or false. Correct the false statements.

- In interpretivism, the researcher aims to remain completely detached and neutral to ensure the findings are not influenced by personal bias.
- Critical theory is primarily concerned with maintaining the current situation in educational policy.
- Pragmatism is considered a flexible paradigm that allows researchers to choose methods based on the specific research problem at hand.

Exercise 3: Answer the following questions in short essays.

- If you were investigating why a specific group of students feels marginalised in a school, which paradigm would best support your goal of driving social change, and why?
- How does the interpretivist belief that "reality is socially constructed" change the way you would design an interview compared to a more objective approach?

Project 1:

Select one paradigm (Interpretivism, Critical Theory, or Pragmatism). Then present a hypothetical research study on a common topic, such as the following:

- The impact of generative AI on writing proficiency.
- Students' perspectives towards task-based learning.

Explain how the assigned paradigm would frame the research question and methods.

UNIT Six: Research Ethics in Didactics

Unit 6: Research Ethics in didactics provides a brief outline of different research ethics. It equips students with the moral principles and rules that guide how a research is planned, conducted, and reported. It explains how to conduct research responsibly, with respect for participants, the scientific community, and society.

Learning outcomes

After the completion of this unit, students will be able to:

- Explore the main research ethics researchers consider when collecting, analysing, and reporting data.
- Pinpoint what counts as acceptable and unacceptable behaviour in research (e.g., no harm, no deception without justification, no fabrication of data).
- Highlight core principles of research ethics.

Unit 6:	**Research Ethics in Didactics**
Week	Topic
11	Ethics Definition Ethics in Educational Research
12	Fundamental Research Ethics

1) Ethics Definition

Ethics has become a more persistent notion extending from the origins of a research study to its completion. Ethics should be a primary consideration rather than an afterthought, and it should be at the forefront of the researcher's agenda.

Ethics are the moral principles that govern a person's behaviour or the conduct of an activity (Oxford Dictionary, 2014). Dealing with morality, ethics concerns distinguishing between good and evil in the world, between right and wrong human actions, and between virtuous and non-virtuous characteristics of people.

2) Ethics in Educational Research

Educational research plays a significant role in developing the teaching and learning processes. It seeks to advance knowledge in the field and, in turn, to inform educational policies that enable informed decisions about teaching methodologies, resources, and training. However, as with any research endeavour, the value of educational research depends as much on ethical accuracy as on the originality of its discoveries. Ethics in research concerns the researchers' responsibility to be honest and respectful to all individuals involved in their study. Ethical considerations are paramount.

In educational research, ethics refers to the moral principles and values that guide researchers' behaviours during the conduct of research. It is a profound commitment to the principles of fairness, justice, and respect that guides the processes of collecting, analysing, and reporting data about learners, teachers, and educational institutions. This commitment also expects safeguarding the participants' rights, dignity, and prosperity.

3. Fundamental Research Ethics

Some ethical considerations may include

- **Honesty**: Ethical educational research depends on honesty and transparency. In this regard, researchers often need to provide clear, precise descriptions of the methods used for data collection, any funding sources (if any), and any potential conflicts of interest. Fair and honest data reporting enhances accountability, enables replication of study results, and promotes the research's credibility. The

researcher’s honesty throughout the research process, from data collection to reporting findings, sustains the integrity of the research. Thus, research should be designed and undertaken to ensure integrity and quality. The researcher must fairly report the research results, methods, and procedures without fabricating.

- **Integrity:** the researcher must ensure the accuracy of scientific knowledge by maintaining integrity or probity in the conduct of the research. This ethical principle underpins the correctness of all data collection and analysis activities. In this vein, Given (2008) states, "Integrity is central to ethical research principles that focus on the responsibility of the researcher to do no harm, to gain informed consent from participants, and to represent respondents' views" (p. 240).
- **Consent** is a pillar of ethical research denoting the principle of respect for autonomy. This research ethic recognises participants' right to make decisions about their involvement freely and voluntarily. In educational research, this means that students, teachers, staff, and stakeholders should be informed about the research’s objectives, procedures, and potential implications. In this sense, researchers should provide information on the aims of the research and the kind of information being sought from the study subjects, so that they can be permitted to test their hypotheses.
- **Privacy and confidentiality:** Ethical principles also protect the privacy and confidentiality of participants involved in educational research. To uncover insights and generate knowledge, researchers often collect personal information, ranging from students’ classroom performance to their personal experiences. Thus, researchers often need to respect participants' privacy to prevent harm and encourage open and honest participation, which leads to more reliable research outcomes. Accordingly, the researcher must protect the anonymity of the research subjects and keep the collected data confidential. The essence of this consideration is that the researcher should not reveal the identity of the informants and keep their names anonymous.
- **Minimising risk of harm:** researchers must consider sensitive ethical issues while trying to maximise benefits and minimise harm. Known as beneficence,

this ethical principle requires researchers to seek participants' well-being in their research. At the same time, non-maleficence requires avoiding harm or negative consequences. This ethical consideration emphasises the need for careful planning, risk assessment, and continuous monitoring to ensure that the benefits of research outweigh any potential harm.

- **Respect for intellectual property:** In educational research, this principle means that researchers must recognise that ideas, theories, and formulations belong to their original authors and should be acknowledged whenever they are used. In this sense, secondary data, whether quoted directly or paraphrased, should be credited. This ethical concern protects the rights of original authors, maintains academic integrity, and prevents plagiarism. Plagiarism is indeed considered a serious ethical violation in educational research. Thus, the researcher must credit the source each time s/he paraphrases or quotes another author.

Tutorial

Exercise 1: Answer the following questions in short essays:

- Suppose you are conducting a study on students' use of social media in class. How would you explain the research to them in a way they can truly understand?
- What practical steps can you take to keep names and identifying details out of your study report?
- When do you think it is not enough to paraphrase an author's idea without a citation? Give an example.
- How might failing to credit sources influence your credibility as a researcher?

Exercise 2: Filling the gaps with the following words: informed consent, risks, confidentiality, anonymous, attribution/citation, property.

In educational research, researchers must obtain …….. from participants before collecting data. This means giving clear information about the purpose, procedures, and possible ……. and benefits. Researchers must also protect participants' ……. by keeping their data …… and using codes instead of names where possible. If a researcher uses ideas from another

author, even when paraphrasing, they must give proper …… to respect intellectual …….

Exercise 3: Build a consent form

- Write a consent form for a questionnaire seeking students' perspectives on the use of AI applications to write essays.

Project 1: Explain the ethical issues in educational research, relating it to:

- The author
- The participants

Project 2: Choose one key ethical dimension in educational research, for example:

- Informed consent and assent from children
- Confidentiality and data protection in schools
- Avoiding harm and ensuring beneficence
- Respect for intellectual property and plagiarism
- Fairness and justice in selecting participants
- Ethics of teacher–researcher roles in the classroom

- Define the chosen principle in simple terms.
- Give at least one example from a real or hypothetical educational study.
- List 3–5 ways this principle can be violated in educational research.
- Suggest 3–5 concrete good practices (e.g., how to design a consent form, how to store data, how to cite sources).

UNIT SEVEN: Research Approaches

Unit 7 highlights three different research approaches, explains their characteristics and cites their main types. It aims to enable students to conduct different researches such as quantitative research, qualitative research and mixed-methods research.

Learning outcomes

After the completion of this unit, students will be able to:

- Define a research approach.
- Describe the quantitative research approach.
- Describe the qualitative research approach.
- Distinguish the quantitative research from the qualitative research.
- Identify mixed-methods research and its use.

Unit 7:	**Research Approaches**
Week	Topic
13	Quantitative approach to research
14	Qualitative approach to research
15	Mixed methods approach

The chief purpose of any research project is to provide answers to questions using a particular research approach, depending on the nature of the research. Indeed, there are two basic approaches to research: the quantitative and the qualitative. The former is generally carried out to obtain numerical data, e.g., numbers and percentages, whereas the latter is based on careful, detailed descriptive data that do not use statistics. Nonetheless, there is a third approach that combines quantitative and qualitative methods to offer the best of both. This latter is known as the mixed-methods approach.

1. Quantitative Approach

Definition

Undertaking research through the quantitative approach is based on the assumption that facts about reality can exclusively be attained through the eyes of the researcher. 'Quantitative' approximately indicates 'quantity' or 'amount' signifying the degree to which something (e.g., phenomenon, event, or situation) does or does not take place in terms of numbers, percentages, or frequency. The word 'quantity' in this situation refers to measuring or counting (Jonker and Pennink, 2010).

The scientific methods of natural sciences originally inspired the quantitative approach. It requires methods of data collection that yield numerical information, which are then analysed using statistical methods (Dörnyei, 2007).

Generally, the scientific method comprises four main stages in conducting a research project.

A. Observing a particular phenomenon and identifying a problem.
B. Formulating some research hypotheses.
C. Collecting a valuable amount of data and analysing it using standardised procedures.
D. Testing the claimed hypotheses. If the suggested hypotheses are confirmed, they will directly become recognised as scientific theories.

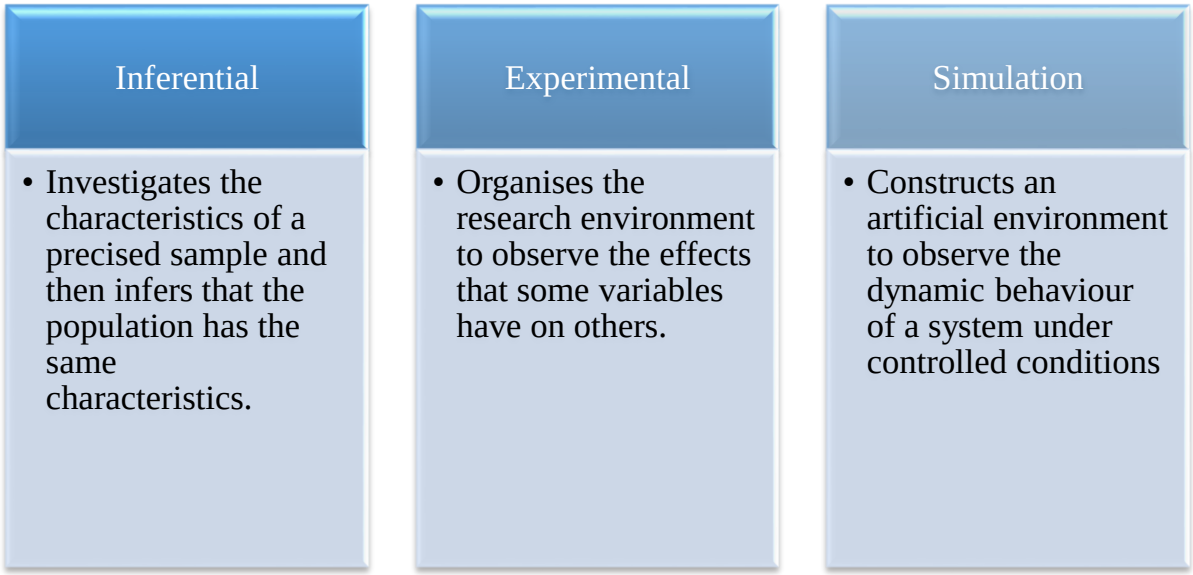
At this level, it should be noted that the scientific method is closely allied to statistics and numerical values. Thus, it affords an objective tool for searching questions, which aim to minimise the researcher's bias and prejudice and, therefore, result in what the quantitative approach devotees consider 'an accurate, reliable description of the world' (Dörnyei, 2007).

Thus, quantitative research is based on the measurement of quantity or amount. It is, then, applicable to the study of phenomena that can be expressed in terms of numbers and statistics. It is defined by Kothari (2004) as "the generation of data in quantitative form which can be subjected to rigorous quantitative analysis in a formal and rigid fashion" (p. 5).

Quantitative Approaches

The quantitative approach can be classified into three main approaches, as shown in **Figure 7.**

Figure 7. The Sub-Approaches of Quantitative Research



In situations where time and resources are limited, the quantitative approach is suitable, as it typically involves data collection instruments such as questionnaires with closed-ended and multiple-choice questions to measure specific variables. This data collection method can provide useful data in a short period of time.

Characteristics

Dörnyei (2007) has summarised several features of the quantitative approach:

a. Using numbers: presenting data in numerical form is typically the first characteristic that distinguishes the quantitative approach from the qualitative one.
b. Searching variables rather than cases: quantitative research emphasised the study of variables that hold the common features of groups of individuals.
c. Using statistics and the language of statistics: the language of statistics and measures is considered a notable quantitative approach feature. Therefore, most of the statistical methodology has become part of the quantitative vocabulary.
d. Assessing objective reality through standardised procedures: this research aspect involves avoiding researchers' subjectivity by developing systematic canons and rules for each facet of data collection and analysis.
e. Quest for generalizability and universal laws: this feature is reached through the use of numbers, statistics, and standardised procedures and scientific reasoning that all fall under the quantitative quest for making generalisations from the particular to the wider context.

As a conclusion, we may deduce that the quantitative approach to research is systematic, rigorous and focused. It also entails defined measurement in an attempt to produce reliable and valid data that are generalizable to the wider context

2. Qualitative Approach

Definition

The qualitative approach to research is often contrasted with the quantitative one. In conducting qualitative inquiry, researchers use different principles, strategies of investigation, and methods of data gathering and analysis. It depends greatly on data in the form of texts (such as field notes, journal and diary entities, and documents) and images (Creswell, 2012).

Evidently allied with qualitative phenomenon, the qualitative approach includes the use of data collection methods that yield non-numerical data, which are then examined through non-statistical procedures (Dörnyei, 2007).

It is defined as "any kind of research that produces findings not arrived at through statistical procedures or other means of quantification" (Hancock and Algozzine 2007, p.86).

Besides, the qualitative approach is said to focus on subjectively inquiring into participants' attitudes, opinions, and behaviours. Henceforth, the study in these situations is reliant on the researcher's insights and impressions. The findings are thus generated through a non-quantitative procedure, which is then subjected to rigorous quantitative analysis.

The qualitative approach is a valuable research method in the behavioural sciences that can be used to examine the causes of human behaviour. It intends to seek the question of why people behave in a particular manner or do certain things.

Additionally, inductive reasoning underpins the qualitative research approach. Researchers adopting qualitative procedures often start with

1. Making field observations and analysing documents.
2. Generating hypotheses.

This technique is thoroughly associated with inductive approaches. In fact, these hypotheses may be modified or changed by further data assembly. This means the inquiry remains open so it can respond flexibly to new facts that may arise during the course of the research.

Characteristics

Drawing largely on what was formerly mentioned in this section, We might summarise the main features that characterise the qualitative approach to research:

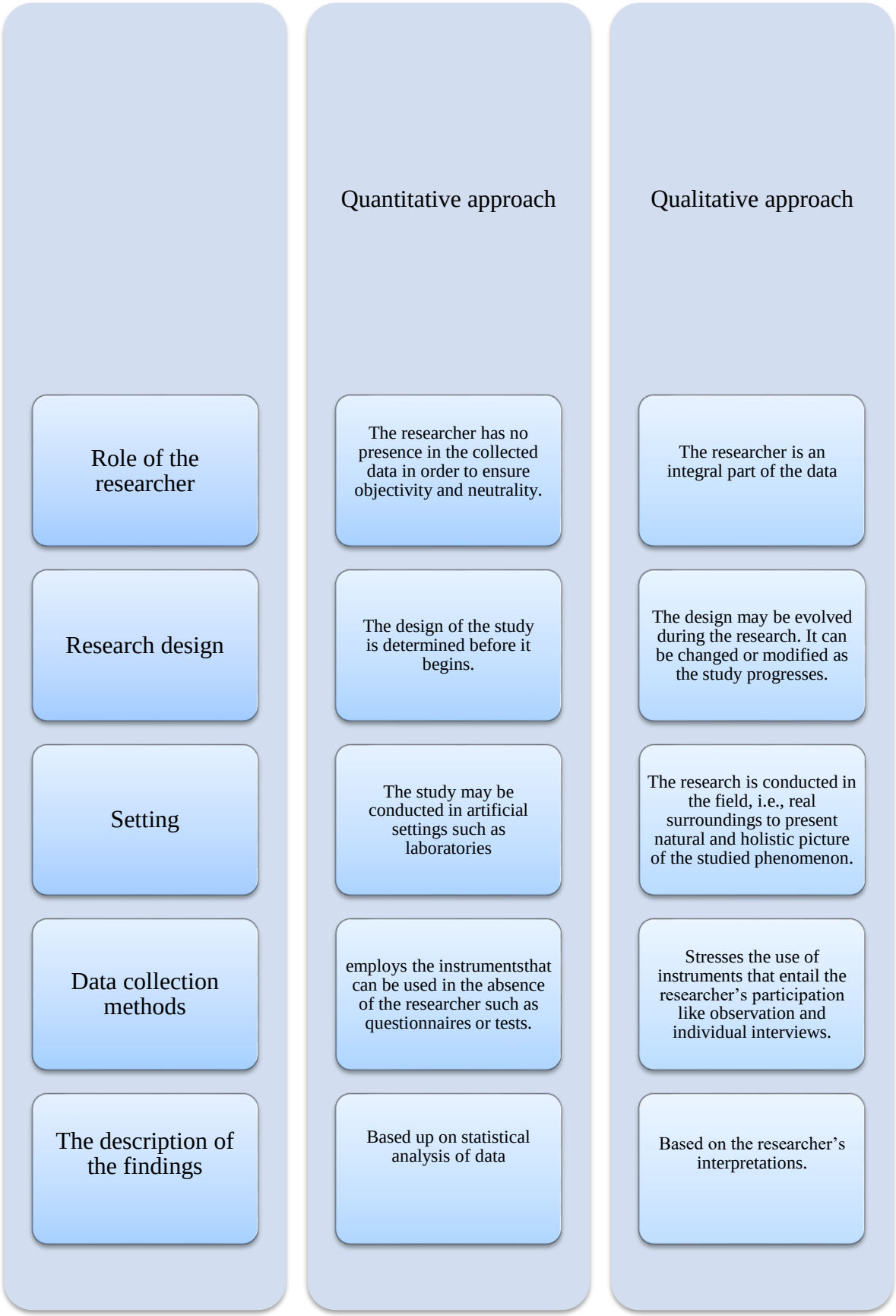
- Searches the areas, phenomena, situations, or events that relate to or involve quality or kind.

- Takes place in natural settings.
- Answers 'why' questions
- Affords open-ended data of a non-numerical nature reflecting the participants' opinions and the researcher's interpretations.
- Tries to expand the scope of research through generalisation.
- Offers the option of longitudinal assessment of phenomena in an attempt to explore the sequential events or the changes that occur through time.
- Allows the researcher to modify, redefine, or change things during research in a flexible way.

The qualitative research is conducted in natural setting to study people behaving in real life situations portraying the world around them using their own words. It aims to identify the characteristics and structure of phenomena and events examined in their natural context.

Obviously, the qualitative and quantitative approaches to research are not mutually exclusive; rather, they follow different principles and purposes. The following table will present the many areas where the two approaches vary:

Figure 8. The Main Differences between the Quantitative and Qualitative Approaches



3. The Mixed Methods Approach

Although the quantitative and qualitative approaches to research represent two distinct standpoints in empirical research, they need not be seen as mutually exclusive. The combination of their principles has led to the emergence of a new research approach known as 'mixed methods research'.

Definition

Generally known as the mixed-methods approach, this emerging methodology combines quantitative and qualitative methods to offer the best of both. Thus, the main aim of such a combination is to produce complementary data, so that the findings will not reflect only impressions or statistics. In this view, Dörnyei (2007) says, "I agree that qualitative and quantitative methods are not extremes but rather form a continuum" (p. 25).

The mixed-methods approach is considered a new approach that combines the strengths of both methods to best explore research problems.

Accordingly, the use of multiple research approaches enables the researcher to develop a detailed method that is expected to yield diverse types of data for better exploration of the studied situation. In this context, Given (2008) stresses that, "the use of both qualitative and quantitative approaches will provide a more complete understanding of the research problem than either approach alone" (p. 527)

Actually, using different research instruments that yield data of different natures allows the researcher to triangulate the results and guarantee their validity and vigour.

Triangulation occurs when the researcher relies on multiple sources of data to obtain a range of perspectives. It is defined by Cohen et al. (2000) as, "The use of two or more methods of data collection in the study of some aspect of human behaviour"(p. 112).

Characteristics

- Collecting both quantitative and qualitative data (complementary data)
- Providing a complete vision for the studied phenomenon

- Allowing for triangulation

Major of mixed methods designs

- **Convergent parallel design**:

This type entails collecting and analysing both quantitative and qualitative data simultaneously, then mixing the two databases by merging the results during interpretation.

- **The explanatory sequential design:**

This type entails collecting and analysing quantitative data first, then qualitative data. The two phases are merged to help explain quantitative results through qualitative findings.

- **Exploratory sequential design:**

This type entails collecting and analysing qualitative data first, followed by quantitative data. The two phases are connected to support the quantitative findings using qualitative results.

- **Embedded design:**

This type entails providing one form of data (quantitative or qualitative) in a supportive, secondary role in a study that is primarily based on the other form (quantitative or qualitative). The Embedded Design combines quantitative and qualitative datasets at the design level, with one type of data embedded within a methodology supported by the other.

Tutorial:

Exercise 1: Answer the following questions in short essays

- When is it most useful to use quantitative research in an educational setting (e.g., testing a new teaching method)?
- What are two possible limitations of treating everything as numbers in education?
- Why might qualitative research be better if you want to understand students' feelings about a new curriculum?

- How can the researcher's own views affect a qualitative study, and how can this be managed?

Exercise 2: Filling the gaps with the following words: quantitative, qualitative, mixed-methods, large, meanings, numerical, non-numerical/qualitative.

In …….. research, the researcher collects numerical data using tools such as surveys and tests, then analyses them statistically to find patterns and relationships. This approach often uses a …… sample to allow for generalisation. In contrast, …….. research focuses on rich descriptions, using methods such as interviews and observations to understand participants' …….. and experiences in context. Sometimes a researcher uses ……. research, which combines both ……. and ……. data to get a more complete picture of the research problem.

Exercise 3: Choose a topic and write one clear research question. Decide:

- Will it be quantitative, qualitative, or mixed-methods?
- Which type (e.g., survey, experiment, case study, ethnography, grounded theory, mixed-methods design)?

State briefly one advantage and one limitation of this approach for your question.

PROJECT:

Mackey and Gass (2005), as investigators of second language research, say,

> The growing practice of using both qualitative and quantitative data demonstrates that these two research approaches should not be viewed as opposing poles in a dichotomy, but rather as complementary means of investigating the complex phenomena at work in second language acquisition. (p. 164)

- Using the main ideas in the quote above, write a research paper in which you discuss the applicability of each approach in second/foreign language research.

UNIT EIGHT: Case Study Research

Unit 9 specifically focuses on describing the meaning and nature of case study research, its characteristics as a research process, and equips students with the main steps of designing case study research. This unit also introduces the main case study design types.

Learning outcomes

After the completion of this unit, students will be able to:

- Define a case study
- Consider and list the steps in the process of case study design
- Describe the main features of case study research
- List and describe the case study research design

Unit 9:	**Case study research**
Week	Topic
16	Definition of case study research The steps of case study design
17	Characteristics of case study research Types of case studies

1. Case Study Definition

Often named as a monograph, the case study is not a research method but uses a range of methods and techniques for the enquiry into a specific subject. It is the most appropriate approach in language education research. In In this manner, J. McDonough and S. McDonough (2006) argued that case studies are "a very suitable format for studies of language learning" (p. 203).

Within educational research, the case study offers holistic explanations of language learning or use within a particular sample, i.e., it provides thorough reports on specific students or, sometimes, complete classes within their learning setting (Mackey and Grass, 2005).

A case study is usually regarded as a research approach in which one or more instances of a specific phenomenon are examined in depth. It is more likely to be concerned with explaining and understanding the specific mechanisms between causes and effects rather than clarifying the key factors that cause an effect (Given, 2008). Thus, it emphasises a particular case, item, or phenomenon in action and attempts to answer or suggest how and why something has happened, "the case study is most appropriate for questions that begin with 'how' and 'why'" (Tayie, 2005, p. 102).

Consequently, the central objective of case study research is to specify the factors responsible for the behavioural patterns of a given individual or group (Kothari, 2004). According to Yin, case study research involves conducting an empirical investigation of a current phenomenon in its real context using multiple sources of evidence (Hancock and Algozzine, 2006).

2. The Steps of Case Study Design

According to Yin, a case study is an empirical inquiry that examines a current phenomenon within its real-life context, particularly when the borders between the phenomenon and its context are not noticeably apparent (Woodside, 2010).

Furthermore, Yin proposed that the design of a case study must incorporate five major components or steps, including:

a. Formulating the research questions
b. Stating prepositions or suggestions
c. Specifying the unit(s) of analysis
d. Linking the obtained data to the suggestions (hypotheses)
e. Selecting criteria to interpret the findings (Marczyk et al., 2005).

In another suggestion, Stake, as an educational researcher, perceives a case study as "the study of the particularity and complexity of a single case", and postulates that it must consider two essential elements (J. McDonough and S. McDonough, 2006):

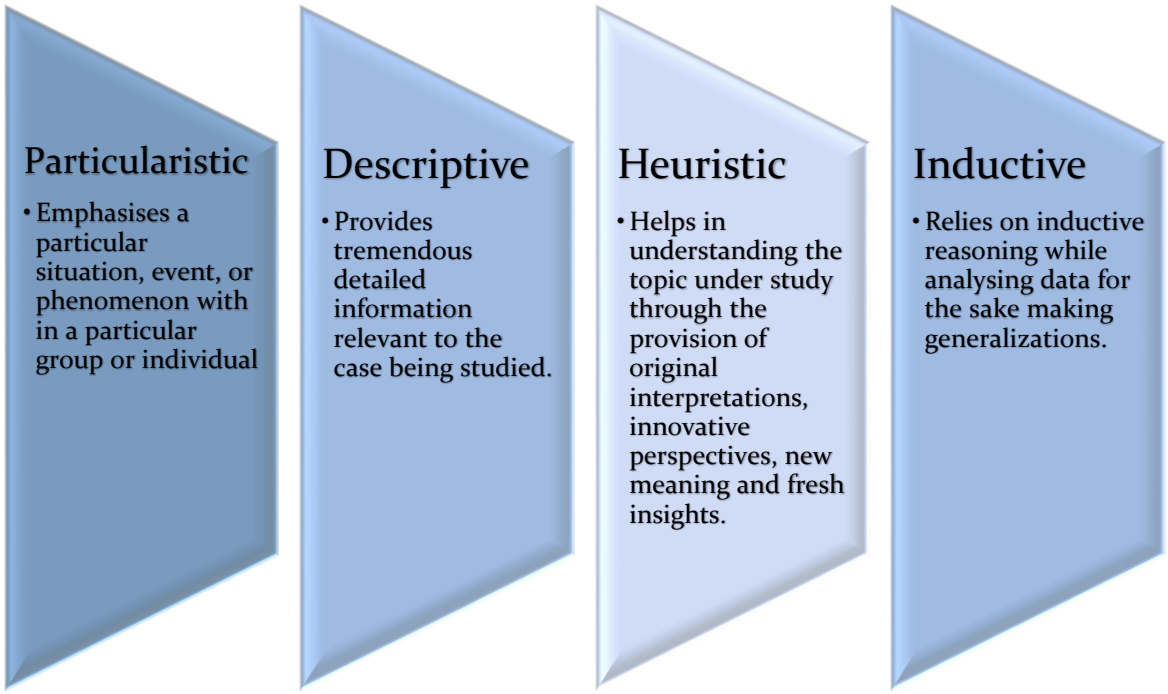
- Theme: denotes the subject matter under examination.
- Issue: signifies the problematic scaffolding upon which research questions are raised and hypotheses are proposed.

3. Characteristics

A case study is an empirical inquiry that can be drawn from various data collection methods to examine a group or an individual within a group and to report that group's or individual's experience in a particular setting. It is also said to be consistent with the qualitative research approach; however, this judgment depends on the nature of the data collection methods (Lodico et al., 2006; Tayie, 2005).

The following figure typically lists the critical features of case study research.

Figure 9. The Characteristics of Case Study Research



These characteristics support the idea that case study research is neither limited to a single objective nor characterised by a single trait; consequently, it affords varied insights into the phenomenon under study.

4. Types of Case Studies

Case studies can be categorised into three main design types, and the nominated design depends on how the research is conducted and the research objective. Yin distinguishes between three major kinds of case studies (J. McDonough and S. McDonough, 2006):

- **An exploratory case study**:

It is a type of case study that aims to explore a defined phenomenon by formulating hypotheses to understand its causes and effects.

- **Descriptive case study**:

This type of case study generally seeks to portray the situation or phenomenon under investigation.

- **Explanatory case study:**

It usually uses a specific theory as a basis for examining the selected phenomenon.

Tutorial:

Exercise 1: Answer the following questions in short reflective essays.

- Why is case study research useful when a researcher wants to understand a single school, classroom, student, or program in detail?
- Why are "how" and "why" questions often better than "how many" questions in case study research?
- What is one strength and one limitation of studying only one case deeply?
- What kinds of data sources can make a case study more convincing?

Exercise 2: fill in the gaps using these words: bounded, exploratory, how, why, context.

A case study is an in-depth investigation of a ……. case, such as a student, classroom, school, or program. It focuses on the …… in which the case happens and usually uses multiple sources of evidence, such as interviews, observations, and documents. Case studies are especially useful for answering …….. and …… questions. Common types include ……, descriptive, explanatory, and evaluative case studies.

Exercise 3: Match each scenario with the best type of case study.

• A researcher studies a new school program to generate ideas for a larger future study. • A researcher provides a detailed account of how one inclusive classroom operates. • A researcher explains why one school successfully reduced absenteeism. • A researcher evaluates whether a literacy intervention achieved its goals. • A researcher studies several schools to understand a broader issue.	• Evaluative • Descriptive • Exploratory • Multiple case studies • Explanatory

Project 1: There are several strengths and weaknesses of case study research that stem from its characteristics.

- In a **PowerPoint Presentation**, examine the main strengths and weaknesses of case study research.

Project 2: Prepare 5–7 minutes of slides or a poster on the following suggested topics:

- Characteristics of case study research.
- Main types of case study design.
- How to design a single case study in education.
- How to design a multiple-case study in education.

End the presentation with a “mini protocol” slide that shows: a research question, a case, selected data sources, and, lastly, expected findings.

UNIT NINE: Action Research

Action research—or participatory action research—is research initiated to solve an immediate problem. It is a reflective process led by teachers to improve the way they practice to solve problems in classrooms. Action research involves the process of active participation while conducting research. This unit will provide some basic skills and knowledge about the nature and types of action research.

Learning objectives

After the completion of this unit, students will be able to:

- Explain the nature of action research
- Discuss the characteristics of action research
- List models of action research

Unit 9:	**Action research**
Week	Topic
18	Definition of action research Stages of action research design
19	Models of action research

1. Definition of Action Research

As its name implies, action research involves both action and research at the same time:

- The action side entails a sort of premeditated intervention that may take in a strategy, a process, or an activity, intentionally put into practice in the research context.
- The research side entails the researchers' collection of data to assess the results of the scheduled intervention.

Henry and Kemmis (1985) stated that action research includes participants' investigation of their own situations to develop their own social and educational practices, as well as their understanding of these practices and the conditions in which they are performed.

Action research is a part of the broad movement in education. It is closely associated with the ideas of '**reflective practice**' and the '**teacher as a researcher**'. In this sense, action research entails integrating a critical, reflective approach to explore one's teaching context.

As action researchers, teachers have to raise a questioning or a problematizing stance towards their teaching. The word problematizing does not merely mean that teaching is unsuccessful or beset with difficulties, but may mean that teachers can identify an area in which they can perform better, expose it to questioning, and then develop new practices (Burns, 2010).

2. The Steps of Action Research Design

Participant researchers can go through four main stages while conducting action research.

a) The first phase entails defining a starting point for developing one's own performance.

b) The second stage requires the participant researcher to use data-gathering methods such as observation, journaling, or interviews, then to clarify the situation based on the analysis of the obtained data.

c) The third step entails using the analysed data as a basis for developing alternative strategies for practice. Nevertheless, the developed strategy is not expected to solve the defined issue immediately; thus, the participant researcher must re-enter the clarification stage to develop additional strategies.

d) The fourth stage entails the teacher-researchers' sharing of their research results, making their professional knowledge accessible to others for critical discussion.

3. Models of Action Research

There are various models of action research, including the Kemmis and McTaggart (1988) model and the Kurt Lewin Spiral of Cycles.

a) Kemmis and McTaggart (1988) model

The major authors in the field have defined four major stages in a cycle of research. Dependently, the first cycle may become a continuous spiral that recurs until the anticipated outcome is achieved.

- ✓ **Planning**: In this phase, the action researcher first identifies the problem and then develops an action plan to bring about positive change.
- ✓ **Action**: after identifying the problem, the researcher develops a carefully designed plan. The latter is based on thoughtful interventions into the teaching situation that the researcher implements.
- ✓ **Observation**: It is a data-gathering phase in which the researcher observes the possible effects of the action plan. It involves documenting the situation in addition to the participants' actions and opinions.
- ✓ **Reflection**: In the last phase, the researcher reflects on, evaluates, and describes the outcomes of the action plan to identify the problem under study. Based on the outcomes, more cycles of action research can be undertaken to improve the situation.

b) Kurt Lewin's Spiral of Cycles

Kurt Lewin was the first to introduce the term action research as a model comprising a spiral of cycles. The basic activities in these cycles are:

- ✓ Planning the first action step for change.
- ✓ Acting and observing the procedure and the results of the change.
- ✓ Reflecting on the procedure and the results, then planning the second action step.
- ✓ Acting and observing the procedure and the results of the change
- ✓ Reflecting on the procedure and the results, then planning the third action step, and so on. (Elliott, 1991)

To conclude, action research is a form of applied research that enhances practice, develops new theoretical insight and introduces change in the studied setting.

Tutorial:

Exercise 1: Answer the following questions in short analytical essays.

- Think of one problem you have observed in a classroom or school. Why might it be suitable for action research?
- Why is reflection important after you try a new teaching strategy?
- What might happen if a teacher only "acts" but never analyses and reflects?
- Why is action research usually not suitable if you want to generalise findings to many schools? What is its main strength instead?

Exercise 2: fill the blanks using the following words: plan, solve, implement, analyse, identify, applied, data, individual, repeat, reflect, participatory, collaborative

Action research is a type of …….. research that aims to both …… a problem and make a practical change. It usually follows a cyclical process: first, the

researcher ……. a specific problem in the classroom or school. Then they …… an intervention and plan how to collect …….. In the next stage, they……. the plan and gather information. After that, they ……. the data and …… on what worked or did not. Finally, they may …… the action for the next cycle. Common types include …… action research (one teacher), …… action research (teachers working together), and …….. action research that involves community members as co-researchers.

Exercise 3: Design a very simple action research project in education, using this structure:

1. Problem/focus area (e.g., low participation, poor homework completion, lack of peer correction in writing).
2. Research question (one sentence) starts with: "How does … affect …?" or "To what extent does … improve …?"
3. Action plan: What change or intervention will you try (e.g., structured group roles, weekly peer feedback, short formative quizzes)? And for how long will it run (e.g., 2–4 weeks)?
4. What simple tools will you use? (observation checklist, short survey, student work samples, quick quizzes, teacher journal notes).
5. Briefly describe the sequence: Before → during → after the intervention.
6. How will you compare the "before" and "after" data and reflect on the results?

Project:

Action research is a type of participatory research also called teacher-led inquiry. Generally, there are two main types of action research: **critical action research** and **practical action research.**

- In a research paper, discuss each type, highlighting its definition, features and principles.

UNIT TEN: The Process of Sampling

Unit 11 introduces students to the process of sampling as a leading step in any research design. Students will learn to select a sample that best fits the research objectives. The unit will also present the types of samples, define the characteristics of a reliable sample and discuss the size of the sample.

Learning objectives

After the completion of this unit, students will be able to:

- Define the sampling process
- Describe the various sample designs
- Identify the characteristics of a reliable sample
- Identify the suitable size of the sample

Unit 10:	**The process of sampling**
Week	Topic
18	Definition of sampling Types of sampling
19	Types of Sampling Characteristics of a reliable sample
20	Characteristics of a reliable sample Size of the sample

Searching the entire population is said to be a difficult task for researchers; for that reason, they often need to obtain information from a smaller group or division of the whole population or the universe.

1. Sampling Definition

The process of selecting units from the population is called sampling. This leading procedure goes through two major stages:

a. Defining the population

b. Choosing a particular sample from that population.

As a result, the sample is considered a subset (or subgroup, subselection, subdivision) of a defined population.

The **design of a sample** is a definite plan adopted by the researcher to select a sample from a given population and to make judgments about the number of items to be included in that sample (Kothari, 2004). Such a plan has great emphasis on the generalizability of the attained data; therefore, Morrison states that the quality of any research project is not only the outcome of the suitable methodology, but the appropriateness of sampling strategies and procedures as well (Cohen et al., 2000).

2. Types of Sampling

Choosing units for the sample or sampling is not an arbitrary procedure that happens in a vacuum; it is centred on a sum of scientific techniques and procedures that the researcher must implement.

Generally, there are two central types of sample designs based on two different criteria:

a. **The representation basis**: based on this type, the sample can be selected using a probability or non-probability sampling technique.
    - *Probability sampling* entails that the researcher randomly selects from the entire population, and each item (informant) has an equal probability of being selected for the study. There are two types of random sampling:

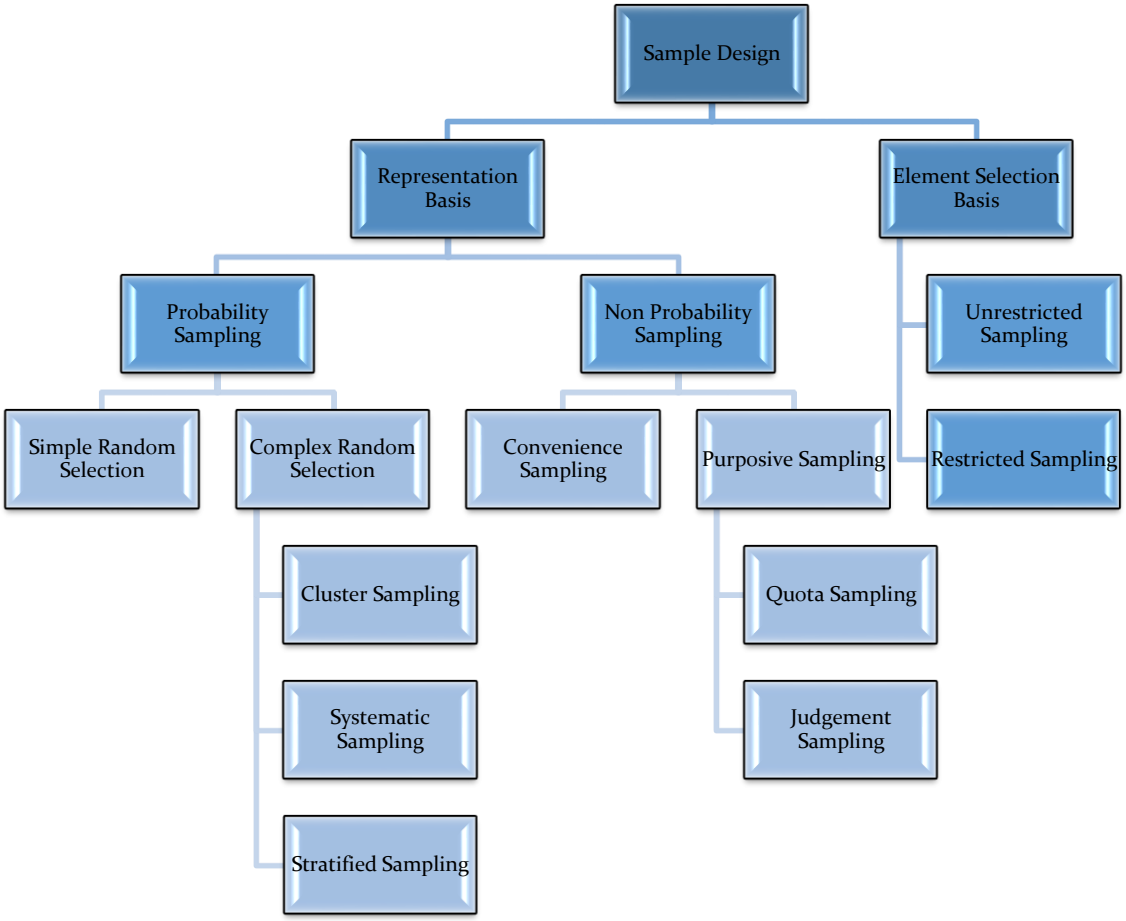
- ✓ Simple random selection, which is said to be the best technique to get a sample that is characterised by representativeness.
- ✓ A complex random sampling technique that uses criteria that are rather different to select items. Examples of this type include stratified sampling, which classifies sample items in groups or categories based on age, sex, or occupation.

- *Non-probability sampling* requires the researcher to select participants in a non-random way; i.e., participants do not have the same chance of being included in the sample. This type of sampling entails deliberately selecting items by the researcher. The main types of nonprobability sampling are convenience sampling and purposive sampling, which in turn include quota and judgment sampling.

b. **Based on the element selection,** there are 'unrestricted sampling,' which entails selecting each sample item individually from the large population, and 'restricted sampling,' which encompasses all other types of sampling.

The following figure will demonstrate the sample design as explained previously.

Figure 10. Basic Sample Designs



3. The Characteristics of a Reliable Sample

The consistent sample should possess the following features

- ✓ **Goal-oriented**: the selected sample should align with the research goals and reflect the investigation conditions.
- ✓ **Representativeness**: the sample should reflect the population from which it is drawn. In brief, it has to be carefully selected to include the same features as the entire population.
- ✓ **Generalizability**: the sample should be sufficiently large to provide statistical stability or reliability enough to represent the population

properly. The sample size should be acceptable to allow the researcher to make generalisations.

- ✓ **Homogeneity**: the characteristics of the sample items should be approximately identical or similar

4. The Size of the Sample

The sample size the researcher selects from the entire population is vital to the study's credibility. It mentions the number of items actually chosen for the study. Although there are no established rules for defining sample size, there are general guidelines to consider when selecting a sample.

Thus, the researcher is not obligated to specify a particular sample size. However, it is assumed that the sample size is related to the population's characteristics. A good maximum sample size is usually 10%, as long as it does not exceed 1000 items. Therefore, a few points have to be taken into consideration while selecting the size of the sample:

- The sample size depends on the population size.
- The size depends on the subject matter.
- When the group is homogeneous, a small sample is accepted.
- When the group is heterogeneous, a large sample is required.
- If the Attrition problem is encountered, a large sample is needed.

Tutorial

Exercise 1: Answer the following questions in short essays.

1. If your population is “all EFL students in Naama University,” why can you not study all of them? How would a sample help?
2. When is it important to use a **probability** sample (e.g., for generalising results)?
3. What might happen if your sample only includes students from one class or one school when your research question is about “all students in your town”?

4. How can stratification (e.g., by gender, level, school type) make a sample more representative?

Exercise 2: fill in the blanks using the following words: sample, sampling frame, target population, method, population, equal, size, sampling, bias, representative, precision, variability.

In research, it is usually not possible to study an entire ……... Instead, researchers select a …… that should represent the larger group. The first step is to clearly define the ……. and the ……. (the list of eligible individuals). Then researchers choose a sampling ……., such as simple random, stratified, cluster, or convenience sampling. Probability methods give each member of the population a …….. and known chance of being included, which increases the chance that the sample is ……. and reduces ……. Non-probability methods are easier but can introduce ……. The ……. of the sample depends on factors such as the size of the population, the level of …… desired, and the expected …….. in responses.

Exercise 3: Match each to the most suitable sampling method and briefly justify your choice.

a) A national survey randomly selects phone numbers from all regions, with proportional numbers of men and women and age groups. b) A teacher selects all students in her own class because they are easy to reach. c) A researcher interviews 20 advanced learners deliberately because they can provide rich information. d) A study selects entire classrooms at random from a list of all schools in a district.	• **Purposive/judgmental sampling** • **Stratified sampling** • **Cluster sampling** • **Sanow ball sampling**

e) A researcher selects every 10th student from an alphabetical class list. f) A researcher seeks rare bilingual students and asks participants to refer others like them.	• **Systematic sampling** • **Convenience sampling**

PROJECT:

Depending on the study's overall purpose and the research approach (quantitative or qualitative), a researcher may decide on a sample. For generalisation purposes, there are probability sampling and non-probability sampling techniques. In a PowerPoint presentation, highlight

- What is sampling? Steps of the sampling process.
- Probability sampling methods (with simple examples).
- Non-probability sampling methods
- The strengths and weaknesses of each technique.
- How to choose a sample size and judge a reliable sample.

UNIT ELEVEN: Data Collection Methods

A research tool is a testing device for assessing a given phenomenon, such as a questionnaire, an interview, or an observation. The research instrument is what one uses to collect information. This unit highlights different research tools and aims to enable students to construct and administer different research tools such as questionnaires, observations, and interviews.

Learning Objectives

After the completion of this unit, Students will be able to:

- Construct a research questionnaire
- Explain and conduct an interview
- Prepare an observation schedule

Unit 11:	**Data collection methods**
Week	Topic
21	Questionnaire design and characteristics
22	Interview design, characteristics, and types
23	Observation definition and categories

1. Questionnaire

Definition

The questionnaire is generally regarded as a document involving a limited number of questions or other forms of items considered, especially to ask for information appropriate to explain and test research problems (Jonker and Pennink, 2010).

The questionnaire is usually considered as a convenient research tool that offers qualitative and numerical data on behaviours, attitudes, and opinions from several informants; therefore, it has been commonly used to explore problems in many fields, including behavioural sciences, social sciences, and educational research (Dörnyei, 2007; J. McDonough & S. McDonough, 2006).

Brown defines it as,

> Any written instrument that presents respondents with a series of questions or statements to which they are to react either by writing out their answers or selecting them among existing answers (qtd. in Mackey and Gass, 2005, p. 92).

The questionnaire is a suitable data collection method for collecting survey information, providing structured, quantitative data, and allowing administration without the researcher's presence, as well as being easy to analyse.

Questionnaire items/questions

Depending on how they are structured, planned and ordered, the questions or items used in a questionnaire must be designed carefully to obtain valuable qualitative and quantifiable results. In fact, there are several types of questions and response styles in questionnaires, including:

- Factual questions:

These questions seek to elicit personal information or facts about the respondents, such as demographic characteristics (e.g., age, sex), occupation, level of education, and residential location.

- Close-ended questions:

These questions specify a variety of responses from which respondents must choose. In general, this type includes many kinds of questions, such as

  - Dichotomous questions which entail a 'yes'/' no' response.
  - A rating scale is one in which degrees or intensities of response are offered in the form of choices to a given question or statement.
  - Multiple-choice questions are the type in which a range of alternative responses is suggested for the respondents to tick only one or several choices. Such questions are used to elicit responses about opinions, attitudes, and perceptions.

- Open-ended questions:

These questions require respondents to produce a free piece of writing in their own words by providing a blank space (e.g., dotted lines) to fill in. This type of question seeks to obtain personalised data on views, attitudes, and perceptions, along with the reasons for those responses.

Accordingly, the questionnaire may be used to obtain three types of data depending on the nature of the questions. It affords **factual data** about the participants; **behavioural data** on actions, lifestyles, and habits; and attitudinal data, mainly on opinions, beliefs, interests, and values (Dörnyei, 2007).

Characteristics of a reliable questionnaire

The effective questionnaire is the one that offers valuable information for the researcher; the latter has to take into consideration the following points:

- ❖ The opening of the questionnaire. It is based on the idea of informed **consent**, that is, a brief introduction in which the researcher explains the purpose of the questionnaire and asks respondents to participate in the research by answering the questions.
- ❖ The questions sequence and wording
- ❖ The questions should smoothly move from the general to the specific and from closed-ended to open-ended.

- ❖ Avoiding ambiguous statements or questions
- ❖ Asking for only one piece of information at a time
- ❖ Minimize subjectivity and bias
- ❖ Using correct language and exact vocabulary
- ❖ Respecting the scope of the studied case

To conclude, the questionnaire is a popular instrument in many fields of research. This popularity can be attributed to the fact that it is greatly flexible in its nature and exclusively capable of obtaining an incredible quantity of information in a relatively short period of time.

2. Interview

Definition

The interview is a well-known qualitative data collection method. A qualitative interview involves the presentation of an oral question by the interviewer (researcher), followed by an oral response from the interviewee (Kothari, 2004).

This research instrument has the advantage of providing the researcher with rich and personalised information. In fact, there are many forms of interviewing, such as one-to-one, focus group, telephone, and e-mail interviews.

The typical qualitative interview is a **one-to-one** professional conversation with a structure and purpose to elicit descriptions of the interviewee's life, intending to interpret the meaning of the described phenomenon.

Types of Interviews

One-to-one interviews can be classified into three main categories based on the level of process structure.

a. **Structured Interview**

This type involves a set of questions that the researcher arranges in advance and directs to all respondents in the same order and format.

b. **Semi-structured Interview**

This category relies on a particular set of prepared questions, subject to modification during the interview process. Thus, its design is open-ended, and the interviewee is prompted to expand on the raised points through probing. Indeed, probes entail that the researcher will use the interviewee's statement as an opening to ask another question.

c. **Unstructured Interview**:

This type is based on a general conversation of the topic after the interviewee is informed about the subject and is allowed to speak freely. This type does not require an interview guide, but the researcher must prepare a set of opening questions to elicit the interviewee's narratives.

Key features

For the qualitative interview to yield valuable data, it must possess several key features.

- Starting with the ethical considerations, particularly informed consent. The interviewer must first ask the interviewee for permission by outlining the aims of the interview.
- It naturally flows with the various questions, connecting faultlessly; i.e., the interviewer must provide the respondents with the opportunity to express the information spontaneously without interrupting them.
- It is rich in details. In this area, the use of probes can make the difference.
- The neutrality of the researcher means the interviewer should ask questions without imposing personal views or directing the interviewee to provide specific answers, i.e., without bias.

The interview may include four types of questions: factual, dichotomous, multiple choice and open-ended depending on its design organization. The researcher should pilot it in order to check the quality of the questions and the way of asking them in order to get data of good quality.

3. Observation

Definition

Observation is among the oldest research methods. This research tool involves documenting the observed setting using all the researcher's senses, primarily sight and hearing, in a purely scientific, systematic way to collect information about the studied phenomenon in its natural setting. Although it is reflected as a fundamental research instrument, it is frequently employed alongside other methods (Given, 2008).

In this vein, Mason noted that

> observation usually refers to Methods of generating data which involve the researcher immersing [him or herself] in a research setting, and systematically observing dimensions of that setting, interactions, relationships, actions, events, and so on, within it (qtd. in Mackey and Gass, 2005, p. 175)

Accordingly, actions, activities, and events are assessed and recorded to explore:

- What participants do.
- Why do they behave in a particular way, and with whom?
- What is happening in their setting?
- What are the main apparent aspects of their activities?

Moreover, the physical setting in which participants act should be noted, including the equipment present. Henceforth, each aspect is of vital significance and must be recorded for the researcher to appreciate the studied case.

Therefore, data obtained through observation are expected to be eye-catching, as they allow the researcher to collect 'live' information from 'live' locations (Cohen et al., 2000).

Types of Observations

Researchers can observe the phenomena they study in many different ways. To organise these ways, three dichotomies are offered: "**structured**" versus "**unstructured observation**", "**participant**" versus "**nonparticipant observation",** and "**covert**" versus "**overt observation**".

a. ***Structured vs Unstructured***:

Highly structured observation, usually termed an observational schedule, requires entering the observed setting with a specific focus and a clear plan. It requires some preparation in advance, with objectives limited and recording tools, such as a checklist or a rating scale, selected. In contrast, the unstructured observation is less clear, as it means observing before determining which objectives or points to elicit from the observation. Thus, it does not entail any precise planning; rather, it entails completing narrative field notes while observing.

b. ***Participant vs Nonparticipant***:

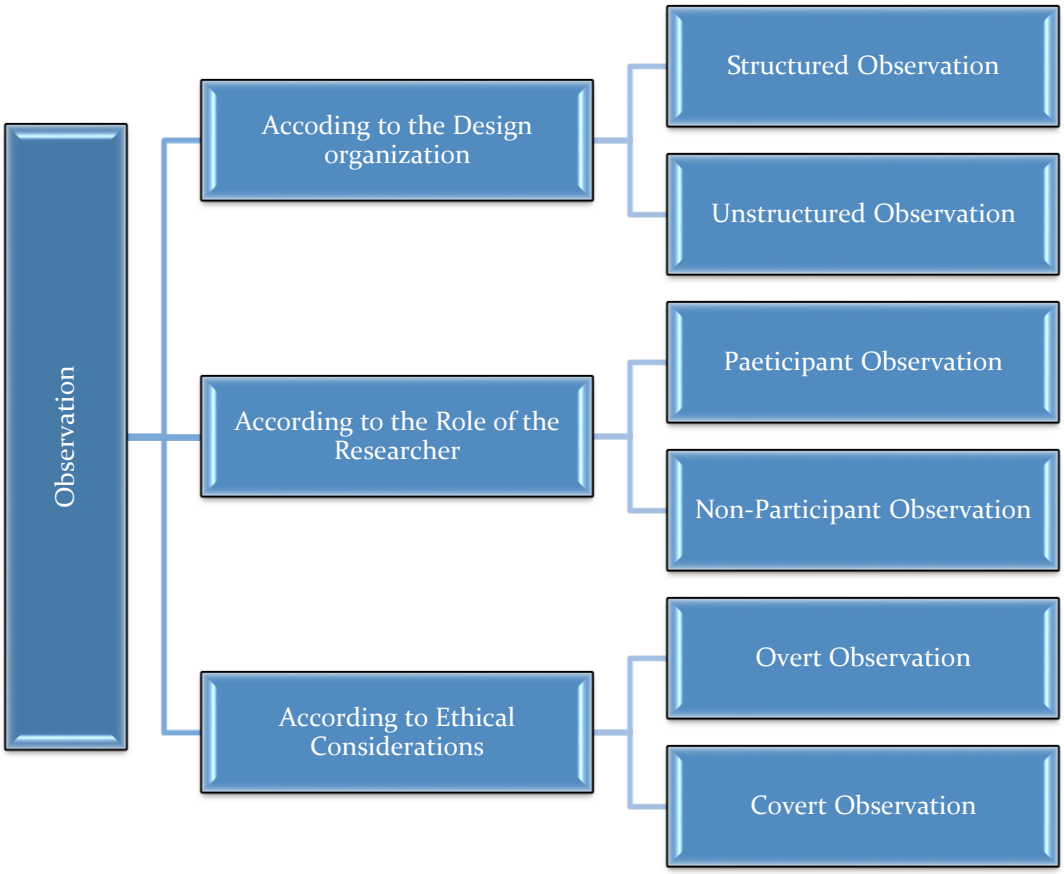
Participant observation requires the observer's full involvement in the process being observed. In this case, the investigator becomes an integral member of the observed group and a member of it as well. On the contrary, nonparticipant observation denotes the type in which the researcher is an observer merely as s/he is not involved in the observed situation.

c. ***Covert vs Overt:***

Covert observation means that the researcher does not inform the observed subjects of the purpose of the observation. Thus, the observer fails to consider ethical issues, particularly the principle of informed consent. On the other hand, within overt observation, the subjects are informed that they are being observed for a specific objective.

The three dichotomies are grouped into three main categories, as shown in the figure below.

Figure 11. Observation Categories



Recording Tools

- **Rating Scale:** There are many kinds of rating scales, including the Likert scale (named after its inventor, Rensis Likert, 1932), in which a range of responses is proposed for a given statement.

  For instance, to assess interest in the classroom, ratings on a five-point scale (extremely low- low- fair - high-extremely high) were provided for the observer to mark the degree to which interest is displayed during the lesson. The points are listed in a table, and the researcher indicates the rating by placing a tick next to each point.

	Extremely low	Low	Fair	High	Extremely high
The students' interests				✓	

- **Checklist:** The checklist contains several statements, each with a range of responses. It encompasses the inquirer selecting one of the pre-proposed alternative responses to a question or statement. ***For instance***,
    - The teacher's encouragement of the students' participation in the classroom.
        - Very seldom
        - Occasionally
        - Quite often
        - Very often
- **Narrative field notes** or **note-taking:** encompass the observers' impressions, intuitions, perceptions, and evaluations of the events that take place in the studied site, recorded in a form of open-ended or qualitative comments.

Tutorial

Exercise 1: Answer the following questions briefly

- When is a questionnaire more suitable than an interview in your educational research?
- What are two possible drawbacks of using only closed-ended questions in a questionnaire?
- How does a semi-structured interview differ from a fully structured one in generating rich data?
- What kind of educational topic (e.g., students' experiences, teachers' reflections) is best explored with an interview?
- Why is it important to have an observation checklist or guide instead of only taking free notes?

- What risks to reliability and validity might arise if the observer is also the teacher in the same class?

Exercise 2: Fill in the gaps using the following words: pilot, questionnaires, research instrument, questions, unstructured, Observation, valid, observation, interviews, reliable.

In research, a ……. is any tool used to gather data. Common instruments include ……., …….., and …….. A questionnaire contains a set of …….. and can be delivered online or on paper. Interviews can be structured, semi-structured, or ……., allowing researchers to explore participants' views in depth. …… involves systematically watching and recording behaviour in a natural setting using a checklist or field notes. To ensure quality, instruments should be …….. (measuring what they are supposed to) and ……. (giving stable results if used again). A …… should be done before using the final instrument to detect unclear questions or technical problems.

Exercise 3: design a **small research instrument** for a given topic in education (e.g., "students' attitudes toward online learning," "teachers' use of collaborative methods," "classroom discipline strategies").

The answer must include the following:

1. **Research question** (one sentence).
2. **Choose main instrument(s)**
    - One primary instrument (e.g., questionnaire, interview guide, observation checklist).
    - One complementary instrument (e.g., short questionnaire + few interview questions).
3. **Design concrete items/questions**
    - Questionnaire: 8–10 items (mix 2–3 closed-ended and 1–2 open-ended).
    - Interview guide: 4–5 main questions (e.g., 2-3 open, 1 reflective).

- Observation checklist: 4–6 behavioural indicators with a simple rating or yes/no scale.

Project 1: Based on the lesson, design a questionnaire for either teachers or learners to seek one of the following objectives

- The efficiency of authentic materials in EFL classrooms
- Reasons behind students' lack of interest in literature sessions.
- Students' attitudes towards cooperative learning.

Project 2: Based on the lesson, prepare a structured interview to seek teachers' assessment strategies in EFL classrooms.

Project 3: the teachers' offered possibilities for learners' active participation in the classroom are among the challenges that irritate teachers due to the limited time offered.

- Prepare an observational checklist to assess the degree to which learners are given opportunities to take a role in the classroom.

UNIT TWELVE: Data Treatment/Analysis

Analysing data is the process of examining, transforming, modelling, and coding data with the goal of underlining useful information, suggesting conclusions, and testing hypotheses. Data analysis has multiple facets and approaches depending on the selected research instruments. This unit covers the analysis of both quantitative and qualitative data.

Learning Objectives

After the Completion of this Unit, Students will be able to:

- Define quantitative data analysis
- Identify the major steps in quantitative data analysis
- Explain qualitative data

Unit 12:	**Data treatment/analysis**
Week	Topic
24	Definition of quantitative data analysis Descriptive statistics
25	Inferential statistics Stages in quantitative data analysis
26	Qualitative data analysis

As Brown points out, accumulating the required data is 'half the battle'; thus, researchers need to attack the other half, which includes the analysis of these data. In fact, data analysis is the process by which researchers organise, simplify, abstract, transform, and summarise the data they collect.

Cooper and Schindler perceive the process of data analysis as "editing and reducing accumulated data to a manageable size, developing summaries, looking for patterns, and applying statistical techniques" (qtd. in Jonker and Pennink, 2010, p. 142).

Research instruments can be designed to obtain either quantitative or qualitative information. The analysis of these data will be quantitative or qualitative, depending on the research instruments' design.

1. Quantitative Data Analysis

Definition

Quantitative analysis uses a range of mathematical procedures, called statistics. Given (2008) argues that analysing quantitative data enhances the validity, credibility, honesty, and transferability of research results. However, statistics fall into two categories: descriptive and inferential.

Descriptive Statistics

As its name indicates, descriptive statistics describe and present the gathered data. Its purpose is to review and expose the attained data in numbers and figures. According to Burns (2010), reporting data through descriptive statistics can be done in two different ways:

- ***Measures of central tendency***, in which one measure is given to the range of quantitative results in three different ways:
  - ✓ The **mean** is the average score.
  - ✓ The **mode** is the score obtained by the most people.
  - ✓ The **median** is the score obtained by the middle participant in a categorized group.

- ***Measures of dispersion or variability***, in which a measure is given to show how numbers disperse across a set of data. dispersion can be shown through:
  - ✓ The **variance** is a measure of how far scores are from the mean.
  - ✓ The **standard deviation (SD)** is a measure that shows the dispersal or range of scores. SD represents the average of the distance of each score from the mean.

Inferential Statistics

In contrast, inferential statistics aim to generalise from a specific sample to the population as a whole (Given, 2008). This type includes **hypothesis testing**, **difference testing**, and correlation analysis.

In general, there are three inference modes:

- **Abduction** is the process of suggesting a hypothesis after studying observational data.
- **Induction** means testing the proposed hypothesis.
- **Deduction** is concluding by making deductions.

Usually, deductive reasoning is used when the researcher formulates a hypothesis based on a theory, selects a representative sample, gathers quantitative data, and then generalises after testing the hypothesis.

Major Steps in Quantitative Data Analysis

Following mathematical procedures is not the only way to analyse quantitative data. There are other procedures, including arranging the collected data, reporting the results, and discussing them. Creswell (2012) has proposed a set of steps for analysing quantitative data.

a. The first stage involves organising the data for analysis and defining how to assign numeric scores. This procedure is also identified as **coding**, which Kothari defines as "assigning numerals or other symbols to answers so that responses can be put into a limited number of categories or classes" (2004, p. 123).

b. The second stage includes analysing the data using either descriptive or inferential statistics.
c. The third stage entails reporting the statistical results in:
    - Tables that sum up statistical information in rows and columns.
    - Pie Charts/Bar Graphs that represent the data gathered from every quantitative instrument.
    - Passages that provide detailed explanations after each table, Pie Chart, or Bar Graph.
d. The last stage includes interpreting the findings with reference to the proposed hypotheses, deducing the research limitations, and concluding with recommendations.

2. Qualitative Data Analysis

Definition

Qualitative data analysis is a simple process that involves a thorough comprehension of the collected data to answer the research questions and test the proposed hypotheses.

Qualitative data analysis is a language-based analysis, as qualitative outcomes are transformed into textual form. Indeed, the findings of qualitative research instruments are inductive and explanatory, referred to as '**interpretative**' or '**heuristic**'.

Major Steps in Qualitative Data Analysis

Dawson defines qualitative data analysis as "a very personal process, with few rigid rules and procedures" (2009, p. 116). He adds that it involves three main processes:

- Reflecting on the data in the course of collection.
- Judging the value of the data.
- Interpreting the data to facilitate readers' understanding of the phenomenon under study.

Tutorial:

Exercise 1: Answer the following questions in short essays.

1. What is the difference between **descriptive** and **inferential** statistics? Give one example of each in an educational context.
2. What is the main purpose of coding in qualitative data analysis?
3. How is thematic analysis different from simply summarizing interview notes?
4. When a research question asks "how many" or "to what extent," which type of analysis (quantitative or qualitative) is usually more suitable?
5. When a question asks "how do participants experience" or "why do they feel this way," which type of analysis fits better?

Exercise 2: Fill in the gaps within the following words: themes, coding, inferential, qualitative, quantitative, descriptive, thick descriptions, validation, thematic analysis, cleaning/preparation

In …… data analysis, researchers usually start with …….. statistics such as frequencies, percentages, means, and standard deviations. They then may use ……. statistics (e.g., t-tests, ANOVA, regression) to generalize findings to a larger population. In …… data analysis, researchers often use …… to label segments of text or speech, then group these into …… that capture the main ideas. A common technique is …….., where the researcher identifies patterns across many interviews or documents. To ensure trustworthiness, qualitative studies often include ……. (quoting participants) and …….. procedures (e.g., checking with participants or colleagues). Before analysis, both types of data may need ……., such as handling missing values or cleaning interview transcripts.

PROJECT:

In a research paper, define the ways researchers follow to count the mean, mode, median, variance, and standard deviation for the following a range of scores (test scores out of 20)

- 12 8 11 12 13 9 13 15 14 13 13 15

Answer the following questions:

- How might these descriptive statistics help you describe your students' performance?
- When would you need to move beyond this to inferential analysis (e.g., comparing to a national average)?

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