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Ministry of Higher Education and Scientific Research

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Faculty of Letters and Languages

Department of English

Pedagogical Handout in University Research Methodology Designed for 3rd year LMD students

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Course Description

Semester: 05

Teaching Unit: Methodology

Module: University Research Methodology

Credits: 4

Coefficient: 2

Course Objectives

-Initiation to the different methods and techniques of university work with a view to empowering students.

- Provide the student with the methodological tools necessary to conduct research.

- Develop students' critical thinking.

-Working in a team as well as individually

Prerequisite: To learn all the skills necessary for a research, writing a paper, searching bibliographical sources and note taking skills.

- Get the student to reinvest the methodological learnt skills in “TTU” for the two previous years in other subjects of research.

-Predisposition to work in collaboration with teammates.

Subject Contents

Define the research project and its content.

-Research objectives

- The stages of university and scientific research

-Selecting a topic

(Section criteria)

- Identifying a problem

* Asking researchable questions

* Formulating testable hypotheses

* Selecting target participants

-Documentary research and state of the art

Assessment

50% - 50% (Written exams and continuous Assessment)

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Subject Contents

- Data collection procedures.

- Selecting appropriate tools for meaningful data.

* questionnaire-

* Observation-

* Interview-

* Written, oral and digital corpora

-Data analysis

o Types of analysis (content, qualitative, quantitative ...)

o Drawing conclusion

Assessment

50% - 50% (Written exams and continuous Assessment)

Lesson 1: Introduction to Research

1. Definition of research:

The term research is composed of two parts “Re” and “Search”; “Re” is a prefix that expresses repetition which means “**doing something over and over”** while **“**Search” means a quest for something.

Several definitions have addressed the word research including;

- Research is “a careful study of a subject, especially in order to discover new facts or information about it” (Oxford Advanced Learner’s Dictionary, n.d).
- “Research is the process whereby questions are raised and answers are sought by carefully gathering, analyzing, and interpreting data” (Perry, 2005, p.8).
- "Research is an honest, exhaustive, intelligent searching for fact and their meanings or implications with reference to a given problem. The product of findings of a given piece of research should be an authentic, verifiable, and contribution to knowledge in the field studied”. (Cook as cited in Singh, 2006).
- “Research is simply a systematic and refined technique of thinking, employing specialized tools, instruments, and procedures in order to obtain a more adequate solution of a problem than would be possible under ordinary means. It starts with a problem, collects data or facts, analyses these critically and reaches decisions based on the actual evidence.” (Crawdford as cited in Singh, 2006).

Although these definitions date back to different historical eras, they share the same idea about the quintessence of research; research is a structured and careful endeavor that is triggered by a problem and aims to find solutions or expand knowledge by means of data, evidence and tools.

2. Significance of Research

Can you imagine life without research?

Research is very important in people's lives that many of them take for granted!

- Teachers at all levels devote their lives to research. Governments spend billions on it, businesses even more. Research goes on in laboratories and libraries, in jungles and ocean depths, in caves and in outer space, in offices and, in the information age, even in our own homes. Research is in fact the world's biggest industry.
- Those who cannot do it well or evaluate that of others will find themselves sidelined in a world increasingly dependent on sound ideas based on good information produced by trustworthy inquiry and then presented clearly and accurately.
- Without trustworthy published research, we all would be locked in the opinions of the moment, prisoners of what we alone experience or dupes to whatever we're told.

Therefore, research is the "invisible engine" of modern civilization. We live in a world built on the results of research, yet because the final products are so seamless, the rigorous process behind them often goes unnoticed.

3. Purposes of research

Research is undertaken for different purposes. According to Kothari (2004, p.2):

- The purpose of research is to discover answers to questions through the application of scientific procedures
- The main aim of research is to find out the truth which is hidden and which has not been discovered
- to gain familiarity with a phenomenon or to achieve new insights into it

- to portray accurately the characteristics of a particular individual, situation or a group
- **Knowledge Expansion:** Research aims to contribute new knowledge to a particular field or discipline. It seeks to expand the existing understanding of a subject, uncovering new facts, theories, or insights.
- **Social Change:** Research can contribute to positive social change by addressing societal issues, promoting equity, and informing policies that aim to improve the well- being of communities.
- **Technological Advancement**: Research drives technological progress by exploring new technologies, improving existing ones, and addressing challenges in various technical domains.

4. **Motivation in research**

What makes people to undertake research is a question of fundamental importance. The possible motives for doing research may be either one or more of the following:

- Desire to get a research degree with its consequential benefits;
- Desire to face challenge in solving unsolved problems;
- Desire to get intellectual joy of doing more creative work;
- Desire to be of service to society; and
- Desire to get respectability
- However, this is not an exhaustive list of factors motivating people to undertake research studies. Many more factors, such as: directives of government, employment conditions; curiosity about new things; desire to understand causal relationships, social thinking and awakening, and the like may as well motivate people to perform research operation (Kothari, 2004).

5. General Characteristics of Research

- It gathers new knowledge or data from primary or first-hand sources; research is not carried out haphazardly, it aims to expand the existing knowledge or find new information about a given problem by collecting data from primary or secondary sources.
- It is an extent systematic and accurate investigation; research is rigorous scientific investigation that follows specific procedures.
- It uses certain valid data gathering devices; the data used and analyzed in scientific research is collected through valid data collection methods such as questionnaire, interview, observation, experiment…etc.
- It is logical and objective; research speaks to the mind and attempts to interpret phenomena in a reasonable and logical way.

* Research is highly purposive; it deals with a significant problem which requires a solution.

- The researcher eliminates personal feelings and preferences; research endeavors to solve problems objectively and in exclusion of any personal feelings and preferences of the researcher.
- Research is patient and unhurried activity; this means that researcher should be patient in conducting research as collecting data and analyzing it takes time. Some longitudinal research designs last from months to decades.
- Research is carefully recorded and reported.

Conclusions and generalizations are arrived at carefully and cautiously (Singh,2006).

6. Types of research

The basic types of research are:

1. Description Vs. Analytical

The major aim of descriptive research is description of the status quo of a

phenomenon or a problem without delving into the details and the reasons behind it. In analytical research, on the other hand, the researcher has to use facts or information to analyze a given problem or phenomenon by delving into the details and trying to dig deep in order to understand the reasons behind it.

2. Applied Vs. Fundamental

Research can either be applied or (action) research or fundamental (basic or pure) research. Applied research aims at finding a solution for an immediate problem facing a society or an organization in a practical situation such as finding solutions to address employees' lack of productivity. On the other hand, fundamental research is mainly concerned with dealing with a problem theoretically in order to develop a theory about it, without trying to provide a practical solution to it.

3. Quantitative Vs. Qualitative

Quantitative research is based on the measurement of quantity or amount. It is applicable to phenomena that can be expressed in terms of quantity. Qualitative research, on the other hand, is concerned with qualitative phenomena, i.e., phenomena relating to or involving quality or kind. For instance, attitude or opinion research, which is designed to find out how people feel or what they think about a particular subject, is also qualitative research.

4. Conceptual Vs. Empirical

Conceptual research is that related to some abstract idea(s) or theory. It is generally used by philosophers and thinkers to develop new concepts or reinterpret new ideas. On the other hand, empirical research relies on experience or observation alone, often without due regard for system or theory. It is data-based research, coming up with conclusions which are capable of being verified by observation or experiment.

7- Research Methods versus Methodology

Definitions of Methodology

Methodology refers to the way of doing something. It is a set of procedures and principles. According to Longman Dictionary of Contemporary English methodology as **"the set of methods and principles that you use when studying a particular subject or doing a particular kind of work".**

Kothari (2004, p.8) states that: Research methodology is a way to systematically solve the research problem. It may be understood as a science of studying how research is done scientifically.

Definition of Method

A method means a specific procedure or a specific technique used to collect and analyze data. Types of research methods: Questionnaire, interview, experiments, case study, observation..etc.

Steps of research:

Research as stated above is not an arbitrary endeavor. It follows many steps called the "research process" which goes as follows; Research problem - Literature review – research questions- Research hypotheses- Research design- Data collection - Data analysis- and Interpretation and reporting of results.

Practice 1:

Task: Classify the following items as either a Method or Methodology

1. A 10-question survey: _____
2. The "Scientific Method" approach: _____
3. A face-to-face interview: _____
4. The logic and philosophy behind the research design: _____

Practice 2: Identify the types of research in the following sets:

Set 1: Descriptive vs. Analytical Research

1- A study that measures and reports the current unemployment rate and demographic breakdown of a country.

2- A researcher investigates the link between social media usage and anxiety levels in teenagers by analysing existing data from past studies.

Set 2: Applied vs. Fundamental Research

1- A pharmaceutical company develops a new vaccine to combat a specific, rapidly spreading virus.

2- A psychologist studies how sleep deprivation affects memory formation in mice to contribute to the general theory of neuroplasticity.

3- An agricultural scientist creates a new type of drought-resistant crop to help farmers in a region facing water shortages.

Set 3: Quantitative vs. Qualitative Research

1- A nationwide survey asking customers to rate their satisfaction with a service on a scale of 1 to 10.

2- An experiment measuring the effect of different fertilizers on plant height and fruit yield.

3- An ethnographer living with a remote tribe for a year to document their cultural practices and social structures.

Set 4: Conceptual vs. Empirical Research

1- A philosopher writes a paper reinterpreting the concept of "justice" in the 21st century by analyzing existing philosophical texts.

2- A researcher proposes a new theoretical model for how the brain acquires a second language.

3- A study where two groups of language learners are tested: one group learns vocabulary through flashcards and the other through interactive games, with their test scores compared.

Lesson two: Research Process

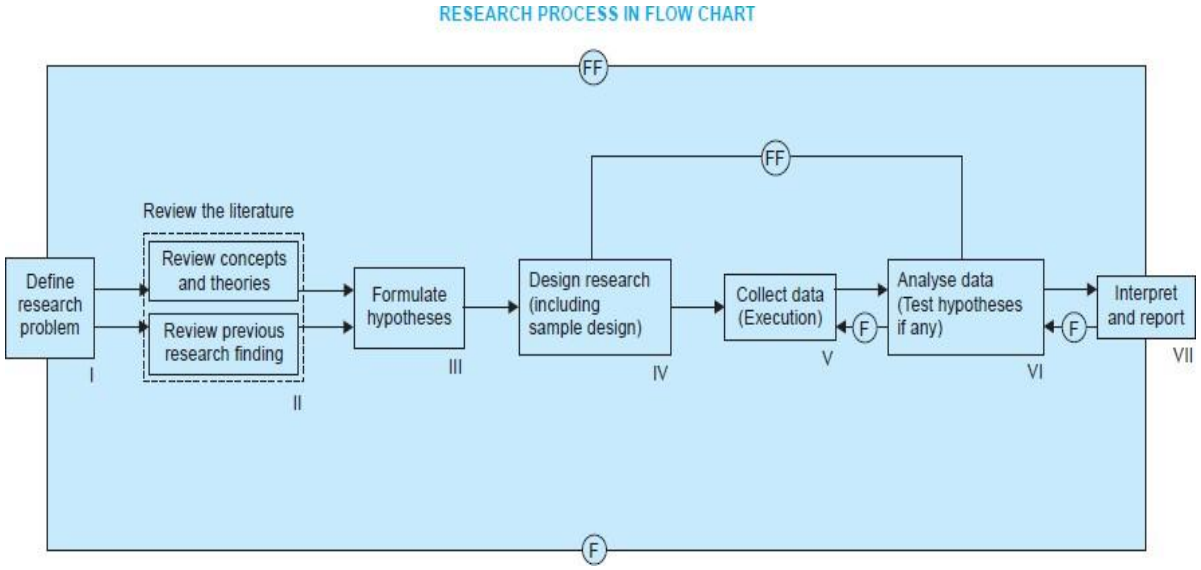
1- Importance of Knowing How Research is Done

The importance of knowing the methodology of research or how research is done stems from the following considerations:

- The knowledge of methodology provides good training especially to the new research worker and enables him to do better research. It helps him to develop critical thinking to observe the field objectively.
- Knowledge of how to do research will inculcate the ability to evaluate and use research results with reasonable confidence.
- Knowledge of research enables us to make intelligent decisions concerning problems facing us in practical life at different points of time and provides tools to deal with things in life objectively.
- The knowledge of research methodology helps the consumer of research results to evaluate them and enables him to take rational decisions.
- The knowledge of research methodology helps one evaluate the soundness of any and evaluate the validity of the results obtained as well as its strengths and weaknesses.
- Knowing how research is conducted is crucial for any student or researcher; researchers and students willing to submit dissertations to get a degree or research papers for publication need to be abreast of the research process and its subtleties.

2- Research Process

Research process consists of series of actions or steps necessary to effectively carry out research and the desired sequencing of these steps.



Kothari (2004)

Kothari (2004) has summarized the steps of the research process starting from the research problem which the most crucial stage in any research, surveying previous studies and research findings in order to spot missing parts in the literature, formulating questions and hypotheses, outlining the research design, proceeding to data collection, analyzing the obtained data and interpreting the results.

Practice:

1- What is the specific benefit of research knowledge when dealing with 'problems facing us in practical life'?

A. It ensures that every practical problem can be solved within a fixed timeframe.

B. It allows individuals to bypass the need for expert advice entirely.

C. It provides a list of pre-determined answers for common life challenges.

D. It provides tools to deal with things objectively and make intelligent decisions.

Lesson Three: Research Problem

1- Definition of research problem

Various definitions have been attributed to the research problem;

- "A research problem is an issue that requires further focus before it is investigated" (Newby, 2014, p. 669).

- "A research problem, in general, refers to some difficulty which a researcher experiences in the context of either a theoretical or practical situation and wants to obtain a solution for the same" (Kothari, 2004).

- "A research problem is the problem or issue that leads to the need for a study." (Creswell, 2014, p. 101).

Therefore, a research problem can be defined as a particular challenge, issue or difficulty springing from theoretical or practical contexts. It is the starting point that every aspect of the research endeavor attempts to solve and elucidate.

Kothari (2004) summarized the components of a research problem as follows:

- There must be an individual or a group which has some difficulty or the problem.
- There must be some objective(s) to be attained at. If one wants nothing, one cannot have a problem.
- There must be alternative means (or the courses of action) for obtaining the objective(s) one wishes to attain. This means that there must be *at least two means* available to a researcher for if he has no choice of means, he cannot have a problem.
- There must remain some doubt in the mind of a researcher with regard to the selection of alternatives. This means that research must answer the question concerning the relative efficiency of the possible alternatives.

- There must be some environment(s) to which the difficulty pertains.

2- SELECTING THE PROBLEM

The research problem to be studies must be meticulously selected. However, each researcher must find one's own research problem cannot be borrowed. A problem must stem from the researcher's mind like a plant springing from its own seed.

However, Kothari (2004) summed up the points that need to be taken into consideration by a researcher in selecting a research problem or a topic for research:

- "Subject which is overdone should not be normally chosen, for it will be a difficult task to throw any new light in such a case.". Although duplication is allowed in academia, it is advisable for a researcher to choose original topics and avoid much-studied ones.
- "Controversial subject should not become the choice of an average researcher."; controversial topics should be avoided because it will be difficult for a novice researcher to dig deep in these topics and give new insights about them.
- "Too narrow or too vague problems should be avoided", the research problem to be studied must be clear and straight to the bottom because the clearer and narrower the problem is, the easier it will be for the researcher to deal with it.
- The subject selected for research should be familiar and feasible so that the related research material or sources of research are within one's reach. Even then it is quite difficult to supply definitive ideas concerning how a researcher should obtain ideas for his research.
- The importance of the subject, the qualifications and the training of a researcher, the costs involved, the time factor are few other criteria that must also be considered in selecting a problem. In other words, before

the final selection of a problem is done, a researcher must ask himself the following questions:

(a) "Whether he is well equipped in terms of his background to carry out the research?"; this means the researcher must choose the problem that falls within the limits of his cognitive capabilities and academic qualifications. A researcher cannot address a topic related to neurolinguistics if he/she is not well-informed about neuroscience and the functioning of the human brain.

(b) "Whether the study falls within the budget he can afford?"; the researcher must have the financial resources or funding that allow the researcher to collect data and publish the research in highly-ranked scientific journals.

(c) "Whether the necessary cooperation can be obtained from those who must participate in research as subjects?", getting access to the research subjects and collecting data from them is crucial in the research process. For instance, a researcher cannot investigate the job satisfaction levels among the employees of a given company if he/she cannot reach out to these employees and obtain their consent to take part in the research.

If the answers to all these questions are in the affirmative, one may become sure so far as the practicability of the study is concerned.

3- NECESSITY TO DEFINE THE PROBLEM

According to Kothari (2004, p.26), the problem to be investigated must be defined unambiguously for that will help to discriminate relevant data from the irrelevant ones. A proper definition of research problem will enable the researcher to be on the track whereas an ill-defined problem may create hurdles. Questions like: What data are to be collected? What characteristics of data are relevant and need to be studied? What relations are to be explored. What techniques are to be used for the purpose? and similar other questions crop up in the mind of the researcher who can well plan his strategy and find answers to all such questions only when the research problem has been well defined.

Thus, defining a research problem properly is a prerequisite for any study and a step of the highest importance. It is the most crucial stage in any research endeavor. Without it, the researcher will be lost and cannot differentiate relevant from irrelevant data. For instance, the research problem “how did 2021 drought affect the wheat yields in the Nile Delta” is well-defined and straight to the point compared to “how is farming in Egypt” which is too broad and touches different domains and fields.

Therefore, a well-defined research problem helps the researcher decide the variables of the research, the design to adopted, and the methods and techniques to be used to collect and analyze.

4- TECHNIQUES INVOLVED IN DEFINING A PROBLEM

Defining a research problem is akin to drawing a map before you go on a journey. It aims at setting clear boundaries that make sure you don't get lost, ensuring every step you take is leads to your final destination.

However, defining a research problem is not an easy task; it is the stumbling block that impedes many researchers from engaging in a research endeavor. Yet, this hurdle can be cleared with a sharp, strategic mind. Therefore, when this task is managed intelligently, the researcher avoids confusion and perplexity during the course of research and fulfills its purpose.

Defining the research problem is the most crucial part of any research endeavor, it can be likened to the foundation of house; if it is unstable and shaky, the whole edifice will collapse. Many researchers take this step lightly, and rush it because they are eager to work on the most exciting part of research which is collecting date and running experiments. To avoid confusion and discrepancy during the research journey, a research has to be methodical and systematic in setting the problem to be studied.

Kothari (2004) have suggested five techniques to defining the research problem methodically;

(i) Statement of the problem in a general way:

First of all the problem should be stated in a broad general way, keeping in view either some practical concern or some scientific or intellectual interest. For this purpose, the researcher must immerse himself thoroughly in the subject matter concerning which he wishes to pose a problem.

Before you can explore a specific problem, whether it is related to a theoretical or a real-life issue, you have to consider the big picture and state the problem is broad terms. A problem cannot be investigated from the sidelines, you have to immerse yourself in it, and try to understand it until the real gaps and questions start revealing themselves.

(ii) Understanding the nature of the problem:

After getting a broad idea about the problem, the next step is to understand its ins and outs by going back to its source. If the problem was first addressed by someone else, the researcher has to reach out to them and ask them questions about how the questions came up and what goals were hoped to be achieved.

If the idea sprang from the researcher's mind, they must take a step back and reexamine the spark that has triggered it. To sharpen the perspective even better, they can discuss the idea with experts in the field; their experience with similar issues can help the researcher spot missing patterns. Finally, the researcher should keep in mind the environment in which the question arises because each environment is different than another.

(iii) Surveying the available literature:

In this stage, the researcher must examine and review previous studies and theories about related problems. By reviewing previous studies, the researcher

will be able to find out what other researchers methods and findings, and most importantly he/she will be able to find the gaps in the literature. If this step is skipped, the researcher might end up obtaining the same results as previous researchers, or making similar mistakes of previous researchers.

(iv) Developing the ideas through discussions:

In order to have a clear vision about the problem, the researcher can discuss it with other researchers or colleagues who are working on similar problems.

Developing the idea through discussion with experts in the field enables the researcher to clean any blind spots and open their minds to other perspectives and angles.

(v) Rephrasing the research problem:

After the origin and nature of the problem have been clearly examined, the previous studies surveyed, the environment of the problem scrutinized, and discussions about the problem have been held with other researchers and colleagues, comes the rephrasing of the problem into a working proposition becomes very easy. The later step consists in expressing the problem to be studied into specific and actionable terms so that questions can be easily asked and hypotheses formulated.

5- **Sources of Research Problems**

According to Kumar (2019), The majority of research conducted in the realm of humanities can be categorized into four fundamental themes, often referred to as the four Ps:

- **People :** You might choose to center your study on a particular group of individuals (people) to investigate the presence of specific issues or problems in their lives
- **Problems :** Alternatively, your focus could be on discerning their attitudes towards a particular matter (problem),
- **Programmes :** evaluating the efficacy of an intervention or initiative

(programme)

• **Phenomena :** establishing the occurrence of a consistent pattern (phenomenon),

You might choose to center your study on a particular group of individuals (people) to investigate the presence of specific issues or problems in their lives. Alternatively, your focus could be on discerning their attitudes towards a particular matter (problem), establishing the occurrence of a consistent pattern (phenomenon), or evaluating the efficacy of an intervention or initiative (programme). This exploration could involve delving into issues, relationships, or phenomena in areas such as unemployment and street crime, smoking and cancer, or fertility and mortality. Information pertinent to these inquiries is collected from individuals, groups, communities, or organizations, with the intention of uncovering associations or causality.

Similarly, the study of a program can encompass various facets like its effectiveness, structure, necessity, or consumer satisfaction. All these dimensions necessitate gathering information from people.

Practice: Identify the sources of problems in the following research topics

1. The impact of students' motivation on second language acquisition.
2. Teachers' attitudes toward integrating technology in the language classroom.
3. Evaluating the effectiveness of task-based learning in improving speaking skills
4. Learners' use of mobile apps for vocabulary acquisition.
5. Use of fillers (um, uh, like) in non-native speakers' oral communication.
6. How do refugee students adapt to local school curriculum?
7. The decline in literacy rates despite increased digital access.
8. The effectiveness of a state-funded nutrition program in rural elementary schools.

Practice 2: Which of the following research statements is considered 'well-defined' based on the criteria of specificity and boundary setting?

- What is the relationship between social media usage and the attention spans of middle school students in Cairo?
- How does digital literacy impact society?
- Why is education important for future generations?
- Investigating the various problems faced by farmers in North Africa.

Lesson Four: Literature Review

1-Definition of Literature Review

The second step of the research process is the literature review, it can be defined as follows:

- "The selection of available document (both published and unpublished) on the topic, which contain information, ideas, data and evidence written from a particular standpoint to fulfill certain aims or express views on the nature of the topic and how it is to be investigated, and the effective evaluation of these documents in relation to the research being proposed." (Hart, 2009, p.13).
- "A research literature review is a systematic, explicit, and reproducible method for identifying, evaluating, and synthesizing the existing body of completed and recorded work produced by researchers, scholars, and practitioners." (Fink, 2010, p. 3).

From the above-mentioned definitions, we can say that literature review consists in selecting and reviewing previous studies, theories and documents about the topic being studied, the methods they used and the results they obtained, in order to create a solid foundation for the researcher's own research and identify the gaps to filled out in the literature.

2. Objectives of Literature Review

The review of literature in research aims to fulfill the following purposes in:

• Instead of starting from scratch, literature review provides you with existing ideas, theories and hypotheses to be used as a foundation to build a much sharper and more interesting research question.

• Literature review enables the researcher to see if the problem to be investigated has already been solved. This saves you from the frustration of "reinventing the wheel" and ensures your work actually adds something new to the literature.

• It provides the sources for hypothesis. The researcher can formulate

research hypothesis on the basis of available studies.

- It suggests method, procedure, sources of data appropriate to the solution of the problem.
- The results of previous studies serve as a benchmark for the researcher's own results. Instead of looking at your findings in a vacuum, you can compare them with what others have discovered to see where you agree, where you differ, and why.
- "Its goal is to bring the reader up-to-date with current literature on a topic and form the basis for another goal, such as the justification for future research in the area. A good literature review gathers information about a particular subject from many sources". (Cronin et al., 2008).

3. Sources of Literature Review

There are various sources of literature which may be used for this purpose. Examples of these are:

- **Scholarly journals:** they are the main source for disseminating original research findings. Because these journals consist of peer-reviewed reports, they offer a level of credibility and rigor that is seldom found in mainstream media. Furthermore, access to these specialized resources is often restricted to university and college libraries, making them the essential hub for researchers looking to share their latest discoveries with the scientific community.
- **Books:** There are different types of books that educate, entertain and provoke thought. However, the main concern here are the ones that comprise reports of original research or a collection of research articles pertaining to different authors.
- **Dissertations:** dissertations can be considered as one of the sources of literature review. They are research works conducted by students under the supervision of their supervisors and examined by a board of examiners. Dissertations are submitted by students for the sake of obtaining a specific diploma (MA, PhD…etc)

• **Conference proceedings:** They are collections of papers presented by researchers at professional meetings, symposiums, or conferences.

• **Trustworthy websites:** Information can be obtained from reliable websites such as official websites pertaining to governmental and international institutions such as the UN, WHO, or national bureaus. Although the internet is a valuable goldmine of data, the internet is also a source of misinformation. Therefore, a researcher must rigorously verify the authenticity and validity of any online information before incorporating it into their study.

4. Steps in Conducting a Literature Review

4.1. Choosing a review topic

Selecting and narrowing down a research topic is frequently the most daunting challenge for students. Because of this, provided mentorship is essential at the outset; it ensures students revolve around subjects supported by both accessible scholarly literature and a foundation of existing empirical research (Timmins & McCabe, 2005, p. 2). Nonetheless, the difficulty often arises from the lack of knowledge in the topic; therefore Timmins & McCabe offered some clues to help in the selection of a topic:

4.2. Deciding the approach to literature review:

There are several approaches for conducting literature reviews. The most suitable approach ultimately depends on your specific objective; any of these methods can be effective as long as they align with the review's intended purpose. Systematic, semi-systematic and integrative are some of the approaches adopted in conducting a literature review about a specific topic.

Synder (2019) has addressed the differences between these types as follows "While systematic reviews have strict requirements for search strategy and selecting articles for inclusion in the review, they are effective in synthesizing what the collection of studies are showing in a particular question and can provide evidence of effect that can inform policy and practice. (…) a semi-systematic review approach could be a good strategy, for example, map

theoretical approaches or themes as well as identifying knowledge gaps within the literature. In some cases, a research question requires a more creative collection of data, in these cases; an integrative review approach can be useful when the purpose of the review is not to cover all articles ever published on the topic but rather to combine perspectives to create new theoretical models." (p. 333-334).

5.3. Searching and selecting appropriate literature

After selecting the topic, and the approach to be used in the literature review comes the phase of identifying, in a structured way, the most appropriate and related information.

When selecting sources for a literature review, it is best to focus on theoretical frameworks, review articles, and empirical studies. While you could theoretically build a review around a single piece of research, a truly robust review draws on diverse—and often conflicting—arguments. Incorporating a variety of findings alongside your own critical perspective significantly enhances the depth and authority of your work.

The researcher must exercise selectivity by prioritizing literature that offers a significant contribution to the field. Furthermore, a rigorous appraisal of these works is necessary to identify and exclude any research characterized by methodological inconsistencies or fallacious arguments.

5.3.1 Defining the types of sources for a review

There are several sources that can be used for conducting literature review, Colling (2003) as cited in (Cronin et al., 2008) has summarized them as follows:

- **Primary source** Usually a report by the original researchers of a study
- **Secondary source** Description or summary by somebody other than the original researcher, e.g. a review article

- **Conceptual/ theoretical Papers** concerned with description or analysis of theories or concepts associated with the topic
- **Anecdotal/ opinion** Views or opinions about the subject that are not research, review or theoretical in nature.

Whenever possible, prioritizing primary sources is the gold standard for academic research. In the scientific community, these typically take the form of peer-reviewed articles in reputable journals. Because the publishing cycle for journals is much faster than that of books, they are generally considered the most current and reliable sources of information.

Secondary sources—such as textbooks, review articles, or summaries written by third parties—synthesize existing research rather than presenting original findings. While these sources are excellent starting points for gaining a broad overview of a topic, they should never be your only resource; it is essential to consult the primary research directly to verify facts and avoid inheriting any interpretive errors (Cronin et al., 2008).

5.3. Analysis and synthesis of the literature

After you have collected the articles you intend to use in your literature review, it is advisable to perform a preliminary scan of your collected articles to grasp their core themes. Most scholarly papers include an abstract or summary, which acts as a quick diagnostic tool to help you decide if the full text warrants a deeper reading or final inclusion in your review. During this initial stage, it is also helpful to categorize and group your sources by type to stay organized. (Cronin et al., 2008).

After your initial scan, you must revisit the selected articles for a more rigorous and critical analysis. It is highly recommended to use a structured template to capture the essential details of each study—typically the title, author, objectives, methodology, and primary findings. Additionally, recording your own critical reflections or "key takeaways" immediately after reading is invaluable. Maintaining meticulous records with full bibliographic

references at this stage prevents the immense frustration of trying to track down a specific point or source later in the writing process. (Cronin et al., 2008).

6. Structure of Literature Review:

According to Cronin et al. (2008) the literature review should be structured as follows; introduction, main body and conclusion.

Introduction : An effective introduction must clearly articulate the research objective alongside a concise summary of the central problem. Furthermore, it is essential to detail the methodological framework, specifically by outlining the primary literature sources and the key search terms employed during the investigation.

Main body:

The main body of the review presents and discusses the findings from the literature. It can be framed in various ways such as; dividing the literature into themes or categories, presenting the literature chronologically, exploring the theoretical and methodological literature, and examining theoretical literature and empirical literature into two sections.

The body should also work not only to summarize what sources have said, but to demonstrate relationships, differences and contradictions between them. Furthermore, the most important part in the literature review is to showcase the gap in the literature, also called “gap-spotting”, which means identifying the missing parts in the puzzle and the uncovered aspects related to the problem being studied.

Conclusion:

The review should conclude with a concise summary of the findings that describes current knowledge and offer a rationale for conducting future research.

Practice 1 : Indicate whether the following are **Primary**, **Secondary**, **Conceptual**, or **Opinion** sources.

1. A journal article presenting results of an experiment conducted by the author……

2. A book chapter summarizing previous research on bilingual education. ……

3. An article discussing theories of second language acquisition. ……..

4. A blog post expressing personal views about online learning……..

Practice 2 :

1. Define literature review in your own words.
2. Mention two objectives of conducting a literature review.
3. Name three sources that researchers use for literature reviews.
4. Why are primary sources preferred in academic research?
5. What are the three main parts of a literature review?

Lesson Five: Paraphrasing, Summarizing and Quoting

In academic writing in general and in literature review, in particular, the researcher/ student resorts to outside information; other people's ideas, in order to give more credibility to their work and to support their ideas. The integration of outside information is generally achieved through three main techniques; paraphrasing, summarizing, and quoting.

1- Paraphrasing

A paraphrase should be expressed in your own words and sentence structure while preserving the full meaning of the original text. Therefore, when paraphrasing, you should neither alter the original ideas nor omit or introduce any new information.

When paraphrasing, it is not necessary to change every word from the original text. In fact, some words and expressions should remain unchanged because they cannot be effectively rephrased. These are known as shared language and include proper nouns, dates and numbers, technical terms, and commonly used words that are difficult to reformulate without compromising clarity or accuracy.

There are several techniques that can be used in paraphrasing such as using synonyms of words, changing the structure by moving from passive voice to active and vice versa, changing the word order, replacing numbers by letters…etc. For a more efficient paraphrase, it is advisable to use a combination of techniques rather than relying on only one technique. Moreover, the paraphrase should be used when the writer wants to convey all the ideas of the original text and the latter is not too long.

Practice:

Choose the best paraphrase of the original. Justify your answer:

- "Despite the heavy rain and poor visibility, the pilot managed to land the aircraft safely at the regional airport."

a- The pilot was incredibly brave and highly skilled to be able to land the plane at the local airport during such a massive thunderstorm and low visibility.

b- Even though there was heavy rain and bad visibility, the pilot was able to land the plane safely at the regional airport.

c- The plane arrived at the local airfield without incident, notwithstanding the storm and limited sightlines.

- "The rise of remote work has led to a significant increase in the demand for home office furniture and high-speed internet services."

a- Because more people are working from home, there is a much higher need for residential desks, chairs, and fast web connections.

b- Working from home is much better for mental health, which is why people are buying more desks and better internet for their houses.

c- The growth of telecommuting has resulted in a major spike in the market for domestic workspaces and rapid data connectivity.

Practice 2: paraphrase the following:

- Due to the widespread availability of imported food, even ordinary people's diets are becoming internationalized.
- Health experts blame sedentary activities like internet use and video games for the dramatic jump in obesity among teenagers.
- The local library will be closed for three weeks while contractors install a new energy-efficient heating system.
- Recent studies indicate that getting at least eight hours of sleep per night can significantly improve a student's ability to retain new information.
- Digital privacy has become a major concern for modern consumers, as personal data is frequently harvested by social media companies for advertising purposes.

2- Summarizing

Summarizing is similar to paraphrasing in that it involves restating the original text using different vocabulary and structure. However, it differs in that a summary focuses only on the main ideas of the original text and is significantly shorter.

To conduct a summary, the writer should sum up the content of the original text by following these steps: read and understand the original text, identify the key ideas, writing a first draft, and revising the summary as necessary.

A summary is required when the original text is too long and contains many details that cannot all be included.

Practice:

Summarize the following:

Slow Food is a global movement that advocates for food that is enjoyable, environmentally sustainable, and economically fair. Founded in Italy in 1986 by Carlo Petrini and a group of friends in response to the encroachment of fast food, the movement seeks to preserve traditional culinary practices and promote local food cultures. It emphasizes three key principles: food should be good (tasty), clean (produced without harm to health, animal welfare, or the environment), and fair (accessible and produced under equitable conditions).

Globally, the number of overweight children and adolescents is projected to rise significantly by 2030, with estimates suggesting up to 250 million children could have obesity, driven by sedentary lifestyles and poor diet. This surge is a "double burden" of malnutrition, with rapid increases expected in low- and middle-income countries.

3- Quoting

Quoting consists in using the exact words of the original text. It is used when everything the author writes is important, when the quote will not make your text too long, and when the words of the original text are so powerful and meaningful that they leave a strong impression on the reader. Unlike in paraphrasing and summarizing, the original text in quoting is put between quotation marks "….".

Reporting verbs are usually used in quoting such as; to indicate, to state, to suggest, to argue…etc. the choice of the appropriate reporting verb depends on the ideas contained in the quote.

Quoting is a straightforward way of incorporating information from external sources. However, it should be used reasonably. Excessive reliance on quotations may give the impression that you depend too heavily on others' words rather than expressing your own ideas.

Practice:

Quote the following using reporting verbs:

- The psychological impact of social media notifications is comparable to a 'digital heartbeat' that keeps users constantly attached to their devices.
- While artificial intelligence offers unprecedented efficiency, we must ensure that human empathy remains the final arbiter in medical decision-making.

Lesson Six : Citing the source of Information

When the writers use other people's ideas, they must cite the all the details of the sources of information by writing the name of the author, the year of publication, the title of the source, and the name of the publisher.

By citing your sources, you enhance the credibility of your writing, acknowledge that the ideas or words are not your own, indicate their origin, and enable readers to locate the original sources for further verification and deeper understanding.

Citing sources helps prevent plagiarism, which involves using others' words or ideas without proper acknowledgment and presenting them as your own. Plagiarism is a serious academic offense, and its consequences can range from the rejection of work to failing an exam or an entire course.

Plagiarism can be avoided by clearly distinguishing between your own ideas and those of others through accurate citation of sources. Common knowledge information shouldn't be cited.

Sources are to be cited in two places; inside the text (called in-text citation or in-text referencing) and at the end of the work (called references or works cited depending on the referencing style used by the writer).

The in-text citation includes only the most essential information that enables the reader to find the source in the references list, however the references list contains all the details about the source.

There are different types of referencing styles, the most used ones are APA and MLA.

1- APA referencing style

APA is a referencing style developed by the American Psychological Association. According to APA guidelines, in-text citations are typically presented in the following format: (Author's last name, year of publication, page number).

Example: (Cuq, 2005, p. 15).

When a source has two authors, both names should be included: (Pym & Miller, 2015, p. 15).

For sources with more than two authors, the first author's name is followed by "et al." which is a Latin phrase "et alia" meaning "and others". For example: (Pym et al., 2015, p. 15).

Examples of in-text citation formats:

There are different ways of in-text citation according to APA guidelines, such as:

Kwan (2024) argues that the Internet is a valuable research tool (p. 16).

Similarly, Kwok (2024) points out that the Internet is a useful research tool (p. 16).

Mok (2024) states, "The Internet is a useful research tool" (p. 16).

"The Internet is a useful research tool" (Or, 2024, p. 16).

Common errors

In-text citations should be provided not only for direct quotations but also for paraphrases and summaries, since they are based on the author's ideas, not solely their exact wording.

* The author's initials should not appear in in-text citations; they are only included in the reference list at the end of the document.

* When citing newspapers or magazines, the day and month of publication should not be included in the in-text citation.

On the other hand, full details of the sources are provided at the end of the work, specifically in the reference list. The formatting of these entries varies depending on the type of source, such as a book, a book chapter, a research article, or conference proceedings.

Examples:

1. Book:

Author, A. A. (Year). Title of the book. Publisher.

Example:

Smith, J. (2020). Introduction to linguistics. Oxford University Press.

2. Book Chapter:

Author, A. A. (Year). Title of the chapter. In E. E. Editor (Ed.), Title of the book (pp. xx–xx). Publisher.

Example:

Brown, L. (2018). Language acquisition theories. In R. Green (Ed.), Perspectives on language learning (pp. 45–60). Routledge.

3. Research Article (Journal Article):

Author, A. A. (Year). Title of the article. Title of the Journal, volume number(issue number), page range. https://doi.org/xxxxx

Example:

Johnson, M., & Lee, K. (2021). The impact of technology on language learning. Journal of Applied Linguistics, 15(2), 123–140. https://doi.org/10.1234/jal.2021.5678

2- MLA referencing style

MLA is a referencing style developed by the Modern Languages Association. According to MLA guidelines, in-text citations are typically presented in the following format: (Author's last name page number).

Example: **(Cuq 15).**

When a source has two authors, both names should be included: **(Pym & Miller 15).**

For sources with more than two authors, the first author's name is followed by

"*et al.*" *For example*: **(Pym et al. 15).**

In MLA style, complete source details are presented at the end of the document in a section titled *Works Cited*, rather than *References*, as used in APA.

The formatting of the sources according to MLA varies from a type to another; Here are some examples of references according to MLA :

1. Book:

Author's Last Name, First Name. *Title of the Book*. Publisher, Year.

Example:

Smith, John. *Introduction to Linguistics*. Oxford University Press, 2020.

2. Book Chapter:

Author's Last Name, First Name. "Title of the Chapter." *Title of the Book*, edited by Editor's First Name Last Name, Publisher, Year, pp. xx–xx.

Example:

Brown, Laura. "Language Acquisition Theories." *Perspectives on Language Learning*, edited by Robert Green, Routledge, 2018, pp. 45–60.

3. Journal Article (Research Article):

Author's Last Name, First Name, and Second Author's First Name Last Name. "Title of the Article." *Title of the Journal*, vol. number, no. number, Year, pp. xx–xx.

Example:

Johnson, Mark, and Kevin Lee. "The Impact of Technology on Language Learning." *Journal of Applied Linguistics*, vol. 15, no. 2, 2021, pp. 123–140.

Practice 1 :

Convert APA to MLA and Vice Versa

1. (Brown, 2018, p. 45) → …….

2. (Johnson & Lee, 2021, p. 130) → …….
3. (Pym et al., 2015, p. 15) →……..
4. (Smith 25) → ……. …….
5. (Brown 45) →……
6. (Johnson and Lee 130) → ……

Practice 2 : Write two sentences about technology in language learning:

- One using **APA citation**
- One using **MLA citation**

Lesson Seven: Research Questions

1- Definition of Research Questions

The formulation of research questions is the sine qua non for a successful research endeavor. Research questions can be defined as the specific questions that the researcher is attempting to answer when conducting a qualitative, quantitative or mixed-methods study (Tashakkori & Teddlie, 2010).

A research question is the central query that a study seeks to address, typically reflected in its thesis statement. It usually focuses on a specific issue or problem, which is explored through the analysis and interpretation of data and ultimately answered in the study's conclusion. (Bouchrika, 2024)

In most studies, the research question is formulated to reflect key elements of the investigation, such as the target population, the variables under examination, and the specific problem being addressed.

A research question is not fixed but can be modified and changed alongside the researcher's understanding of the topic. It is therefore important to align research questions with the scope of the study, as more complex investigations often require multiple questions to address different dimensions of the problem comprehensively.

2- Importance of the research question

If a study is guided only by a general research topic, the researcher may encounter an overwhelming amount of information and struggle to determine when sufficient data has been collected (Booth et al., 2008).

Therefore, is it important to formulate a clear research question because without a specific focus, the research process can become unfocused and inefficient, making it difficult to set boundaries or reach meaningful conclusions.

The primary importance of developing a research question is that it narrows

down a broad topic of interest into a specific area of study. They help you narrow your research to the data that you need to answer the question. They bring focus to a study and narrow the research topic to a size that the researcher can manage and handle.

On the other hand, the research questions influence other key factors in the research such as the choice of the research design, the population and sample size, the data collection method, and the data analysis method.

In formulating research questions, "Words such as 'do', 'does', 'is' or 'are' should be avoided as they invite 'yes'/'no' responses." (Doody & Bailey, 2016).

3- Types of Research Questions

Research questions can be categorized based on the type of study being conducted. Understanding whether the research approach is quantitative, qualitative, or mixed-methods is crucial in crafting precise and effective research questions.

Doody and Bailey (2016) suggest a number of common types of research questions, as outlined below.

3-1 Quantitative research questions

Quantitative research questions are based on numerical data; they are specific and measurable. They generally specify the target population, as well as the dependent and independent variables, along with the research design. These questions are typically defined and settled at the beginning of the study.

Quantitative research questions often aim to measure certain the data to be collected for studying social, familial, educational phenomena or practical issues. They can be further categorized into three types: descriptive, comparative, and relationship.

3-1-1 Descriptive questions:

which are the most basic type of quantitative research question and seeks to explain the when, where, why or how something occurred.

E.g. What percentage of college students have felt depressed in the last year?

3-1-2 Comparative research questions:

They aim to discover the differences between two or more groups for an outcome variable, and often use words such as ‘compare’. They can be causal in nature, such as the effect of X on Y, Such causal questions are implicitly comparative in nature when a comparison is made between a group where X is involved and a group where X is not involved Doody and Bailey (2016).

For instance, the researcher may compare a group where a certain variable is involved and another group where that variable is not present. E.g. Why is it easier for men to lose weight than it is for women?

"What are the differences in learning outcomes between traditional classroom instruction and online distance learning for undergraduate students in science courses?"

3-1-2 Relationship-based research questions:

They are concerned with trends between or among two or more variables, and they often use words such as ‘relate’, ‘relationship’, ‘association’ and ‘trend. Relationship questions involving two variables usually can be written using: ‘What is the relationship between (independent variable) and (dependent variable) among (population)?’ Doody and Bailey (2016)

For example, What is the relationship between teacher-student rapport and academic achievement in high school students?"

3-2 Qualitative research questions

Qualitative research questions aim to collect non-numerical and non-measureable data, and focus on “how” and “why” rather than simply “what.” They explore individuals’ experiences, perspectives, and meanings, making them suitable for investigating a broad variety of issues.

Generally, these questions are non-directional and use words that state that the study will: ‘discover’ (grounded theory), ‘explain’ or ‘seek to understand’

(ethnography), ‘explore a process’ (case study) or ‘describe the experiences’ (phenomenology). Doody and Bailey (2016)

They can be divided into different types among which:

3-2-1 Exploratory Questions: they seek to investigate a phenomenon where little is understood without influencing the results. The objective is to learn more about a topic without bias or preconceived notions.

E.g: What factors influence the decision-making process of high school students when choosing their future career paths?

3-2-2 Generative Questions: they aim to provide new ideas, aiding the development of theories, strategies or actions.

E.g.: How might the integration of augmented reality in primary classrooms redefine student engagement?

3-2-3 Interpretive Questions:

They aim to examine people’s behavior within its natural context, with the goal of understanding how a group interprets and gives meaning to shared experiences related to different phenomena.

E.g.: How do students' cultural backgrounds influence their learning experiences in a diverse classroom?

4- Steps for developing research questions

Formulating research questions can be tricky and challenging especially of novice researchers with no in-depth understanding of the topic to be studied. Among the pitfalls faced in developing research questions “deciding which area to research from a range of issues that are of interest; knowing which area to focus on with no precise topic; and knowing the area and topic but finding it problematic to clearly communicate the question.” Doody and Bailey (2016)

The following steps can help researchers develop effective research questions:

- **Selecting a broad topic of interest**

A broad topic offers writers multiple directions to consider when developing a suitable research question; each broad topic has multiple sub-areas to be explored. When selecting a topic, it is advisable to choose an area that genuinely interests you, as your level of interest will influence your motivation throughout the research process; **the more you are interested in and motivated by a research topic, the more creative and engaged you will be in studying it.**

- **Conducting preliminary research about the broad topic**

Carry out a few preliminary searches in recent journals and periodicals related to the selected topic to determine what research has already been conducted and what results have been obtained. The preliminary research helps you get up-to-date with current research about the topic and enable you to spot the gap in the literature.

- **Narrow down your topic and formulate your questions**

After acquiring sufficient background knowledge on your chosen topic, you can begin to concentrate on a more specific aspect and refine your research question. Generate as many ideas as possible by brainstorming questions that relate to your topic, the research problem, and the identified gap. You should have a list of potential research questions to choose from.

- **Evaluate the soundness of your research question.**

After generating a list of questions, assess them carefully to determine whether they are strong and effective research questions or whether they require further revision and refinement.

To find out whether you have formulated good research questions, Hulley et al. (2007) have suggested what is known as the **“FINER**" criteria to assess

the soundness of research questions:

F Feasible

A strong research question is feasible, meaning it lies within the researcher's capacity to investigate. Researchers should remain realistic about the scope of their study, as well as their ability to gather data and complete the project using their skills and available resources. It is also advisable to prepare a backup plan in case challenges occur.

I Interesting

An effective research question should be engaging not only for the researcher but also for their peers and the wider community. Such interest enhances the researcher's motivation to pursue and answer the question.

N Novel

Your research question should aim to contribute new insights to the field you are exploring. It may serve to confirm, challenge, or build upon existing findings related to your topic.

E Ethical

This is a key consideration when formulating a research question. Both the question itself and the proposed study must meet ethical standards and gain approval from relevant review boards and authorities.

R Relevant

In addition to being engaging and original, a research question should be meaningful to the scientific community and to those within your field of study. Ideally, it should also hold relevance for the broader public.

Practice:

1- Convert the following broad topics into focused research questions**:**

- Artificial Intelligence in education
- English language anxiety
- Online learning
- Language assessment

2- For each research problem listed below, write one clear and focused research question

- Many students do not participate in online discussions.
- Students forget new words a week after learning them.
- Learners feel stressed when asked to write an essay.
- Students lack knowledge about the target language's culture.

Lesson Eight : Research Hypotheses

1. Definition of Research hypothesis

A research hypothesis can be defined as follows:

- "A hypothesis is a logical construct, interposed between a problem and its solution, which represents a proposed answer to a research question. It gives direction to the investigator's thinking about the problem and, therefore, facilitates a solution". (Supino, 2012)

- "A hypothesis is a declarative sentence in which researchers predict the expected answer to the research question based on available knowledge and assumptions." (Ghasemi et al., 2025)

From the above, we can say that a hypothesis is a logical, predictive statement that proposes an expected answer to a research question and guides the research process.

For Example: Daily apple consumption leads to fewer doctor's visits daily exposure to the sun leads to increased levels of happiness

2. Characteristics of a Good Research Hypothesis

Ghasemi et al. (2025) have suggested criteria for an effective research hypothesis; it should be Explicit, Evidence-based, formulated before the experiment (Ex-ante), and possess Explanatory power while being Empirically testable. Ghasemi et al. (2025) discuss these qualities as follows:

- **Explicit:** it should be stated as a clear and specific declarative sentence, and describes variables and their relations.
- **Evidence-based:** it should be logically backed (rationalized) by previous knowledge, and relevant to the research question and problem.
- **Ex-ante to the experiment**: It should be formulated in advance of experiment and observation.
- Explanatory: it should provide evidence-based scientific explanation

for existing facts.

- **Empirically testable**: it should be empirically testable by ethical research to be verified or falsified.

3. Importance of Research Hypothesis

Research methodologists outline the importance of research hypotheses as follows:

- Hypotheses are essential in research as they connect the research problem with the evidence needed to address it.
- They act as a guide that directs and facilitates the investigation of the phenomenon being studied.
- A hypothesis helps channel the researcher's efforts in a focused and productive way.
- It can indicate the appropriate participants, tools, and instruments required for the study.
- Additionally, a hypothesis offers a basis for forming conclusions.

4. Steps of formulating a hypothesis

- **Asking a research question**. The question should be clear, well-defined, and feasible to investigate within the limits of your project.

Example: Research question: Do students who attend more lectures get better exam results?

- **Do some preliminary research:** Your preliminary response to the question should draw on existing knowledge about the topic. Consult relevant theories and prior research to develop informed assumptions about the expected outcomes of your study.
- **Formulate your hypothesis:** At this stage, you should have a general sense of your expected findings. Express your initial answer to the research question in a clear and concise statement. Example: **Attending more lectures leads to better exam results.**

•**Refine your hypothesis**: Ensure that your hypothesis is both precise and testable. Although it can be phrased in different ways, all terms should be clearly defined. It should include the key variables, the target population under study, and the expected outcome of the investigation.

- **Phrase your hypothesis in three ways:** To identify the variables, you can write a simple prediction in if…then form. The first part of the sentence states the independent variable and the second part states the dependent variable. Example: **If a first-year student starts attending more lectures, then their exam scores will improve.**
- In academic research, hypotheses are more commonly phrased in terms of correlations or effects, where you directly state the predicted relationship between variables. Example: **The number of lectures attended by first-year students has a positive effect on their exam scores**.
- If you are comparing two groups, the hypothesis can state what difference you expect to find between them. Example: **First-year students who attended most lectures will have better exam scores than those who attended few lectures.**
- **State the null hypothesis:** The null hypothesis is a statement that there is no relationship between the variables you are studying. Example: **The number of lectures attended by first-year students has no effect on their final exam scores.**

Practice:

1- Read the following statements and decide which ones are **hypotheses** and which are **not**. Justify your answer.

- Students use smartphones in class.
- Increased smartphone use negatively affects students' academic performance.
- What are the causes of language anxiety?

- Project-based learning improves speaking skills among EFL learners.

2- Convert the following research questions into hypotheses:

1. How does AI affect translation quality?
2. Does project-based learning improve speaking skills?
3. What is the relationship between motivation and academic success?

Lesson Nine: Research Design

1- Definition of Research Design

The research design is the overall plan put forward by researchers to carry out an investigation. It gives a clear picture of both the construction and conduction of the research (Balnaves & Caputi, 2001, pp. 27-29).

Therefore, "a completed research design shows the step-by-step sequence of actions in carrying out an investigation essential to obtaining objective, reliable, and valid information" (Mauch & Park, 2003, p. 123).

The research design determines how the participants are selected, what variables are included and how they are manipulated, how data are collected and analyzed, and how extraneous variability is controlled so that the overall research problem can be addressed. (Anderson Dannels, 2018).

Based on the previous definitions, we can say that research design is the overall plan that guides how a study is structured and conducted, providing a clear framework for the investigation. It outlines the step-by-step procedures needed to obtain objective, reliable, and valid results. Additionally, it specifies how participants are selected, variables are handled, data are collected and analyzed, and external factors are controlled to address the research problem effectively.

2- Importance of Research Design in Research

Research design holds an important place in the research process. It is similar to the blueprint made by the architect to build a house. A well-conceived research design ensures that the study is methodologically sound, ethically conducted, and aligned with its objectives. (Abrar et al., 2024).

By establishing a clear roadmap, the design helps in organizing the study in a logical sequence, ensuring that each step is purposefully connected to the overarching objectives. This alignment is essential for producing results that are both credible and meaningful. (Abrar et al., 2024, p.16).

Therefore, building a robust research design ensures coherence throughout the study. It rightly emphasizes how aligning each step with the overall objectives enhances both the credibility and significance of the findings. To strengthen it further, you could briefly mention specific elements (e.g., data collection or analysis) to make the idea more concrete.

3- Types of Research Design:

There are different types of research designs, Blaxter et al. (2006) have provided the following four-type classification:

3-1 Action Research:

Action research has become a widely used approach among small-scale researchers in the social sciences, especially those in professional fields such as education, health, and social care. It is particularly appropriate for practitioners investigating issues within their own workplaces, with the aim of improving their practices and those of their colleagues. For instance, a teacher seeking to enhance classroom performance may benefit from action research, as it provides a structured method for identifying, addressing, and evaluating problems and concerns. Blaxter et al. (2006)

Examples of action research topics:

- Teachers conducting research to find the best way to reduce speaking anxiety in their classroom.
- Language educators researching strategies to improve student participation in speaking activities.

3-2 Case Studies:

A case study researcher typically examines a single unit—such as an individual, group, class, school, or community—in detail. The aim is to conduct an in-depth and thorough analysis of the complex aspects of that unit's life. This detailed investigation helps in drawing broader conclusions that may apply to the larger population to which the unit belongs. Moreover, Case study data is drawn from people's experiences and practices and so it is seen to be strong in reality. Case studies allow for generalizations from a specific instance to a more general issue. Blaxter et al. (2006).

Examples of case studies research topics:

- Conducting a case study of a particular student or classroom to understand the causes of speaking anxiety.
- Investigating a single school or program to understand how it affects English learners' confidence and speaking ability.

3-3 Experiments:

An experiment involves two groups: an experimental group that receives the treatment being studied and a control group that does not. Both groups should be comparable and examined under the same conditions, except for the intervention, to reduce differences and ensure reliable results. Blaxter et al. (2006).

The experiment seems to be more associated with the scientific method, and thus must not be used, or at least avoided, in the social sciences. Problems such as individuals' exposure to the experiment may give rise to many ethical issues which should be taken into consideration. Blaxter et al. (2006).

Examples about experimental research topics:

- Testing the effect of different teaching methods on reducing speaking anxiety among English learners.
- Conducting a classroom experiment to evaluate the effectiveness of

anxiety-reduction interventions.

3-4 Surveys:

Surveys are usually associated as a research approach with the idea of asking groups of people consistent questions in order to collect consistent asnwers. Among the advantages of surveys; With an appropriate sample, surveys may aim at representation and provide generalized results. • Surveys can be relatively easy to administer, and need not require any fieldwork. • Surveys may be repeated in the future or in different settings to allow comparisons to be made. • With a good response rate, surveys can provide a lot of data relatively quickly. Blaxter et al. (2006).

Examples about Survey research topics:

- Sending a questionnaire to 1000 EFL learners to study their perceptions about online teaching.

- A questionnaire was administered to 2000 factory employees to study their job satisfaction levels.

There are other types of research designs such as ;

➢ **Correlational research design**

A correlational research design investigates relationships between variables without the researcher controlling or manipulating any of them. It aims to identify whether a relationship exists between variables and the strength of that relationship.

Examples of correlational research topics

➢ Investigating whether there is a correlation between students' anxiety levels and their speaking performance in English.

➢ Studying the relationship between class participation and language

proficiency.

- **Phenomenological Research Design**

It aims to understand and describe the lived experiences of individuals regarding a phenomenon; it focuses on how people perceive and make sense of their experiences.

Examples of correlational research topics:

- Exploring the lived experiences of students dealing with speaking anxiety in English classes.
- Investigating the psychological and emotional experiences of non-native speakers during oral exams.

Practice:

- Read each scenario and identify the research design used (e.g., experimental, case study, survey, action research).
  1. A teacher tests a new teaching method on one group while another group follows the traditional method.
  2. A researcher studies one school in depth over a year.
  3. A questionnaire is distributed to 200 students to collect their opinions about online learning.
  4. A nurse investigates and improves patient care practices in her own workplace.

- **Select the most appropriate research design:**

  1. Investigating the effect of AI tools on translation accuracy
  2. Exploring students' perceptions of online learning
  3. Studying one successful school in detail
  4. Improving classroom management techniques

Lesson Ten: Data Collection Methods

One of the main stages in a research study is data collection that enables the researcher to find answers to research questions. Data collection is the process of collecting data aiming to gain insights regarding the research topic. (Taherdoost, 2021).

To identify the best data collection method to be used, the researcher must specify the type data to be collected; whether it is qualitative, quantitative data or both. There most used data collection methods are as follows:

1. Questionnaires

Questionnaires are written instruments that present respondents with a series of questions or statements to which they are to react either by writing out their answers or selecting from among existing answers (Brown, 2001).

Questionnaires are one of the most widely used social research techniques. The idea of formulating precise written questions, for those whose opinions or experience you are interested in, seems such an obvious strategy for finding the answers to the issues that interest you. Blaxter et al. (2006).

Questionnaires can be administered in different ways; face to face, via email, via electronic platforms such as Google forms, via social media platforms etc.

There are different types of Questionnaires depending on the types of questions asked;

1-1 Closed-ended or Structured Questionnaires;

A structured questionnaire includes items with predetermined answer choices. Participants are given a set of fixed options and must choose their responses from these choices. Here are some types of close-ended questions:

Simple dichotomy questions:

They are questions with only two answers to choose from such as; yes/no , good/ bad…etc.

Example:

How do you rate the services of your library? Good Bad

- **Multiple Choice questions:**

They are questions with more than two answers to choose from.

how many hours per day do you spend on self-study outside of class?

- a) Less than 1 hour b) 1–3 hours c) 4–6 hours d) More than 6 hours

Multiple choice questions can be further divided into **determinant choice**, in which only one choice can be made, and **checklist**, in which more than choice can be made.

- **Scaling Questions**:

Scaling questions are questions that ask respondents to rate something using a numerical or ordered scale to measure the degree of their opinion, feeling, or attitude.

Examples of scale: Likert scale (strongly agree, agree, neutral, disagree, strongly disagree), numerical scale (0-10), frequency scale (never to always).

Close-ended questions are the primary tool used by the researcher to collect quantitative data because they can be counted and analyzed statistically.

1-2 Open-ended or Unstructured questionnaires;

An unstructured questionnaire consists of questions with no predefined response options; they give respondents the freedom to express their thoughts in their own words. E.g. how can artificial intelligence impact students' learning skills?

1-3 Semi-structured questionnaires:

Semi-structured questionnaires are composed of both close-ended and open-ended questions, so that both quantitative and qualitative data can be collected.

2. Interviews

The interview method involves questioning or discussing issues with people. It can be a very useful technique for collecting data which would likely not be accessible using techniques such as observation or questionnaires. Blaxter etal., (2006).

Interviews can be carried out face to face, via phone or via the internet. The interviewer must obtain the interviewee's permission to record the interview. If the interviewee refuses the recording, the interviewer should resort to note taking to collect data.

There three main types of interviews:

2-1 Structured interviews: In these kinds of interviews, interviewees face the same set of standardized questions which are pre-prepared before the interview session. (Taherdoost, 2021)

2-2 Unstructured interviews: Unstructured interviews are informal methods of interviewing without using a specific structure. There is no guide in this type, and they just conduct casual conversations. (Taherdoost, 2021)

2-3 Semi-structured interviews: Semi-structured interviews are formal and are conducted based on a guide. The interviewers ask questions considering the guidance; however, when researchers or interviewers need extra information, they can continue the conversation based on the questions provided ahead of time. (Taherdoost, 2021)

The advantages of interviews can be stated in the following:

(a) They are particularly good at producing data which deal with topics in in-depth and detail;

(b) They require simple equipments and are built on conversation skills;

(c) They are flexible; and

(d) They allow direct contact.

3- Focus Groups

This method, simply, is a mixture of interviewing and observation. This method is used to discover human behavior, attitudes, and respondents facing a particular concept. This in-depth field method gathers a group of individuals, normally between 6-12 people in each group, commonly with a shared characteristic such as sex, age, and educational status to discuss a specific study field. (Taherdoost, 2021)

Although focus groups are a type of group interview, the exchange is not between the interviewer and participants. Instead, they depend on interaction among group members as they discuss a topic introduced by the researcher. In this setting, the researcher uses observation and note-taking as tools to collect data. The discussion can be moderated by the interviewer himself or another moderator.

4- **Observation**

In these techniques, primary data is collected by directly observing events, behaviors, interactions, and processes to gain a clear understanding of the concepts. This approach allows for the collection of both qualitative and quantitative data: qualitative data in the form of descriptive accounts, and quantitative data through measures such as the duration or frequency of observed phenomena. (Taherdoost, 2021)

Observation is a data collection method that allows researchers to gather real-time data from natural settings. It helps them understand context in an open-ended and inductive way, notice details that might otherwise be overlooked, and uncover information participants may not share in interviews. This approach goes beyond perception-based data and provides access to deeper, experiential knowledge. (Cohen et al., 2005).

There are different types of observation:

Overt: In this type of observation, participants are aware that they are being

observed, as researchers are transparent about their presence and the purpose of the study.

Covert: In this type of observation, researchers operate covertly, so participants are unaware that they are being observed. Although the researcher may be visible, people do not realize that he or she is conducting research.

Participant: In this type of observation, the researcher becomes part of the group being studied, though they may not always disclose their identity—especially in cases of covert observation.

Non-participant: This type of observation occurs when the researcher remains detached, observing from a distance without participating or interfering.

Practice

I- Select the most appropriate data collection method to study the following topics:

1. Collecting opinions from 200 students quickly
2. Exploring teachers' experiences in depth
3. Studying real classroom behavior
4. Understanding group opinions through discussion

II- Read each situation and identify the method used (e.g., questionnaire, interview, observation, focus group).

1. A researcher asks students to fill in a form with multiple-choice questions.
2. A teacher talks individually with students to explore their learning experiences.
3. A researcher watches classroom interaction without participating.

4. A group of students discuss a topic together while the researcher listens.

Lesson Eleven: Sampling Techniques

Before examining the various sampling techniques, it is essential to distinguish between the research population and the research sample. The research population includes all individuals relevant to the study, whereas the sample is a smaller group selected to represent that population. A key requirement of any sample is that it must be representative, as this ensures that the findings are both reliable and generalizable.

For instance, if a researcher aims to investigate the challenges faced by women in Algerian society, all women constitute the target population. However, since it is impractical to study every woman in Algeria, the researcher selects a sample that reflects the characteristics of the broader population.

There two main categories of sampling techniques; **Probability sampling** and **non-probability sampling.**

1- Probability sampling Techniques

A probability sample is regarded as the most reliable method of selection because it relies entirely on random chance. As a result, it minimizes researcher bias, since the researcher has no control over who is included in the sample (Whitaker & Fitzpatrick, 2021).

Probability sampling gives every individual in a group an equal opportunity to be included in a study. This approach is the standard for quantitative research because it ensures your findings accurately reflect the entire population, making your results statistically valid and unbiased.

There are four main types of probability sample.

1-1 Simple random sampling

Simple random sampling is one of the main probability sampling techniques. In statistical terms, the concept ‘random’ does not have the usual meaning of ‘haphazard’ but means that each person in the population has an equal chance of being selected, therefore when the data from the survey has been analysed we can be confident that it represents the population of interest. (Whitaker & Fitzpatrick, 2021).

This technique ensures that every individual in a group has an identical probability of being chosen. It requires a complete list of all potential participants, known as the sampling frame. To carry out this process, researchers rely on objective methods such as random number generators or other lottery-style systems such as writing the names of the participants on pieces of papers and making a draw.

For instance, you want to select a simple random sample of 1000 employees of a social media marketing company. You assign a number to every employee in the company database from 1 to 1000, and use a random number generator to select 100 numbers.

1-2 Systematic sampling

It is a probability sampling procedure in which a random a random selection is made of the first element for the population sample, and then subsequent elements are selected using a fixed or systematic interval until the desired sample size is reached; every *n*th case is selected. (Daniel, 2012)

For instance, All employees of the company are listed in alphabetical order. From the first 10 numbers, you randomly select a starting point: number 6. From number 6 onwards, every 10th person on the list is selected (6, 16, 26, 36, and so on), and you end up with a sample of 100 people.

1-3 Stratified sampling

Stratified sampling is a slight variation of random and systematic sampling where the sampling frame is divides into subgroups (i.e strata) and the sampling process is executed separately on each stratum. Stratified sampling provides greater control over the composition of the sample, assuring the researcher of the representativeness of the sample. (Reis & Judd, 2000)

Therefore, this technique consists in dividing the population into subgroups based on the relevant characteristic (e.g., gender identity, age range, income bracket, job role), then you use random or systematic sampling to select a sample from each subgroup.

For instance, a company has 800 female employees and 200 male employees. You want to ensure that the sample reflects the gender balance of the company, so you sort the population into two strata based on gender. Then you use random sampling on each group, selecting 80 women and 20 men, which gives you a representative sample of 100 people.

1-4 Cluster sampling

When the population is dispersed over a broad geographic region, using random or systematic sampling can be expensive, challenging and time-consuming. In this case, cluster sampling is suitable, it involves drawing a sample with elements in groups (called clusters) rather than one-by-one, then all elements with a cluster are sampled. (Reis & Judd, 2000)

For instance, a company has offices in 10 cities across the country (all with roughly the same number of employees in similar roles). You don't have the capacity to travel to every office to collect your data, so you use random sampling to select 3 offices – these are your clusters, and the study will be conducted on all the elements of these 3 offices.

Practice: Identify the Sampling Methods in the following scenarios

Scenario 1: A researcher wants to study reading habits among 5,000 university students. She assigns a number to every student on the official enrollment list and uses a random number generator to select 300 students.

Scenario 2: A school has 1,200 students listed alphabetically. The researcher randomly selects student number 12 as a starting point and then selects every 15th student until 80 students are chosen.

Scenario 3: A university has students from three faculties: Arts (50%), Sciences (30%), and Engineering (20%). To study students' attitudes toward online learning, the researcher randomly selects 150 students while maintaining these proportions.

Scenario 4: A national study on teaching methods selects 5 secondary schools from different regions at random and surveys all teachers in those selected schools.

Scenario 5: A health researcher wants to survey nurses in a hospital. Nurses are grouped by department (emergency, surgery, pediatrics). Entire departments are randomly chosen, and all nurses in those departments are surveyed.

Lesson Twelve: Non-probability sampling methods

Non-probability sampling involves selecting participants through methods that do not rely on random chance. Because the probability of any specific person being chosen is unknown—and some members of the population may have no chance at all of being included—the resulting sample may be biased. Consequently, this group might not accurately reflect the characteristics of the broader community. (Mandlik et al., 2025)

Non-probability sampling is a more accessible and cost-effective approach, but it carries a significant risk of sampling bias. Because the selection isn't random, the ability to generalize your findings to the broader population is reduced, and the conclusions must be more cautious.

There are different types of non-probability sampling techniques:

1- Convenience sampling

Researchers use convenience sampling when they include in their sample people who are available or volunteer or can be easily recruited and are willing to participate in the research study. That is, the researcher selects individuals who are conveniently selected. It should be noted that technically speaking, we cannot generalize from a convenience sample to a population. (Johnson & Christensen, 2012).

Convenience sampling is not the optimal way to go, especially when a researcher wants to generalize to a population on a basis of a single study. Nonetheless, researchers are forced to use convenience samples because of practical constraints. (Johnson & Christensen, 2012).

For instance, you are researching opinions about student support services in your university, so after each of your classes, you ask your fellow students to

complete a survey on the topic. This is a convenient way to gather data, but as you only surveyed students taking the same classes as you at the same level, the sample is not representative of all the students at your university.

2- Purposive sampling

In purposive sampling, which is also called judgmental sampling, the researcher specifies the characteristics of a population of interest and then tries to locate individuals who have those characteristics. That is to say, purposive sampling is a technique in which the researcher solicits persons with specific characteristics to participate in a research study. (Johnson & Christensen, 2012).

Among the limitations of this technique is that it is difficult to make generalizations on the whole population based on a group of people selected purposively.

For instance, you want to know more about the opinions and experiences of disabled students at your university, so you purposefully select a number of students with different support needs in order to gather a varied range of data on their experiences with student services.

3- Snowball sampling

In snowball sampling, each research participant who volunteers to be in a research study is asked to identify one or more additional people who meet certain characteristics and may be willing to participate in the research study. Only a few individuals might be identified in the beginning of a research, however, over time, as each new participant suggests someone else who might participate, the sample become larger and larger. (Johnson & Christensen, 2012).

This technique can be used when it is difficult to access the population, yet it has a high risk of sampling bias as it is based on recruiting participants via other participants.

For instance, you are researching experiences of homelessness in your city. Since there is no list of all homeless people in the city, probability sampling isn't possible. You meet one person who agrees to participate in the research, and she puts you in contact with other homeless people that she knows in the area.

4- Quota sampling

In quota sampling, the researcher identifies the major groups or subgroups of interest, determines the number of people to be included in each of these groups, and then selects a convenience sample for each group. It is called quota because once the researcher decides how many of certain types of people to be included in a sample, he/she has then tries to meet the quota.

Example: You want to gauge consumer interest in a new produce delivery service in Boston, focused on dietary preferences. You divide the population into meat eaters, vegetarians, and vegans, drawing a sample of 1000 people. Since the company wants to cater to all consumers, you set a quota of 200 people for each dietary group.

Practice: Identify the sampling techniques in the following scenarios:

Scenario 1: A lecturer wants quick feedback on a new assessment method and surveys only the students who attend her morning classes.

Scenario2: A researcher studying high-achieving language learners deliberately selects students who have scored above 90% in national English exams.

Scenario 3: To study informal street vendors, a researcher interviews one vendor, who then introduces her to other vendors in the same area.

Scenario 4: A market researcher wants opinions about a new app. She interviews people in a shopping mall until she reaches 100 males and 100 females, stopping once each group is full.

Scenario 5: A study on teachers' use of AI tools includes 20 primary teachers, 20 secondary teachers, and 20 university lecturers, chosen based on availability rather than randomness.

Lesson Thirteen: Data Analysis Methods

Data analysis is a very important step in every research endeavour. After collecting data, the researcher uses specific techniques and methods that help him/her derive conclusions and results from the data collected.

Data can be defined as short hand for information or numbers, characters, images or other methods of recording, in a form which can be assessed to make a determination or decision about a specification. Data has meaning when it is interpreted and becomes information. (Ngulube, 2020). Therefore, without analysis, data remains meaningless.

1- Types of data in research

There are two main types of data:

Qualitative data: this type of data is not expressed in numbers and values, but rather words and descriptions. When analyzing qualitative data, the researcher deals with meanings, not with plain numbers. Qualitative research can be conducted by using different sorts of sources like observation, unstructured interviews, group interviews, collection of documentary materials and so on. (Graue, 2015).

Quantitative data: quantitative data are numbers, percentages, and measurable figures. They are used to describe things by assigning a value to them. Therefore, quantitative data is data that can be counted, calculated, and expressed numerically. (Ngulube, 2020).

Quantitative data can obtained mainly through closed-ended questions, experiments, and tests scores.

2- Qualitative Data Analysis Methods

There are several techniques to analyze data in qualitative research, here are some commonly used methods:

2-1 Content analysis

Content analysis is an approach to documents that emphasizes the role of the investigator in the construction of the meaning of and in texts. There is an emphasis on allowing categories to emerge out of data and on recognizing the significance for understanding the meaning of the context in which an item being analysed (and the categories derived from it) appeared. (Graue, 2015).

Therefore, content analysis is a qualitative research method that examines and quantifies the presence of certain words, subjects, and concepts in a corpus such as a text, image, video, or audio messages.

Example: A researcher analyzing English language textbooks to identify how cultural references are incorporated into language lessons.

2. 2. Thematic analysis

Thematic analysis (TA) is one of the most widely used methods for analyzing qualitative data, offering a structured yet flexible approach to identifying, analyzing, and reporting patterns or themes within a dataset. Thematic analysis follows the following process: familiarization with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, writing the report. (Ahmed et al., 2025).

For instance, a researcher studies the challenges faced by remote workers during the coronavirus pandemic.

3. Narrative analysis

Narrative analysis is an approach taken to interview data that is concerned with understanding how and why people talk about their lives as a story or a series of stories. This inevitably includes issues of identity and the interaction between the narrator and audience(s); the description of an event or series of events in a manner that conveys meaning as well as factual information. Traditional stories or myths serve a number of purposes including entertainment, instruction and the formation of a collective worldview. When research participants tell a story or a series of stories, the researcher will want to consider what purpose the story serves and why the interviewee has chosen to present their account in this way. (Earthy & Cronin, 2008).

This method is particularly valuable when the research aims to explore personal experiences, identity, or cultural narratives. By focusing on the narratives themselves, researchers can gain insights into how individuals construct and communicate their realities.

Example:

A study exploring language learners' experiences with speaking anxiety. The researcher collects personal stories through interviews and analyzes how students narrate their struggles and strategies for overcoming anxiety

4. Discourse analysis

Discourse analysis is concerned with the ways in which language constructs and mediates social and psychological realities. Discourse analysis is based on the premise that the words we choose to speak about something, and the way in which they are spoken or written, shape the sense that can be made of the world and our experience of it. Discourse analysts are acutely conscious

of the power of discourse, and they consider our social and experiential worlds to be the product of our discursive construction of them. (Clark, 2014)

Therefore, this method focuses on the contextual meaning of language: discourse analysis sheds light on what audiences think of a topic, and why they feel the way they do about it.

Example: Discourse analysis can be used to examine how language shapes our understanding of the conflict between Gaza and Israel.

5. Grounded theory analysis

This method consists in a "theory that was derived from data, systematically gathered and analyzed through the research process. In this method, data collection, analysis, and eventual theory stand in close relationship to one another. By applying grounded theory and its methods on the collected data, the researcher will be able to explain a process or scheme associated with a phenomenon (Graue, 2015).

Grounded theory is considered as a type of **inductive research;** it develops theories out of data. On the other hand, **deductive research** consists in applying an already existing theory on the data collected.

Example: A researcher wants to understand how students develop confidence in speaking English.

Practice:

1- Indicate which method is most appropriate to study the following:

1. To explore students' personal experiences in story form _____
2. To identify common challenges across all interviews _____

3. To examine how students talk about technology and power relations _____
4. To develop a theory about online learning adaptation _____
5. To quantify mentions of specific problems _____

Lesson Fourteen: Quantitative Data Analysis Methods

Quantitative data in academic research can be analyzed statistically in two ways ; **Descriptive statistics** and **inferential statistics**.

1- Descriptive statistics

Descriptive statistics is used to summarize and analyze data, providing insights into the patterns, trends, and characteristics of a dataset. Similarly, in academic research, descriptive statistics are often used as a preliminary analysis technique to gain a better understanding of the dataset before applying more complex statistical methods. Descriptive statistics lay the groundwork for inferential statistics by assisting researchers in drawing inferences about a population based on observed sample data. (Alabi & Bukola, 2023).

Here are a few major types of descriptive analysis methods.

- **Mean (average)–** this is simply the mathematical average of a range of numbers.

E.g. 8+5+6+3+2+9= 33/6= 5.5 mean = 5.5

- **Median –** this is the midpoint in a range of numbers when the numbers are arranged in numerical order. If the data set makes up an odd number, then the median is the number right in the middle of the set. If the data set makes up an even number, then the median is the midpoint between the two middle numbers.

E.g. 1.2.3.4.5.6= Median is 3/ 6, 10, 15, 20, 35, 50= median is (15+20) 17.5

- **Mode –** this is simply the most commonly occurring number in the data set.

Rating: 1.2.2.3.4.5.3.3/ mode is 3

Descriptive statistics don't aim to make inferences or predictions about the entire population – they're merely focused on making a description about the sample**.**

2- Inferential statistics

Inferential statistics are calculated with the purpose of generalizing the findings from a sample to the entire population of interest. For instance, an investigator would use inferential statistics to determine whether differences between groups (ie, treatment and control groups) are unique to his or her sample (because of chance) or are a result of real differences between the population represented by group 1 and the population represented by group 2 (or however many groups are involved). (Allua & Thompson, 2009)

Therefore, unlike descriptive statistics, inferential statistics allow to **make predictions** about what you expect to see in the real world population, based on what you observe in your sample data.

There are different types of tests in inferential statistics:

- **T-Tests**: T-tests **compare the means** (the averages) of two groups of data to assess whether they're statistically different. This type of testing is very useful for understanding just how similar or different two groups of data are.

- Analysis of variance **(ANOVA)**: The statistical procedure is used for testing the degree to which two or more vary or differ in an experiment. A considerable degree of variation means research findings were significant.
- **Correlation analysis**. This type of analysis assesses the relationship between two variables. In other words, if one variable increases, does the other variable also increase, decrease or stay the same. For example, if the average temperature goes up, do average ice creams sales increase too?

- **Regression analysis** – it is quite similar to correlation in that it aims to understand **cause and effect** between variables, not just whether they move together.

Practice:

Calculate the mean for the following data set: $4, 8, 6, 10$.

A researcher collects ratings: $1, 2, 2, 3, 3, 3, 4, 5$. What is the mode?

Calculate the median for this set of numbers: 6, 10, 15, 20.

Lesson Fifteen: Research Proposal

1- Definition of research proposal

A research proposal is a relatively brief document that contains an outline plan for a research project. It is produced at the beginning of the research process in advance of any data collection. A well- constructed research proposal offers a blueprint for the research that shows what the parts look like and how they will fit together. (Denscombe, 2012)

That is to say, a research proposal outlines the plan to be followed to study a specific research topic, and aims to convince the academic committee that you have a worthwhile research project and that you have the competence to complete it. Research proposal are usually written by students willing to write a dissertation/ thesis as part of the requirements for a obtaining a specific diploma/degree (Master's, PhD …etc) or a specific research grant.

2- Good Research Proposal

A good research proposal depends not only on the quality of the proposed project but also on the quality of writing; therefore, it should be clear and coherent. What you should keep in mind is to ensure its acceptance and ultimately the research success. Something not to forget is to prove that the research is feasible in terms of:

- the available time and resources;
- access to data;
- the researcher's experience and expertise;
- ethical, legal, environmental, and safety issues (Denscombe, 2012, p.1).

The success of a proposal will depend on how far it can show that the research will have:

- **Originality**, that makes it different from what has already been done;
- **Timeliness**, addressing current issues and being up-to-date;
- **Precision**, avoiding any ambiguity or vagueness relating to definitions, data, or planning.

3- Structure of a research proposal

A research proposal should contain the following elements:

1- The title

The title should be of current importance providing benefit to the field in which you are conducting the study.

2- Introduction

The introduction presents the study and, crucially, offers the necessary background context for the proposed research. Its primary function is to establish a conceptual framework, allowing readers to see how the work aligns with existing literature.

3- Literature review

To find out what previous studies have found out about the topic of interest and what are the remaining gaps in the literature.

4- Statement of the problem

Answer the question: "What is the gap that needs to be filled?" and/or "What is the problem that needs to be solved?"

5- Research Questions and hypotheses

Research questions should revolve around the research problem.

Hypotheses are possible solutions to the research problem and possible answers to the research questions.

6- Purpose statement /Aim of the Study

The aim(s) of the study should convey clearly what you want to achieve through your research tightly related to the title.

Action-oriented words such as ‘to investigate, to describe, to analyze, to determine, to find out, to ascertain can be used in formulating the aims and specific objectives

7- Research Methodology

In this section, you describe how you are going to answer the formulated questions. It includes:

- the research approach to be used in the proposed study;
- the methods of collecting data;
- the population and sample (including sampling techniques)
- and the data analysis methods

8- References

This part should contain all the sources used and cited in the proposal. Sources must be written following the same referencing style.

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