Methods of Educational Research

منهج البحث التربوي

المرحلة الثالثة\ الكورس الاول

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1-1 Definition of Research

Thinkers who have contributed in defining the research are given below:

1) Grinnel further adds: 'Research is a structured inquiry that utilizes acceptable scientific methodologies to solve problems and creates new knowledge that is generally acceptable'.

2) Burns defines: Research as a systematic investigation to find answer to a problem.

3) According to Kerlinger: 'scientific research is a systematic, controlled empirical and critical investigation of propositions about the presumed relationships about various phenomena.

4) Bulmer states: 'Nevertheless sociological research is primarily committed to establishing systematic, reliable and valid knowledge about the social world'.

On the basis of the definitions given above we can summarize that the research is an organized inquiry designed and carried out to provide information for solving problem. It is a careful inquiry to discover new information to expand the existing knowledge. It is an investigation, recording and analyzing evidences for on going knowledge. The main thrust of research is on going knowledge to solve the problem. Unless the problem is properly assessed, no appropriate solution can be provided.

1.2 Choosing a Topic

The first step in any research project is obviously that of choosing the topic. When you are selecting a topic, the following **methods** should be born in mind:

1- **Reading A magazine article**: A current news magazine can direct you to a subject that interests you in order to lead you into a research project.

2- **Drawing upon past experiences**: Personal experiences such. As travel and direct observations may lead you to a subject.

3- **Relying on previous knowledge**: Books , academic   courses   and previous research projects can sometimes provide you with an appropriate subject . If you have read a book, some of its ideas may direct you toward a

topic. An earlier research project may have suggested ideas that you were unable to pursue at the time; a- review or a reworking of an earlier report or paper might lead to a new research work.

4- Communication with others: conversations, discussions and.. even arguments can be the genesis of research papers. Discussing ideas in a group or with a friend, you may hear an approach to an old. Problem that could evolve into a subject .

5- Using reference works and guides: Reading about a particular subject or several topics in a general reference work such as ENCYCLOPEDIA can give your ideas• and lend you some background for the investigation.

1.3 What to Avoid in Choosing a Topic (Subject)?
1-Too recent subjects.
2- Hard to investigate research topics.
3- Controversial topics.
4- Subjects are too broad,
5- Subjects are too narrow,
6- Subjects are too obscure.
7- Highly technical subjects.

1.4 Types of information Sources
Generally, there are three basic types of information sources in research including primary, secondary, and tertiary. They are as follows:

a-Primary Sources: Primary sources of information are first-hand accounts of research or an event including original scholarly research results, raw data, testimony, speeches, historic objects or other evidence that provides unique and original information about a person or an event. These sources were created at the time which the observation or event occurred but can also be created later by an eyewitness. Primary sources allow researchers direct access to original ideas, events, and data. Some examples of primary sources include published original scholarly research articles, original creative works, and eyewitness accounts of contemporaneous events.

b- Secondary Sources: Secondary sources analyze, synthesize, evaluate, and interpret primary sources (or other secondary sources). Secondary sources are created after an event has occurred and are written by someone who did not experience or observe the event first hand. Some examples of secondary sources include articles that interpret original scholarly research results and critiques of original creative works. Secondary sources are not evidence, but rather comment on and discuss previous evidence.

c- Tertiary Sources: Tertiary sources of information provide broad overviews or condensed narratives of topics. They analyze and summarize the information in primary and secondary sources in order to provide background on an idea, event, or topic. Tertiary resources often provide data in a convenient form and provide context of the topic for a frame of reference. Some examples of tertiary sources include textbooks, dictionaries, encyclopedias, and handbooks.

PRIMARY LITERATURE

- Original research and/or new scientific discoveries
- Immediate results of research activities
- Often includes analysis of data collected in the field or laboratory

EXAMPLES:
- Original research published as articles in peer-reviewed journals.
- Dissertations
- Technical reports
- Conference proceedings

SECONDARY LITERATURE

- Summarizes and synthesizes primary literature
- Usually broader and less current than primary literature

EXAMPLES:
- Literature review articles
- Books

Since most information sources in the secondary literature contain extensive bibliographies, they can be useful for finding more information on a topic

TERTIARY LITERATURE

- Summaries or condensed versions of materials
- Usually with references to primary or secondary sources
- Good place to look up facts or get a general overview of a subject

EXAMPLES:
- Textbooks
- Dictionaries
- Encyclopedias
- Handbooks

Primary Sources	Secondary Sources	Tertiary Sources
Original journal research articles	Bibliographies	Abstracts
Conference proceedings	Essays or reviews	Almanacs
Theses and dissertations	Monographs	Compilations
Technical reports	Literary criticisms or commentaries	Dictionaries
Lab notebooks	Magazine and newspaper articles	Encyclopedias
Patents	Biographies	Handbooks
Interviews	Media documentaries	Fact books
Government documents		Gazetteers
Archival materials		Atlases
Diaries, letters, memoirs, autobiographies, correspondence, and manuscripts		Chronologies
Speeches		Reference books
Photographs and film (including news film footage)		Directories
Artifacts		Textbooks
Original creative works		

1.5 Writing an outline

A research paper **outline** is a supporting document that lists all the topics to include in a paper in the intended order, usually divided by paragraphs.

The typical outline of a research paper also consists of other details like subtopics and evidential sources to help the writer stay organized.

1.5.1 How to write a research paper outline
Follow these steps to start your research paper outline:

1. Decide on the subject of the paper
2. Write down all the ideas you want to include or discuss
3. Organize related ideas into sub-groups
4. Arrange your ideas into a hierarchy: What should the reader learn first? What is most important? Which idea will help end your paper most effectively?
5. Create headings and subheadings that are effective
6. Format the outline in either alphanumeric, full-sentence or decimal format.

1.5.2 kinds of research paper outline
There are three different kinds of research paper outline: **alphanumeric, full-sentence and decimal outlines**. The differences relate to formatting and style of writing.

a- Alphanumeric Full-sentence Decimal
An alphanumeric outline is most commonly used. It uses Roman numerals, capitalized letters, arabic numerals, lowercase letters to organize the flow of information. Text is written with short notes rather than full sentences. Example
    I-BODY PARAGRAPH 1
      A-First point
        1.Sub-point
          a-Sub-point of sub-point 1

b-Full-sentence research paper outline
Full-sentence research paper outlines have the same organization as alphanumeric outlines—with main topics listed as Roman numerals,

subtopics as capital letters, subtopic points as Arabic numerals, and details for each point as lowercase letters.

However, the significant difference is that you would write the information in incomplete sentences instead of quick blurbs. The advantage is that your outline is more specific and easier to share with colleagues when working as a team. The disadvantage is that it takes a little longer to write.

Full-sentence research paper outline example
I. Michael Jordan is often considered the greatest basketball player of all time.
A. Jordan's career in basketball is full of accomplishments and accolades.
1. During his career, Jordan won six NBA Championships.
a. Jordan was named NBA Finals MVP all six times he was eligible.

c- Decimal research paper outline
Decimal research paper outlines forgo the alphanumeric system and instead use a system of numbers with increasing decimal points—with main topics listed as whole numbers (1 or 1.0), subtopics with one decimal point (1.1), points under a subtopic with two decimal points (1.1.1), and further details with three decimal points (1.1.1.1). Decimal research paper outlines are the most thorough but can get complicated. They are recommended for writers who prefer technical precision or for lengthy outlines with many topics and subtopics.

Decimal research paper outline example
1 Michael Jordan
1.1 Career Highlights
1.1.1. Six NBA Championships
a. Six NBA Finals MVP
1.1.2 US Olympics Basketball Team
a. 1984 Gold Medalist
b. 1992 Gold Medalis

Lectures of

Educational Reaserch Methodology

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1 - Science and Scientific research

Science: is a systematic project that builds on previously existing knowledge but within a narrow framework. So it works to organize and expand it in the form of testable explanations and predictions that work to provide new knowledge about the universe**.**

Scientific research: is a systematic process of inquiry aimed at discovering new knowledge or validating existing theories. It involves formulating a research question, developing a hypothesis, conducting experiments or observations, and analyzing data to draw conclusions. This process helps advance our understanding of specific phenomena and can lead to new technologies, treatments, or insights across various fields.

2 – Stage of achieving knowledge

Achieving knowledge is very important for human progress in various areas of life. Since knowledge is something acquired, it follows methods to gain it

Reading: learning about different things.

Critical thinking: wondering why something happens and how it works.

Research: finding the reason for the existence of things around us.

Experiment: applying the available methods to know and experience something.

Results: the summary of the experiment that leads to the occurrence of knowledge

3 – The nature of science

science isn't just about memorizing facts – it's a method of figuring out how the world works.At its core, science is all about curiosity and asking questions. Scientists start by making observations about the world, like "I wonder why the sky is blue?" Then, they come up with possible explanations, or hypotheses. After that, they design experiments or

studies to test those ideas.It's important to remember that science is always changing and evolving. As new information comes along, our understanding of the world can change too. Scientists are always open to new ideas and testing them out. to sum it up, science is a way of exploring the world around us through observation, questioning, and experimentation.

4- Objectives of science

 The objectives help ensure that scientific research is systematic, objective, and contributes to a deeper understanding of the world . In research methods, the objectives of science can be summarized as follows:

Formulating Hypotheses: To create testable statements based on observations that guide research.

Collecting Data: To gather quantitative or qualitative data systematically through experiments, surveys, or observations.

Testing Hypotheses: To rigorously evaluate hypotheses using statistical analysis and experimental design.

Establishing Causality: To determine cause-and-effect relationships through controlled experiments.

Replicability: To ensure that findings can be reproduced by other researchers, validating results.

Generalization: To apply findings from a sample to a broader population or context.

Theory Development: To contribute to or refine existing theories based on empirical evidence.

Critical Evaluation: To assess and critique methodologies and findings to enhance scientific rigor.

5- Characteristics of reaserch

The characteristics help ensure that research is credible and useful in advancing knowledge.

Systematic: Research follows a structured and organized approach to gather data and analyze information.

Empirical: It relies on observable and measurable evidence, often through experiments or surveys.

Replicable: Research methods should be clear enough for other researchers to reproduce the study and verify results.

Objective: Aims to minimize bias and subjectivity, focusing on facts rather than personal beliefs.

Logical: Conclusions are based on reasoning and supported by data, following a coherent structure.

Generalizable: Findings should ideally apply beyond the specific sample studied, allowing for broader conclusions.

Innovative: Research often seeks to contribute new insights or knowledge to a field.

Critical: Involves critical evaluation of methods, data, and conclusions to ensure rigor and validity.

6- Educational reaserch and its steps

Educational research involves systematic investigation aimed at understanding and improving educational practices and outcomes. The steps typically include:

Identifying the Research Problem: Defining what you want to study.

Literature Review: Reviewing existing research to inform your study.(old study befor 2000, and resent study after 2000)

Formulating Hypotheses or Research Questions: Establishing what you aim to discover.

Research Design: Choosing qualitative, quantitative, or mixed methods.

Data Collection: Gathering information through surveys, interviews, observations, etc.

Data Analysis: Analyzing the collected data to draw conclusions.

Interpreting Results: Understanding the implications of your findings.

Reporting and Dissemination: Sharing results through publications or presentations.

7. Ethical considerations in educational reaserch

Key ethical considerations in educational research include:

Informed Consent: Participants must be fully informed about the study and agree to take part voluntarily.

Confidentiality: Researchers must protect participants' identities and data.

Minimizing Harm: Studies should avoid causing physical or emotional distress to participants.

Right to Withdraw: Participants should be able to leave the study at any time without consequences.

Integrity and Honesty: Researchers should report findings accurately and avoid any form of deception.

8 – Search classifcation

Imagine you're an English student with a huge pile of notes, essays, and articles. It would be really hard to find a specific piece of information if everything was just jumbled together, right? That's where search and classification come in. Search is like using keywords to find the exact paper or quote you need. Maybe you type in the author's name or a key word from your topic. On the other hand, 'classification' helps you organize your notes into neat categories. You could put things into folders by subject, by the type of paper, or even by the date you got the info.

Just like a library, having a good system makes it so much easier to find what you're looking for when you need it.

9- Descriptive research

Descriptive research is a type of research that focuses on describing and summarizing data. It aims to provide a detailed picture of a particular phenomenon or situation. Unlike explanatory research, which seeks to understand the causes and relationships between variables, descriptive research simply provides a snapshot of what is happening.

10- Experimental research

is about figuring out cause and effect. You change one thing to see if it makes something else happen. It's kind of like being a detective, trying to figure out what makes things work the way they do.

So, scientists use it to test out theories and see if they're right. They might test a new drug to see if it helps a disease, or try out a new teaching method to see if it helps kids learn better. It's a way to discover new things and learn how the world works.

11- Historical research

Is like putting together a puzzle. You start by figuring out what you want to learn about. Maybe you want to find out about a specific event, or a famous person, or even a whole period of time. Once you know what you want to research, you need to find the right pieces of the puzzle. These pieces are called sources. Some sources could be old letters, newspaper articles, or even photographs. Others might be books or articles written by historians

12- The research problem and its hypotheses

the research problem is basically the question you're trying to answer. It's what your whole research project is centered around. A good research problem is clear, specific, and focused.

while, the hypothesis is like your best guess at the answer to that problem. It's what you think the answer might be, and it needs to be something you can actually test.

13- Sources of getting the problem

Sometimes it's about noticing a gap in our knowledge – like, we know a lot about one part of something, but there's a big question mark in another area. Other times, it's about seeing an issue that needs fixing, like maybe there's a problem that keeps coming up over and over again.

14- Rules for formulating the problem

for formulating a good research problem:

- It's gotta be clear and specific. Avoid being too vague or broad.
- Keep it focused. Don't try to tackle everything at once. Pick one specific question.
- Make sure it's something you can actually research. You'll need enough information available to work with.
- Your problem should be important and worth investigating. It should add to what we already know.

15- Pilot study

Is like a test run for your main research project. You try out your research methods on a small scale to see if they work and to find any potential problems.
For example, if you're planning a big survey, you might do a pilot study with a smaller group of people first. This helps you make sure the questions are clear, that the survey isn't too long, and that you're getting the kind of data you want.
It's like a dress rehearsal for your main event – it helps you make sure everything goes smoothly when it really counts.

16- Search variables

Are specific terms you use to refine your search results. For example, if you wanted to find videos of funny cats being lazy, "funny" and "lazy"

would be your search variables, while "cats" would be your main search term.

17- Research hypothesis

Is like a well-educated guess about what you think will happen in your study. It's based on what you already know about the topic, but it still needs to be tested to see if it's actually true.

18- Review the literature related to the research problem

a review of literature related to your research problem is like diving into what other researchers have already discovered. You'll read their studies, figure out what they found, and see if there are any gaps in their knowledge that your research could fill.

19- Sampling and population

Think of a population as the entire group you're interested in learning about. Maybe it's all the students in your school, or all the dogs in your city. A sample is like a smaller snapshot of that group – it's a smaller number of people or things you'll collect data from. You can use that sample data to learn about the bigger population.

20- Sampling methods

There are lots of different sampling methods, but the basic idea is how you choose your sample. Some popular ones are random sampling, where everyone has an equal chance of being picked, and stratified sampling, where you divide the population into groups and then randomly select from each group.

21- Non-probability samples

Non-probability sampling is when you choose your sample in a non-random way. So, unlike random sampling, where everyone has a chance of being picked, non-probability sampling methods rely on the researcher's judgment.

22- Sample size

There are lots of different sampling methods, but the basic idea is how you choose your sample. Some popular ones are random sampling, where everyone has an equal chance of being picked, and stratified sampling, where you divide the population into groups and then randomly select from each group.

23- Data collection tools

Are things that help you gather your information. Some examples are surveys or questionnaires to get people's thoughts, interviews if you want more detailed answers, and observation if you want to watch how people behave.

24- Questionnaire

A questionnaire is a research tool with a set of questions that people read and respond to in writing. Others call these surveys or quizzes, but the basic idea is the same.

25- The interview

An interview is like a live conversation between a researcher and someone else. The researcher asks questions to learn about the person's thoughts, experiences, or opinions.

26- Note

notes are pieces of written information that help you remember things. They can be things you write down yourself, like when you're taking notes in class, or they can be pre-written, like you might find in a book.

27- Preparing the research report

Is like putting together a story about what you discovered. You start by organizing all your notes and data. Then, you write up an introduction explaining what your research is about, the body where you share your findings, and a conclusion summarizing everything.

28- Libraries and scientific research

Libraries are storehouses of knowledge that are critical to scientific research. They provide access to books, articles, journals, and other resources that researchers need to conduct their studies. In addition to physical materials, libraries also offer online databases and research tools that make it easier for scientists to find the information they need.

29- Abstract

An abstract is a short summary of a research paper or article. It usually comes right at the beginning and gives readers a quick overview of what the whole paper is about. Think of it as a sneak peek into the research.