

Overview of Research and its Methodologies

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1. CONCEPT OF RESEARCH

In the broadest sense of the word, the definition of research includes:

- (1) Any gathering of data, information and facts for the advancement of knowledge.
- (2) The systematic investigation into and study of materials and sources in order to establish facts and reach new conclusions.

Research is a systematic and objective analysis and recording of controlled observations that may lead to the development of generalizations, principles or theories, resulting in prediction and possible control of events.

Scientifically research is defined as: Performing a methodical study in order to prove a hypothesis or answer a specific question. Finding a definitive answer is the central goal of any experimental process. Also confirm/ascertain what is already known.

Research must be systematic and follow a series of steps and a rigid standard protocol. These rules are broadly similar but may vary slightly between the different fields of science.

Scientific research must be organized and undergo planning, including performing literature reviews of past research and evaluating what questions need to be answered.

Any type of 'real' research, whether scientific, economic or historical, requires some kind of interpretation and an opinion from the researcher. This opinion is the underlying principle, or question, that establishes the nature and type of experiment.

The scientific definition of research generally states that a variable must be manipulated, although case studies and purely observational science do not always comply with this norm.

Research is therefore a systematic quest for undiscovered knowledge. Good research is planned, organized and has a specific question. Research is a systematic search for knowledge, getting additional information and search for the truth. Research process should be systematic and should be based on scientific methods. The problem needing solution is identified, a hypothesis is pospulated, observation or data collected and interpreted to prove or disprove the hypothesis. This ultimately leads to a new body of knowledge. Research process therefore followed will defined steps and stages. Research may be defined as identification of problem and proffering solutions through a planned and systematic collection analysis and interpretation of data.

1.1 Steps to Follow When Conducting Research

The specific steps to follow when conducting research depend, in part, on the topic of investigation, where the researchers are in their overall program of research, and other factors. Nonetheless, it is accurate to say that much research in the social sciences follows a systematic course of action that begins with the statement of a research question and ends with the researcher drawing conclusions about a null hypothesis. This section describes the research process as a planned sequence that consists of the following six steps:

1. Identifying the problem
2. Developing a statement of the research hypothesis
3. Developing the research plan (Defining the instrument i.e questionnaire, unobtrusive measures)
4. Gathering the data
5. Analyzing the data
6. Drawing conclusions regarding the hypothesis.

1.2 The Need for Research (why we do research)

- Advance knowledge
- Generate new knowledge
- To establish facts and reach new conclusions. Through research findings, psychologists are able to explain individuals' behaviors, including how people think and act in certain ways. This helps to determine disorders and their impact on the person and society, thus developing appropriate treatments to improve the individual's quality of life.
- In business, market research helps companies to make projections and formulate appropriate strategies to ensure survival. Businesses conduct surveys to understand the needs of the community and consumption habits.
- Innovation research has led to the introduction of new medical treatments and cures that have helped counter several diseases, thus increasing human life expectancy. It is now possible to live 10 years longer than in the 1960s and 20 years longer than in the 1930s. Causes of early deaths and crippling vitamin deficiencies have also been identified by progress made in the medical field through research.
- Confirm/ascertain what is already known and thereby make improvements/modifications

2.0 TYPES OF RESEARCH

Research can be collapsed according to procedure or sophistication into scientific and non-scientific researches.

Scientific research employ scientific methods while non-scientific research does not.

Non-Scientific research depends largely on literary speculation or other estimations and conclusions that are not evidence based.

Scientific research depends largely on evidence and use of statistical and numerical data in classification of values and test of hypotheses. Also in scientific research, vigorous logical procedures are used in arriving at conclusions. These procedures help to increase confidence of public in scientific findings, transparency and openness.

Scientific research can further be divided into Observations studies and True experiments.

2.1 Observational Studies/Descriptive studies

These are studies where variables are not manipulated or changed but observed as they are with view to recording any changes and patterns of the changes. Descriptive studies are also called observational studies because you observe subjects without otherwise intervening.

Descriptive also called case study: it attempts to describe systematically a situation, problem, phenomenon, services or programme, or provide information about, say, living condition of a community, or attitude towards an issue. It refers to research that provided an accurate portrayal of characteristics of a particular individual, situation or group. It is also known as statistical research. Descriptive studies are means of discovering new meaning, describing what exists and determining the frequency with which something occurs and categorizing information. It deals with anything that can be counted and studied, which has an impact on the lives of people it deals with. For example finding the most frequent disease that affects the children of a town. The reader of a research will know what to do to prevent the disease, thus more people will live a healthy life. Help to determine answers such as who? What? When? How? But not why?

In descriptive studies no attempt is made to change behavior or conditions. We measure things as they are. Types of descriptive studies include.

1. Case (the simplest descriptive study)
Here data is reported on only one subject e.g an outstanding individual in an event.
2. Case Studies: This includes many cases.
3. Cross Sectional: Here variables of interest in a sample of subjects are assayed once and the relationships between them are determined.
4. Prospective/Cohort/longitudinal: In prospective or cohort studies, some variables are assayed at the start of a study, then after a period of time the outcomes are determined.
5. Case-control/Retrospective: Case-control studies compare cases with a particular attribute, eg. Injured with controls (subjects without the attribute). Comparison is made based on the exposure. Case-control studies are also retrospective, because they focus as conditions in the past that have caused subjects to become cases rather than controls.

Others include

B. Correlational studies – Researcher is interested in finding out if there are changes in the manner same target variables occur or change eg. to know if memory increases with age (positive relationship) or decrease with age (negative) or has no predictable or chance relationship with age (zero relationship).

Correlational research refers to a systematic investigation **or** statistical study of a relationship among two or more variables without necessarily determining cause and effect. For example to test for hypothesis “listen to music lowers blood pressure level”. There are two ways of conducting research: experimental and survey. In experimental, group samples make one group listen to the music and then compare the blood BP levels. Survey; ask people how they feel? How often they listen? And then compare.

(C) Explanatory Research

Explanatory Research: Attempts to clarify why and how there is a relationship between two or more aspects of a situation or phenomenon. It is undertaken to explore an area where little is known or to investigate the possibility of undertaken particular research study (feasibility/pilot study). It tends to build on exploratory and descriptive research.

(D) Exploratory Research: Looks at new topics/ideas/areas may led to bigger research can be done using survey, case studies, pilot studies. Usually have no definite answers.

2.2 True Experiment

Reffers to an experimental situation that involves actual manipulation of the independent variables(s) to check effect on the result. Often this takes place in the laboratory where every aspect of the research is controlled in order to narrow the factors that affect the dependent variables(s) only by the independent variables of interest to the researcher.

Experimental Studies

Experimental studies are also known as longitudinal or reported – measures studies. They are called interventions because you do more than just observe the subjects. Experimental studies can include or exclude control groups.

(i) Without control group

A true study with more or more measurements taken on all subjects before and after a treatment:

(ii) With a control group:

In this design, all subjects are measured but only some of them the experimental group – receive the treatment. All are then measured again and change in experimental group is compared with change in control group. If subjects are assigned randomly to experimental and control groups or treatments, the design is known as randomized controlled trial. The control treatment in such a study is called placebo.

Qualitative and Quantitative Researches

Qualitative	Quantitative
- Generates numerical and statistical data	- Generates Words

<p>- Reliability depends on methodology and quality of measuring tool/instrument</p> <p>- eg How much money do professors in Nigeria earn every month?</p>	<p>- Reliability depends on the researcher</p> <ul style="list-style-type: none"> - How skillful - How meticulous - How rigorous <p>-eg: How do professors in Nigeria spend their monthly earnings?</p>
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3.0 LITERATURE REVIEW

A literature review is an account of what has been published on a topic by accredited scholars and researchers. It is part of the introduction to an essay, research report, or thesis. In writing the literature review, your purpose is to convey to your reader what knowledge and ideas have been established on a topic, and what their strengths and weaknesses are. As a piece of writing, the literature review must be defined by a guiding concept (e.g., your research objective, the problem or issue you are discussing, or your argumentative thesis). It is not just a descriptive list of the material available, or a set of summaries.

It is also a text of a scholarly paper, which includes the current knowledge including substantive findings, as well as theoretical and methodological contributions to a particular topic. Literature reviews are secondary data sources, and do not report new or original experimental work. Most often associated with academic-oriented literature, such reviews are found in academic journals, and are not to be confused with book reviews that may also appear in the same publication. Literature reviews are a basis for research in nearly every academic field.

3.1 Need for literature review

The purpose of a literature review are:

- To establish a theoretical framework for your topic / subject area
- Define key terms, definitions and terminology
- Identify studies, models, case studies etc supporting your topic: This is closely connected with demonstrating that you know the field. It is the knowledge of your field which allows you to identify the gap which your research could fill. However, it is not enough to find a gap. You have also to be able to convince your reader that what you are doing is important and needs to be.
- Define / establish your area of study, ie your research topic.
- It helps you create a sense of rapport with your audience or readers so they can trust that you have done your homework. As a result, they can give you credit for your due diligence: you have done your fact-finding and fact-checking mission, one of the initial steps of any research writing. As a student, you may not be an expert in a given field; however, by listing a thorough review in your research paper, you are telling the audience, in essence, that you know what you are talking about

- It helps to avoid incidental Plagiarism. Imagine this scenario. You have written a research paper, an original paper in your area of specialization, without a literature review. When you are about to publish the paper, you soon learn that someone has already published a paper on a topic very similar to yours. Of course, you have not plagiarized anything from that publication; however, if and when you publish your work, people will be suspicious of your authenticity.
- It sharpens research Focus. As you assemble outside sources, you will condense, evaluate, synthesize, and paraphrase the gist of outside sources in your own words. Through this process of winnowing, you will be able to place the relevance of your research in the larger context of what others researchers have already done on your topic in the past

The three key points of a literature review include:

- To tell what the research says (theory).
- To tell how the research was carried out (methodology).
- To tell what is missing, ie the gap that your research intends to fill.

3.2 HOW to Carry Out a Literature Review

1. Choose a topic. Define your research question.

Your literature review should be guided by a central research question. Remember, it is not a collection of loosely related studies in a field but instead represents background and research developments related to a specific research question, interpreted and analyzed by you in a synthesized way.

Tips:

- Make sure your research question is not too broad or too narrow. Is it manageable?
- Begin writing down terms that are related to your question. These will be useful for searches later.
- If you have the opportunity, discuss your topic with your professor/supervisor.

2. Decide on the scope of your review.

How many studies do you need to look at? How comprehensive should it be? How many years should it cover?

Tip: This may depend on your assignment. How many sources does the assignment require?

3. Select the databases you will use to conduct your searches.

Make a list of the databases you will search. Remember to include comprehensive databases such as WorldCat and Dissertations & Theses, if you need to.

Tips:

- Look at the Library's research guides in your discipline to select discipline-specific databases. Don't forget to look at books!
- Make an appointment with or contact your subject librarian to make sure you aren't missing major databases.

4. Conduct your searches and find the literature. Keep track of your searches!

Tips:

- Review the abstracts of research studies carefully. This will save you time.
- Write down the searches you conduct in each database so that you may duplicate them if you need to later (or avoid dead-end searches that you'd forgotten you'd already tried).
- Use the bibliographies and references of research studies you find to locate others.
- Ask your professor or a scholar in the field if you are missing any key works in the field.
- Use RefWorks to keep track of your research citations. See the RefWorks Tutorial if you need help.

5. Review the literature.

Some questions to help you analyze the research:

- What was the research question of the study you are reviewing? What were the authors trying to discover?
- Was the research funded by a source that could influence the findings?
- What were the research methodologies? Analyze its literature review, the samples and variables used, the results, and the conclusions. Does the research seem to be complete? Could it have been conducted more soundly? What further questions does it raise?
- If there are conflicting studies, why do you think that is?
- How are the authors viewed in the field? Has this study been cited?; if so, how has it been analyzed?

Tips:

- Again, review the abstracts carefully.
- Keep careful notes so that you may track your thought processes during the research process.
- Literature reviews entail these processes: finding suitable literature, assessing it, summarizing it and synthesizing it. First of all, decide what 'suitable literature' means. Encourage the group to be as specific as possible about what literature it wants to include in the review, otherwise it will end up with too many studies to read. To find suitable literature, search on the internet, on council or government websites, and in your local and university libraries. A librarian will be able to help the young researchers to do this.

Next, assess each study. These questions will help the group to do this:

- Is it highly relevant to the research question?
- Is it objective and unbiased?
- Is it accurate?
- Is it well written?
- Is it a reliable source of evidence? If it is research, is it robust?
- Is it recent? If not, is it still relevant?

Note down the key pieces of information on each of the studies that the groups has decided to include, also with a summary of the study's main findings. When the group has summarized all the studies, look across the summaries and think about the following questions:

- What key themes have emerged?
- What do the studies disagree and agree on?
- Is there any consensus in the literature?
- Are there any gaps in it?

3.3 SOURCES OF LITERATURE REVIEW

The term sources refer to print, electronic or visual materials necessary for your research. Sources are classified into primary, secondary and tertiary.

- **Primary sources:** letters/correspondence, diaries, memoirs, autobiographies, official or research reports, patents and designs, and empirical research articles.
- **Secondary sources:** academic journal articles (other than empirical research articles or reports), conference proceedings, books (monographs or chapters' books), documentaries.
- **Tertiary sources:** Encyclopedias, dictionaries, handbooks, atlas