

WEEK 2 research method

RESEARCH PAPER

What is research paper?

Research paper is:

- A substantial piece of academic writing usually done as a requirement for a class. In which the author does independent research into a topic and writes a description of the findings of that research.
- A formal written report that includes research findings and a student's own ideas.
- Research papers are all about organizing your ideas in a linear, understandable format.
- A research paper is a report summarizing the answers to the research questions you generated from the sources you gathered information from. Then presenting the work in research paper format.

Various stages of a research

Whenever a scientific problem is to be solved there are several important steps to follow. A general set of sequential components of research is the following:

1. Selection of a research topic
2. Definition of a research problem
3. Literature survey and reference collection
4. Assessment of current status of the topic chosen
5. Formulation of hypotheses
6. Research design
7. Actual investigation
8. Data analysis
9. Interpretation of result
10. Report

Step1. Choose a Topic

1. Choose a topic which interests and challenges you. Your attitude towards the topic may well determine the amount of effort and enthusiasm you put into your research.
2. Focus on a limited aspect - narrow it down from

3. Obtain teacher approval for your topic before embarking on full-scale research.
4. Select a subject you can manage. Avoid subjects that are too technical, learned, or specialized.
5. Avoid topics that have only a very narrow range of source materials.
6. Choose a topic which interests and challenges you. Your attitude towards the topic may well determine the amount of effort and enthusiasm you put into your research.

Step 2: Definition of a research problem

A situation or circumstance that requires a solution to be described, explained, or predicted. It is an unsatisfactory situation that wants you to confront. If there is a **knowledge gap** in an area that need to be **investigated**, the research problem **identifies** this gap. Whereas the **research topic** is simply a **broad area of interest**, the research problem identifies what is problematic about that topic.

A statement specifies exactly what is being studied. The research statement should include five elements:

1. Information about the research topic that provoked the study
2. The scope of the problem (e.g. how many people are affected by it).
3. Why it is important to study the problem
4. General characteristics of the population of interest
5. The overall goal or aim of the study or the question to be answered.

Step3: Literature survey and reference collection

A literature review surveys scientific articles, books, journals, dissertations and other sources relevant to a particular issue, area of research, or theory, providing a description, summary, and critical evaluation of each work.” It is very essential to know whether the defined problem has already been solved, status of the problem, techniques that are useful to investigate the problem and other related details.

One can survey:

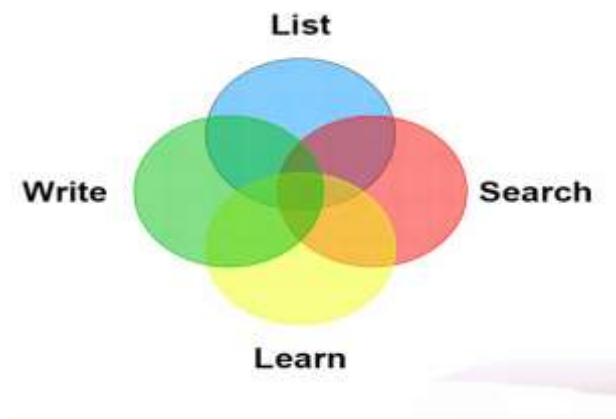
1. The journals which publish abstracts of papers published in various journals,
2. Review articles related to the topic chosen,
3. Journals which publish research articles,
4. Advanced level books on the chosen topic,

5. Proceedings of conferences, workshops, etc.,
6. Reprint/preprint collections available with the supervisor and nearby experts working on the topic chosen
7. Internet.

No research shall be complete unless we make use of the knowledge available in books, journals and internet. Review of the literature in the area of research is a preliminary step before attempting to plan the study.

A literature review may constitute an essential chapter of a thesis or dissertation, or may be a self-contained review of writings on a subject. In either case, its purpose is to:

- Place each work in the context of its contribution to the understanding of the subject under review
- Describe the relationship of each work to the others under consideration
- Identify new ways to interpret, and shed light on any gaps in, previous research
- Identify areas of prior research to prevent duplication of effort
- Place one's original work (in the case of theses or dissertations) in the context of existing literature



Sources of Literature

1. Journal articles:

These are good sources, especially for up-to-date information. They are frequently used in literature reviews because they offer a relatively concise, up-to-date format for research. Depending on the publication, these materials may be **refereed materials**. **Non-refereed** materials such as Trade Journals or magazines use less rigorous standards of screening prior to

publication. Non-refereed materials may not be **checked** as intensely as refereed materials, but many can still be considered useful, although not for **scientific literature and research**.

2. Books:

Remember that books tend to be **less up-to-date**, as it takes longer for a book to be published than for a journal article. They are still likely to be **useful** for including in your literature review as they offer a **good starting point** from which to find **more detailed** and up-to-date sources of information

3. Conference proceedings:

These can be useful in providing the latest research, or research that has not been published. They are also helpful in **providing information about people** in different research areas, and so can be **helpful in tracking down** other work by the same researchers.

4. Government/corporate reports:

Many government departments and corporations' commission carry out research. Their published findings can provide a useful source of information, depending on your field of study.

5. Theses and dissertations:

These can be useful sources of information. However there are disadvantages:

- a. They can be difficult to obtain since they are not published, but are generally only available from the library or interlibrary systems
- b. The student who carried out the research may not be an experienced researcher and therefore you might have to treat their findings with more caution than published research.

6. Internet:

The fastest-growing source of information is on the Internet.

- Bear in mind that anyone can post information on the Internet so the quality may not be reliable

- The information you find may be intended for a general audience and so not be suitable for inclusion in your literature review (information for a general audience is usually less detailed).

Step4: Assessment of current status of the topic chosen

Generally, it is not difficult to know the current status of research work in a specific topic. The current status of the chosen topic can be identified by:

1. Reading the relevant journals and the recent papers,
2. Discussions in conferences,
3. Seminars and workshops.

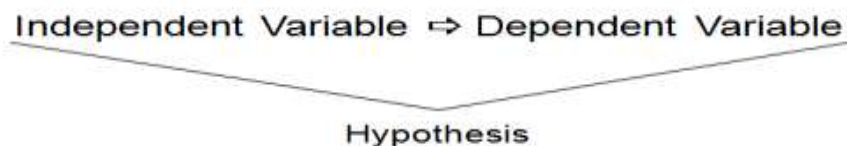
Step 5: hypothesis

A hypothesis is a proposition in testable form and **predicts** a particular relationship between two or more variables. If a researcher thinks that a relationship exists, he should first state it as a hypothesis and then test the hypothesis in the field.

A hypothesis is less general than a theory. Theories and hypotheses describe causal relationships between two or more variables.

Dependent variable – what you're trying to explain

Independent variable – what we think causes the dependent variable.



There are **two types** of hypothesis:

1. **The null hypothesis (H_0)**. states that there is **no change** or **difference** as a result of the independent variable. In other words, work experience **does not** result in a difference in grades among college students. Group1 = group 2
2. **The alternative hypothesis (H_A)** states that there is a change or difference. In other words, work experience result in a difference in grades among college students. Group 1 \neq group 2

If we find that students with work experience perform at the same level as those without work experience, for example, our results show that there is no difference. We would therefore accept our null hypothesis. If we find that one group performs significantly different than the other, we would then reject the null hypothesis, and by definition, accept the alternative.

Step 6: Research Design

Plan your work and work your plan is the suggestion of Napoleon Hill. For a scientific research one has to prepare a research design. It should indicate the various approaches to be used in solving the research problem, sources and information related to the problem and, time frame and the cost budget.

Essentially, the research design creates the foundation of the entire research work. The design will help **perform the chosen task easily and in a systematic way**. Once the **research design is completed the actual work can be initiated**.

The actual work design has two steps:

1st step: learn the theoretical methods, numerical techniques, experimental techniques and other relevant data and tools necessary for the present study have to be collected and learnt.

2nd step: the validity and utility of the information gathered should be tested before using them. Scientific research is based on certain mathematical, numerical and experimental methods. These sources have to be properly studied and judged before applying them to the problem of interest.