

Research Methodology



by

Dr. Ranj Nadhim Jalal

*BDS, Hawler Medical University, College of Dentistry
Professional Diploma in Dental Implantology
PhD in Dental Implantology (University of Plymouth/UK)*

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Introduction to research II

What research is NOT?

- Research is not merely information gathering.

Gathering information may be information discovery; may be learning referencing skills but definitely not a research.

- Research is not merely rummaging for information.

Rummaging, whether through one's personal records or at the public or college library, is not research. It is more accurately called an exercise in self-enlightenment.

- Research is not a catchword used to get attention.

- Research is not branding or (catchword) to get public attention for products or services. For instance, a company using the phrase (years of research has produced this high quality product) is simply demonstrating the clever use of a catchword.

Criteria of Good Research

- *Good research is **systematic***
- *Good research is **logical***
- *Good research is **empirical***
- *Good research is **replicable***

Characteristics of Research

- Research originates with a **question** or **problem** in the mind of the researcher.



Research requires a **clear aim.**



Research requires a **specific plan** or **procedure**.



Research usually divides the **principal problem** into more manageable **subproblems**.

- Research is guided by the specific research **problem, questions or hypothesis.**



Research requires the **collection and interpretation of data** to resolve the problem that initiated the research.

Research is fully recorded and reported.



Research is **cyclical**.



How to define your project? Your research question or scientific problem?



Select a question (problem)

The following points must be considered:

- Subject which is overdone should not be normally chosen.
- Controversial subject should not become the choice of an **average researcher**.
- Too narrow or too vague problems should be avoided.

- 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.
- 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.

Understanding 5 Ws

- What?
- Why?
- When?
- Who?
- Where?



What?

- What is your research ? What are you going to do?

Why ?

- Why do you want to do the research? What is its purpose?

Why?

- Are you interested in the topic?
- Have you identified a gap in the literature?
- You want to obtain funding for a particular service or enterprise and you need to find out whether there is a demand for what you are proposing.
- You need to conduct some research to aid decision making.

Who

- Who will be your participants?
- If participants (subjects) are people, are you able to contact them during the proposed time scale?
- If you conduct an animal study, how easy it is to provide and deal with them?

When ?

- When are you going to do your research?
- Is your proposed research suitable the proposed time scale?
- Are participants ready during the proposed time? For example, if your participants are university students, you wouldn't conduct your research in summer

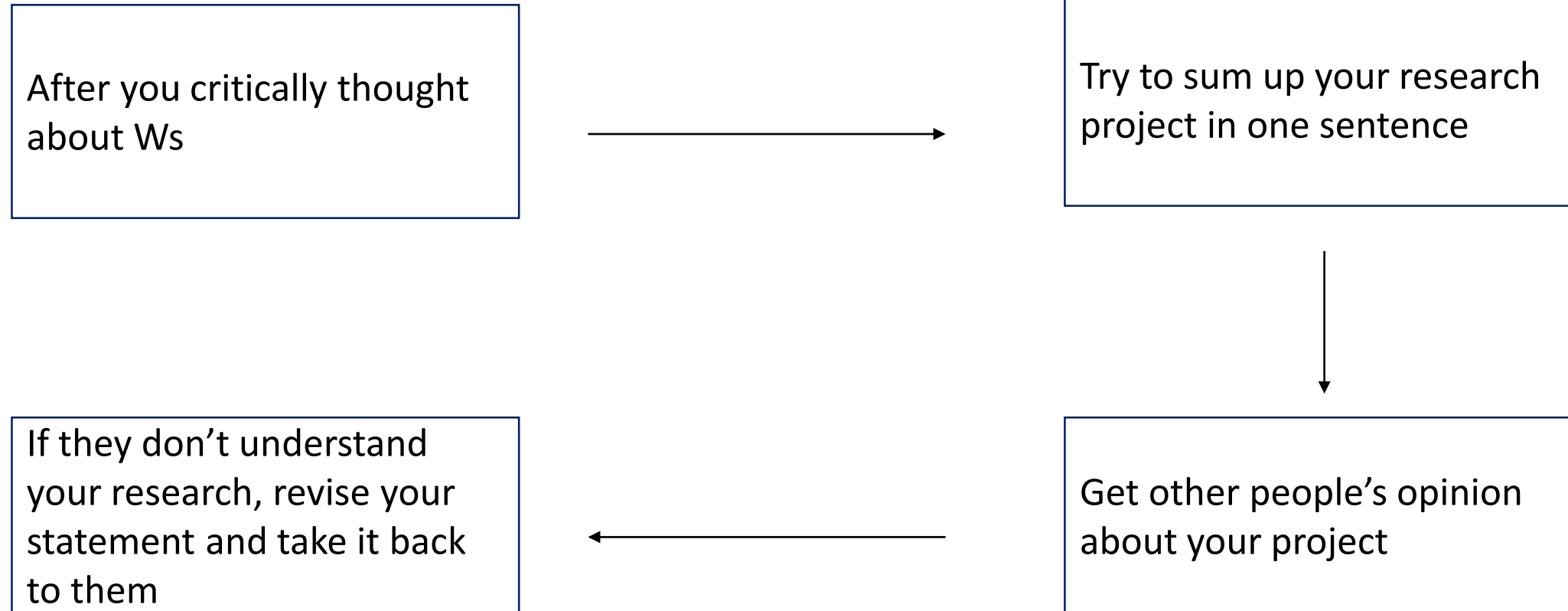
Where?

- Where are you going to conduct your research?
- Think about **resources** in terms of **budget and time**.
- If you have a **limited budget** and have to travel, try to choose somewhere which is close to you.
- If you are planning to conduct interviews or focus group, you have to think about a **venue**, there might be a room at your institution free of charge.

Exercise

- Please define Ws in your proposed research.

Summarize your research



Why do we need to critically define our research question?

- A proper definition of research problem will enable the researcher to be on the track whereas an ill-defined problem may create hurdles!

Process of research

Define research
problem (question)

Review the
literature

Formulate
hypothesis

Design the research
(methodology)

Collect data

Analyze data

Interpret and
conclude

Designing the research

- research design is the **arrangement of conditions** for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure.

Important concepts relating to research design

1-Dependent and independent variables:

A concept which can take on different quantitative values is called a **variable**. Such as; weight, pocket depth, height.

- If one variable depends upon or is a consequence of the other variable, it is termed as a **dependent variable**, and the variable that is antecedent to the dependent variable is termed as an **independent variable**.

For instance, if we say that height depends upon age, then height is a dependent variable and age is an independent variable.

2-Extraneous variable

- Independent variables that are not related to the purpose of the study, but may affect the dependent variable are termed as extraneous variables.
- Examples;

Suppose the researcher wants to test the hypothesis that there is a relationship between dental caries and high sugar diet. In this case high sugar diet is an independent variable and dental caries is a dependent variable. However, xerostomia may as well affect the dental caries, but since it is not related to the purpose of the study undertaken by the researcher, it will be termed as an extraneous variable.

- Whatever effect is noticed on dependent variable as a result of extraneous variable(s) is technically described as an 'experimental error'
- A study must always be so designed that the effect upon the **dependent variable** is attributed entirely to the **independent variable(s)**, and not to some **extraneous variable or variables**.

3-Control

- One important characteristic of a good research design is to minimize the influence or effect of **extraneous variable(s)**.
- The technical term '**control**' is used when we design the study minimizing the effects of **extraneous independent variables**.
- In experimental researches, the term '**control**' is used to refer to restrain experimental conditions.

4-Research hypothesis

- The research hypothesis is a predictive statement that relates an **independent variable** to a **dependent variable**.
- Usually a research hypothesis must contain, at least, one independent and one dependent variable.
- Predictive statements which are not to be **objectively verified** or the relationships that are assumed but **NOT** to be tested, are **NOT** termed research hypotheses.

5-Experimental and control groups

- In an experimental hypothesis-testing research when a group is exposed to **usual conditions**, it is termed a **'control group'**, but when the group is exposed to **some novel or special condition**, it is termed an **'experimental group'**.

6-Treatments

- The **different conditions** under which experimental and control groups are put are usually referred to as **'treatments'**.

- Example;

We have control group and experimental group (each 25 participants), participants in both groups were given **amoxicillin** to test its efficacy,

What is the treatment ?



Thank you!