

People's Democratic Republic of Algeria
Ministry of Higher Education and Scientific Research
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Research Methodology Practice Lessons
(First Year Master Degree)

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Research

Objectives

At the end of this course the student will be able to:

- Know what is research.
- Know what are the general ways of writing research.
- Know what are the types of research and the manner used in developing each of them.
- Know what is the purposes of doing research.
- Know what is the research process (selecting a topic, identifying a research problem, conducting a literature search, stating the research questions and the hypothesis, determining the research design, determining the research method and the analysis procedure).
- Do research following the steps stated previously.

Lesson One: Research and its Types

What is Research?

Research is a systematic inquiry to describe, explain, predict and control the observed phenomenon. Research involves inductive and deductive methods (Babbie, 1998). Inductive methods analyse the observed phenomenon and identify the general principles, structures, or processes underlying the phenomenon observed; deductive methods verify the hypothesised principles through observations. The purposes are different: one is to develop explanations, and the other is to test the validity of the explanations.

One thing that we have to pay attention to in research is that the heart of the research is not on statistics, but the thinking behind the research. How we really want to find out, how we build arguments about ideas and concepts, and what evidence that we can support to persuade people to accept our arguments.

Gall, Borg and Gall (1996) proposed four types of knowledge that research contributed to in education as follows:

1. *Description*: Results of research can describe natural or social phenomenon, such as its form, structure, activity, change over time and relationship to other phenomena. The descriptive function of research relies on instrumentation for measurement and observations. The descriptive research results in our understanding of what happened. It sometimes produces statistical information about aspects of education.
2. *Prediction*: Prediction research is intended to predict a phenomenon that will occur at a time Y from information at an earlier time X. In educational research, researchers have been engaged in:
 - Acquiring knowledge about factors that predict students' success in school and in the world of work
 - Identifying students who are likely to be unsuccessful so that prevention programmes can be instituted.
3. *Improvement*: This type of research is mainly concerned with the effectiveness of intervention. The research approach includes experimental design and evaluation research.
4. *Explanation*: This type of research subsumes the other three: if the researchers are able to explain an educational phenomenon, it means that they can describe, can predict its consequences, and know how to intervene to change those consequences.

What are the Purposes of Research?

Patton (1990) pointed out the importance of identifying the purpose in a research process. He classified four types of research based on different purposes:

1. *Basic Research*: The purpose of this research is to understand and explain, i.e. the research is interested in formulating and testing theoretical construct and propositions that ideally generalise across time and space. This type of research takes the form of a theory that explains the phenomenon under investigation to give its contribution to knowledge. This research is more descriptive in nature exploring what, why and how questions.
2. *Applied Research*: The purpose of this research is to help people understand the nature of human problems so that human beings can more effectively control their environment. In other words, this type of research pursues potential solutions to human and societal problems. This research is more prescriptive in nature, focusing on how questions.
3. *Evaluation Research* (summative and formative): Evaluation research studies the processes and outcomes aimed at an attempted solution. The purpose of formative research is to improve human intervention within specific conditions, such as activities, time and groups of people; the purpose of summative evaluation is to judge the effectiveness of a programme, policy, or product.
4. *Action Research*: Action research aims at solving specific problems within a programme, organisation, or community. Patton (1990) described that design and data collection in action research tend to be more informal, and the people in the situation are directly involved in gathering information and studying themselves.

Lesson Two: The Research Process (Part One)

What is the Research Process?

Gall, Borg, and Gall (1996) described the following stages of conducting a research study:

1. Identify a significant research problem: in this stage, find out the research questions that are significant and feasible to study.
2. Prepare a research proposal: a research proposal usually consists of the sections including introductory, literature review, research design, research method, data analysis and protection of human subject section, and timeline.
3. Conduct a pilot study: the purpose is to develop and try out data-collection methods and other procedures.
4. Conduct a main study.
5. Prepare a report.

Gall, Borg, and Gall (1996) also explained that these five stages may overlap or occur in a different order depending the nature of the study. Qualitative studies which involve emergent research design may gather and analyse some data before developing the proposal, or a pilot study can be done before writing a research proposal or not at all.

Lesson Three: The Research Process (Part Two)

Anglin, Ross, and Morrison (1995) took a closer look at the stages of identifying a research problem and preparing the research proposal. They advised a sequence of planning steps:

Select a Topic

Research requires commitment. As a researcher, you want to make sure you are doing something that you have a great interest in doing.

Identify the Research Problem

Based on your own understanding and interest of the topic, think about what issues can be explored? Sometimes, a research problem cannot be immediately identified. But, through reviewing the existing literature and having continuous discourse with peers and scholars, the research problem will start to take its shape.

Conduct a Literature Search

Reviewing literature has two major purposes: one is to build up the researcher's knowledge base of the topic under exploration for a deeper understanding, and the other is to ensure the significance of the research. The researcher needs to make sure how the research will be able to contribute to the knowledge in the related field compared with the existing research literature.

State the Research Question

The research problem will evolve during your pursuing knowledge base through reviewing literature and discourse with peers and scholars. To specify what questions your research study wants to answer helps to provide the basis of planning other parts of your study, e.g. the research design, the methods for data collection and analysis.

Experimental/Positivist Study	Correlational Study	Qualitative/Naturalist Study
<ul style="list-style-type: none"> • Questions about whether a certain instructional method or strategy improve a certain skill or learning outcome • Questions about whether a certain student characteristics have effects on a certain skill or learning outcome, or whether the characteristics interact with the instructional strategy or method to affect learning of a certain skill or cognitive process 	<ul style="list-style-type: none"> • Questions about whether two or more variables are related to each other? Those questions intend to use or control one variable to predict a future performance of a particular variable 	<ul style="list-style-type: none"> • Questions to generate a theory to describe certain patterns of interaction or process of an observed phenomenon • Questions about lived experience of research participants • Questions about the cultural patterns or social patterns in the classroom

Ideas abstracted from Anglin, Ross, and Morrison (1995)

Determine the Research Design

When the intention of the research study is to verify a causal relationship between certain variables, use an experimental design; if the intention of the research study is to find out how variables relate to one another, use a correlational design; if the intention of the research study is to describe and understand a particular social condition/pattern and meaning of a social experience, conduct a qualitative study.

Determine Methods

Three major elements in the research study need to be considered: participants, materials, and instruments.

- **Participants:** It concerns whom to study. For experimental studies, the researcher needs to consider statistical sampling to make sure that sample is representative of the population, e.g. techniques of random sampling and stratified sampling. For qualitative research, purposeful sampling is the major principle. The selection of individuals, groups, or cases depends on how the characteristics, or properties of the

individuals, groups, or cases will best inform the researcher with the focus of what is under investigation.

- **Materials and Instrumentation:** For experimental research, operationalisation of the variables is the focus, i.e. what are different treatment conditions, and how to measure the dependent variables. The researcher has to consider issues about the reliability (the consistency of the test), and validity (whether the test is testing what is meant to test) of the measurement. The design of the experimental conditions has taken the threats of the internal and external validity into account. The researcher wants to make sure that the establishing of the causal relationship is not influenced by other factors than the controlling factors, and the researcher needs to consider to what extent the results of the research can be generalised to the population beyond the sample under study.

For qualitative research, the issues are the sources of data, where the researcher can find the information and what methods the researcher can use to get the information. Qualitative research usually focuses on the verbal information gathered from the interviews, observations, documents or cultural artefacts. The very distinctive feature about the qualitative research is that the researcher is part of the instrument. The recognition of this researcher's subjective interpretation of the information yields the process of triangulation, which emphasises use of multiple sources, methods, investigators, and theories to ensure the credibility of the research.

- **Procedures:** A procedural planning of how to get approval from IRB, how to get entry to research participants or to the field, how to implement the experimental treatment or to schedule observations and interviews, and how to prepare for write-up. A general outline of the process and a timeline will facilitate the research progress.

Identify Analysis Procedures

Different research questions and different research designs entail different analysis method to take. Experimental design employs statistical analysis to give statistical descriptions of the groups in terms of different independent variables and dependent variables, and to determine the significance of the differences whether the dependent variables are caused by the independent variables. On the other hand, qualitative design employs semantic analysis to identify themes, categories, processes, and patterns of an observed phenomenon, and provides rich descriptions of the phenomenon in order to develop a deeper understanding of human systems.

Lesson Four: Practice on the Lessons

In this part, a book is given to students to summarise its chapters and present them orally. Then, they are asked to provide the teacher with the written form of the same presentation via email. This is done like that because this subject matter is based on continuous assessment. Other assignments are normally done in class every now and then.

References

Anglin, G. J., Ross, S. M., & Morrison, G. R. (1995). Inquiry in instructional design and technology: Getting started. In G. J. Anglin (ed.), (2nd ed.) *Instructional technology: Past, present, and future*. Englewood, CO: Libraries Unlimited, Inc.

Gall, M. D., Borg, W. R., & Gall, J. P. (1996). *Educational Research: An Introduction* (Sixth ed.). White Plains, NY: Longman.

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