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ROLE OF RESEARCH IN BUILDING KNOWLEDGE

SHYAM KUMAR
MBA, MA (PSYCHOLOGY)
Asst. Professor, Management Programme,
L.N. Mithila University, Darbhanga

Abstract

Effective research methods are the tools by which information is gathered. Without the appropriate design and use of research methods, we are unlikely to gather quality information and as such create a shaky foundation to any review, evaluation or future strategy How- ever, we do not believe that the use of research methods is the preserve of so called 'experts' and in all instances requires sophisticated knowledge and practice. Clearly, to be experts in their use, requires practice, but like any tool, the basic principle behind its use can be understood and applied, by all. Furthermore, for those who have no intention of actually using a research method, it is important, perhaps in your work in overseeing or commissioning research activity, to know what the purpose of particular research methods are. This enables you to assess the appropriateness of their use. In this paper, therefore attempts on the one hand to explain and demystify the world of research methods, whilst on the other it seeks to provide a starting point for their use. In this, we are not suggesting that using research methods is easy, but merely that it can be appreciated and undertaken by practitioners and non-research experts.

Introduction

Research is required not just for students and academics, but for all professionals. It is also important for budding and veteran writers, both offline and online. For those looking for a job, research is likewise a necessity.

Among professionals and scribes, finding an interesting topic to discuss and/or to write about should go beyond personal experience. Determining either what the general public may want to know about or what researchers want them to realize can serve as a reason to do research. Doing research to reveal lies or truths involving personal affairs contributes in either making a relationship work or in breaking away from a dysfunctional one.

Research comprises "creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications." It is used to establish or confirm facts, reaffirm the results of previous work, solve new or existing problems, support theorems, or develop new theories. A research project may also be an expansion on past work in the field. To test the validity of instruments, procedures, or experiments, research may replicate elements of prior projects, or the project as a whole. The primary purposes of basic research (as opposed to applied research) are documentation, discovery, interpretation, or the research and development (R&D) of methods and systems for the advancement of human knowledge. Approaches to research depend on epistemologies, which vary considerably both within and between humanities and sciences. There are several forms of research: scientific, humanities, artistic, economic, social, business, marketing, practitioner research, etc.

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 generalize 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 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 program, policy, or product.
4. Action Research: Action research aims at solving specific problems within a program, organization, 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.

Method and Methodology

Method

Research methods are the tools, techniques or processes that we use in our research. These might be, for example, surveys, interviews, Photovoice, or participant observation. Methods and how they are used are shaped by methodology.

Methodology

Methodology is the study of how research is done, how we find out about things, and how knowledge is gained. In other words, methodology is about the principles that guide our research practices. Methodology therefore explains why we're using certain methods or tools in our research.

Research methodology is a systematic way to solve a problem. It is a science of studying how research is to be carried out. Essentially, the procedures by which researchers go about their work of describing, explaining and predicting phenomena are called research methodology. It is also defined as the study of methods by which knowledge is gained. Its aim is to give the work plan of research.

Stages of Research

Whenever a scientific problem is to be solved there are several important steps to follow. The problem must be stated clearly, including any simplifying assumptions. Then develop a mathematical statement of the problem. This process may involve use of one or more mathematical procedures. Frequently, more advanced text books or review articles will be needed to learn about the techniques and procedures. Next, the results have to be interpreted to arrive at a decision. This will require experience and an understanding of the situation in which the problem is embedded. A general set of sequential components of research is the following:

1. Selection of a research topic

The ability to develop a good research topic is an important skill. An instructor may assign you a specific topic, but most often instructors require you to select your own topic of interest. When deciding on a topic, there are a few things that you will need to do:

- brainstorm for ideas
- choose a topic that will enable you to read and understand the literature
- ensure that the topic is manageable and that material is available
- make a list of key words
- be flexible
- define your topic as a focused research question
- research and read more about your topic
- formulate a thesis statement

Be aware that selecting a good topic may not be easy. It must be narrow and focused enough to be interesting, yet broad enough to find adequate information. Before selecting your topic, make sure you know what your final project should look like. Each class or instructor will likely require a different format or style of research project.

2. Definition of a research problem

The first step in the research process is to choose a problem to investigate. The researcher begins with a general topic and then narrows it to a specific problem statement, which is a detailed description of the problem and its importance.

3. Literature survey and reference collection

A literature review is a description of the literature relevant to a particular field or topic. This is often written as part of a postgraduate thesis proposal, or at the commencement of a thesis. A critical literature review is a critical assessment of the relevant literature. It is unlikely that you will be able to write a truly critical assessment of the literature until you have a good grasp of the subject, usually at some point near the end of your thesis.

4. Assessment of current status of the topic chosen

It is very much required to assess the topic choosen for study whether it serves the purpose of research or not.

5. Formulation of hypotheses

The primary research question should be driven by the hypothesis rather than the data. That is, the research question and hypothesis should be developed before the start of the study. This sounds intuitive; however, if we take, for example, a database of information, it is potentially possible to perform multiple statistical comparisons of groups within the database to find a statistically significant association. This could then lead one to work backward from the data and develop the "question." This is counterintuitive to the process because the question is asked specifically to then find the answer, thus collecting data along the way (i.e., in a prospective manner). Multiple statistical testing of associations from data previously collected could potentially lead to spuriously positive findings of association through chance alone. Therefore, a good hypothesis must be based on a good research question at the start of a trial and, indeed, drive data collection for the study.

The research or clinical hypothesis is developed from the research question and then the main elements of the study — sampling strategy,

intervention (if applicable), comparison and outcome variables — are summarized in a form that establishes the basis for testing, statistical and ultimately clinical significance.

6. Research design

A detailed outline of how an investigation will take place. A research design will typically include how data is to be collected, what instruments will be employed, how the instruments will be used and the intended means for analyzing data collected.

A **research design** is a systematic plan to study a scientific problem. The design of a study defines the study type (descriptive, correlational, semi-experimental, experimental, review, meta-analytic) and sub-type (e.g., descriptive-longitudinal case study), research question, hypotheses, independent and dependent variables, experimental design, and, if applicable, data collection methods and a statistical analysis plan.

7. Actual investigation

Investigation process must be continued till the completion of the research.

8. Data analysis

The process of
evaluating data using analytical
and logical reasoning
to examine each component of the data provided. This form of analysis is just one of the many steps that must be completed when conducting a research experiment. Data from various sources is gathered, reviewed, and then analyzed to form some sort of finding or conclusion. There are a variety of specific data analysis method, some of which include data mining, text analytics, business intelligence, and data visualizations.

9. Interpretation of result

Researchers should describe their results clearly, and in a way that other researchers can compare them with their own results. They should also analyse the results, using appropriate statistical methods to try to determine the probability that they may have been chance findings, and may not be replicable in larger studies. But this is not enough.

Results need to be interpreted in an objective and critical way, before assessing their implications and before drawing conclusions. Interpretation of research results is not just a concern for researchers.

10. Report

The presentation of the research and its results in a rigorously formatted document that follows a conventional structure. In presenting your research, you pull all its elements together into a focused, coherent document.

Contribution of research in education

Research is a systematic inquiry to describe, explain, predict and control the observed phenomenon. Research involves inductive and deductive methods (Babbie, 1998). Inductive methods analyze the observed phenomenon and identify the general principles, structures, or processes underlying the phenomenon observed; deductive methods verify the hypothesized 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 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 education as follows:

1. Description: Results of research can describe natural or social phenomenon, such as its form, structure, activity, change over time, 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 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 programs can be instituted.
3. Improvement: This type of research is mainly concerned with the effectiveness of intervention. The research approach include experimental design and evaluation research.
4. Explanation: This type 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.

Conclusion:

A lot of what we do in our daily lives is based on common sense, what we have learnt from others or what we have learnt through personal experience or observation. But sometimes common sense is not the best approach and sometimes there are conflicting theories about what is best or what works in a particular situation. Moreover, what works in one situation or for one condition might be ineffective or even dangerous in another, or when combined with other measures. Common sense approaches may overlook the impact of external factors which may contribute to what is observed. At last we can say more emphatically research requires involvement of dedicated researchers. Researcher attitude is key to success for any research work.

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