RESEARCH PAPER

Steps and Procedures of Educational Research: A Review

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ABSTRACT

Educational research is a systematic attempt to obtain answer to questions about events through the application of scientific methods. It is an objective, empirical, logical analysis of evidences that may lead to principle, generalization, theory which helps to understand the events in the educational field. Educational research is conducted using the steps as followed in scientific method. Although detailed discussion on the steps in educational research will provide a holistic understanding of the process of educational research. Hence, all the steps and procedure of educational research are dependent to each other. Educational research is blessing to human beings which helps them to solve day-to-day life problem. And also it will show path for the future development.

Key words: Steps, Procedure, Educational Research

BACKGROUND

INTRODUCTION:

Still one decade research is conducted in the field of P.G projects, M.Phil dissertations and PhD. thesis work. Everywhere the research steps and procedure are not specific or trendy.

OPERATIONAL DEFINITION:

1. Educational Research: The meaning of word "Research" if we ask a layman he will say to search a new thing or to see the phenomenon or thing in a new context which is already known .The Advanced Learner's Dictionary of Current English lays down the meaning of research as "a careful investigation or inquiry specially to search for new facts in any branch of knowledge". So, research is purposeful investigation. So, educational research is a scientific research involves a systematic process that focuses on being objective and gathering information for analysis so that the researcher can come to conclusion.

2. Steps: Step in Educational Research means the chronological step to be followed to complete an Educational research.

3. Procedure: Procedure means the way through which a researcher will do a research work smoothly.

4. A review: Review means to view a new aspect on the basis of modern trend and issues in the field of educational research on the basis of steps and procedure as per the studies conducted within the decades to compete within the updation standardization, and finalization to a new view for future prospect.

5. Need of the Study: The study is too much needed as researchers have been doing a number of researches but none has done research regarding improving the step and procedure of research work. Hence what a new innovation the problem is!

METHOD

The researcher has used the Descriptive Analytical Method for the Study

RESEARCH QUESTION
1. What is Steps of a research work?
2. What are the relevant procedures of a research work?

OBJECTIVES
1. To study the Steps of a research work?
2. To study the relevant procedures of a research work?

HYPOTHESES
1. There is significant Steps of a research work?
2. There are significant relavant procedures of a research work?

SAMPLES
The researcher has taken 10 M.Ed. Dissertations 10 M.Phil Dissertations 10 Ph.D. Dissetations10 D.Litt. Dissertations as Sample of this study

SCOPE AND LIMITATION
The Scope of this study is covered the area of PG, M.Phil and Ph.D. level of research works. Limited to Educational research

TOOLS AND TECHNIQUES
Nothing but Self made questionnaires for the suggestions are used for the works

RESEARCH PROCEDURE
Analytical studies and group discussions is the best procedures for this study

FINDINGS

STEPS OF EDUCATIONAL RESEARCH:
The path of systematic gathering of information for educational research is known as   the steps of educational research. There are10 steps of educational research. These are as follows:
1. Identification and Definition of a Problem
2. Selection Area
3. Definition of the Problem
4. Evaluation of the Problem
5. Survey of Relevant Information through Review of Related Literature
6. Formulation of Hypothesis
7. Formulating Objectives
8. Formulating Research Questions
9. Tools to be used
10. Collection of Data
11. Analysis of Data
12. Interpretation of Data
13. Conclusion and Generalization
14. Suggestion for Improvement
15. Suggestion for Future Study
16. Present Research Report
17. Preparation of Preliminary Section
18. Preparation of Main Body
19. References Section
20. Cover Page Design
21. Budget
22. Publishing Research Report
23. Conclusion

PROCEDURES OF EDUCATIONAL RESEARCH:
The processes involved in identifying and developing a topic for research in educational field is known as procedures of educational research which are given below:

1. Identification and Definition of a Problem:
The foremost step of research process, i.e. identification and definition of a problem consists of two parts. First is concerned with 'Identification of a Problem' and second one with the 'Definition of a Problem'.
Identification of the problem means to identify the problem first. The first step in the identification of the problem is the selection of the area. It should be according to the interest and ability of the researcher.

2. Selection of Area:
A thorough understanding of the known facts and ideas in the area selected is the first and most important step in selecting a problem. This helps the researcher in knowing about various problems which have remain unsolved.
Each researcher selects a problem according to his/her unique purpose. Few sources are there which help the researcher in giving a definite shape to the problem. Some of the important sources are listed below:-
➢ List of theses already published can suggest other problems in the same, related or so far neglected areas, e.g. "University News" published by Association of Indian Universities (AIU) New Delhi.
➢ One of the most fruitful sources of problems for the researcher in his own experiences, which he/she has acquired as a Professional educator. Ex: In the classroom, there is dynamic interaction between teacher and pupil, pupil and pupil and between pupil and material.
➢ Contacts and discussion with research oriented people, attending conferences, seminars and listening to the learned speakers are helpful in locating research problems.

3. Definition of the Problem:
The definition of the problem is threadbare analysis or to pin-point the problem.
➢ The researcher should be sure that the topic chosen is neither too vague nor too broad in scope.
➢ He should make the problem more clearer and more understandable.
➢ He should carefully state the limits of the problem.
Thus, definition of the problem involves two steps:
➢ Statement of the problem.
➢ Operational definition of the main words in the statement.

4. Statement of the Problem:
As we have learnt that in formation of the problem, the researcher writes down the statement. It is in the form of a brief and clear question.
"Statement of the problem is not exactly the same as the title of thesis."
Ex: Suppose a researcher is interested in studying the creativity of Engineers and Doctors.
The statement is broad and definite. Now what the researcher is to do. The researcher delimits the range of the problem in terms of his/her interests and skills. She/he can state the problem more specifically as follows:
"A comparative study of Engineers and Doctors belonging to different socio-economic status i relation to their creativity."
Still the delimitation is not complete. Next step for delimitation is to give operational definition of the terms used in the topic.

5. Operational Definition:
Here, the terms used in the topic are defined by specifying what they will mean in the investigation. Care should be taken so that the meaning should be within the accepted concept of the words and not beyond them. The delimitation of the main words e.g. in the above problem may be done in the following manner.

For delimiting the populations of Engineers and Doctors, the population from which the samples will be taken will have to be described as Engineers and Doctors studying in final year of their respective colleges and universities situated in the N.C.R of Delhi.

We may define Socio-Economic Status (SES) and Creativity by telling what tools will be used for measuring SES and creativity.

6. Evaluation of the Problem:

Few questions are such which need answers before a researcher starts doing work on the problem. These questions are helpful in the evaluation of the problem on the basis of personal suitability of the researcher and that on social value of the problem. Best (1977) mentioned the list of these questions as under:

➢ Is this the type of problem that can be effectively solved through the process of research? Can relevant data be gathered to the test theory or find the answer to the problem under consideration?
➢ Is the problem significant?
➢ Is the problem a new one?
➢ Is research on the problem feasible?

After a research problem has been evaluated, there   remains the problem of suitability for a particular research. Some of the questions that should be raised are the following:

➢ Am I competent to plan and carry out a study of this type?
➢ Am I well grounded in the necessary knowledge of research?
➢ Are pertinent data accessible?
➢ Will we have the necessary financial resources to carry on this study?
➢ Will we have enough time to complete the project?

7. Survey of Relevant Information through Review of Related Literature:

This review of the knowledge or study of related literature not only acquaints the researcher with the current knowledge but also serves many other purposes like:

➢ It helps the researcher in delimiting and defining his problem.
➢ It helps the researcher to avoid unfruitful and useless problem.
➢ It helps the researcher to avoid unintentional duplication of well-established findings.
➢ The most important reason for reviewing the related literature is to know about the recommendations of previous researchers for further research which they have listed in their studies.

The first step in reviewing the literature is concerned with identification of the material in the literary. It can be done through the use of primary and secondary resources available in the library. Before we proceed further, let us know first what these primary and secondary sources are:-

➢ Primary Sources are those in which the author reports his own work directly in the form of research articles, books, dissertations or theses.
➢ Secondary Sources are those in which the author complies and summarizes the findings of the work done by others and gives interpretations of these findings.

The use of primary sources is time consuming in comparison to secondary sources.

Different resources:-

➢ Reference Books
➢ Encyclopedias
➢ Dictionaries
➢ Directories and Bibliographies
➢ Index
➢ Journals
➢ Abstracts
➢ Psychological Abstracts
➢ Educational Abstracts
➢ Theses and Dissertations

FORMULATION OF HYPOTHESIS:

The purpose of research is to get a general principle. The very first step in this process which we have already discussed is to identify the problem and state it in clear cut and operationally defined terms. This is possible only by reviewing concepts, theories and previous research findings. Now the next step in this process of research is to formulate hypotheses and test them. Before we go into the details of this step it is necessary first to acquaint ourselves with the meaning of hypothesis, its sources, qualities and types.

CONCEPT AND MEANING:

The word hypothesis consists of two words: hypo and thesis. "Hypo" means subject to verifications. "Thesis" means statement about the solution of a problem.

SOURCES OF HYPOTHESIS:

➢ Study of book related to subject.
➢ Reading of contemporary newspaper and research journals.
➢ One's own experiences.
➢ Conversation with specialists in the field.
➢ Survey of existing solution.

But all these sources do not supply readymade hypothesis. Here researcher applied his creative thinking. So, for a good hypothesis researcher usually uses two logical processes. These processes are:

➢ Inductive Thinking
➢ Deductive Thinking

Example:

➢ The voters for the parliament are adults. (A general truth)
➢ Amita is a voter for the parliament.
➢ Amita is an adult. (A specified truth)

What we observe in the said example? We observe that we are extracting a specified truth from a general truth. This is an illustration of deductive thinking in which we deduce specific truth from the general one. But in inductive thinking the procedure if, different. Instead of saying that voters for the parliament are adults and then extracting the conclusion that Amita is a voter for parliament.

➢ Examine the age of all the voters of the parliament.
➢ Then after examination, we will find that they are adults.

Now we can say that the voters of the parliament are adults (generalization). This process is known as inductive thinking i.e. in which we extract a general truth from the specific one.

TYPES OF HYPOTHESIS

There are two types of hypothesis –

➢ Directional Hypothesis
➢ Non-Directional Hypothesis

DIRECTIONAL HYPOTHESIS:

It is one which stipulates the direction of the expected difference or relationships.
Ex: Engineers will have more mechanical interests than the Doctors.

NON-DIRECTIONAL HYPOTHESIS:

It is one which does not specify the direction of the expected difference or relationship.
Ex: There is a difference in the mechanical interests of Engineers and Doctors.
The non-directional hypothesis is classified into three forms of hypothesis and these are:

➢ Declarative Form
➢ Null Form
➢ Question Form

➢ **Declarative Form:** The researcher makes a positive statement.
    Ex: The mechanical interests of engineers are significantly more than that of doctors.

➢ **Null Form:-** The researcher makes a statement that n relationship exits.

Ex: There is no significant difference in the mechanical interests of Engineers and Doctors.

➢ **Question Form:** A question asked as to what the outcome will be instead of stating what outcome is expected.
Ex: Is there any difference in the mechanical interests of Engineers and Doctors?

TESTING HYPOTHESIS:
After the hypotheses are formulated, they are subjected to testing. The purpose of testing a hypothesis is to determine the probability that it is supported by fact or not. When hypotheses are simple, they can be tested directly. But when they are complex, it is not possible to test them directly.

FORMULATING OBJECTIVES

A critical component of a successful research engagement is a set of clearly defined and meaningful objectives. Having well-defined objectives narrows and focuses the research and ensures that the findings are relevant to decision - makers. The research objectives drive all aspects of methodology, including instrument design, data collection, analysis, and ultimately recommendations.
Six important guidelines that should be observed when developing research objectives are:
1. They should be presented briefly and consciously.
2. They should be presented in logical sequence.
3. They should be realistic.
4. They should be phrased in operational definition.
5. They should use action verbs that are specific enough to be evaluated or measured.
6. They should be static once the study work begins.

FOMULATING RESEARCH QUESTION:

Formulating a research question allows a researcher to conduct more open-ended investigation. This form is little previous research on the topic. It also allows a wider range of outcomes to be reported.

TOOLS TO BE USED

TOOLS OF RESEARCH:

Tools of research are required to collect evidences to empirically validate the research hypothesis or find out answers to research questions. The nature of any kind of tool for research work depends on the objective of the study. For example, if someone is interested in collecting information about the achievement of 10th grade students in Mathematics, researcher would use an achievement test for this purpose. But if the researcher's purpose is to find out the interaction of students with their teacher in the classroom, the researcher would like to make use of an observational schedule .Hence, tools of research generally include both tests and techniques. Let us understand the concept of test.

WHAT IS A TEST?

Tests are instruments of assessing human behaviour, traits, characteristics etc. in an objective manner. Tests consist of a series of a series of tasks, which the subject is required to perform. They are designed to measure general mental ability or intelligence, special abilities or aptitudes; creativity, academic achievement, personality traits and adjustments interests and values". Tests are generally meant to measure psychological abilities of human being and hence called as psychological tests. According to coronach (1964),"a test is a systematic procedure for comparing the behaviour of two or more person at particular time: or one or more persons at different time". In educational researcher, we use various types of tests. The tests can be classified in various ways. Let us discuss main classification of tests.

CLASSIFICATION OF TESTS

The classification of the tests may be made in term of their purpose, that is, the type of psychological traits that is claimed and described to measure. For examples, tests of general intelligence test of aptitude test of achievements, etc. The test may be non-standardized, or standardized. Another classification on the basis of types of responses which an item requires e.g., paper-pencil test and performance tests. Let discuss the classifications details.

1. Standardized test versus teacher made test
2. Power test versus speed tests
3. Group test versus individual test
4. Paper pencil test versus performance test
5. Verbal test versus non -verbal test
6. Objective test versus subjective test
7. Norm-referenced test versus criterion-reference test
8. Projective versus non-projective test of personality

TOOLS OF RESEARCH:

These include inquiry forms questionnaires, check lists, rating scales, observation and interview.

1. Questionnaires
2. Check lists
3. Rating scale
4. Observation
5. Interview

COLLECTION OF DATA

We have learned that hypothesis shows the way for deciding the nature of data needed. But collection of data needs appropriate instruments or tools and the sample whose number is to be measured. In research usually researcher comes across unmanageable population, where in large numbers are involved. In this situation s researcher has to use different sampling methods such as random, systematic, stratified, cluster, judgmental, purposive or quota sampling depending upon his requirements.

In order to collect data, different tools both testing and no testing is used. The tools are intelligence tests, aptitude test, achievement test, personality inventories, observation, interview and rating scale. The reliability and validity of these standardized tools should find a place in research proposal. If the researcher is developing his own tools, he should outline the procedure to be followed in their development. In historical research and philosophical researches, the nature of the data and their treatment is different from other types of research. What data is collected, the next task that lies before the researcher is –how to organize, analyze and interpreted data.

ANALYSIS OF DATA

The data collected from sample and through and administration of various tools do not lead to interpretation, unless the data is edited, classified and tabulated in the form needed for testing of hypothesis and consequent interpretation and generalization.

ORGANIZATION:

The first step in treatment of data is its organization includes editing implies checking of gathering raw data for accuracy, usefulness and completeness.

Classification refers to dividing of the data into different categories, classes, groups. Tabulation refers to the recording of the classified data in quantified terms which not only facilitates its manipulation but also increase precision.

ANALYSIS:

The second step in treatment of data is its analysis. Analysis of data means studying the organized material in order to discover inherent facts. This requires an alert, flexible and open mind. The data are first made to yield "statistic" descriptive of the silent features of the sample and then from these parameters of the population are in furred.

INTERPRETATION OF DATA:

After the collection and analysis of the data, the researcher interprets the results. Interpretation is not a routine and mechanical process. This last step in treatment of data requires a careful, logical, and critical examination of the result obtained after analysis, keeping in view the limitation of the sample chosen, tools selected and used in study.

Generally, in research we try to find out whether the differences in statistics of the different samples are only due to sampling change or something else. As we have already learnt in the third step of research process i.e. formulation of hypotheses, the research hypothesis is converted into null hypothesis for the purpose of testing. If the null hypothesis will not reject then the researcher's hypothesis becomes doubtful.

CONCLUSION & GENERALIZATION:

If the hypothesis is tested and upheld several times, it may be possible for the researcher to arrive at generalization i.e. to build a theory. As a matter of fact, the real value of research lies in its ability to arrive at certain generalization. Hence we can able to know various steps and procedures of educational research. It requires hard labour and critical thinking. All the steps and procedures are dependent on one another.

If hypothesis is tested and upheld several times, it helps the researcher to arrive at generalization, which is basically required in the educational research. If we analyze all the steps and procedures of research process, we will realize that all of them are dependent with each other and they have virtually to be considered together. It is necessary for a researcher to demarcate the steps of research for lucid exposition.

SUGGESTION FOR IMPROVEMENT

In this spirit, I now offer 10 suggestions that may go some way towards supporting "Better" research in the field of education. In short I would like to make the case for encouraging research and writing that fulfils the following conditions-i.e. Research and writing that….

1. Has nothing to sell
2. Is certain only of the uncertainty of it all
3. Is close (but not too close) to the digital technologies that are being researched.
4. Always ask "what is new here?"
5. Is aware of the global, national and local context of education and technology
6. Maintains a sense of history
7. Engages with the politics of education and technology
8. Makes good use of theory when and where is helpful
9. Is open minded and curious when it comes to methodology is rigorous and appropriate when it comes to methods.
10. Always considers how education, technology and society can be made fairer

SUGGESTION FOR FUTURE STUDY

Strengthening desired outcomes for Pacifica researcher is dependent on the whole education system engaging in iterative processes of shared knowledge-building and use. Research and development can be powerful systematic level for change in education, if evidence-based practices become embedded within everyday educational practice. This literature review clearly suggests that there is an urgent need to build both capability and capacity in the educational research sector, if system change is to be informed by, and generated through, evidence of effective practice. The following section identifies a number of areas worthy of ongoing research and development.

PRESENTING RESEARCH REPORT

After completion of the research process the researcher has to prepare a report of his study as per designed in design of the study. Quoting the reference will ensure the reliability, authenticity and originality of the factual and necessary information provided.

PREPARATION OF PRELIMINARY SECTION

Generally preparation of introduction we have to focus on five steps;
1. The title page
2. Acknowledgement page
3. Table of contents
4. The lists of the table
5. The lists of figure

PREPARATION OF MAIN BODY PARTS

It focuses on five steps;
1. Introduction
   A. Statement of the problem- specific question to be answered-hypothesis should be tested.
   B. Significance of the problem
   C. Purpose of the study
   D. Assumption and limitation
   E. Definition of important terms
2. Review of related literature
3. Design of the study
   A. Procedure used
   B. Sources of data
   C. Methods of gathering data
4. Presentation and analysis of data
   A. Text
   B. Table
   C. Figure
5. Conclusion and summary of findings
   A. Restatement of the problem
   B. Description of procedures used
   C. Recommendation for further research

REFERENCE SECTION:

This is also impotent aspect of a research report in which all the sources that were directly used in writing the report are listed alphabetically by author's last name. Of course, most of the references appear in the introduction section of the report .Every source cited in the report must appear in the report. The citations of secondary sources should indicate their primary sources from which they are taken and invariably mentioned in the references.
Reference section mainly consists of: 1.Bibiliography 2.Appendices.

BIBLIOGRAPHY:

Typically a bibliography includes;
1. The complete name of the author
2. The full title of any material researched
3. The name and location of the publisher
4. The date the material was published
5. The exact page numbers of the source material.

APPENDICES:

Appendices are also necessary in reports. Appendices may include raw data, material especially developed for the study and data analysis sheets.
These documents help the reader to understand the contents of the research report better.
The appendix has some formatting conventions to be followed. They are as below;
1. Title of the appendix
2. Content order
3. Placement and page numbers
4. Make your appendix perfect

5. Review and revise
6. Check for quality
7. Check if the appendix is cited in the text properly

COVER PAGE DESIGN:
The cover page has become something a pre-visit to a school. Hence it should be showcase of the total research report.

BUDGET:
The budget should be not so high. It should be affordable to all classes of people.

PUBLISHING THE RESEARCH REPORT:
Research has been conducting for purpose knowledge generation. Conducting knowledge should be disseminated though open window system to access the people for availing the new knowledge regarding the topic .Otherwise the research report would have been taking rest and rust in dissertation racks of particular institution, organisation or body. Hence the research or institutions concerned should be taken interest and initiatives to publish the thesis. In India University of grant commission has been publishing the entire doctoral theses awarded by its recognized universities through the websites of Shodhganga, which is open access one and all, the website specially created for the purpose. Now days many governmental and non-governmental agencies are funding to publish the research report.

CONCLUSION
Steps and procedure are important work for performing research work. Because, without prior know a researcher can't perform the research work well. Because steps and procedures are the basic knowledge and blueprint for performing educational research.

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