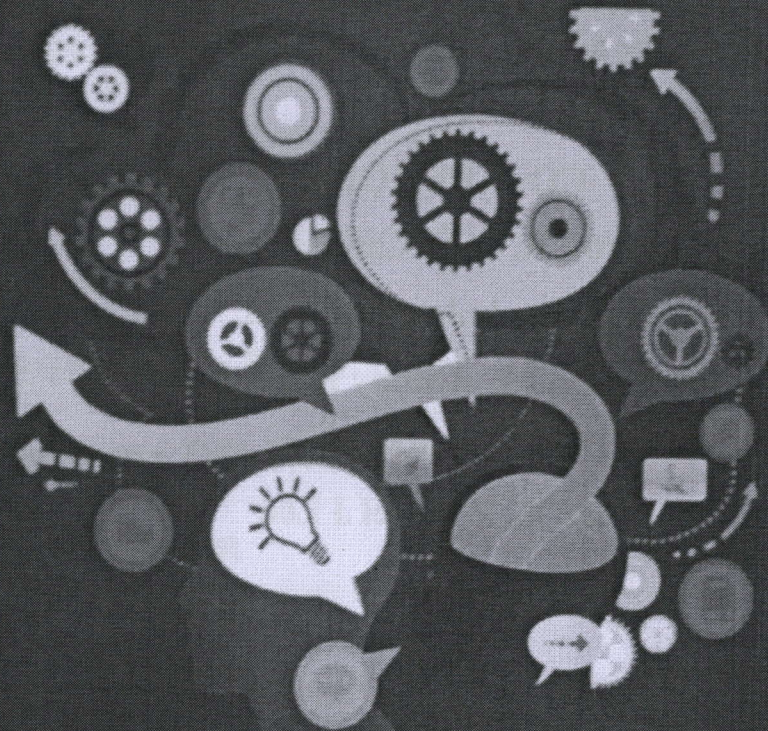


FUNDAMENTALS ON EDUCATIONAL RESEARCH



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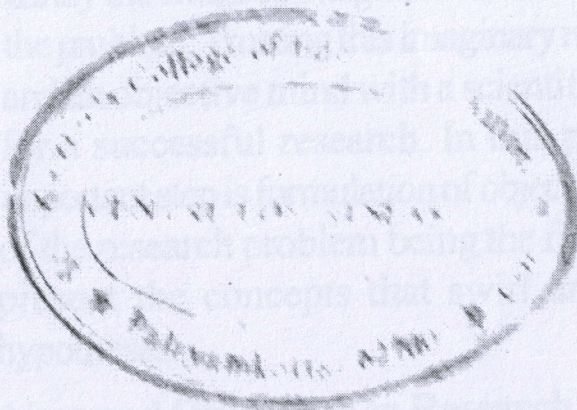
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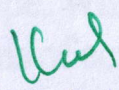
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V. PREPARATION OF A RESEARCH TOOL

Dr. M. Antony Raj

Introduction

Research is an academic activity and as such the term should be used in a technical sense (Kothari, 2007). Research is a careful and detailed study into a specific problem, concern, or issue using the scientific method. Psychological researchers want to learn and understand human behavior. It can be about how people think, how they feel, how they behave, or some combination of these issues. Research and understanding that follows, drips down from the researchers and alters society. There is constant and competing research.

More specifically, psychological research is used to measure, describe, and categorize human behavior. This can result in understanding what might be called normal behavior. More interesting and more often researched are the abnormal behaviors, those that eventually become categorized and labeled with a diagnosis. A diagnosis is a constellation of common behaviors, thoughts, and feelings that occur together. Tools or instruments are needed to diagnose.

Research

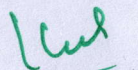
Research has been defined in a number of different ways. A broad definition of research is given by Martyn Shuttleworth (2008), "In the broadest sense of the word, the definition of research includes any gathering of data, information and facts for the advancement of knowledge."

Another definition of research is given by Creswell (2008) who states that "Research is a process of steps used to collect and analyze information to increase our understanding of a topic or issue". It consists of three steps: Pose a question, collect data to answer the question and present an answer to the question.

Research Tools

Meaning

Research tool can be defined as the instrument in the hands of researchers to measure what they intend to in their study. Research


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tools are the vehicles that broadly facilitate research and related activities. Social science and humanities tools enable researchers to collect, organize, analyze, visualize, mobilize and store quantitative and qualitative data and creative outputs. Tools can be created as part of a research or related undertaking, or purchased off the shelf.

Functions of Tools

The tools of data collection translate the research objectives into specific questions/ items, the responses to which will provide the data required to achieve the research objectives. In order to achieve this purpose, each question/item must convey to the respondent the idea or group of ideas required by the research objectives, and each item must obtain a response which can be analysed for fulfilling the research objectives.

Information gathered through the tools provides descriptions of characteristics of individuals, institutions or other phenomena under study. It is useful for measuring the various variables pertaining to the study. The variables and their interrelationships are analysed for testing the hypothesis or for exploring the content areas set by the research objectives.

Types of Tools

There are innumerable types of tool of research. Some of them are, observation schedule, interview guide, interview schedule, mailed questionnaire, rating scale, checklist, document schedule/data sheet, and Schedule for institutions.

Each of the above tools is used for a specific method of data gathering: Observation schedule for observation method, interview schedule and interview guide for interviewing, questionnaire for mail survey, and so on.

i. Observation Schedule

This is a form on which observations of an object or a phenomenon are recorded. The items to be observed are determined with reference to the nature and objectives of the study. They are grouped into appropriate categories and listed in the schedule in the order in which the observer would observe them.

The schedule must be as devised as to provide the required verifiable and quantifiable data and to avoid selective bias and misinterpretation of observed items. The units of observation must be simple, and meticulously worded so as to facilitate precise and uniform recording.

ii. Interview Guide

This is used for non-directive and depth interviews. It does not contain a complete list of items on which information has to be elicited from a respondent. It just contains only the broad topics or areas to be covered in the interview. Interview guide serves as a suggestive reference or prompter during interview. It aids in focussing attention on salient points relating to the study and in securing comparable data in different interviews by the same or different interviewers. Interview schedule and mailed questionnaire both these tools are widely used in surveys. Both are complete lists of questions on which information is elicited from the respondents. The basic difference between them lies in recording responses. While the interviewer fills out a schedule, the respondent completes a questionnaire.

iii. Rating Scale

This is a recording form used for measuring individual's attitudes, aspirations and other psychological and behavioural aspects, and group behaviour.

iv. Checklist

This is the simplest of all the devices. It consists of a prepared list of items pertinent to an object or a particular task. The presence or absence of each item may be indicated by checking 'yes' or 'no' or multipoint scale. The use of a checklist ensures a more complete consideration of all aspects of the object, act or task. Checklists contain terms, which the respondent understands, and which more briefly and succinctly express his views than answers to open-ended question. It is a crude device, but careful pre-test can make it less so. It is at best when used to test specific hypothesis. It may be used as an independent tool or as a part of a schedule/questionnaire.

v. Document Schedule / Data Sheet

This is a list of items of information to be obtained from documents, records and other materials. In order to secure measurable data, the items included in the schedule are limited to those that can be uniformly secured from a large number of case histories or other records.

vi. Schedule for Institutions

This is used for survey of organisations like business enterprises, educational institutions, social or cultural organisations and the like. It will include various categories of data relating to their profile, functions and performance. These data are gathered from their records, annual reports and financial statements.

vii. Schedule and Questionnaire

Schedules and questionnaires are the most common instruments of data collection. These two types of tools have much in common. Both of them contain a set of questions logically related to a problem under study; both aim at eliciting responses from the respondents; in both cases the content, response structure, the wordings of questions, question sequence, etc. are the same for all respondents. But the methods for which they are used are different. While a schedule is used as a tool for interviewing, a questionnaire is used for mailing.

This difference in usage gives rise to a subtle difference between these two recording forms. That is, the interviewer in a face-to-face interviewing fills a schedule, whereas the respondent himself fills in a questionnaire. Hence there is a need for using two different terms. The tool is referred to as a schedule when it is used for interviewing; and it is called a questionnaire when it is sent to a respondent for completion and return.

Questionnaire

The questionnaire is a widely used and useful instrument for collecting survey information, providing structured, often numerical data, being able to be administered without the presence of the researcher and often being comparatively straightforward to analyse (Wilson and Mc Lean 1994).

The Process of Construction of a Questionnaire

The researcher also should study other questionnaire and the items should be submitted for criticism of other members of the class or faculty, especially to those who have had experience in questionnaire construction (John W Best, 2007). The process of construction of a schedule and a questionnaire is almost same, except some minor differences in mechanics. This process is not a matter of simply listing questions that comes to researcher's mind. It is a rational process involving much time, effort and thought.

1. Construction of Schedules and Questionnaires

Researchers are often very disappointed when the questionnaires or surveys they send out as part of their research work have a very low response rate, and this may even affect the validity of their research. It is very important, therefore, that questionnaires be well prepared and well constructed in order to minimize non-response. To draft a questionnaire or schedule is an art. The success of statistical investigation depends on proper drafting of the questionnaire. It is a highly specialized job and following points should be borne in mind:

a) Brief and limited questionnaire

The number of questions in a schedule should be brief and limited as possible. Only relevant questions to the problem under investigation should be added.

b) Keep the questionnaire as short as possible

If the questionnaire is long and complicated, it will greatly lessen the chances of receiving a correct response. Just stick to the essential or very useful information needed; discard any questions which relate to supplementary, secondary or unnecessary data.

c) Simple and clear

The questions should be simple, clear and precise. Its language should be very simple so that informants may easily understand.

d) Unambiguous questions

All unambiguous questions should be avoided, complicated and long-worded questions may irritate the respondents which results in careless replies.

e) Don't make it too formal or informal

It's not an official document. So just use standard, neutral vocabulary and grammar, but be careful, however, not to use colloquial language.

f) No personal questions

No personal question should be asked from respondents. Such questions should be avoided. If the questionnaire contains sensitive or personal questions, the researcher needs to convince potential respondents that their answers will be confidential. If not, they will not respond.

g) Use of proper words

Questions should be framed with right words. This ensures the validity.

h) Avoidance of calculations

Questions should not be based on calculations. Only those questions should be asked which the respondents may reply immediately. Moreover, questions should avoid memories.

i) Only objective questions

The questions should be objective. It should be based on opinions of the individuals.

j) Sequence of the questions

The arrangement of the questions should be such that no question may slip back. It must involve a logical flow of questions.

k) Start with interesting questions

Interesting, relevant initial questions will immediately involve the respondent in the questionnaire, and make it more likely that they will continue on through the whole thing. Save the more complicated ones for later.

l) Avoid leading questions

These are questions which presume a specific response.

m) Limit or avoid, the use of open-ended questions

Open-ended questions require an original, personal response to a question. So don't leave too much space for the answer; if the respondent sees half a page of blank paper, they may feel that they have to fill it all, and consequently be discouraged from answering at all. Open-ended questions are also more difficult to analyze and categorize.

n) Use simple rating scales or lists of choices

If the respondent facing with a long list of scales or choices, they may be put off. Maybe consider five as a maximum.

o) Put your questions in logical order

There should be a flow of questions. One question should logically follow the previous one. The researcher could perhaps start with one or two general questions, and then become more specific.

p) Cross examination

The questionnaire should be set in such a way that there may be cross examination of the information supplied by the informants. In fact, it is a check on false or inaccurate answers.

q) Secret information

Every respondent should be ensured that information given by them shall be kept secret.

r) Attractive questionnaire

Proper care should be taken to make the questionnaire attractive. A well set questionnaire will certainly impress the recipient.

s) Target the questionnaire carefully

The questionnaire should be completely relevant to the person, whom the researcher is asking to complete. If they're unable to answer the first few questions, then they're very likely to give up.

2. Writing the Questionnaire

This is designing the format. The format should be suited to the needs of the research. The instrument should be divided into different sections or dimensions relating to the different aspects of the problem.

a) Introduce yourself

Introduction of the researcher should explain who the researcher is, and what his credentials are. Researcher should clarify if he is working alone or as a part of a team. Include the name of the academic institution or company for whom the data are collected.

b) Explain the purpose of the questionnaire

Many people will not answer a questionnaire without understanding what the goal of the questionnaire is. No long explanation is needed; instead, a few concise sentences will do the trick.

c) Reveal what will happen with the data you collect

Are you collecting these data for a class project, or for a publication? Are these data to be used for market research? Depending on what you intend to do with the data you collect from your questionnaire, there may be different requirements that you need to pay attention to before distributing your survey.

d) Remember that transparency is best

It is important to be honest about what will happen with the data the researcher collects.

e) Include an informed consent for if necessary

Note that you cannot guarantee confidentiality, but you will make all reasonable attempts to ensure that you protect their information.

f) Estimate how long the questionnaire will take

Before someone sits down to take your questionnaire, it may be helpful for them to know whether the questionnaire will take them 30 minutes or 1 hour. Providing this information at the onset of your questionnaire is more likely to get you more complete questionnaires in the end.

g) Describe any incentives that may be involved

An incentive is anything that you can offer as a reward at the end of the questionnaire. Incentives can be many types of things: they can be monetary, desired prizes, gift certificates, candy etc. There are both pros and cons to offer incentives.

h) Make sure your questionnaire looks professional

In order to have confidence in you as a data collector, your questionnaire must have a professional look.

i) Always proof read

Check for spelling, grammar, and punctuation errors.

j) Include a title

This is a good way for your respondents to understand the focus of the survey as quickly as possible.

k) Thank your respondents

Thank them for taking time and effort to complete your survey.

3. Evaluation of the Draft Instrument

In consultation with other qualified persons, the researcher must rigorously examine each question in the draft instrument.

Before sending the questionnaire to the respondents, it must be properly tested. Pre-testing, colleagues, is important to help you identify any problems with the format or wording of your questionnaire before you send out the final version. At this stage you can iron out any ambiguities, vagueness or inaccuracies and add or delete questions.

4. Piloting

Piloting a questionnaire is so vital to check the validity and reliability of the test draft. A pilot has several functions, principally to increase the reliability, validity and practicability of the questionnaire (Marrison, 1993).

5. Distributing the Questionnaire

This is disseminating the questionnaire. The researcher needs to determine what the best way to disseminate the questionnaire is. There are several common ways to distribute questionnaires.

i) Consider using the mail

If you mail your survey, always make sure you include a self-addressed stamped envelope so that the respondent can easily mail their responses back. Make sure that your questionnaire will fit inside a standard business envelope.

ii) Conduct face-to-face interviews

This can be a good way to ensure that you are reaching your target demographic and can reduce missing information in your questionnaires, as it is more difficult for a respondent to avoid answering a question when you ask it directly.

iii) Try using the telephone

While this can be a more time-effective way to collect your data, it can be difficult to get people to respond to telephone questionnaires.

iv) Include a deadline

Ask your respondents to have the questionnaire completed and returned to you by a certain date to ensure that you have enough time to analyze the results.

v) Make your deadline reasonable

Giving respondents up to two weeks to answer should be more than sufficient. Anything longer and you risk your respondents forgetting about your questionnaire.

vi) Consider providing a reminder

A week before the deadline is a good time to provide a gentle reminder about returning the questionnaire. Include a replacement of the questionnaire in case it has been misplaced by your respondent.

Conclusion

Question designing remains primarily a matter of common sense and experience and of avoiding known pitfalls, as there are no hard and fast rules relating to it. Hence alternative versions of questions must be rigorously tested in pre-tests. Test-revision-retests play a crucial role in questionnaire construction. Every researcher must remember that the knowledge of procedures involved in research is perhaps the most important tool because without this, the best computers and most reliable tests would be useless.

VI. QUANTITATIVE DATA ANALYSIS

Dr. A. Michael J. Leo

Data analysis in any educational research is an important task of the researcher. There are quantitative and qualitative analyses depending upon the nature of the methodology. This chapter explains precisely the process of quantitative data analysis in educational research. The following are the steps involved in the process of quantitative data analysis.

1. Data Collection
2. Data Entry
3. Analysis of Data

1. Data Collection

Data collection methods in educational research are used to gather information that is then analyzed and interpreted. As such, data collection is a very important step in conducting research and can influence results significantly. Once the research question and sources of data are identified, appropriate methods of data collection are determined. Data collection includes a broad range of more specific techniques.

Historically, much of the data collection performed in educational research depended on methods developed for studies in the field of psychology, a discipline which took what is termed a 'quantitative' approach. This involves using instruments, scales, tests, structured observation and interviewing. As contemporary educational researchers also draw from fields such as business, political science and medicine, the data collection in education has become a multidisciplinary phenomenon.

Need for Data Collection

From the following points, a researcher can understand the need for data collection in educational research.

- i) It provides a definite direction to a research inquiry.