



## "Basics of Research Tool Construction"

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**Abstract:** - In a research process the researchers choose the most appropriate instrument and procedures of research tools that provide for the collection and analysis of data upon which hypotheses may be tested. The data gathering devices that have proved useful in educational research include psychological tests and inventories, questionnaires, opinionnaires, Q-methodology, observation, checklist, rating scales, content analysis, interviews, sociograms. Some research investigations use one of these devices. Others may employ many of them in combination.

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The means by which data or the required information is gathered is referred to as a tool or at times as an instrument. It is that device which helps you to collect information essential to answer a researcher's research question. But to design one needs lot of time and effort as it has to elicit what one requires to answer or obtain response for the unique research question that the investigator has posed.

A variety of tools are available for this purpose, but the type of tool one opts for depends on the features of the research as it has to unveil facts which are unknown or confirm the hypothesis that one has set out to explore. Some of the well-known mediums of data collection are questionnaire, check list, opinionnaires, observation, content analysis, interview which include both structured and unstructured, Scales: attitude scale, rating scales and psychological tests. Depending on the study researchers may use any one of them or in combination.

When the researcher decides to conduct a study the first thing the researcher needs to is identify the type of tool one desires to use to obtain required information, question the decision is this the best tool or what other options are available. What is the hypothesis, which needs to be, tested which the tool provides the data. E.g. If one decides to use questionnaire spend time reflecting will it give that one needs which type of questions to be used i.e. open ended, multiple choice, 'Yes or No' type, if to assess intensity/frequency a rating scale.

When construction the statements or questions in the tool they should be grammatically correct, free of jargon, clear and direct avoid any confusion or

giving lead or cue to the respondent. Pose only one question and not two in the same statement. Be careful if asking a sensitive question. Therefore write questions or statements which respondent is comfortable to answer first then those that they find uncomfortable as it may break the link or emotionally upset them. Avoid too many questions keep it short as much as possible yet ensure all important aspects required for the study are included. It should be difficult to neither administer nor require any special arrangement to administer. Remember to frame questions at the level of the respondents. The tool should ensure to maintain privacy of the respondent i.e. identity should be confidential which will facilitate getting more participation. Question placed in the tool should be justified not asked for sake of asking question.

The tool should be based on the objective of the study, so that one gets answers to the main or key question, indirectly means the aim of the study should get fulfilled from the action of developing the tool. For e.g. If the nurse desires to understand patient's perception regarding a selected procedure, she needs to be aware that the perception will differ from patient to patient. A self-reporting tool would help to assess patient's perception regarding the procedure. The instrument should aim to facilitate free expression regarding how patient perceives the procedure so that even misperceptions can be elicited too. As a result the nurses can identify sensitive aspects which require attention during pre-procedure. The developing of the tool needed to be backed with wide literature reviews, one to identify any available tool or if a need was felt in other studies related to this aspect.

When you start designing the tool first part should identify who the researcher is that is self-introduction if tool is distributed but if contact with respondent will be there then verbal introduction can be done. Then inform participants' purpose of the tool, get their consent for participation, time required and inform what will be done with the data collected. At the end of the tool don't forget to thank the respondents as they are doing the investigator a favour

Before distributing the tool to collect data check for grammatical error, validity and reliability of the tool needs to be done. Next conduct Pilot it help to



know the feasibility, is question relevant, comfort level of respondents to answer, helps investigator to get familiar with questions or any difficulty that is encountered can be taken care before implementing tool for final data collection.

To ensure the tool is well designed to measure what it intend to measure the researcher should do good literature search to identify areas not covered by previous researches or difficulties encountered. Another aspect that support the development of the tool is to look back at our own experience as often what we do in our lives is based on common knowledge or common sense, that what we learn from others and what we have personally experienced. But one needs to be cautious, what is the best approach in one way need not be in another situation, it could be ineffective or risky in another. The investigator has to consider the impact of external factors which may contribute to observation. If today one is comparing the benefits of consuming green tea, one has to rule out external factors that could be contributing or hindering the results, are the participants involved in exercise or following a specific diet plan as compared to those who don't which may clarify the findings.

Whereas in Qualitative research it involves gathering of data through unstructured method, like observation, interview. Which could be either individual or through focus group to understand reason for events or behaviour. The objective is mainly being to unveil new themes/ concepts,

attitude. Keep in mind the design of qualitative research one is going to use that is 'Ethnographic, Phenomenological, Grounded, Case study and Action research'. Data can be collected through direct/ participatory observation, interview, survey or content analysis.

One has to conduct a literature search to identify if any information already exists; only then frame the key question and develop interview guide which comprised of lead questions and probes. Which can be developed by the investigator as the process continues but it's advisable to keep a list of probe question so that no aspect required for the study is missed. Validate the question used to assess, will they elicit the information required.

#### CONCLUSION:-

To conclude the key to developing a tool/instrument for data collect is to have wide reading of literature, visit the clinical area or community to understand the scenario and interact with the people, experts and enrich one's own experience and then frame questions/statements. Ensure tool meets the study objectives and is appropriate. The tool should be reliable, viable conceptually clear and easy to use. One may need to use more than one tool to get the information required so as to fulfil the objective of the study. Selecting a design and framing a tool is critical to research, it will also reflect the type and quality of data that is generated.

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