
A STUDY OF THE PRINCIPLES OF EDUCATIONAL TEST CONSTRUCTION

Sandeep Mathur

Research scholar, School of Education, Central University of Haryana

Anwita Singh

Research scholar, Department of Political Science, Central University of Haryana

Abstract

The most popular technique for gathering data from respondents to assess the research activity in social sciences is the formulation of legitimate and trustworthy questionnaires. In order to effectively meet the evaluation requirements of a particular programme or intervention, it is crucial to keep a few key points in mind when designing a questionnaire. What kind of data is first required to both capture the crucial programme goals and achieve the evaluation's objectives? Secondly, what kind of inquiries and responses will best provide the data you desire? Last but not least, consider how the questionnaire should be formatted to be both user-friendly and collect the range of data required to evaluate a research effort. This conceptual research paper gives a piece of detailed information about the test construction and its principles.

Keywords: steps of test construction, types of questions, procedure of test construction

Introduction

The science and art of planning, preparing, conducting, scoring, statistically evaluating, and publishing test results is known as test construction. This paper focuses on a systematic approach to developing experiments in order to maximize the validity evidence for test results. A test is a set of questions to be asked from respondents in an interview, with appropriate instructions indicating which questions are to be asked, and in what order. According to **Downing and Haladyna (2006)**, in their book *Handbook of Test Development* summarized a 12-step process model of test development activities which are used in all type of test designs. Test development is viewed as an interconnected operation with several discrete stages that must be completed in a sequential order in this general model. Systematic planning, content definition, preparation of a content sampling plan, item or prompt writing, test design, development and administration, test scoring, standard setting, item banking, score reporting, and a technical review are all major steps in the model.

A test will be effective if it is planned and designed in the right way from the side of researcher as well as respondents. In the event that there is a solitary, fundamental standard for building up a sound questionnaire (**Labaw, 1980**). It is that the respondent characterizes what you can do: the sorts of questions you can reasonably ask; the kinds of words you can sensibly utilize; the ideas you can investigate; the procedure you can utilize. The plan is reliant on the researcher's choice to gather subjective information for better agreement and generation of the result regarding a matter, or quantitative information to test design hypotheses.

As the view of **Peterson (2000)**, questionnaire construction required seven important activities for its effective result. This paper discusses the various steps in questionnaire design like:

- Planning for construction of questionnaire
- Defining the content of the Questionnaire
- Define the format of responding of questions
- Deciding appropriate wording for each Question
- Planning the meaningful sequence of the questions
- Questionnaire sequence
- Questionnaire pre-test
- Develop the final draft of questionnaire

Let us elaborate each of these aspects.

Planning for construction of questionnaire

Before framing the final questionnaire, in this stage, researcher must make a number of questions in his/her mind related to-

- Information needed for the study
- what types of questions need to be framed
- who will be the target group respondents and
- what kind of techniques needed for test administration?

Defining the content of the questionnaire

Assuming that a conscious and deliberate decision has been taken to use a questionnaire to collect information, it is then important to translate the information into questions that can extract the desired information. These inquiries should be as detailed as possible. If the design of the questions is more specific, it will be easier to understand the information and analyze the data in the required way. **Sung Heum Lee (2005)**, in his chapter “**constructing effective questionnaire**” defined that each question should have specific value and researcher should have followed some questions while design the test content. That are,

- What is the utility of the data collected?
- How effective is a question in producing the required data?
- Can the respondent answer the question accurately?
- How the collected data will be analyzed?
- What is the chance of the responses being influenced by external events?

Define the format of responding of questions

In this stage researcher needs to define the specific strategies required to response to each question on the basis of the nature and demand of the research problems. The formatting of the question should deal with the issues related to the freedom of knowledge of the respondent while they are providing information. For **Pew Research Center surveys**, the popular format of question used in design of the test is open-ended questions or unstructured or unrestricted questions and closed-ended or structured or restricted questions, it is also found one more popular formats of questions as mixed structured or quasi-structured questionnaire (**Aryal, 2011**).

Open-ended/unstructured/unrestricted questions

An open-ended question is a form of question that allows participants to answer in their own words without being limited to pre-defined response options. In and of themselves, open-ended questions are structured. Despite the fact that they are searching for unstructured answers, there is a specific structure in the order of questions in the questionnaire. They help to establish relationships, gather information and increase understanding. The interviewer should make the respondent speak as clearly as possible and record the answers with the same words used by the interviewer. Open-ended questions are useful when the respondent is able to provide an explanatory answer, when the researcher is unsure which answers are needed or wants to conduct an exploratory research. Open-ended questions can be further categorized into three categories (**Schweizer,2011**)- free answer, Probing and projective.

- **Free answer questions:** The degree of freedom to response any type of question is given to the interviewee in free- response question varies widely.
- **Probing questions:** In this type of question, researcher starts with the probing questions to get the specific information from the interviewee. The real open-ended questions are reached a little later in the process when probing open-ended questions are used.
- **Projective question:** A projective open-ended question is a vague question or stimulus used by the researcher to project a person's attitudes from their answers. These forms of questions are most widely used in projective techniques.

Close-ended/structured/restricted questions

Close ended questions are that which required response from the interviewee from the pre-defined list of answer choices. Closed questions provide respondents with a comprehensive list of relevant responses from which to select (Jenn, 2006). When the respondent has a particular response to give (for example, gender), the researcher has a pre-defined collection of answers in mind, comprehensive narrative information is not required, or there are a finite number of ways to answer a question, certain questions are deemed suitable. In survey research, these types of questions are popularly used. Closed-ended questions can be broken down into four main structure ((**Labaw, 1980**)). Such as, binary question, ranking questions, multiple question and checklist.

- **Binary questions:** Binary questions are popularly known as dichotomous questions as they allow only two possible answers. The respondent must choose one of the two appropriate answers. Binary questions help collect simple, factual data, and they can be used to keep track of the interviewee's classification data (demographic data). These questions have options to answer " Yes " or " No " or " 'True' or " False " or " Agree " or " Agree ". Such questions should not be included in the questionnaire because these decisions may not include the entire answer list.
- **Ranking questions:** In this type of questionnaire respondent need to rank the response options listed in the selection sequence. Standard questions are used to obtain information that reveals participants' attitudes and opinions. These questions list a range of options that may affect a person's decision-making.
- **Multiple choice questions:** In this type of questions researcher give emphasis on, all significant level of answer which is cover by the questionnaire. The respondent must choose the choice that best expresses their emotions. This is mainly the diversity of binary questions with many answers provided. These are often referred to as

"cafeteria" questions. This type of questions is popular because of its clarity, simplicity and applicability whereas preparation of multiple-choice question is not so easy. Researcher needs to give emphasis on the following factors while construction of multiple-choice questions (**Brace, 2004**).

- The response options must be arranged in such a way which qualify the validity of the questions.
- The position of the responses should be varied to prevent selection of any specific response due to position bias
- Each given response option should be different from one another.
- **Checklist question:** Checklist allows the respondent to be free to choose any option or more than one options presented in the questionnaire. Checklist is quite different from the multiple-choice question because it gives freedom to respondent to choose one or more of the available options. It's important to make sure the choices are put in a random order rather than a preferred order. In addition to the options selected by the researcher, a field labelled "other" should be given for the respondent to fill in if he so desires.

The terms and phrases used in a question are crucial in conveying the question's context and purpose to the respondent and ensuring that all respondents understand the question in the same way. Even slight wording variations can have a major impact on how people react. The key to getting responses is to effectively translate the desired question material into appropriate terms. Questions often take a long time to clear up, suggest alternatives and explain explanations. In these situations, a lack of proper language may cause the respondent to misinterpret the question and give incorrect answers or even refuse to reply (Martin, 2006). A minor grammatical error in a questionnaire may be aggravating and potential problems in the data analysis, which has led to incorrect results. Despite the fact that the value of wording has been recognized, a set of basic rules for questionnaire wording has yet to be discovered. However, previous study experiences have taught us that the following considerations should be considered when framing a questionnaire.

- **Use simple, short and clear word:** The questionnaire should be written in an easy-to-understand language. Short, straightforward sentences are less vague and complicated than lengthy, complex ones (**Leung, 2006**). Questionnaire questions should be straightforward, concise, and easy to understand. The more complicated the issue, the more difficult it is to answering. Fewer words are preferable to more, and shorter questions attract more answers. (**Pershing, 1996; Sheatsley, 1983**).
- **Request one piece of idea at a time:** While framing questions researcher should give emphasis that each question should be related to only one topic or idea. Questions that have two different ideas or that try to combine two questions into one are called "double barreled" questions (**Babbie, 1990; 2001; Neuman, 1997**). For example, researcher asked, "Please rate the extension lecture in terms of its content and communication skills of presentation" asks for two pieces of information at the same time. Here researcher needs to divide the question into two specific parts: "Please rate the extension lecture in terms of (a) its content, (b) its communication skills at presentation."
- **Avoid reference question:** Researcher needs to avoid the linked preferred questions which is connecting to previous questions (**Kumar, 2011**). For example: "As I asked in Question number 12 above about....".

- **Use of Leading and embarrassing questions (Wording, Leading and threatening):** Biased questing can be used to lead and embarrass others. People find it insulting to respond to these questions, and they often contribute to biased responses, so they should be avoided.
- **Negative and double negative questions should not be used:** In the language of the question, double negatives must be avoided. The presence of a negation in a questionnaire object, such as the word not, allows for easy misinterpretation. In everyday language, double negatives are grammatically wrong and confusing (Neuman, 1997). Double negative questions are also confusing and difficult to answer.

Planning the meaningful sequence of the questions

In questionnaire design, the layout of a questionnaire is critical. The composition of the questionnaire is determined by whether it is self-administered or administered with the assistance of an interviewer. Questionnaire structure refers to the order in which questions should be answered in order to get the best result. Starting with general questions and moving to more detailed ones, the sequencing appears to guide the interview into a 'funnel-shaped' phase. Before moving on to the next move, the interviewer provides a brief overview of the survey's basic objective and client confidentiality. This sequence is explained by the following steps:

- **Lead-in questions:** This is the first part of the questionnaire, and it consists of well-crafted ice-breakers. These can be extremely helpful in gaining the participant's confidence and cooperation. At this point, the questions should be clear, non-threatening, and not too personal. These questions assess the respondent's ability to answer and their level of interest.
- **Qualifying questions:** These are the questions that gradually lead to the survey's goal. This stage is marked by questions that assess the respondent and qualify him or her for further interrogation. The interviewer leads the interview into a relevant collection of questions based on the answers.
- **Warm-up questions:** This stage manipulates the respondent's mind by asking him or her to remember relevant information related to the survey questions. When asked such questions directly, an individual might not be interested in answering or providing information, but after a series of lead-in and qualifying questions, resistance fades and cooperation emerges (Jenn, 2006).
- **Specifics questions:** This stage includes questions that are unique to the study's goals. As a result, they are only asked of participants who respond positively. These specific questions are essential in the data collection and analysis process. This section will probe to gain insight into sensitive issues after ensuring that enough rapport has been developed.
- **Demographics questions:** Any survey must include these questions. Responses to survey questions cannot be analyzed until they have been sorted according to the study's various characteristics. This is particularly true for surveys that analyze responses based on respondents' demographic characteristics. These usually consist of a series of questions about age, sex, place, occupation, and other factors. These questions are kept to the end to avoid interviewee resistance and to prevent the interviewee's attention from being diverted.

Questionnaire Pre-testing

Pre-testing means placing the questionnaire to the test on a select number of people who aren't that different from the real people who would fill it out. The aim is to find bugs and problems and fix them. Pre-test includes examining all aspects of the questionnaire from question content to the order in which they are asked (Colosi, 2006). This aids in the detection of unclear interpretations, incorrect question order, leading questions, and awkward answers. Personal interviews can be used for pre-testing regardless of the final mode of administration. This will make it easier for interviewers to track respondents' responses and behaviors, providing them with firsthand knowledge of possible issues and the results that can be expected from the questionnaire.

To make analysis easier, the responses from pre-testing are coded. Pre-testing allows the researcher to fix any bugs in the questionnaire and eliminate any ambiguous questions (Martin, 2006). It also assists researchers in determining whether interviewers use correct sample selection procedures.

Development of final draft of the questionnaire

In this step the research instrument is now ready for its final draft, which will be used for the actual survey, after following the revision. The final draft questionnaire must be reviewed by the researcher. Consider how valuable the knowledge gleaned from each question would be to the analysis. Make sure you don't ask any questions that aren't important. Obtain input from the questionnaire respondents.

Ethical consideration of the questionnaire

Researchers gather data about values, perceptions, viewpoints, emotions, and activities using questionnaire-based methods such as surveys or interviews. The design of a questionnaire should be ethical (Colosi, 2006). Clear and objective research questions are needed. Leading questions, such as those that elicit an answer by wording or a limited set of responses, should be avoided. Following ethical guidelines guarantees that researchers behave in good faith and that the quality of the data generated is preserved. Let's discuss some ethical consideration of the questionnaire.

- **Informed consent:** Participants in questionnaire-based research cannot be duped or forced to participate. Respondents should be advised about the research's existence and intent, as well as any possible disadvantages of participating. Furthermore, explanations must be provided in a language that is suitable for the target audience. In other words, the research's importance cannot be distorted by technical explanations or jargon. Participants must be allowed to ask questions, and, if they choose, to quit the study.
- **Confidentiality:** If respondents are guaranteed confidentiality, it must be maintained. Client pressure or incentives to reveal respondents' names, contact details, or identifying information would not make researchers give in. Furthermore, no matter how exciting the findings are, researchers do not share them with friends or family members (Massad, 2003). It is forbidden to sell data from one project to another.
- **Anonymity:** Although a researcher may have the best of intentions, they have behaved unethically if they neglect to properly distinguish personally identifiable information from survey responses, or worse, store that information in a way that makes it open to prying eyes.

- **Pressure and persuasion:** If participants are overly pressured, cajoled, or tricked into taking part in a study, there are ethical issues in research.
- **Certain information should be included in questionnaire:** A questionnaire should include details such as who funded the survey, who administered it, the exact wording and sequencing of questions, a summary of the population and how a sample was chosen, sample sizes and sampling tolerance, and the process, location, and dates of data collection.

Conclusion

A good questionnaire is needed for good research results. The questionnaire can be judged on the basis of its relevance (no unnecessary data collection) and accuracy (details must be reliable and valid). This paper has discussed the proper design of the questionnaire for best results. Since there are no set rules for such construction, the steps outlined in this paper are based on experiences gathered from various studies.

Previous research experience has helped to establish general guidelines for questionnaires and sequences. It should be ensured that the questions turn to the shared language and other adequate means of better understanding and response levels. Questions should not be ambiguous, biased and loaded. There should also be no two-part questions that would irritate the respondent to provide general and rigorous answers. The sequence of the questionnaire is very important to get the information needed by the participant. Finally, the questionnaire should be reviewed before management to find errors and updated with the necessary corrections and deletions. This will result in the final draft being used in actual research.

REFERENCES

1. Colosi, L. (2006). Designing an Effective Questionnaire. Cornell University. Retrieved from file:///C:/Users/madhu/OneDrive/Desktop/construction%20of%20test/Designing%20an%20Effective%20Questionnaire.pdf
2. Frank Quansah, I. A. (2011). Teachers' Test Construction Skills in Senior High Schools in Ghana: Document Analysis. *International Journal of Assessment Tools in Education*, 6(1), 1-8.
3. Jenn, N. C. (2006). Designing A Questionnaire. *Malays family physician*, 1(1), 32-35.
4. Lee, S. H. (2005). Constructing Effective Questionnaire.
5. Martin, E. (2006). *Survey Questionnaire Construction*. Director's Office. Washington: U.S. Census Bureau.
6. Massad, C. E. (2003). *Maximizing Equity and Access in Test Construction*. pearson.
7. Metcalf, T. (2011, November 08). *Characteristics of a Good Questionnaire*. Retrieved from bizfluent: <https://bizfluent.com/info-8419146-characteristics-good-questionnaire.html>