

Mechanism of Data Collection in Research: In Reference to Questionnaire As a Research Tool

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Abstract

Data collecting is an essential component of modern research. Researchers obtain data from various sources in a variety of settings and geographical places. Modern data gathering processes rely on digital technologies, automation, and large-scale connectivity to acquire information rapidly and correctly. These strategies are commonly utilized in research, industry, healthcare, and government. These are the primary modern data collection mechanisms. A data collecting mechanism is the set of procedures, instruments, and processes used to collect data for analysis, decision-making, or research. The mechanism you select is determined on your purpose, data type, and available resources. A data collecting mechanism is the method used to gather information, such as questioning individuals, monitoring them, using existing records, or using automated systems. In this study, the researcher highlights Questionnaire as tools, along with their pros and cons, for data collection in qualitative research.

Keywords: Questionnaire, Qualitative Data, Quantitative Data

INTRODUCTION

Data collection refers to various ways for gathering information about specific study variables with the goal of using them in the data analysis phase to achieve the study's outcomes, answer research questions, or test hypotheses. Data gathering as a first step in research might increase the quality of outcomes by reducing the possibility of errors during a research effort. As a result, in addition to a proper study design, plenty of quality time should be spent on data collecting in order to obtain acceptable results, as insufficient and erroneous data hinders ensuring the correctness of findings.

(Kabir, 2016). On the other hand, although a suitable data collection method helps to plan good research, it cannot necessarily guarantee the overall success of the research project (Olsen, 2012).

TYPES OF DATA

Before deciding on a data collection method, consider the sort of data needed for the project (Kabir, 2016). This section tries to provide a summary of probable data kinds before proceeding to the various data gathering methods and data sources depending on these categories. However, we need to know exactly what data is. Data is the embodied information in the form of numbers or facts that is utilized to analyze for various calculations and eventually obtain a result to address the study question or hypothesis testing (Hurrell, 2005). Data can be categorized in a variety of ways, including quantitative and qualitative.

A. QUALITATIVE DATA

Qualitative data, represented through words or sentences, encompasses both nominal and descriptive non-numeric information that cannot be quantified. This type of data addresses the "how and why" aspects of

a research inquiry, primarily concentrating on feelings, perceptions, and emotions gathered through unstructured approaches like interviews. Researchers gather information using various methods, including audio recordings, sketches, notes, and photographs.

While qualitative data can be valuable for gaining deeper insights to explore and identify new effects and outcomes of programs within the study, and ultimately enhance the quality of quantitative findings, its execution typically requires a considerable investment of time and resources, and the findings may lack generalizability. This implies that the results of case studies may be applicable to specific contexts but not universally.

B. QUANTITATIVE DATA

Numerical data that is mathematically generated and computed is classified as quantitative data. There are several scales for measuring quantitative data, including nominal, ordinal, interval, and ratio scales (Kabir, 2016). Scales can be divided into two categories: "Rating Scales" and "Attitude Scales." Rating scales assign numerical values to the points or categories being evaluated. More complex methods, such as attitude scales, determine people's predispositions toward any human, phenomena, or object (Taherdoost, 2016b). A qualitative method answers the "what" question in a study. These approaches use organized data collection methods and rely on random sampling. When compared to qualitative methods, these methods are thought to be less expensive, and the findings can be standardized to get different results based on parameters like size. The results can be simply generalized and summarized. A simple comparison of the outcomes is also possible. However, because these approaches' implementation and investigation capacities are limited, they may encounter unforeseen variations and challenges. These approaches acquire data using a variety of methodologies, including experiments and structured interviews, as detailed in the data collecting method section.

DATA COLLECTION METHODS

Data collection techniques are generally divided into two main types: primary data collection and secondary data collection. Figure 1 shows the key approaches used for gathering both forms of data. Primary data is original information that has not been previously published and is collected directly by researchers for a specific study. Because it is obtained first-hand, it is usually more valid, reliable, objective, and authentic than secondary data. This is especially important in research methods such as statistical surveys, where the required information is specific and cannot be found in existing sources. Although secondary data can support research, dependable conclusions often depend on the use of primary data.

On the other hand, secondary data refers to information that has already been collected, processed, or analyzed by other individuals or organizations. While it is useful for providing context and supporting research, it may not always fully meet the specific needs of a study. Therefore, using both primary and secondary data together can improve the completeness and accuracy of research findings. In addition, primary data collection enables researchers to obtain high-quality information and add further data when needed during the research process.

Collecting primary data requires careful planning, including defining the research purpose, identifying the required data, deciding the timing of collection, and selecting suitable methods. However, it is often expensive, time-consuming, and may require significant funding. Researchers must also ensure data quality by collecting accurate information, removing irrelevant data, and avoiding false or manipulated

results. Common methods of primary data collection include experiments, surveys, interviews, and questionnaires (Kabir, 2016; Taherdoost, 2021).

PRIMARY DATA COLLECTION METHODS

Primary data collection is based on the techniques by which you collect data for your study, and no one gets access to this data until it is published. Qualitative and quantitative approaches are utilized for this purpose. The primary data gathering is described here, with 14 different categories shown in Figure 1. The most prevalent types, such as questionnaires, interviews, focus groups, observation, surveys, case studies, and experimental procedures, are first thoroughly defined. Then, various strategies are briefly discussed.

QUESTIONNAIRE METHOD

A questionnaire is a structured research tool made up of a set of questions used to collect information from individuals within a specific population or demographic group. It allows researchers to obtain data that is not available from secondary sources (Pandey & Pandey, 2015). Questionnaires are useful for gathering both qualitative and quantitative data. Although they are not commonly used in qualitative studies, they are highly effective when information needs to be collected from a large number of respondents.

The questionnaire was first developed by Sir Francis Galton and has since become one of the most widely used methods of data collection in research. It is typically used to gather statistical data and to measure different variables such as attitudes, behaviours, preferences, opinions, and factual information (Kabir, 2016). While the design and administration of questionnaires are relatively simple, they require careful preparation to ensure that the questions are clear, relevant, and capable of producing valid and reliable responses. Questionnaires are particularly useful when it is not feasible to interview each participant individually (Pandey & Pandey, 2015). As a result, they enable efficient data collection from large groups of individuals, organizations, or communities. Questionnaires may be categorized based on the types of questions they include and the methods used for their administration.

Questionnaire items can be developed for different research purposes. Some are designed to measure specific variables, as is common in surveys, while others are used for indexing or scaling purposes, such as in psychological or educational assessments.

Based on their response format, questionnaire items are generally divided into two main types:

- Closed-ended questions: These provide respondents with a fixed set of answer options from which they select the most appropriate response. Since the responses are pre-coded, they are easier and faster to analyze (Olsen, 2012).
- Open-ended questions: These allow respondents to answer in their own words, offering more detailed and descriptive information. According to Taherdoost (2019), open-ended questions are mainly qualitative in nature and require coding before analysis due to the variation in responses.

TYPES OF QUESTIONS

First, questions can be devised to measure variables, such as those found in a survey. In contrast, questions can be based on indexing or scaling, such as in tests. Second, question types are divided into closed-ended and open-ended inquiries. Close-ended questions present respondents with a restricted range of answers from which to choose, whereas open-ended questions require respondents to submit articulated responses. Taherdoost (2019) describes qualitative questions as open-ended. For this type, the responses should be

coded into a response scale. Closed-ended questions are commonly presented using the following response scales:

- Dichotomous scale: Respondents choose between two options (e.g., Yes/No, True/False).
- Nominal (polytomous) scale: Respondents select one option from multiple categories that have no specific order.
- Ordinal (polytomous) scale: Respondents choose from several categories that follow a ranked order (e.g., Poor, Fair, Good, Excellent).
- Continuous (or bounded) scale: Respondents indicate their answers along a numerical continuum within defined limits, allowing for more precise measurement of opinions, attitudes, or perceptions.

THE MODE OF ADMINISTRATION

Questionnaires can be used in various ways. A face-to-face questionnaire mode can be used to present the questions verbally, while paper-and-pencil kinds can be employed with the items provided on paper or computerized questionnaires for data collection (Kabir, 2016). Questionnaires can also be distributed over the phone, online, or by post. An online questionnaire is a cost-effective choice; nevertheless, you should consider the probability of missing samples owing to internet connection issues. In these cases, many online survey services can be employed to give questionnaires for research purposes, and the obtained data can then be simply incorporated to the analyzing software (Taherdoost, 2021). All of these decisions must be made while keeping ethical concerns in mind, such as participant confidentiality. Participants, on the other hand, should make an effort to respond to inquiries politely and clearly.

GENERAL RULES FOR CREATING A QUESTIONNAIRE

- Whenever possible, make brief and straightforward questions.
- Provide straightforward navigation to guide and encourage responders to answer questions (Olsen, 2012).
- Use simple and clear statements for respondents with varying educational levels.
- Write positive sentences.
- Avoid asking numerous questions (double-barrelled) in one item.
- Consider adding an open-ended question after the listed responses.
- Avoid making assumptions about respondents (Kabir, 2016).
- Improve dependability by using appropriate terms.

Taherdoost (2021) warns against using objective questions, such as advice, suggestions, or hints, to direct responders to certain answers.

Explain the significance of the questionnaire's contents and cover letter (Pandey & Pandey, 2015).

- Ask sensitive questions following harmless or solid ones. The arrangement of the questions is a crucial consideration. For example, questions about sexual activities, drugs, wealth, and so on should be placed at the end of the questionnaire to help the researcher earn participants' trust and minimize embarrassment (Kabir, 2016; Taherdoost, 2016a). There are additional special obstacles and considerations that may arise in designing an acceptable questionnaire. First, the maximum number of respondents should be ensured, as well as the highest level of reliability and validity conceivable. To maximize responder rates, you should:
- Demonstrate your commitment to securing their information and maintaining their trust.
- Reward their cooperation.

On the other hand, you can obtain an accurate data set by considering two factors:

- Create a relevant collection of questions.
- Choose proper sample size and type to prevent biases and unanswered issues (Taherdoost, 2021).

ADVANTAGES OF QUESTIONNAIRES

When compared to other survey techniques, questionnaires have the following advantages: collecting a lot of data from a big sample size;

1. Saving time.
2. Economical solutions;
3. Extremely organized.
4. The potential to acquire extremely precise data.
5. The study may be carried out by someone other than the researcher, which could affect group administration and validity and reliability. Quickly entering data into software makes it easy to assess the results. the possibility of a more objective and scientific analysis.
6. Changes can be evaluated by comparing quantitative data to other studies.
7. The capacity to design and administer comprehensive tests and perform research using relevant data.
8. Using quantitative data to test existing theories or develop new ones (Frechtling, 2002; Kabir, 2016; Taherdoost, 2021).
9. Suitable for many academic fields.
10. Reliable in specific instances (Pandey & Pandey, 2015).

THE DISADVANTAGES OF QUESTIONNAIRES

However, there are numerous drawbacks that are not minor. There are various issues researchers may confront while using questionnaires, including the following:

- Certain types of data, such as emotional and behavioral changes, may be difficult to interpret.
- Human mistakes, such as forgetfulness or inability to fully comprehend concepts.
- It is not feasible to determine the reliability of answers.
- Misunderstanding the questions may overshadow the responses.
- Belief variations can impact responses, as even a standard subject might be perceived differently by different groups (Kabir, 2016).
- Taherdoost (2021) identifies challenges for participants seeking clarification on specific questions in impersonal administrations, including the risk of not receiving an answer.
- Low response rates if respondents' low interests cannot be addressed to answer questions (Frechtling, 2002);
- The possibility of illegible answers;
- Useless and wrong answers are prevalent (Pandey & Pandey, 2015).

CHALLENGES OF THE DATA COLLECTION PROCESS

Specific challenges that can occur during each of the data collection methods have been discussed in the previous sections. Here, some other general challenges are explained that can occur due to the following conditions:

LOCATION OF THE DATA COLLECTION

Location is an important aspect of data collection considerations. If you wish to conduct a reliable process, you must use a neurological location. Because participants must feel free to submit their comments. Otherwise, there is a great probability of receiving biased responses. For example, when you interview pupils in the school setting, they may believe they will experience challenges and problems if they raise the matter with their school staff.

LITERACY OF THE PARTICIPANTS AND THE LANGUAGE OF THE QUESTIONS

You must ensure that the questions are designed appropriately for the participants' literacy levels, or you must select a target sample with a proper level to respond to your questions. Pilot testing must be conducted to determine whether these examples are effective or not. Additionally, auditory assistance approaches can be employed to solve these types of difficulties.

Timing

As described in previous sections, various criteria can influence the time necessary for data gathering. A good schedule is also required for research initiatives, as seen below:

✓ First, appropriate time allows people to be more engaged with the project without stress and other concerns, whereas discomfort can present different challenges.

CONCLUSION

This article provides an overview of several data gathering methods, the challenges that researchers may encounter when carrying out these processes, and, finally, the ethical considerations that must be addressed during data collection operations. We first discussed the most common methods, including as questionnaires. The benefits and drawbacks, as well as the scenarios in which each method can be applied, were also reviewed. Then, the less prevalent methods were briefly described. The most important factors considered while investigating the benefits and drawbacks of these approaches are the necessary cost, time, and training considerations, as well as bias issues, dependability, and process validity. The general problems and barriers that may develop during data collection procedures were then highlighted, along with suggestions on how to overcome them. Finally, the ethical commitments were evaluated, which included the potential problems, how the method can be handled ethically, and a list of documents that must be given to the committees in order to obtain the ethical commitments.

REFERENCES

1. Frechtling, J. (2002). An overview of quantitative and qualitative data collection methods The 2002 user-friendly handbook for project evaluation (pp. 43-62).
2. Hox, J. J., & Boeijs, H. R. (2005). Data collection, primary versus secondary Encyclopedia of social Measurement (Vol. 1): Elsevier.
3. Data collection challenges (2005).
4. Kabir, S. M. S. (2016). Methods Of Data Collection Basic Guidelines for Research: An Introductory Approach for All Disciplines (first ed., pp. 201-275).
5. Olsen, W. (2012). Data collection: Key debates and methods in social research (Vol. 1): Sage.
6. Pandey, P., & Pandey, M. M. (2015). Research Methodology: Tools and Techniques (Vol. 1). Romania: Bridge Center.
7. Rimando, M., Brace, A. M., Namageyo-Funa, A., Parr, T. L., Sealy, D.-A., Davis, T. L., . . . Christiana,

- R. W. (2015). Data collection challenges and recommendations for early career researchers. The Qualitative Report, 20(12), 2025-2036.
8. Taherdoost, H. (2016a). How to design and create an effective survey/questionnaire; A step by step guide. International Journal of Academic Research in Management (IJARM), 5(4), 37-41.
 9. Taherdoost, H. (2016b). Measurement and scaling techniques in research methodology; survey/questionnaire development. International Journal of Academic Research in Management (IJARM), 6(1), 1-5.
 10. Taherdoost, H. (2016c). Sampling methods in research methodology; how to choose a sampling technique for research. International Journal of Academic Research in Management (IJARM), 5(2), 18-27.
 11. Taherdoost, H. (2019). What is the best response scale for survey and questionnaire design; review of different lengths of rating scale/attitude scale/Likert scale. International Journal of Academic Research in Management (IJARM), 8(1), 1-10.
 12. Taherdoost, H. (2021). Handbook on Research Skills: The Essential Step-By-Step; Guide on How to Do a Research Project (Kindle ed.): Amazon.