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| **THEME 16. QUANTITATIVE DATA COLLECTION** |

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| Learning outcomes  This lesson offers you opportunities to:   * Gain an overview about quantitative data collection; * Learn about population, target population, and sample; * Develop note-taking skills while watching speech; * Develop knowledge about how to conduct questionnaire.   *Key-words: quantitative, data collection, analysis, questionnaires, quantitative data collection, population, target population, sample, sample size.* |

**Quantitative data collection** involves the gathering of numerical data that can be quantified and subjected to statistical analysis. The primary aim is to derive conclusions from a sample that can be applied to a broader population, as well as to identify trends or assess hypotheses.

The process of collecting quantitative data comprises five components. This process involves more than mere information collection; it consists of interconnected processes. The process involves identifying study participants, obtaining necessary permissions from various individuals and organizations, determining the types of information to be gathered from multiple sources relevant to quantitative research, selecting appropriate instruments for data collection, and executing the data collection procedure to acquire the required data.

The initial step in the quantitative data collection process involves identifying the subjects and locations pertinent to your research. This involves determining whether to concentrate on individuals, entire institutions (such as schools), or a combination of both. When selecting either individuals or organizations, it is crucial to determine the specific type of subjects for your investigation and the necessary sample size for your research. The choices require the identification of a unit of analysis, the selection of the group and individuals to be examined, the methodology for selecting these individuals, and the assessment of the necessary sample size for data analysis.

It is essential to understand some words during the first phase of data collecting, including population, target population, and sample, among others.   
A **population** is a collection of people with same characteristics. For instance, the whole cohort of educators would constitute the population of teachers, whereas all secondary school administrators within a district would form the population of administrators. These examples demonstrate that populations may vary in size, being either tiny or enormous. You must select which group you want to examine.

In practice, quantitative researchers choose samples from accessible lists and individuals. A **target population**, or sample frame, is a collection of persons or organizations sharing a certain distinguishing trait that can be identified and analyzed by the researcher.

Researchers then choose a **sample** for investigation from this target group. A sample is a subset of the target population that the researcher intends to examine for the purpose of generalizing findings to the broader population. In an ideal scenario, one may choose a sample of people that accurately represents the whole population.

Researchers employ either probability or nonprobability sampling techniques. In **probability sampling**, the researcher selects individuals from the community who accurately represent that group. This represents the most rigorous form of sampling in quantitative research, as the investigator can claim that the sample accurately reflects the population, thereby allowing for generalizations to be drawn.

**Simple random sampling** is the most common and rigorous method of probability sampling from a population. In basic random selection, the researcher selects participants in a manner that ensures each individual has an equal chance of being chosen from the population. The objective of simple random sampling is to select individuals who accurately represent the population.

It is essential to ascertain the requisite **sample size** when choosing volunteers for research. A fundamental guideline is to choose the largest feasible sample from the population. A higher sample size reduces the likelihood of deviation from the population.

In some research, the participant pool may be restricted to those who are readily accessible for examination. Additionally, factors such as accessibility, financial resources, total population size, and the quantity of variables will also affect sample size. One method to ascertain the sample size is to choose an adequate number of participants for the statistical analyses you want to use. This assumes that you have selected the statistic for analysis.

Subsequent to discovering and choosing participants for your research, it is essential to get their **consent for participation**. This authorization will guarantee their collaboration in your research and the provision of data. In addition to collaboration, their consent signifies their comprehension of the study's goal and your commitment to ethical treatment. Authorization is often required prior to accessing a site and gathering data. This endorsement often originates from leaders or those in positions of influence inside organizations. Securing permissions from organizational people necessitates prior communication before the commencement of a research to get their consent for access and examination of their environment.

The most effective method to get **approval** from the requisite persons or organizations is to officially request it in writing. Specify the study's objective, the duration of data collection at the location, the time commitment expected from participants, and the intended use of the data or findings. Additionally, specify the particular activities you will do, the advantages to the business or person resulting from the research, and the measures you have implemented to ensure the confidentiality of study participants. By supplying this information, you will demonstrate awareness of the possible encroachment of the research into their professional and personal life, therefore establishing reasonable expectations on their behalf.

An **informed consent** form is a document that participants sign before to engaging in research activities. This document must affirm that you will ensure certain rights, and by signing it, they consent to participate in the research and recognize the safeguarding of their rights.

After identifying participants and establishing a protocol for obtaining consent, the next step is to determine the specific types of data required to effectively address your study questions or hypotheses. This phase involves identifying the variables in your inquiries and hypotheses, obtaining definitions for these variables, and considering the types of data that will aid in assessing these variables.   
Research inquiries and hypotheses encompass variables. To determine the essential data for collection, it is crucial to explicitly define the variables in your study. This will encompass independent, dependent, and control variables. A systematic method involves creating a list of variables to determine which ones are operational within a research context.

After establishing operational definitions for your variables, the next step is to identify the types of data that will quantify these variables. Researchers collect data regarding instruments. An instrument serves as a device designed for the measurement, monitoring, or recording of quantitative data. The instrument, designated before data collection by researchers, may encompass a test, questionnaire, tally sheet, log, observational checklist, inventory, or evaluation tool. Researchers employ various tools to measure achievement, assess individual abilities, observe behavior, develop psychological profiles, or carry out interviews.

**Gathering Data via Questionnaires**

This approach to data collection is widely utilized, especially in the context of large inquiries. A questionnaire is distributed to the relevant individuals, requesting their responses to the inquiries presented. A questionnaire is composed of a series of questions arranged in a specific sequence on a form or collection of forms. The questionnaire is distributed to respondents who are required to read and comprehend the questions, providing their responses in the designated space within the questionnaire. The respondents are required to provide their own answers to the questions.

Prior to implementing this method, it is recommended to carry out a pilot study to test the questionnaires. The importance of a pilot survey is greatly recognized in a large inquiry. The pilot survey serves as a replication and practice run for the main survey. A survey conducted by specialists highlights any potential weaknesses in the questionnaires and the survey methodologies employed. Improvement can be achieved through the experience gained in this manner.   
The questionnaire is frequently regarded as the core component of a survey operation. Therefore, it must be constructed with great care. If it is not adequately configured, the survey is likely to be unsuccessful. This fact necessitates an examination of the primary components of a questionnaire, including its overall structure, the order of questions, and the formulation and phrasing of those questions.

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| **Activity 1. Reading. Read the text and answer the following questions.** |

1. What are the components of collecting quantitative data?
2. What is the initial step in the quantitative data collection process?
3. Can you tell me about population, target population and sample?
4. What is the most effective method to get approval?
5. What is questionnaire and how effective is it for collecting data?

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| **Activity 2. Watch the video about “Research Design: Choosing your Data Collection Methods”, make notes while watching.** |

You tube link: <https://www.youtube.com/watch?v=q17s84ADGfA&ab_channel=Scribbr>

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| **Activity 3. Speaking. Answer the following questions.** |

1. What is a data collection method?
2. What is the effectiveness of surveys for data collection?
3. What is a questionnaire and what is its effectiveness?
4. Is it possible to utilize interviews for the collection of quantitative data?
5. In what ways can observations be utilized?
6. What distinguishes quantitative observation from qualitative observation?
7. In what ways can media and communication facilitate the collection of quantitative data?
8. What alternative data collection methods can be utilized in the field of education?
9. What is secondary data and how can it assist researchers?
10. What is the concluding step in selecting the suitable method for data collection?

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| **Activity 4. Listening. Complete the notes below. Write ONE / TWO WORDS for each answer.** |

**Choosing your Data Collection Methods**

Data collection methods are ways of directly measuring 1\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and gathering information.

* Surveys allow you to collect data about opinions behaviors experiences and 2\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ characteristics.
* Questionnaires are more common and quantitative research. They usually include close questions with multiple choice answers or rating 3\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Observations allow you to collect data unobtrusively, observing characteristics behaviors or social 4\_\_\_\_\_\_\_\_\_\_\_\_\_\_without relying on self-reporting.

**Quantitative and qualitative observation**

* Quantitative observation involves systematically 5\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or counting specific events, behaviors, characteristics etc.
* Qualitative observation involves taking detailed notes and writing rich 6\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of what is observed.

**Other data collection methods**

* In education, you may use tests or 7\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to collect data about knowledge and skills and the physical sciences you may use scientific 8\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Secondary data: the other researchers already collected, such as 9\_\_\_\_\_\_\_\_\_\_\_\_\_\_ surveys or previous studies on your topic.
* Secondary data gives you access to much larger and samples, however it also means that you don't have any 10\_\_\_\_\_\_\_\_\_\_ over which variables to measure.

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| **Activity 4. Vocabulary. Match the words with an appropriate definition.** |

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|  | **Words** | **Definitions** |
| 1 | Academic Integrity | 1. A process in which academic work is evaluated by experts in the field before publication, ensuring the quality, validity, and originality of research findings. |
| 2 | Ethical Standards | 1. Creations of the mind, including inventions, literary and artistic works, symbols, names, and images, which are protected by law and require proper attribution when used by others. |
| 3 | Honesty Policy | 1. The commitment to honesty, trust, fairness, respect, and responsibility in academic work, ensuring that all contributions are genuine and properly attributed. |
| 4 | Citation Practices | 1. Actions that violate established ethical standards in academic work, including fabrication, falsification, plagiarism, and other forms of dishonesty. |
| 5 | Research Ethics | 1. Principles that guide behaviour in academic settings, outlining expectations for honesty, accountability, and ethical conduct in research and scholarship. |
| 6 | Peer Review | 1. The practice of being open and honest about research processes, methodologies, and funding sources, allowing for accountability and reproducibility in academic work. |
| 7 | Intellectual Property | 1. The obligation of individuals and institutions to take responsibility for their actions and decisions, particularly concerning ethical practices and maintaining academic integrity. |
| 8 | Misconduct | 1. Guidelines and principles that govern the conduct of researchers to ensure the integrity and quality of research, including the treatment of subjects and data handling. |
| 9 | Transparency | 1. Established methods for acknowledging sources of information, ideas, or data used in academic work, ensuring proper attribution and credit to original authors. |
| 10 | Accountability | 1. A set of guidelines established by educational institutions that outlines acceptable practices and the consequences of academic dishonesty, including plagiarism and cheating. |
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