LITERATURE REVIEW: TYPE, SCALE, AND DATA SOURCES

Fitari Ramadhani[1], Bintang Faris Ghiyatis[2], Nadia Nadawina[3]

[1,2,3]*Sekolah Tinggi Keguruan Dan Ilmu Pendidikan Amal Bakti*
E-mail : [1]fitariramadhani@email.com, [2]bintangparis942@gmail.com,
[3]Nadianadawina273@gmail.com

ABSTRACT

This study aims to examine and explain fundamental concepts in statistics, particularly those related to data types, data scales, and data sources. The approach used is a literature review of 20 articles or books published between 2020 and 2025. The findings of this study reveal that a deep understanding of both qualitative and quantitative data types is essential for determining research methods and data analysis techniques. The selection of appropriate data scales, such as nominal, ordinal, interval, and ratio, affects the accuracy of statistical analysis. Data sources also play a major role in research, whether they are primary or secondary data, each of which has its own strengths and limitations. By understanding the relationship between data types, data scales, and data sources, researchers can be more precise in collecting and processing data, resulting in more accurate, systematic, and relevant research.

Keywords : *Statistics, Data Types, Data Scales, Data Sources.*

INTRODUCTION

Statistics is basically a collection of data used to describe a problem and then draw accurate conclusions (Lutfiana, 2020). In the business field, data analysis uses statistics to predict sales trends and optimize marketing strategies. With previous sales data, entrepreneurs can find out which products are selling well and which are declining in sales. In the social field, such as education, statistics help measure the impact of programs, such as how education levels affect unemployment rates, with solutions to expand access to education to reduce unemployment. Therefore, everyone needs to learn statistics.

This research relates to basic statistics and is divided into three types, namely data type, data scale, and data source. Each is interconnected in the research, but has a different function. All three are used simultaneously to explain the characteristics of the data completely. Discussing data, the role of data is very important in educational research because it makes it easier for researchers to analyze, understand, and improve learning outcomes (Sutriyanti, 2024). By identifying a deeper understanding of the types of data and how to research them, researchers can produce useful, unbiased findings that can be used widely (Aida et al., 2025).

One of the main problems in research is the lack of understanding among researchers in determining the appropriate type of data, which leads to errors in selecting the data scale and data sources. Therefore, careful data collection and in-depth analysis are very important to produce meaningful research that contributes to increasing knowledge or helping to solve problems (Sulung & Muspawi, 2024). Data types are divided into quantitative and qualitative data, and this determination is an important basis for choosing the appropriate research methods, data collection methods, and analysis techniques. In addition, data scale and data sources must also be considered as supporting elements. Data scale helps determine the analysis technique used, while data sources are considered in terms of where the data is obtained, whether from primary or secondary data. This study aims to examine and explain the various types of data, data scales, and data sources obtained. It is hoped that this study can assist researchers in understanding their research needs and serve as a guide to improve the accuracy of data collection and processing, as well as produce more targeted results.

METHOD

This study uses the library research method. It involves reviewing various sources such as books, journals, and scientific articles by previous researchers that specifically discuss the basic concepts of data types, scales, and sources. By combining 20 scientific articles discussing data types, scales, and sources, this ensures that the process of collecting and analyzing sources is carried out systematically so that it can provide direct support for the discussion in this study. It is hoped that this study will produce well-organized information that is in line with the research needs so that the analysis carried out can support the achievement of the research objectives to the maximum extent possible.

RESULTS AND DISCUSSIONS

Types Of Data

The data in this study is divided into two main types, namely qualitative and quantitative, each of which has its own characteristics in terms of purpose, content, data, sources, and data analysis methods (Sofwatillah et al., 2024).

1 Quantitative Data

Quantitative data is data that shows the results of calculations or measurements in the form of numbers, which is why it is often referred to as numerical data (Soesana et al., 2023). Quantitative data allows researchers to analyze phenomena mathematically and statistically, enabling them to obtain an objective view free from personal bias. Quantitative data usually takes the form of numbers that can be calculated and analyzed using statistical methods, such as test scores, the number of people in a region, or income levels (Haifa et al., 2025).

In quantitative research methods, there are various approaches that can be used, and the most commonly chosen ones include correlation, description, comparison, experimentation, surveys, and inference. These are useful for testing and identifying theories and assumptions through in-depth research (Siroj et al., 2024). By analyzing number-based data, researchers can find general patterns, specific values, and correlations between various factors that can be measured objectively.

2 Qualitative Data

Qualitative data is data in the form of words, sentences, or paragraphs that are relevant to research, such as public opinion data (Nasution, 2023). This data is used to gain a deep understanding of the meaning, characteristics, and various social events with a primary focus on the direct views of the people who are the subjects of the research itself. Data collection must be in accordance with the prepared research design plan, through direct observation, interviews, survey content, or data collection from other sources (Rifa'i, 2023).

In qualitative research, the method is often referred to as naturalistic because the research is conducted in very natural conditions. It is known as ethnography because it was originally widely used for research in the field of cultural anthropology, and it is called qualitative because the data collected and analyzed is more qualitative in nature (Ash-Shiddiqi et al., 2025). Therefore, analyzing qualitative data involves a fairly complex process and requires specialized skills (Syahrizal & Jailani, 2023).

Data Scale

Measurement scale is a process to determine the scale of variables based on research variables, so that it becomes a reference in selecting measuring instruments that can produce quantitative data (Hertina et al., 2024). Here are the 4 types of scales:

1. Nominal Scale

A nominal scale is a type of data measurement scale that categorizes or names specific objects or variables. In this scale, there is no order that indicates levels and involves numbers. These numbers are simply labels, without hierarchical meaning, so that no one is superior. For example, in the use of numbers on a nominal scale, 1 represents male and 2 represents female, and these numbers are only symbols; they do not indicate any value, large or small, but are only labels (Maskhuliah et al., 2025). Thus, the nominal scale plays an important role in research, helping to group data into specific categories to make descriptive analysis easier.

2. Ordinal Scale

An ordinal scale is a scale that measures data by grouping it into categories that have an order or level, but the distance between these levels cannot be measured precisely. In other words, an ordinal scale can only show which order is greater or smaller, but it does not indicate how big the difference is. For example, when talking about height, C can be taller than D, and D can be taller than E, so C is automatically taller than E. These symbols help to show a clear order without having to explain it again. This scale has the potential for more in-depth analysis than a nominal scale, but there are still limitations when using mathematical operations (Elwahdiyah & Hartono, 2025).

3. Interval Scale

An interval scale is a type of scale that provides a sequence or level of values with uniform intervals between each value, but without a truly absolute zero point. For example, yellow and purple pencils are given a value of 1. Then the difference between blue and purple pencils is given a value of 2. However, this does not mean that yellow pencils are twice as valuable as purple pencils, or that blue pencils are twice as valuable as purple pencils. This shows that this type of scale is only based on order or ranking, not actual distance. This scale has all the characteristics of a nominal and ordinal scale, with equal distances between objects (Reza et al., 2021).

4. Rasio Scale

A ratio scale is a type of scale in which the distance or interval between consecutive values is always the same. In addition, this scale has an absolute zero point to indicate the total absence of the attribute being measured.

This allows researchers to obtain new and more accurate information. This data can be converted into ordinal and interval scales, and supports algebraic mathematical operations. In interval data, addition does not work like ratio data. For example, if you mix one glass of water at a temperature of 200℃ and one glass of water at a temperature of 150℃, the temperature will not be 350℃ but around 175℃ (Akbar et al., 2024). Due to these characteristics, the ratio scale is the primary choice in quantitative studies, providing the most complete and accurate data for the analysis process.

Data Sources

Data sources are the main subjects or objects from which we collect information. Data does not just appear; we must obtain it from something concrete (Asman, 2021). Based on their source, data can be divided into two types: primary data and secondary data.

1. Primary Data

Primary data is data collected directly by researchers from original sources in the field, rather than from existing documents or reports. This type of data collection is generally carried out directly, such as through face-to-face interviews with respondents, direct observation of events at the location, or distributing questionnaires to the people involved (Hafizah et al., 2025). Although primary data collection takes considerable time, effort, and cost compared to other data sources, its advantage lies in its high level of accuracy and relevance.

2. Secondary Data

Secondary data is data obtained indirectly, not from field collection but from existing sources collected by previous researchers. This secondary data includes books, articles, journals, and other writings related to the discussion (Wijaya et al., 2025). The use of secondary data can save time and money, but researchers must first ensure that the sources are accurate and find reliable sources in line with the research objectives.

From the article search results, researchers found articles published in Sinta-accredited national journals and openly published books. Table 1 displays a list of articles published from 2020 to 2025. Each article in this table includes information such as the author's name, year of publication, research title, and conclusions obtained from the research.

Table 1. Evaluation of Reference Articles (Literature)

No	Author	Year	Article Title	Conclusion
1	Lutfiana	2020	Analysis of statistical journals in data management and student report card scores at SDN Pangkah Wetan.	Student data and report card grades at SDN Pangkah Wetan are managed using statistical principles for efficiency and accuracy. Teachers visualize operational data via tables, symbol diagrams, bars, lines, and circles.
2	Sutriyanti	2024	Types of data in education using qualitative and quantitative approaches.	Qualitative data helps understand the context, experiences, and personal meanings in the learning process, while quantitative data allows for objective measurement and generalization of results.
3	Aida et al.	2025	Types of quantitative research data (correlation, comparative, and experimental).	Quantitative research emphasizes the collection and analysis of numerical data to obtain objective conclusions that can be widely applied, by selecting the appropriate type of data depending on the research method, such as correlational, comparative, or experimental.
4	Sulung & Muspawi.	2024	Understanding research data sources: primary, secondary, and tertiary.	The importance of understanding primary, secondary, and tertiary data sources to ensure the quality and accuracy of results, by selecting and using the appropriate sources.
5	Sofwatillah et al.	2024	Quantitative and qualitative data analysis techniques in scientific research.	Quantitative and qualitative methods each have their own characteristics, objectives, types of data, and methods of analysis. The selection of analysis techniques that are appropriate to the research objectives will ensure accurate results.
6	Soesana et al.	2023	Quantitative research methodology.	Quantitative research is based on a positive paradigm with the aim of producing objective, measurable results using appropriate methodology and analysis.

7	Haifa et al.	2025	Identification of research variables and types of data sources in educational research.	The success of educational research depends on the ability to accurately identify research variables and select suitable data sources.
8	Siroj et al.	2024	Quantitative research methods: a scientific approach to data analysis.	Quantitative research methods are systematic scientific ways of testing theories through the measurement of numerical data and statistics, which are useful for understanding the relationships between variables.
9	Nasution	2023	Qualitative research methods	Educational research requires a deep understanding of the fundamentals of research, from formulating problems, determining variables, selecting methods, to analyzing data.
10	Rifa'i	2023	Analysis of qualitative research methodology in data collection in scientific research in the preparation of mini research.	Qualitative research methodology is important for mini research, as it can provide contextual and comprehensive insights into the phenomenon being studied.
11	Ash-Shiddiqi et al.	2025	Theoretical study; qualitative data analysis.	Qualitative data analysis is a systematic and reflective process to understand social phenomena holistically, as well as to test the validity of data so that the results are meaningful.
12	Hertina et al.	2024	Business research methods.	Research steps are obtained systematically, including basic concepts, problem formulation, variables, measurement techniques, data collection, and hypothesis testing.
13	Maskhuliah et al.	2025	Basic concepts of measurement and scales in educational management research: a literature review.	Measurement involves a clear process of conceptualization and operationalization, taking into account sensitivity as the basis for accurate data-driven decisions in educational management.
14	Elwahdiyah & Hartono.	2025	Data types and measurement scales: understanding data classification, measurement scales,	Measurement scales and instrument scales are the main foundations in choosing the right statistical analysis method, understanding the differences

			and their implications in analysis.	and relationships between data types and data scales.
15	Reza et al.	2021	Descriptive statistics for economics & business.	Descriptive statistics play an important role in collecting, processing, and presenting data so that it is easy to understand and can be applied in business decisions.
16	Akbar et al.	2024	Quantitative research data analysis.	Statistical testing techniques must be appropriate for the type of data and measurement scale, using correlation tests such as Pearson, Spearman, Kendall's tau, contingency, and SPSS software to enable accurate analysis.
17	Asman	2021	Data sources, population, and research sample.	Data sources, population, and sample are basic elements of research that affect the quality and validity of results and must be adjusted to the nature of the population.
18	Hafizah et al.	2025	Identification of research variables and types of data sources in educational research.	Determining research variables and selecting the appropriate data sources are key to the quality of educational research.
19	Syahrizal & Jailani.	2023	Types of research in quantitative and qualitative research.	Quantitative approaches include methods such as descriptive, comparative, correlation, survey, experimental, policy research, action research, evaluation, quasi-experimental, and single subject, while qualitative approaches include case studies, descriptive, classroom action research, phenomenology, ethnography, grounded theory, history, hermeneutics, field research, and discourse analysis.
20	Wijaya et al.	2025	Data sources, research subjects, and related issues.	Qualitative research emphasizes a deep understanding of social phenomena through the selection of relevant and contextually appropriate data sources and subjects.

CONCLUSIONS

From the results of the literature review that has been conducted, it can be concluded that understanding the type of data, data scale, and data source is important in research. The types of data, which are divided into quantitative and qualitative data, have different characteristics and methods of analysis, so they must be adjusted to the research objectives. Data scales, such as nominal, ordinal, interval, and ratio scales, are important in determining the appropriate statistical techniques. Finally, data sources, which are also divided into primary and secondary data, also affect the accuracy, suitability, and reliability of research results. Therefore, the quality of good research is determined by the appropriate type, scale, and source of data, and the findings must be accurate.

ACKNOWLEDGMENTS

The author would like to express sincere and deep gratitude to all individuals and institutions that have provided support and assistance during the process of compiling this research. In particular, great appreciation is given to colleagues and supervisors for their brilliant ideas, appropriate guidance, and constructive and useful advice. The author is also grateful to the educational institutions and scientific works that have served as the main foundation for the ideas in this research. Every form of assistance, whether provided directly, such as face to face discussions, or indirectly, such as available references, has played an important role in ensuring that this research ran smoothly and was successfully completed. Without all of that, this research might not have been completed.

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