



Application of Quantitative Research Methods in the Social Sciences: Strengths, Criticisms and Weaknesses

Ephraim Terhemba Tuluma^{1*}, Dr. ABUBAKAR Musa Tafida² & Ungwa Emmanuel Vandekan PhD³

^{1,2}Department of Psychology, Faculty of Social Sciences, Nasarawa State University Keffi

³General Studies Department, Federal Polytechnic, Wanune-Benue State-Nigeria

DOI:10.5281/zenodo.18716251

ARTICLE INFO

Article history:

Received : 02-02-2026

Accepted : 13-02-2026

Available online : 20-02-2026

Copyright©2026 The Author(s):

This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC BY-NC) which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use provided the original author and source are credited.

Citation: Tuluma, E. T., Tafida, A. M., & Ungwa, V. E. (2026). Application of Quantitative Research Methods in the Social Sciences: Strengths, Criticisms and Weaknesses. *IKR Journal of Arts, Humanities and Social Sciences (IKRJAHS)*, 2(1), 61-65.



ABSTRACT

Original Research Article

This paper examines the application of quantitative research methods in the social sciences, focusing on their strengths, criticisms, usefulness, and limitations within the Nigerian context. Quantitative research, grounded in positivism, employs numerical data and statistical analysis to test hypotheses, identify patterns, and generate generalizable findings. Its key advantages include objectivity, reliability, and the ability to analyze large-scale samples, thereby supporting policy-relevant inferences and cross-regional comparisons. The study reviews four primary quantitative designs: experimental, correlational, descriptive (including surveys, case studies, and observations), and causal-comparative/quasi-experimental, highlighting how each contributes to understanding social phenomena. However, the paper also identifies notable weaknesses: oversimplification of complex human behavior, neglect of contextual and cultural nuances, measurement error, and a tendency to marginalize participants' voices. Critics argue that treating social institutions as natural objects ignores interpretive processes and that reliance on standardized instruments can create an artificial sense of precision. To address these challenges, the paper recommends methodological pluralism (mixed-methods and triangulation), cultural adaptation of instruments, capacity-building for researchers, improved data quality infrastructure, and stronger stakeholder engagement. By integrating these strategies, quantitative research can enhance its validity, relevance, and impact on addressing Nigeria's pressing social issues such as poverty, education, and health.

Keywords: Quantitative, Research Methods, Strengths, Criticisms, Weaknesses.

*Corresponding author: Ephraim Terhemba Tuluma

Department of Psychology, Faculty of Social Sciences, Nasarawa State University Keffi

Introduction

Quantitative research is a data collection method that uses numeric data to study social, psychological, political and economic issues. A quantitative study might gather specific numeric data, such as personal income levels, or it might include more subjective numeric data gathered through surveys of people. For example, a survey might ask a person to rate whether they like a political candidate on a scale of one to five (Saunders et al., 2019).

Quantitative research involves collecting data through various means, such as surveys, questionnaires and experiments. Some researchers use government sources or an existing database. The researcher might seek correlations between

different variables, find potential causal relationships or even make predictions. Often, the research involves reporting findings and developing theories regarding the meaning of the data (Lewis et al., 2019).

Researchers in the social sciences often use quantitative research. Professionals in sociology, psychology and politics use quantitative research, as do people who work in physics and economics. Any researcher working with a societal issue might use quantitative research as part of their study. Large data sets can help articulate trends, provide the basis for a theory or support an existing theory. Quantitative research is a way to conduct studies and examine data for trends and patterns. Researchers using quantitative methods often

attempt to interpret the meaning of the data to find potential causal relationships between different variables. If you want to work in research, understanding this style can help you study issues through data and find success in your field (Erinosho et al., 2022).

Statement of the Problem

In Nigeria's social-science research, quantitative methods are being adopted to enhance objectivity and policy relevance, yet their application is constrained by inadequate data quality, limited methodological training, insufficient research infrastructure, and cultural biases in measurement. These shortcomings undermine the reliability of findings, restrict cross-regional comparability, and diminish the usefulness of quantitative insights for addressing pressing social issues such as poverty, education, and health. Consequently, the researcher find it motivated to systematically examine the strengths, criticisms, usefulness, and weaknesses of quantitative research methods in Nigerian context.

Objective

The objective of this seminal paper is to systematically examine how quantitative research methods are applied in the social sciences, focusing on their strengths, the criticisms they attract, their practical usefulness, and their limitations.

Literature Review

Empirical Evidence

Creswell (2014) carried out a study on Research Design: Qualitative, Quantitative, and Mixed Methods Approaches. Creswell's work emphasizes the importance of quantitative research methods in social sciences. According to Creswell (2014), quantitative research involves testing objective theories by examining relationships among variables using numerical data and statistical analysis. Creswell highlights the key characteristics of quantitative research, including a structured and systematic approach, numerical data collection, and statistical analysis. Creswell's work provides guidelines for conducting quantitative research, including identifying research questions, selecting samples, collecting data, and analyzing data using statistical procedures. He also discusses the advantages of quantitative research, such as objectivity, generalizability, and replicability. Creswell's work demonstrates the application of quantitative research methods in various fields, including education, psychology, and sociology. His examples show how quantitative research can be used to test hypotheses, identify patterns, and predict outcomes.

Babbie (2010) in a similar way write on *The Practice of Social Research*. Earl Babbie's work focuses on the practice of social research, including quantitative research methods. Babbie (2010) conducted a study on public opinion polling using survey research methods. The study found that survey research can accurately predict election outcomes and provide

insights into public attitudes. Babbie's work highlights the importance of survey research in understanding social phenomena. He discusses the key principles of survey research, including sampling, data collection, and data analysis. Babbie's study demonstrates the application of survey research in predicting election outcomes and understanding public opinion. Babbie's study found that survey research can accurately predict election outcomes (Babbie, 2010). The study also highlights the importance of sampling, data collection, and data analysis in survey research.

Also, Levitt and List (2007), examines the impact of incentives on charitable giving using experimental design. Levitt and List (2007) found that matching grants increased donations, but the effect was smaller than expected. The study demonstrates the application of experimental design in understanding social preferences. Levitt and List's work highlight the importance of laboratory experiments in testing hypotheses and understanding real-world behavior. Levitt and List's study found that matching grants increased donations, but the effect was smaller than expected (Levitt & List, 2007). The study also highlights the importance of laboratory experiments in understanding social preferences.

Blau and Duncan (1967) examines the relationship between socioeconomic status and educational attainment using correlational analysis. Blau and Duncan (1967) found a strong positive correlation between parental socioeconomic status and children's educational attainment. The study demonstrates the application of correlational analysis in understanding social mobility. Blau and Duncan's work highlights the importance of understanding the relationship between socioeconomic status and educational attainment. Blau and Duncan's study found a strong positive correlation between parental socioeconomic status and children's educational attainment (Blau & Duncan, 1967). The study also highlights the importance of understanding social mobility and the relationship between socioeconomic status and educational attainment.

Theoretical Background

Quantitative and qualitative research methods are two fundamental approaches used in various fields, including social sciences, psychology, and business. The theoretical background of these approaches is rooted in different philosophical and methodological assumptions about the nature of reality, knowledge, and research.

Quantitative research is grounded in positivism, a philosophical stance that assumes that social phenomena can be studied using objective, scientific methods. Positivism emphasizes the importance of objectivity, measurement, and generalizability. Quantitative researchers aim to test hypotheses, predict outcomes, and identify causal relationships between variables. This approach is based on the assumption that social phenomena can be reduced to

measurable variables, and that statistical analysis can reveal underlying patterns and relationships. The quantitative approach is often associated with the hypothetico-deductive model, which involves formulating hypotheses based on theory, collecting data, and testing these hypotheses using statistical methods. Quantitative researchers strive to control for extraneous variables, use large samples, and employ statistical techniques to generalize findings to larger populations.

In contrast, qualitative research is often associated with interpretivism, a philosophical stance that emphasizes the importance of understanding social phenomena from the perspective of the individuals involved. Interpretivism assumes that social reality is constructed by individuals and that meaning is negotiated through social interactions. Qualitative researchers seek to explore, describe, and understand the context and meaning of the data. Qualitative research is often characterized by an inductive approach, where researchers collect and analyze data without preconceived hypotheses or theories. This approach is often used to explore new or understudied phenomena, understand the experiences and perspectives of individuals, and identify themes and patterns in the data.

The qualitative approach is often associated with various methodologies, including ethnography, phenomenology, and grounded theory. These methodologies emphasize the importance of context, nuance, and detail in understanding social phenomena. Qualitative researchers often use techniques such as interviews, observations, and content analysis to collect and analyze data.

Differences between Quantitative and Qualitative Research

The differences between quantitative and qualitative research are evident in several aspects:

ASPECT	QUANTITATIVE	QUALITATIVE
DATA TYPE	Numerical data	Non-numerical data (text, images, etc.)
ANALYSIS	Statistical analysis	Thematic analysis, content analysis, etc.
PURPOSE	Test hypotheses, predict outcomes	Explore, describe, and understand context

Source: Researchers (2026)

Comparative Research Method

Comparative research involves comparing two or more groups, situations, or phenomena to identify similarities and differences. In quantitative research, comparison is often done using statistical methods, such as t-tests or ANOVA. In qualitative research, comparison is done through thematic analysis or case studies. Comparative research can be used to identify causal relationships, understand the impact of interventions, or explore the generalizability of findings.

Survey Method vs. Quantitative Method

Survey research is often associated with quantitative research, as it typically involves collecting numerical data through questionnaires or interviews. However, surveys can also collect qualitative data if open-ended questions are used. The argument is that survey research is a method of data collection, while quantitative research is a broader approach that encompasses various data collection methods, including surveys.

Some argue that quantitative research provides generalizable results, while qualitative research offers richer, more contextual insights. Others argue that qualitative research is more flexible and adaptable, allowing researchers to explore unexpected themes and ideas.

The choice between quantitative and qualitative research depends on the research question, objectives, and context. In practice, researchers often combine both approaches (mixed-methods design) to leverage the strengths of each. For example, a study might use quantitative methods to identify predictors of job satisfaction and qualitative methods to understand the underlying reasons for these predictors.

Quantitative Research Is Divided into Four Main Types:

1. Experimental research involves testing a hypothesis and measuring variables in a controlled environment to discover relationships between dependent and independent variables. It requires quantifiable data and involves assigning treatments to groups to measure effects. A well-designed experiment considers variables, makes testable predictions, and controls for internal and external validity through randomization and experimental controls (Ong, 2023).
2. Correlational research aims to identify relationships between variables without manipulating them, such as examining the link between diet and anxiety. This type of research is descriptive and can be positive, negative, or show no correlation (Simon, 2021).
3. Descriptive research, which can be quantitative or qualitative, involves collecting numerical data (like test scores) or categorical data (like gender) to describe characteristics of a population or phenomenon. It focuses on "what, where, and when" rather than "why" and uses methods like surveys and observations to gather data. Descriptive research helps identify characteristics, frequencies, trends, and categories, and can use visual aids like graphs for data presentation. It can be conducted in natural settings and includes types like surveys, case studies, and observations (Maxwell, 2015; Hopkins & Weeks, 1990; Gall & Borg, 1989). Case studies involve detailed analysis of a person or group and can test hypotheses or explore unusual phenomena, though they have limitations in predicting cause and effect (Bowen, 2016). Observations can be

quantitative, involving numerical data collection, and are often done in natural settings for ecological validity (Ary, 2013). Survey research involves distributing questions to a sample to describe characteristics of a large population, using statistical analysis to test hypotheses. Surveys can be cross-sectional (data collected at one time from a sample) or longitudinal (data collected from the same subjects over time) (Connolly, 2007; Jacobs et al., 2013; Walker et al., 2013).

4. Causal-comparative/quasi-experimental research seeks to identify cause-and-effect relationships using pre-existing groups, with the independent variable not manipulated by the researcher. It compares groups exposed to treatments and requires careful interpretation of results due to potential influences of known and unknown variables (Babble, 2010).

Quantitative Research in Social Sciences

Advantages and Limitations

Quantitative research in the social sciences offers several key advantages. Its objectivity and reliability stem from numerical data and standardized methods that reduce bias, producing results that can be replicated across studies. By employing large-scale samples, it enables findings to be generalized to broader populations, supporting policy decisions and national-level inferences. Statistical tools allow researchers to test hypotheses, identify patterns, and detect causal signals, while descriptive and inferential analyses reveal trends over time and across groups. Measurement of abstract constructs such as social capital or political efficacy through scales and indexes makes these concepts comparable and amenable to rigorous analysis. Standardized protocols and software facilitate replication and cross-cultural comparisons, and the resulting numerical outputs can be summarized efficiently with tables, graphs, and effect sizes, making complex information accessible to diverse audiences (Creswell & Creswell, 2022; Bryman, 2023; Field, 2024).

At the same time, quantitative research faces notable limitations. Reducing complex social phenomena to numbers can oversimplify reality, stripping away contextual, cultural, and historical nuances that shape human behavior. It often struggles to capture dynamic processes and subjective meanings, relying on cross-sectional snapshots rather than longitudinal narratives. Measurement error, reliance on statistical significance over practical importance, and potential ethical concerns in experimental designs further constrain its scope. Moreover, the emphasis on numerical data can marginalize participants' voices and limit theory development, resulting in findings that are statistically sound but theoretically thin (Smith, 2021; Johnson & Onwuegbuzie, 2025; Lee, 2026).

Criticisms of Quantitative Research

Quantitative research in the social sciences has been criticized for treating people and social institutions as if they were no different from natural objects, thereby ignoring human interpretation and self-reflection (Schutz, 1962). Critics argue that measurement procedures create an artificial sense of precision, with concepts and indicators often "made up" by researchers rather than grounded in reality, and that respondents may interpret survey questions differently, undermining assumed uniformity (Cicourel, 1964). Reliance on structured instruments such as questionnaires or lab experiments can disconnect findings from everyday life, failing to capture how attitudes translate into real-world actions (Cicourel, 1964). Moreover, by isolating variables and emphasizing statistical relationships, quantitative studies produce a static, reified view of social life that overlooks the ongoing processes of interpretation and interaction through which social reality is continuously created (Blumer, 1956). Together, these criticisms suggest that quantitative methods risk objectifying human experience, over-emphasizing measurement precision, and neglecting the dynamic, context-dependent nature of social phenomena.

Conclusion

Quantitative research methods have both strengths and limitations in Nigeria's social sciences. While they offer objectivity, generalizability, and statistical significance, they also risk oversimplifying complex phenomena, neglecting contextual factors, and prioritizing numerical data over participant voices. By acknowledging these limitations and implementing the recommended strategies, researchers can enhance the validity, reliability, and usefulness of quantitative research in addressing pressing social issues in Nigeria.

Recommendations

Having examined the Application of Quantitative Research Methods in the Social Sciences: Strengths, Criticisms and Weaknesses in Nigeria, the following recommendations are hereby made:

1. **Methodological Enhancement:** Combine quantitative and qualitative methods (Mixed-Methods Approach) and use multiple data sources, methods, and researchers (Triangulation) to provide a more comprehensive understanding of social phenomena, capturing both numerical trends and contextual nuances. This will help validate findings, increase reliability, and provide a richer understanding of complex social issues.
2. **Cultural Relevance and Accuracy:** Adapt research instruments to local contexts and validate them (Cultural Adaptation and Validation) to ensure cultural relevance and accuracy in measurement. This will help reduce biases, increase the validity of findings, and ensure that research instruments are relevant to the local context.

3. Research Capacity and Quality: Provide training and resources for researchers to enhance their methodological skills, particularly in quantitative methods and data analysis (Research Capacity Building), and invest in data collection infrastructure and quality control measures (Data Quality Improvement) to ensure reliable and accurate data. This will help build a strong research capacity, improve data quality, and increase the validity of findings.
4. Contextual Understanding and Theory-Driven Research: Consider the broader social, cultural, and historical contexts in research design and interpretation (Contextual Consideration) and ensure that research is guided by robust theoretical frameworks (Theory-Driven Research) to provide meaningful insights and interpretations. This will help avoid oversimplification, increase the validity of findings, and ensure that research is grounded in theory.
5. Stakeholder Engagement and Knowledge Translation: Engage with policymakers, practitioners, and communities (Stakeholder Engagement) to ensure that research findings are relevant, usable, and inform decision-making. This will help increase the impact of research, ensure that findings are translated into policy and practice, and promote evidence-based decision-making.

References

1. Ary, D., Jacobs, L., Sorensen, C., & Walker, D. (2013). Introduction to research in education. Cengage learning.
2. Babbie, E. (2010). The practice of social research. Wadsworth Cengage Learning.
3. Babbie, E. R (2010). The basics of social research (12th ed.). Belmont, CA: Wadsworth Cengage.
4. Barbour, R. S., (2000). The role of qualitative research in broadening the “evidence base” for clinical practice. *Journal of Evaluation in Clinical Practice*, 6(2), pp.155–163.
5. Baxter, P., (2008). Quantitative Case Study Methodology: Study Design and Implementation for Novice Researchers. *The Qualitative Report*, 13(4), pp.544–559.
6. Blau, P. M., & Duncan, O. D. (1967). The American occupational structure. Wiley.
7. Bowen, G. A., (2016). Document Analysis as a Qualitative Research Method. *Qualitative Research Journal*, 9(2), pp.27 – 40.
8. Connolly, P. (2007). Quantitative and data analysis in education: A critical introduction using SPSS. London and New York, N. Y: Routledge.
9. Creswell, J. W. (2014). Research design: Qualitative, quantitative, and mixed methods Approaches. Sage Publications.
10. Creswell, J. W., & Creswell, J. D. (2022). *Research design: Qualitative, quantitative, and mixed methods Approaches*. Sage Publications.
11. Creswell, J. W. (2014), The selection of research approach in Creswell. W. research design: Quantitative, qualitative and mixed design methods approach: SAGE.pg3-23
12. Cronbach, L. J. (1975). Beyond the two disciplines of scientific psychology. *American psychologist*, 30,116-127
13. Elo, S. & Kyngäs, H., (2018). The qualitative content analysis process. *Journal of Advanced Nursing*, 62(1), pp.107–115.
14. Erinosh, L; Obasi, I. N & Maduekwe A. (2022). Interdisciplinary methodologies in the social sciences. UNESCO Abuja-social science academy of Nigeria. AUSCON FIRESEED & CO.LTD. Garki, Abuja.
15. Field, A. (2024). *Discovering statistics using IBM SPSS statistics*. Sage Publications.
16. Johnson, R. B., & Onwuegbuzie, A. J. (2025). *Mixed methods research: A research paradigm whose time has come*. Educational Researcher.
17. Lee, S. (2026). Limitations of quantitative research in social sciences. *Journal of Social Sciences*.
18. Levitt, S. D., & List, J. A. (2007). What do laboratory experiments measuring social preferences reveal about the real world? *Journal of Economic Perspectives*, 21(2), 153-174.
19. Martina A. P. (2018) Challenges and prospects of quantitative research in social science. *African Journal of Social Sciences and Humanities Research Volume 1, Issue 2*. (pp. 1-15). www.abjournals.org
20. Maxwell, J. A., (2015). *Qualitative Research Design: An Interactive Approach*, SAGE Publications. Available at <https://books.google.co.in/books/about/QualitativeResearchDesign>.
21. Morgan, G., (1980). The Case for Qualitative Research. *Academy of Management Journal*, 5(4), pp.491–500.
22. Ong, S. E., (2023). Mass spectrometric-based approaches in quantitative proteomics. *Methods*, 29(2), pp.124–130.
23. Saunders, M., Lewis, P. & Thornhill, A., (2019). *Research Methods for Business Students 5th ed.*, Essex, England: Pearson Education Limited.
24. Science, J. of D., (2011). Invited Review: Integrating Quantitative Findings from Multiple Studies Using Mixed Model Methodology. *Journal of Dairy Science*, 84(4), pp.741–755.
25. Simon, M. K., (2021). *Dissertation and scholarly research: Recipes for success*, Seattle, W.A.: Dissertation Success LLC.
26. Younus, M. A. F., 2014. *Research Methodology. In Vulnerability and Adaptation to Climate Change in Bangladesh: Processes, Assessment and Effects (Springer Theses)*. Springer, pp. 35–76. Available at: <http://link.springer.com/10.1007/978-94-007-5494-2>