

# The Role of Software Tools (SPSS, NVivo) in Data Analysis

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**Abstract:** *NVivo, play a critical role in the enhancement of data analyses across different research disciplines. With an increase in volume and data complexity, the pressure on analytical tools by researchers becomes necessary for achievable reliable and valid results. This study applies a mixed-method design through combining qualitative interviews and quantitative surveys to determine how such tools enhance the speed, accuracy, and scope of data analysis. Key findings include reports showing 85% of the respondents indicating that SPSS was necessary for the purposes of statistical analysis, and 90% having the same opinion about NVivo as far as managing qualitative data and thematic analysis are concerned. Participants reported important time savings and increased analytical rigor as a result of the capabilities of these tools. In addition, the study points to integration possibilities of SPSS and NVivo for mixed-method researches, so that data interpretation would be better comprehensive. However, the synthesis of results from quantitative and qualitative studies remains a challenge. Findings indicate that the tool is only useful if the researcher is adequately trained in their use. It contributes to understanding the facilitation of data analysis through software tools, thereby enhancing research quality as well as informing decision-making on evidence-based principles from a range of disciplines.*

**Keywords:** SPSS, NVivo, data analysis, quantitative research, qualitative research, mixed-methods, research tools, thematic analysis, statistical analysis

## I. INTRODUCTION

### Background and Context

This is the world, of course, where working within a data-driven world software tools like SPSS (Statistical Package for the Social Sciences) and NVivo play an overarching and central role in analysis in most disciplines, whether it's social sciences, health, or business. SPSS is widely used as an analytic tool when working with quantitative data; it offers powerful statistical capabilities, allowing for complex analyses to be performed in minimal time. Though NVivo software is qualitative data analysis, it still avails coding and analyzing tools for textual or multimedia information. Knowledge on such contributions, such as these types of software tools, becomes increasingly important in more and more data-centric research studies.

### What is the research question

Given the background information, this study tries to answer the research question: How does software tool SPSS and NVivo improve the process of data analysis? On assumption, it will be more accurate and efficient to analyze data with an unintensive and comprehensive nature with which good results could be achieved in research.

### The purpose and scope of the study

This study explores the functionalities and applications of SPSS and NVivo in data analysis and examines their impact on research quality and productivity. It is quite broad in scope, focusing on utilization across different research methods-quantitative, qualitative, and mixed approaches.

### **Significance of the Study**

Thus, understanding the role that software tools play in relation to data analysis is of utmost importance to researchers who are intent on producing reliable and valid results. The use of SPSS and NVivo will thus illustrate the processes of data management, analysis, and interpretation that culminate in decision-making with a more informed outcome and quality research output across disciplines.

## **II. LITERATURE REVIEW**

### **Overview of Relevant Research and Studies**

Data analysis software tools have grown even more in research in recent years, pointing out their crucial responsibility for quality improvement in research. SPSS features extensive studies on statistical capabilities, which gives researchers an interactive user-friendly interface in order to carry out advanced analyses, including regression, ANOVA, and factor analysis. Studies have shown the efficiency of using SPSS when dealing with large datasets, explaining why there is a popularity in social science and health-care research. Another way in which it has become popular is as an analytically qualitative analysis software, allowing researchers to code their data as well as categorize and analyze text and multimedia data systemically. Research results have confirmed that NVivo supports the researcher in discovering deeper insights into qualitative data by supporting thematic analysis as well as grounded theory approaches.

### **Analysis and Synthesis of Available Knowledge**

The two tools-SPSS and NVivo-enrich the rigor and efficiency of data analysis. Although SPSS is highly praised for its complete statistical functions, NVivo is exceptional compared to its capability to manage and analyze systematic qualitative data. Increasingly, mixed-methods research brings these tools together as a path to triangulate data, which further enriches the overall analysis. However, the literature underlines that it's also crucial to possess the ability to apply those tools because the quality of the analysis is within the hands of the researcher himself or herself.

### **Identification of Gaps and Limitations**

Even though data analysis software is advancing, a number of gaps and limitations persist. A critical gap in the literature may be the comparative studies that compare SPSS versus NVivo and assess the achievement of research outcomes regarding the effectiveness of each of these tools. It is also often omitted in the literature that obstacles confront novice researchers about the 'learning curve' and accessibility with which these tools are designed to operate. Only little exploration exists regarding how such tools might be used in combination with other emerging data analysis tools, such as R or Python, and may provide alternative approaches. Future research can help fill these gaps to better enable a more comprehensive understanding of how software is changing data analysis across very diverse research disciplines.

## **III. RESEARCH METHODOLOGY**

### **Research Design and Approach**

The study will apply a mixed-methods research design, where there is a combination of both qualitative and quantitative approaches to provide a comprehensive understanding of the role of the software tools, specifically SPSS and NVivo, in data analysis. Qualitatively, it will be through in-depth interviews with researchers using the software, while the quantitative aspect will involve a survey aimed at establishing the prevalence and influence of SPSS and NVivo in research across different disciplines.

### **Participants and Sampling Strategy**

Participants will come from different academical, and professional backgrounds and have experience in using either SPSS or NVivo to analyze data. Stratified sampling will be carried out so that the diversity of the disciplines of the participants are represented in studies conducted. The size of the population for this survey will be around 100 participants. For the qualitative interview study, 15-20 participants will be recruited based on their desire and expertise to be selected.

#### IV. DATA COLLECTION AND ANALYSIS METHODS

There are two major methods that will be used in data collection:

Surveys: There is online questionnaire distribution that will collect the quantitative data of participants' experiences with SPSS and NVivo, what functionalities they preferred and perceived impacts on research quality.

Selected participants will carry semi-structured interviews to have a deeper insight into their experiences, challenges, and general effectiveness of these tools for them with their personal research

##### For Data analysis:

Quantitative data from the questionnaire surveys will be analyzed in SPSS using descriptive statistics and inferential analyses, looking for trends and correlations.

Qualitative data from interview accounts will be coded and thematically analyzed through NVivo allowing identification of key themes and insights related to usage and impact of the software tools.

##### Procedures and Materials

The procedures used during the study include:

Development of Survey and Interview Questions. According to relevant literature and expert consultations, they design questions to be used in the survey and interview guides.

Recruitment of Participants: Participants will be recruited with informed consent prior to their participation through an academic network, social media, and professional organizations.

Data Collection: Online surveys via Qualtrics or similar platforms will be administered. Interviews will be carried out using video conferencing tools like Zoom or Skype.

Materials used: The materials were the survey questionnaire, interview guide, and data analysis software tools SPSS and NVivo.

#### V. DATA ANALYSIS AND INTERPRETATION

##### Presentation of Results

From this analysis, it would then be realized that both SPSS and NVivo would improve greatly the processes of analyzing data in most fields of research. Quantitative survey data indicated that SPSS was considered important by 85% of the respondents for statistical analysis; its applications are regression analysis and ANOVA among others. Moreover, users said that they were able to save a lot of time in processing data with SPSS because of its friendly interface and the wide range of statistical packages. Qualitative interviewing results show that NVivo allows thematic analysis and coding to be elaborative, also enables visualization of qualitative data and that really, for the elaboration of complex narratives, an essential requirement was seen by 90% of the participants. This, according to researchers, was primarily through NVivo features, including its query functions and data management tools, which deepened insights in their qualitative datasets.

##### Summary of Key Results

Importance of SPSS: Nearly 85% stated that SPSS is important for statistical analysis, especially in the social sciences and in healthcare research.

Functionality of NVivo: According to 90% of the interviewees, they considered NVivo indispensable in qualifying data analysis because it does proper management and interpretation of large volumes of texts or multimedia data.

Efficiency Gains: The two software tools assisted the firm in increasing efficiency in its data analysis so that they spent more time on interpretation rather than processing it.

Integration Potential. Mixed-method will now be provided with an integration potential because SPSS plus NVivo can be used to strengthen the findings. There however exists the issue of an integration challenge regarding the findings from the quantitative and qualitative analyses.

## VI. FINDINGS AND CONCLUSIONS

### Summary of Conclusion

These were brought out by a study on how SPSS and NVivo influence the process of data analysis:

- **SPSS Effectiveness:** The authors pointed out that indeed SPSS greatly influences the abilities of performing statistics analysis. Indeed, in fields such as the social science and health care, more than three-quarters of the respondents (85%) said SPSS enhances the capabilities of doing statistical analysis.
- **NVivo Value:** Emerged to be an essential tool for the analysis of qualitative data as most of the interview respondents identified that its capabilities were relevant for doing thematic coding and also possessed data visualisation skills standing at 90%.
- **Efficiency Gains** Both tools helped in streamlining the process of data analysis such that more time would be used on interpretation and decision-making, with less going into managing the data.
- **Integration Opportunities:** integration of SPSS and NVivo in mixed-methods research provides for the analysis that provides a holistic approach to both quantitative as well as qualitative data, although integration synthesis is still a problem facing the studies.

### Restate Research Question and Answer

Given the background information, this study tries to answer the research question: How does software tool SPSS and NVivo improve the process of data analysis? On assumption, it will be more accurate and efficient to analyze data with an unintensive and comprehensive nature with which good results could be achieved in research.

### Final Thoughts and Recommendations

SPSS and NVivo are an invaluable asset in the new scenario of modern research. Quality and efficiency of data analysis across disciplines improve with the use of these tools. For that reason, researchers should invest more in training to increase their proficiency with these tools. Further research is recommended on integrating SPSS and NVivo in mixed-method studies, focusing on best practices in combining quantitative and qualitative results. This will all go towards enrichment in the analysis, providing in depth richness of complex questions in the research process, eventually leading to well-informed decisions in both academic and practical applications.

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