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The impact of NVivo in qualitative research: Perspectives from graduate students

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Keywords

Analysis software;
graduate students;
NVivo;
perspectives;
qualitative data;
Thailand.

Abstract

This study aims to explore the impact of NVivo, a qualitative data analysis software, from the perspective of graduate students. The study employed a qualitative method, utilizing in-depth interviews with ten graduate students selected through purposive sampling. The data were analyzed using content analysis and NVivo. NVivo has become a valuable asset in the toolkit of graduate students engaged in qualitative research. The software's ability to organize and analyze vast amounts of qualitative data enhances research efficiency, facilitates collaboration, and supports the production of high-quality research outcomes. However, it is essential to recognize the challenges associated with implementing NVivo and to provide the necessary resources and support to students, ensuring they can fully leverage its potential. As graduate students continue to embrace NVivo in their research endeavors, its impact on qualitative research is expected to grow significantly, advancing the field and contributing to valuable insights and discoveries. This study contributes to the broader field of qualitative research by providing valuable insights into the impact of NVivo from the perspective of graduate students. It enhances our understanding of how NVivo enhances research efficiency, facilitates collaboration, and addresses challenges in implementing the software. These contributions contribute to the advancement of qualitative research methodologies and inform best practices for utilizing NVivo effectively.

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Introduction

Every study must include an explicit, disciplined, and systematic approach in order to produce the most appropriate results. Qualitative research is a common component of graduate students' research projects as it offers several benefits for graduate students, particularly in disciplines such as social sciences, humanities, education, and health sciences (Hunt et al., 2009; Mohajan, 2018; Tilley, 2019; Tomaszewski et al., 2020). Qualitative research is a research method used to gather in-depth understanding and insights into human behavior, attitudes, experiences, and perceptions. It aims to explore and interpret the meanings, beliefs, and motivations underlying individuals' actions and interactions within a specific context. Unlike quantitative research that focuses on numerical data and statistical analysis, qualitative research is primarily concerned with capturing rich, descriptive data. It relies on methods such as interviews, focus groups, observations, case studies, and textual analysis to gather information. These methods allow researchers to delve into the participants' perspectives, emotions, and subjective experiences, providing a detailed understanding of the research topic (Austin & Sutton, 2014; Taherdoost, 2021; Tenny et al., 2022). In short, qualitative research is primarily concerned with understanding the "how" and "why" aspects of a phenomenon, as opposed to the quantitative approach that focuses on "how many" or "how often" something occurs (Mulisa, 2022).

Qualitative research often employs a flexible and iterative approach, allowing researchers to adapt their data collection and analysis techniques as they gain new insights. It emphasizes the researcher's involvement in the research process, recognizing their influence on data collection, interpretation, and representation. This involvement is known as reflexivity and involves acknowledging the potential biases and subjectivity that researchers bring to the study (Busetto et al., 2020; Köhler et al., 2022). When conducting qualitative research, researchers usually analyze data by coding and categorizing information. They identify patterns, themes, and relationships within the data, extracting key ideas and concepts and interpreting their significance within the broader research context. This analysis not only aids researchers in exploring complex phenomena, generating theories, informing policy decisions, and improving practices but also provides a deeper understanding of human experiences and social processes (Bengtsson, 2016; Collins & Stockton, 2018; Mohajan, 2018; Tomaszewski et al., 2020).

In recent years, the use of qualitative data analysis software such as NVivo has gained popularity among researchers in various disciplines due to its potential to streamline and enhance qualitative research processes. One of the notable advantages of NVivo is its ability to efficiently manage and organize large volumes of qualitative data, ranging from textual documents to multimedia sources, enabling researchers to delve deeper into complex datasets. By providing a user-friendly interface and a comprehensive set of tools for coding, categorization, and exploration of data, NVivo facilitates the extraction of meaningful insights and patterns from diverse sources, ultimately contributing to the rigor and depth of research findings. Moreover, NVivo supports collaborative work, allowing multiple researchers

to collaborate and share data, fostering a sense of teamwork and enhancing overall research productivity (Allsop et al., 2022; Fearnley, 2022; Niedbalski & Ślęzak, 2023).

Despite these advantages, it is essential to acknowledge some potential drawbacks associated with NVivo. First and foremost, the cost of acquiring NVivo licenses and the need for additional training might pose financial and time constraints, particularly for individual researchers or smaller research projects with limited resources. Furthermore, the learning curve for mastering NVivo's advanced functionalities could be steep, potentially requiring considerable effort and practice to fully exploit the software's capabilities. Researchers must also consider the potential risk of technical issues and data compatibility challenges that may arise when dealing with large or complex datasets, which could impede the smooth progress of research activities. Notwithstanding these limitations, the benefits offered by NVivo in terms of data management, analysis, and collaboration make it a compelling choice for qualitative researchers seeking to maximize the potential of their research endeavors (Kaefer et al., 2015; Dollah et al., 2017; Lund et al., 2023).

While other articles may have reached similar conclusions regarding NVivo's benefits and challenges, they have used different participant groups, which can lead to variations in experiences and perspectives. This study aims to explain the impact of NVivo, a qualitative data analysis software, from the perspectives of graduate students. By specifically examining the perspectives of graduate students, this research provides unique insights into how NVivo influences the qualitative research process from the viewpoint of individuals who are at a critical stage of their academic and research careers. This research's originality lies in its unique focus on graduate students as the participant group, providing valuable and distinct insights into the impact of NVivo on their qualitative research experiences. The choice of participants, in this case, is crucial as graduate students represent a distinct demographic with specific research needs and challenges. Their academic pursuits often involve extensive qualitative research, making NVivo an essential tool in their research toolkit. As a result, their experiences with NVivo might differ from those of other researchers or professionals. The study highlights how NVivo contributes to the efficiency and quality of graduate students' research outcomes, fostering collaboration and facilitating the production of valuable insights and discoveries. Additionally, it acknowledges the challenges they face when implementing the software, which may differ from those encountered by other participant groups. Furthermore, this research contributes to the broader field of qualitative research by providing a targeted examination of NVivo's impact on graduate students. While other studies may have covered a wide range of participants or focused on researchers from different academic levels, this study specifically homes in on graduate students, filling a potential gap in the existing literature. The findings shed light on how NVivo benefits this particular group and provides recommendations for optimizing its utilization to meet their specific needs and circumstances.

The paper is structured into six sections, each contributing to a comprehensive and informative analysis. The first section introduces the study, emphasizing its significance

and objectives. In the second section, a thorough review of existing literature is conducted. The third section outlines the research methodology employed to collect relevant data. The fourth section presents the findings and results obtained from the study. In the fifth section, a detailed discussion takes place, analyzing and interpreting the results in relation to the research objectives. The final section presents the conclusions drawn from the study, addresses any limitations encountered during the research process, and provides recommendations for future studies.

Research objective

In the realm of qualitative research, NVivo holds significant potential for enhancing the research process and outcomes. Therefore, it is a critical topic to study. This study aims to explain the impact of NVivo, a qualitative data analysis software, from the perspectives of graduate students. By providing insights into the benefits and challenges faced by graduate students when employing NVivo in their research projects, this study seeks to shed light on the value of incorporating NVivo into qualitative research methodologies.

Research question

What are the perspectives of graduate students on the impact of NVivo software on the conduct of their qualitative research?

Related literature review

NVivo is a powerful qualitative data analysis software that provides researchers and analysts with a comprehensive set of tools not only to manage and organize but also to analyze qualitative data. NVivo offers a user-friendly interface and a wide range of features designed to facilitate in-depth exploration and understanding of qualitative research data (Allsop et al., 2022; Dhakal, 2022). With NVivo, researchers can import various types of data, including text documents, audio and video recordings, images, surveys, social media data, and more. The software supports multiple file formats, allowing users to seamlessly integrate and work with diverse data sources. In addition, one of the key strengths of NVivo is its data organization capabilities. Users can create nodes or codes to label and tag specific sections of their data, making it easier to categorize and retrieve information based on themes or topics of interest. This flexible coding system enables researchers to analyze data at a granular level, identify patterns, and uncover meaningful insights (Jackson & Bazeley, 2019; Kent State University, 2023).

NVivo also offers support for those employing mixed methods in their research. NVivo enables researchers to analyze open-ended survey questions and conduct comparisons based on demographic data. Moreover, the software allows for seamless data exchange with other applications such as Microsoft Excel and IBM SPSS Statistics. This integration enhances the versatility of NVivo, empowering researchers to incorporate quantitative elements into their analysis while

benefiting from the robust qualitative analysis capabilities the software provides. NVivo offers a range of analysis tools tailored to different data types. For text-based data, users can perform text searches, conduct word frequency analyses, code and annotate documents, and use various techniques for text analysis. The software also supports the analysis of multimedia content, allowing users to transcribe audio and video recordings, code specific segments, and analyze visual data to gain a deeper understanding of their research material (NVivo, n.d.; O'Donoghue, 2022; University of Illinois, 2023).

The significance of software in supporting data analysis for researchers is increasingly recognized. In the realm of social sciences, the Statistical Package for the Social Sciences (SPSS) has long been the dominant tool for quantitative data analysis. However, there exists a broader array of software tools available to facilitate qualitative data analysis. Moreover, there has been a noticeable rise in the mention of qualitative software tools in published works (Sotiriadou et al., 2014). The utilization of qualitative data analysis software has witnessed significant growth in the past twenty years, benefiting from advancements in technology that enable researchers to analyze larger volumes of data at a faster pace and employ more intricate analytical approaches (Robins & Eisen, 2017). In the field of qualitative management and business studies, NVivo has been the prevailing software package of choice (Sotiriadou et al., 2014).

Johnston (2006) provided insights gained from over 11 years of experience in teaching and utilizing qualitative data analysis software, specifically QSR NUD*IST and NVivo, within doctoral research. The author highlights the challenges that arise from the existing separation between qualitative methods training and qualitative data analysis software training, which often leads to disjointed learning curves in terms of technical skills and methodological understanding. This poses difficulties for doctoral students, as they may not receive the necessary support and exposure to navigate the ongoing 'methods revolution' through methods literature, their postgraduate training programs, or their supervisors. The paper discussed three significant factors influencing the use of qualitative data analysis software, specifically QSR NVivo, in the context of teaching and learning. Firstly, there is an increasing popularity of qualitative data analysis software among individuals from traditionally positivistic backgrounds, indicating a shift towards embracing computer-assisted approaches in qualitative research. Secondly, the software offers the promise of enhanced transparency in research processes, which can be appealing to researchers seeking to improve rigor and credibility. Lastly, many individuals rely on the free tutorials provided with the software to acquire both qualitative research methods knowledge and proficiency in software operations.

Woods et al. (2016) discussed the use of qualitative data analysis software programs, including ATLAS.ti™ and NVivo™, in qualitative research. The analysis revealed several key findings. Firstly, the number of articles reporting the use of qualitative data analysis software programs is increasing annually, indicating the growing adoption of these tools in qualitative research. The majority of studies

utilizing ATLAS.ti™ and NVivo™ were published in health sciences journals, and the authors primarily originated from the United Kingdom, United States, Netherlands, Canada, and Australia. Regarding research design, qualitative data analysis software programs were employed to support various types of studies. The most commonly analyzed data sources included interviews, focus groups, documents, field notes, and open-ended survey questions. Researchers predominantly used qualitative data analysis software for data management and analysis, with fewer utilizing it for data collection or creation, as well as for visually representing their methods and findings. The study has raised important considerations regarding the extent to which qualitative data analysis software users have fully leveraged the potential of these programs to support new research approaches. While the usage of qualitative data analysis software programs has increased, the analysis suggests that there may still be untapped opportunities for utilizing these tools in innovative ways.

Dalkin et al. (2021) addressed the need for enhanced transparency in realist methods, specifically in the process of developing and refining program theories. Their study showcases the utilization of NUD*IST Vivo (NVivo), a computer-assisted qualitative data analysis software, for the purpose of building and refining program theories through the analysis of literature and interview data within a realist evaluation. The authors emphasize the intricacies involved in coding various data sources into nodes and child nodes, alongside the creation of 'attached memos' to document the progression of theory generation. NVivo plays a pivotal role in establishing a transparent and well-documented audit trail of programme theory refinement, aligning with the growing demand for increased transparency in realist analysis. The RAMESES I and II initiatives have made significant contributions by introducing consensus-based and evidence-based reporting guidelines to enhance transparency in reporting realistic research. Additionally, incorporating NVivo into realist approaches can offer a structured framework for the iterative and complex process of generating, refining, and testing intricate program theories using multiple data sources concurrently. This utilization of NVivo effectively establishes a well-organized record of the analytical process, reinforcing its rigor and transparency.

Elliott (2022) discussed the preferred methods for analyzing large volumes of text responses, particularly in the context of research involving open-ended questions (OEQs). When dealing with thousands of responses and focusing primarily on the content of the text rather than its form, automated analysis is often favored over using specialized software like NVivo (a CAQDAS package). Large sample sizes can help mitigate imprecision and potential misinterpretations caused by the ambiguity of language. An example is given of a study using Natural Language Processing (NLP) and topic modeling in R to analyze over 6,500 responses to an open-ended question (OEQ) about imagining being 60. The focus is on exploring gender and social class differences in the responses. However, this automated analysis only provides a broad overview of frequently mentioned topics by different groups. In contrast, NVivo12 is highlighted as a more comprehensive tool for analyzing smaller samples (a few hundred responses). It allows researchers to identify

and count specific codes like the use of the word "not" but also provides the flexibility to delve deeper into the data through qualitative or hermeneutic analysis. This approach enables the identification of strategies individuals use when responding to questions, and it allows for closer attention to the form and style of responses. One advantage of using OEQs is that they provide access to respondents' thoughts and ideas in their own words, allowing for a more subtle analysis of the specific vocabulary and phraseology used by participants. Such nuanced examination can reveal patterns and deeper insights.

In a recent study, Tang (2023) established that NVivo software is widely favored as a valuable tool for facilitating qualitative analyses. Specifically designed for exploring and categorizing text-based data, NVivo offers a range of features, including code-and-retrieve capabilities for conducting thematic analyses. Additionally, the software provides functions that enable researchers to establish connections between codes or categories of information, facilitating the construction of conceptual frameworks and even theories based on the data.

The summary of the literature overview in this study highlights the significance of NVivo software in qualitative research. NVivo offers a comprehensive set of tools to manage, organize, and analyze qualitative data, making it a popular choice among researchers. The software's user-friendly interface and various features enable in-depth exploration and understanding of text-based data. It supports multiple file formats, provides flexible coding systems, and facilitates the analysis of multimedia content. The literature also emphasizes the growing adoption of qualitative data analysis software and the potential for increased transparency and rigor in research processes. The focus of the research being reported is on exploring the impact of NVivo from the perspective of graduate students, offering unique insights tailored to this specific group of researchers.

Methodology

In this study, a qualitative research approach was utilized as a research strategy, incorporating in-depth interviews to gather comprehensive and precise responses in line with the research objectives. The interview protocol focused specifically on how graduate students perceive NVivo as a support tool and consisted of open-ended questions that allowed for detailed responses. The interviews were conducted in English, offering both in-person and remote options, and audio recordings were utilized to facilitate analysis. Furthermore, the study employed the documentary method to examine relevant survey questions from secondary data in order to obtain primary data results. To guide the selection of participants and shape the interview questions, the researchers established clear research objectives, questions, and topics. Purposive sampling was employed to select participants based on their relevant characteristics and experiences. In addition to the structured questions, the authors also incorporated open-ended questions into the study design. This deliberate choice allowed the participants to express their opinions more freely and in-

depth, contributing to a richer and more comprehensive understanding of the research topic.

Prior to the main study, a pilot test was conducted with a small group of participants to ensure the clarity of the questions. The participants were presented with the interview questions and encouraged to provide feedback on their clarity, relevance, and appropriateness. This valuable feedback helped identify any potential ambiguities or misunderstandings in the questions. Based on the input received from the participants, adjustments and improvements were made to the wording and structure of the interview questions. Furthermore, the pilot test served to assess the participants' comfort level with the questions and the overall interview process, ensuring that they would feel at ease during the actual interviews. Informed consent was obtained from the participants, and the interviews were conducted in comfortable settings, respecting their preferences. Detailed notes or recordings were taken during the interviews, which were subsequently transcribed for analysis. Qualitative data analysis techniques, such as content analysis, were applied to identify patterns, themes, and relationships within the data. The interpretation of the findings took into account the research objectives, revealing significant insights and implications.

The interview questions were as follows:

- How has NVivo helped you in organizing and managing your qualitative data effectively?
- Can you share an example of how NVivo has streamlined your analysis processes and made them more efficient?
- In what ways has NVivo facilitated collaboration among team members and enhanced teamwork in your research projects?
- How have the visual tools in NVivo enhanced your data exploration and visualization process? Could you provide an example of how NVivo has enhanced your data exploration and visualization, leading to deeper insights?
- How has the use of NVivo ensured rigorous analysis in your qualitative research?
- Can you discuss how the integration of literature within NVivo has impacted the depth and quality of your research findings?
- How has NVivo increased your productivity in qualitative research tasks? Can you provide specific examples?
- What challenges have you faced in learning and utilizing NVivo effectively, and how have you overcome them?

- How have you addressed the challenge of maintaining consistency and accuracy in data coding and analysis using NVivo?
- How have you managed the cost considerations associated with acquiring an NVivo license for your research projects?

According to Francis et al. (2010) and Namey (2017), a minimum of six interviews appears to be the optimal number for achieving data saturation in qualitative research. Therefore, this study utilized purposive sampling, a recognized qualitative research technique, to select ten key informants based on the researchers' expertise, aligning with the objectives of the study. This sampling method aimed to gather comprehensive knowledge about a specific population or phenomenon of interest. The inclusion of graduate students in the study was based on their experience, expertise, and familiarity with the subject being investigated, ensuring valuable insights. The participants needed to fulfill three inclusion criteria: being at least 18 years old, being Thai graduate students studying in Bangkok, Thailand, and possessing recent knowledge and experience in using NVivo. The data from the interviews were collected in May 2023.

Ten graduate students were interviewed to gather their perceptions of the use of NVivo. Table 1 presents the information of the respondents, including their gender, age, and major, as well as the date and time of the interviews. The sample comprised ten graduate students, with an equal distribution of five males and five females. Their ages ranged from 28 to 48. There were two graduate students pursuing Ph.D. degrees in Communication Studies, one in Entrepreneurship, two in Education, two in Business Administration, one in Political Science, one in Finance, and one in International Business.

Table 1. Demographic information on the respondents and interview dates and times.

| No. | Gender | Age | Major | Date and time of interview |
|-----|--------|-----|----------------------------------|----------------------------|
| R1 | Male | 29 | Ph.D. in Communication Studies | May 02, 2023 at 09:30 am |
| R2 | Male | 32 | Ph.D. in Entrepreneurship | May 02, 2023 at 10:00 am |
| R3 | Male | 47 | Ph.D. in Education | May 02, 2023 at 10:30 am |
| R4 | Male | 31 | Ph.D. in Business Administration | May 02, 2023 at 11:00 am |
| R5 | Male | 28 | Ph.D. in Communication Studies | May 02, 2023 at 11:30 am |
| R6 | Female | 43 | Ph.D. in Political Science | May 03, 2023 at 09:00 am |
| R7 | Female | 31 | Ph.D. in Education | May 03, 2023 at 09:30 am |
| R8 | Female | 44 | Ph.D. in Finance | May 03, 2023 at 10:00 am |
| R9 | Female | 36 | Ph.D. in International Business | May 03, 2023 at 10:30 am |
| R10 | Female | 48 | Ph.D. in Business Administration | May 04, 2023 at 11:00 am |

The researchers employed content analysis for data analysis, a widely used method in qualitative research for identifying patterns, themes, and relationships within textual data. The data collected from the in-depth interviews were transcribed and carefully reviewed to extract meaningful insights. To facilitate the data analysis process and manage the extensive qualitative data, the researchers utilized NVivo, a powerful qualitative data analysis tool. NVivo enables efficient organization, categorization, and analysis

of data, supporting a systematic and rigorous exploration of themes and patterns identified during content analysis. The combination of content analysis and NVivo ensured a robust and thorough examination of the data, leading to a deeper understanding of the participants' experiences, perceptions, and the impact of NVivo, a qualitative data analysis software, from the perspective of graduate students.

Results

In the study, participants' responses were analyzed to identify various themes. The findings revealed several benefits of using NVivo, such as efficient data organization and management, streamlined analysis, improved data exploration and visualization, collaboration and teamwork, integration of literature, and time-saving and increased productivity. Additionally, the study highlighted certain challenges associated with using NVivo, including a learning curve, difficulties in data management and organization, and considerations regarding cost. The interviews and analysis were carried out using content analysis and the NVivo software. To enhance the comprehensibility of the results, a word frequency query was employed, and the commonly used words by participants during the interviews were visually represented in a word cloud (Figure 1). A word cloud is a graphical representation of text data, where words are displayed in different sizes based on their frequency of occurrence in the text. Word clouds are often used to provide a quick visual summary of the most commonly used words in a given dataset.



Figure 1. Word cloud.

Benefits of using NVivo

NVivo, as perceived by graduate students, has had a significant impact on graduate students' research and overall academic experience in several ways, including efficient organization and management of data, streamlined data analysis, enhanced data exploration and visualization, collaboration and teamwork, literature integration, and time-saving and

productivity. NVivo has had a transformative impact on graduate students' qualitative research endeavors. It has improved data organization, streamlined analysis processes, facilitated collaboration, enhanced data exploration and visualization, ensured rigorous analysis, integrated literature, and increased productivity. By leveraging the capabilities of NVivo, graduate students can conduct more rigorous and insightful qualitative research, leading to high-quality scholarly outputs.

Efficient organization and management of data

NVivo allows graduate students to store, organize, and manage their qualitative data in a systematic and efficient manner. It provides a centralized platform where they can import and organize various data sources such as interviews, surveys, documents, audio/video recordings, and literature. This makes it easier to access and retrieve specific data during analysis, saving valuable time and effort.

NVivo allows us to store and organize our qualitative data in a really systematic way. We can import all our interviews, surveys, documents, audio/video recordings, and even literature into one centralized platform. It's so much easier to access and retrieve specific data during analysis (R1).

With NVivo, you can create folders and categories to sort your data. You can tag and label specific sections of interviews or documents, and the software automatically links related information together. It saves so much time because you don't have to search through endless files and documents anymore (R3).

NVivo has a range of tools for data analysis. It supports various coding techniques, so you can identify patterns and themes within your data. It also has visualizations like charts and graphs, which make it easier to understand complex relationships. And the best part is that it's all in one place, so you don't have to switch between different software or applications (R4).

Streamlined data analysis

NVivo is perceived by graduate students as a valuable tool that offers a range of features to facilitate data analysis. The software provides support for various coding techniques, particularly thematic coding, which empowers graduate students to identify patterns, themes, and relationships within their data. With easy-to-use annotation, highlighting, and data segment categorization functionalities, NVivo streamlines the analysis process, providing a more structured and systematic approach to research.

NVivo can enhance the quality and rigor of qualitative analysis. It provides a structured framework for analyzing data, making it easier to draw meaningful conclusions and support your research findings. It's a valuable tool for graduate

students like us who rely on qualitative research methods (R8).

NVivo is great for qualitative data analysis. It has a bunch of tools and features that make the analysis process much easier. For example, it supports different coding techniques like thematic coding. It helps you identify patterns, themes, and relationships within your data (R9).

NVivo also allows you to annotate and categorize your data segments. You can add notes, comments, or even your own interpretations right alongside the relevant sections. This helps in keeping track of your thought process and provides a comprehensive analysis (R10).

Enhanced data exploration and visualization

NVivo offers visual tools that help graduate students explore their data in meaningful ways. It enables the creation of charts, graphs, and diagrams to visualize patterns and trends within the data. These visual representations can aid in data interpretation and provide a clearer understanding of complex relationships and concepts.

NVivo's visual tools allow you to see connections and relationships between different themes or concepts. You can also create diagrams to illustrate complex relationships or create visual summaries of your findings. It enhances your data interpretation process and helps communicate your research more effectively (R2).

NVivo has some great visual tools that allow you to explore your data in meaningful ways. You can create charts, graphs, and diagrams to visualize patterns and trends within your qualitative data (R6).

Collaboration and teamwork

NVivo supports collaborative work, allowing graduate students to work together on a research project. It enables sharing and synchronization of project files, coding schemes, and annotations, facilitating teamwork and promoting a coordinated approach to qualitative analysis. This is particularly beneficial for interdisciplinary research projects or when working in research teams.

NVivo allows multiple graduate students to work on the same research project simultaneously. It enables sharing and synchronization of project files, coding schemes, and annotations. It's great for promoting teamwork and maintaining a coordinated approach to qualitative analysis (R2).

NVivo is really convenient! It makes collaboration much smoother. It's especially useful when working in research teams or interdisciplinary projects. We can share our coding schemes and annotations, allowing everyone to see and contribute to the analysis process. It fosters a coordinated approach,

ensuring consistency and collaboration among team members (R5).

Let's say we're working on a research project together. We can both access the project files and work on them simultaneously. Any changes or updates made by one person are automatically synced for everyone else. This eliminates the need to manually merge different versions of files or worry about conflicting changes (R9).

Literature integration

NVivo enables the integration of literature and external references within the software. Graduate students can link their qualitative data with relevant literature, enabling a comprehensive analysis that combines empirical evidence with existing theoretical frameworks. This integration fosters a deeper understanding of the research context and facilitates theoretical interpretations.

NVivo allows you to integrate literature and external references directly into the software. You can link your qualitative data with relevant literature, which helps in combining empirical evidence with existing theoretical frameworks. It's really helpful for a comprehensive analysis (R1).

NVivo enables you to make connections between your qualitative data and the literature you've reviewed. You can reference specific sections or concepts from the literature within your coding and analysis process. This integration helps in developing theoretical interpretations and supporting your research findings with existing scholarly work (R6).

Let's say you have a collection of journal articles or book chapters that are relevant to your research. In NVivo, you can import and link those references to your qualitative data. This integration allows you to connect your empirical findings with existing theories and concepts, fostering a deeper understanding of the research context (R9).

Time-saving and productivity

NVivo automates many manual tasks involved in qualitative analysis, such as data organization, coding, and retrieval. This saves graduate students considerable time and effort, allowing them to focus on higher-order analysis and interpretation. The software's efficiency and productivity-enhancing features enable students to work more effectively, especially when dealing with large volumes of qualitative data.

NVivo's automation allows us to focus on higher-order analysis and interpretation rather than getting caught up in the mundane tasks of organizing and coding data. It enhances our productivity and enables us to work more effectively, even with large volumes of qualitative data. By automating manual tasks, NVivo helps us work more efficiently

and effectively. It allows us to devote our energy to the critical thinking and analysis required in qualitative research (R6).

NVivo's automation features extend to coding as well. It offers tools that allow you to code your data, which involves assigning labels or categories to different segments. The software can even suggest potential codes based on patterns it identifies in the data. This automation speeds up the coding process and makes it more efficient (R7).

NVivo can automate many manual tasks involved in qualitative analysis. For example, it helps with data organization, coding, and retrieval. It saves us a lot of time and effort by streamlining these processes. Let's say you have a large volume of qualitative data, such as interview transcripts, documents, and audio recordings. NVivo provides a centralized platform where you can import and organize all of this data. It automatically indexes and tags the data, making it easier to retrieve specific information when you need it (R9).

Challenges associated with using NVivo

While NVivo offers numerous benefits to graduate students in qualitative research, there are also challenges associated with using the software.

Learning curve

NVivo can be complex and may have a steep learning curve for graduate students who are new to the software. It requires time and effort to become proficient in using its various features and functionalities. Students may need to invest time in training or self-learning to maximize the potential of NVivo.

Learning NVivo does require an investment of time and effort. However, once you get the hang of it, it can really streamline your qualitative research process and save you time in the long run. One thing that helped me was taking advantage of the available resources. NVivo provides tutorials and online documentation that can guide you through the software's features and functionalities. You can also check if your university offers any workshops or training sessions on using NVivo (R1).

Being patient and investing time to learn the software properly is crucial. It may seem overwhelming at first, but as I dedicate myself to training and self-learning, my proficiency in using NVivo will improve gradually. It's important to keep in mind that NVivo is a research tool designed to support us. Once we become familiar with its features, we can harness its full potential to enhance our qualitative analysis. The effort put into mastering NVivo will certainly be rewarding in the end (R7).

Challenges in data management and organization

While NVivo provides tools for efficient data organization, graduate students may still face challenges in managing and structuring their data effectively. Deciding on the appropriate coding structure, developing a coding scheme, and maintaining consistency across the project can be demanding tasks. Without careful planning and organization, students may encounter difficulties in retrieving and analyzing data later on.

It's important to have a clear idea of how I want to organize and structure my data before diving into coding and analysis. Consistency is also something I worry about as well. My advisor has suggested that having a coding manual would certainly help me stay consistent in my coding decisions. I'll make sure to develop one for my project. Also, careful planning and organization are crucial when using NVivo. It seems like the initial investment of time and effort in designing the coding structure and maintaining consistency will pay off in the analysis phase (R8).

I've been using NVivo for my qualitative research, and I must admit, data management and organization have been quite challenging. I find myself constantly questioning whether I've organized my data in the most efficient way. Sometimes I worry that I might have to redo the entire coding structure if I realize later on that it's not working well (R10).

Cost considerations

NVivo is commercial software that requires a license, and the cost can be a factor for graduate students with limited budgets. The availability of funding or institutional support for acquiring NVivo licenses may vary, and students may need to consider alternative options or explore open-source software alternatives for qualitative analysis.

I've been considering NVivo for my qualitative research, but the cost is also a factor that worries me. The good news is that NVivo provides a trial version, allowing you to test the software before making a purchase. This is a valuable opportunity to explore its capabilities and determine if it aligns with your research requirements. Typically, the trial period for NVivo lasts between 14 to 30 days, depending on the version and any ongoing promotions (R3).

NVivo is commercial software, and acquiring a license can be a significant expense, especially for students with limited funding. It's definitely an important factor to consider. There are a few alternatives to NVivo that you can explore. One option is to check if your university provides institutional licenses for NVivo. Some universities, like mine, have site licenses that allow students to access the software at no additional cost (R4).

Discussion

The study explored the impact of NVivo from the perspective of graduate students engaged in qualitative research. The findings indicated that NVivo has become a valuable asset in the toolkit of graduate students engaged in qualitative research. The software's ability to organize and analyze vast amounts of qualitative data enhances research efficiency, facilitates collaboration, and supports the production of high-quality research outcomes. However, it is essential to recognize the challenges associated with implementing NVivo and to provide the necessary resources and support to students, ensuring they can fully leverage its potential. As graduate students continue to embrace NVivo in their research endeavors, the impact of this software in qualitative research is expected to grow significantly.

The perception of NVivo by graduate students indicates that it has had a profound impact on their research and academic experience. Some of the key ways in which NVivo has influenced graduate students include efficient data organization and management, streamlined data analysis, improved data exploration and visualization, facilitated collaboration and teamwork, seamless integration of literature, and notable time-saving and increased productivity. The findings were consistent with several studies. For instance, Zamawe (2015) highlighted the benefits of using NVivo, emphasizing that the software provides a centralized location for all sources. Unlike manual coding, where researchers may struggle to locate specific papers or files, NVivo streamlines the retrieval process through links and organization within a single project. This feature enables researchers to save time and enhances efficiency. Additionally, NVivo offers flexibility in reshaping and reorganizing coding and node structures, allowing for quick adjustments as needed. Kraiwani et al. (2023) concluded that NVivo has grown in popularity as a powerful tool for managing and analyzing large volumes of qualitative data, allowing researchers to delve deeper into complex datasets and gain valuable insights. In addition, Maher et al. (2018) conducted a study indicating that while digital analysis software packages like NVivo may not fully support the analysis process, they do offer excellent data management and retrieval capabilities that facilitate analysis and write-up. The research suggests that a combination of traditional tools such as colored pens, paper, and sticky notes for coding, along with digital software packages like NVivo for data management, can provide a valid and tested method for generating grounded theory. This approach acknowledges the benefits of both traditional and digital tools, harnessing their respective strengths to enhance the analysis process. Hoover and Koerber (2009) highlighted the practical enhancements in NVivo version 8 and the expanded capabilities in version 9, particularly regarding the increased exporting power of NVivo elements. These elements include transcripts, coding summaries, and reports of demographic data, which can now be exported to Word and HTML formats. This upgrade proved beneficial in facilitating collaboration with team members involved in infant-feeding research, even if they did not have direct access to the software. However, it is acknowledged that having access to NVivo for all team members would be ideal. The software offers several collaborative features and multiple options to accommodate different styles of collaboration, further

supporting collaborative research efforts.

NVivo provides many advantages to graduate students in qualitative research, but it also comes with certain challenges. According to Davidson and Jacobs (2008), qualitative researchers are confronted with the need to adapt to the technological revolution, which entails learning and teaching qualitative data analysis software in higher education research courses. This shift presents a challenge as researchers grapple with incorporating these tools into their qualitative research methodologies. Hoover and Koerber (2009) acknowledged that despite the improvements in NVivo, the software presented initial challenges due to its steep learning curve. They candidly admitted that, like many others, they faced difficulties in understanding and effectively utilizing the software and are still in the process of overcoming these challenges. Moreover, Mitchell et al.'s (2007) research illuminated the unique challenges faced by psychology students as they engage with qualitative research methods. The study highlights the difficulties inherent in learning qualitative methods within a discipline that traditionally emphasizes quantitative approaches. Sanusi (2019) also confirmed that NVivo poses challenges for beginners. While NVivo is intended to support qualitative researchers and undergoes regular updates to align with research interests, it incorporates additional features. These features, such as nodes, classification, query, and others, may be unfamiliar to novice users. As a result, beginners may be reluctant to embrace the software and may opt for manual methods instead.

Conclusion

This study sheds light on the importance and benefits, as well as challenges, of NVivo in qualitative research and emphasizes the need for continued exploration, development, and support in order to maximize its potential and contribute to the advancement of the field.

The findings revealed that NVivo has become a valuable asset in the toolkit of graduate students, offering benefits such as enhanced research efficiency, facilitated collaboration, and support for producing high-quality research outcomes. By utilizing NVivo, graduate students were able to organize and analyze vast amounts of qualitative data, leading to streamlined research processes and deeper insights. However, the study also highlighted the importance of recognizing the challenges associated with implementing NVivo and providing the necessary resources and support to students to fully leverage its potential. As graduate students increasingly adopt NVivo in their research endeavors, its impact on qualitative research is expected to grow significantly. This software has the potential to contribute to valuable insights and discoveries, further advancing the field. Therefore, it is crucial to continue supporting and promoting the use of NVivo while addressing any associated challenges.

This study holds important implications for policy and practice in the field of graduate research. It highlights the significance of NVivo in qualitative research for graduate students, emphasizing the need for support and resources

to maximize its potential. Policymakers and institutions can promote NVivo adoption by providing training programs and technical assistance to graduate students. Integrating NVivo training into research methodology courses can better equip students with essential data analysis skills. Moreover, fostering a collaborative research culture and supporting innovative approaches in qualitative data analysis using NVivo can advance qualitative research methodologies. Ethical considerations related to NVivo usage should also be emphasized. Overall, by implementing these implications, policymakers and institutions can create a conducive environment for graduate researchers to leverage NVivo's capabilities effectively, ultimately enhancing the quality of qualitative research.

Furthermore, this study also contributes to the broader literature on qualitative research by providing valuable insights into the impact of NVivo from the perspective of graduate students. It enhances our understanding of how qualitative data analysis software enhances research efficiency, facilitates collaboration, and addresses implementation challenges. These implications inform best practices for utilizing NVivo effectively, advancing qualitative research methodologies, and promoting the use of technological tools in qualitative research practice.

While the study provides valuable insights into the impact of NVivo from the perspective of graduate students, it is important to acknowledge its limitations and make recommendations for future studies to build upon this research. One limitation of the study is the small sample size. Interviewing only ten graduate students through purposive sampling may limit the generalizability of the findings. Future studies could consider expanding the sample size and employing diverse sampling techniques to include a broader range of graduate students from different disciplines and institutions. This would provide a more comprehensive understanding of the impact of NVivo across various contexts. Additionally, the study focused primarily on the benefits and challenges associated with NVivo. While this is valuable information, future research could explore the specific research questions or methodologies that NVivo is most useful for. Investigating the ways in which NVivo supports specific qualitative research approaches or addresses specific research questions would provide deeper insights into the software's potential applications. Lastly, the study primarily focused on the perspectives of graduate students. Future research could consider incorporating the views of other stakeholders, such as research advisors, faculty members, or research collaborators, to gain a more comprehensive understanding of the broader impact of NVivo on qualitative research practices. These recommendations would contribute to a more nuanced understanding of the impact of NVivo and its potential implications for qualitative research.

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