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NVivo as a Tool for Rigor and Efficiency in Qualitative Research

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NVIVO AS A TOOL FOR RIGOR AND EFFICIENCY IN QUALITATIVE RESEARCH

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Abstract

[May be drafted after review of contents below]

Key Words:

[Ditto]

Introduction

This paper describes how a qualitative data analysis package, NVivo, is used as an important tool to demonstrate rigor and efficiency in qualitative research, using as an example the researcher's recent [?] study of creative instructional leadership (IL) enhancing an innovative and constructivist classroom [in a Malaysian setting?]. In particular, the paper details how the basic and advanced features of NVivo facilitate the analyses of observational (video) data, interviews and field notes and finally its adequacy in meeting the twin criteria of rigor and efficiency for qualitative research in general.

Weitzman & Miles (1995) notes that Computer Aided Qualitative Data Analysis Software (CAQDAS) has been used in social research since the early 1980s. In addition, Creswell (2007) says, that the development of qualitative data analysis software is well-conceived and assists in expediting and enhancing the process of qualitative research as a whole. The inquirer identifies a text segment, assigns a code label, and then searches through the database for all text segments that have the same code label. Early CAQDAS software does not do coding and interpretation, unlike NVivo.

CAQDAS can facilitate the following: data reduction; systematic coding; effective searching; the analysis of large data sets; the testing of hypotheses; and the identification of negative cases.

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Creswell (2007) claims that using a computer for all mechanical aspects of the process allows the researcher to devote more energy to analysis and interpretation.

Computer Coding. Miles and Huberman (1994) divides data analysis into three stages: data reduction, data display and verification. While coding may be part of the analysis process, it should not be thought of as a substitute for analysis, says Atkinson, Coffey and Delamonts (2003). Coding links data fragments to concepts, but the important analytic work lies in establishing and thinking about such linkages. However, Tech (1990) claims that the coding process does not merely consist of a random division into smaller units, but requires skilled perception and artful transformation. Richards (2002) regards coding as a theorizing process. Different analysts may use different coding systems for the same data, and the same analyst may apply different coding systems at different stages; there is no one ideal coding structure. Furthermore to gain thick and rich description of data, analysis must be rigorous in order that the report is sufficient and in depth, not superficial as “student engage in learning activity and they relate their experience” (very thin and superficial explanation).

Coffey and Atkinson (1996) views the process of analysis and coding as iterative because, while the identification of relevant concepts and codes depends on analysis, codes are used as tools to “think with”. Eisenhardt (1989) details out that analysis is an iterative process with the development and presentation of an initial set of theoretical propositions based on evidence from the first phase of data collection during fieldwork and the theoretical assumptions associated with the theoretical framework. The initial propositions then become a vehicle for generalizing the phenomenon studied. Next, the emergent propositions from the first phase are systematically compared with evidence from the second phase. The theoretical propositions are either supported by evidence, revised; or not supported for lack of sufficient evidence. Finally, the process is repeated when refined theoretical propositions are systematically compared with evidence from the previous phase. The central idea is to iterate toward a theory that fits the data, where projects which supports the emergent theory enhance confidence in its validity, while projects which do not support the theory often provide an opportunity to refine and extend the theoretical model.

The method of generalization adopted here is "analytic generalization," in which previously developed theory is used as a template with which to compare the empirical results of the case study. Under such logic, when two or more cases are shown to support the same theory, replication may be claimed (Yin, 1994).

Early steps in data analysis. One of the striking main features in the collection of data is the frequent overlap of data analysis in the process of building theory from case studies (Eisenhardt, 1989). The analytical techniques adopted in the first stage of data analysis in our own research are listed below. Note that these techniques are used to help us identify themes, develop categories, and explore similarities and differences in the data, and relationships among them. The process is as follows:

First, field notes are an important means of accomplishing this overlap in our study. Van Maanen (1988) describes field notes as an ongoing stream-of-consciousness commentary about what is happening in the research. By frequently reviewing and refining with reflexive approach our field notes, important issues or conflicting answers provided by different individuals are identified immediately. Then a follow-up with several visitations and interviews of selected key informants to clear up any questions and to provide any additional information that is missing and also to bridge the gap. Once an interview is transcribed, reflective remarks are directly entered into the transcripts within brackets. (In NVivo it is done with Memos file). These statements are ways of getting ideas down and facilitating reflection and analytic insight. They are ways to convert the researcher's perceptions and thoughts into a visible form that allows reflection (Miles & Huberman, 1994; Strauss & Corbin, 1990). Finally, a document summary form is created for each document collected and then filled out in the database. This form puts the document in context, explains its significance, and gives a brief content summary (Miles & Huberman, 1994).

Indeed, a key feature of theory-building case research is the freedom to make adjustments during the data collection process. In our classroom study which forms the background for the use of NVivo, adjustments include adding questions to interview protocol, reviewing more data sources, observing activities in and out the classroom whichever is viable when the opportunity

arises, and interviewing previously unknown individuals who are identified during the study as important actors in the study.

Literature Review. In the mid-1980's, CAQDAS was developed, using computers to aid analysis of qualitative data. With computers, qualitative data analysis became quite different. Richards (2002) claims that this development had the following results: (1) Computing enables new, previously unavailable, qualitative techniques; (2) there are no computerization support prior to this eye-opening reform, and; (3) this innovation of computerization encourages some biases in qualitative techniques, since NVivo does almost everything: character-based coding, rich text capabilities, edit-while-you-code, multimedia data, and splitting up the information load that nodes are being asked to carry. Lyn Richards (2009) regards NVivo as a tool for researchers who wish to display and develop rich data in dynamic documents. She refers to a wide range of data collected over a period of time. Needless to say, in the previous years, computer-based programs has dealt poorly with this kind of data. NVivo addresses this need with features like rich text, memos, DataBites (media files such as video, audio, images, literature review, external data from various sources.), and new capabilities embedded into document and node browsers. Using qualitative data analysis software (QDAS) like NVivo basically helps and assists researchers during labor-intensive process of qualitative data analysis.

Not only are there many different approaches on qualitative research methods and techniques, but the pros-and-cons of computer-assisted analysis of data are widely debated. For instance, Welsh (2002) expresses his concern that the software may "guide" researchers in a particular direction. There are other comments like "using QDAS may serve to distance the researcher from the data, encourage quantitative analysis of qualitative data, and create a homogeneity in methods across the social sciences" (Welsh, 2002).

However, others believe that using computers in the qualitative analysis process can add rigor, efficiency and prestige to research study, plus the trustworthiness and quality of the analysis. This is valid if we think about how NVivo and other similar programs help organize and manage data files as well as support the representation of coding in a neat manner. However, it is still the

researchers who make the final decisions for their data organization, coding, or analysis. Nevertheless, computer analysis programs like NVivo does add rigor to qualitative analysis in the hands of a trained researcher.

Asensio (2000) using phenomenographic study of students' experiences of networked learning in higher education in the U.K., describes the process and rationale of choosing QDAS. Together they investigate and contrast the three most well known software packages, namely: Atlas/ti, QSR NUD*IST, and QSR NUD*IST Vivo (NVivo) and explain why they chose NVivo in their research. The aforementioned study aims at understanding the students' experiences of participating in a networked learning course. The basis of the study is phenomenological and draws on individual interviews of 60 students plus observations of the face-to-face classes and online environments. The study is also complemented by a survey of 300 students and mapping exercise for wide range of teaching staff to show the examples of the use of networked learning in higher education in the UK. This study is interesting in that it gives an example of phenomenographic analysis which is completely different from the grounded theory approach. Asensio (2000) thinks that "the outcome of phenomenographic research is a set of categories of description which describe the variation in experiences of phenomena in ways that they were allowed to deepen their understanding on students' learning".

After using NVivo, the research team agreed that the software increased their speed and flexibility in coding, retrieving, and linking the data. They opined that this new version of NUD*IST is really advanced and flexible compared to other versions. One of the advanced features of NVivo is enabling researchers to work collaboratively on the same project from different geographic regions of the U.K (Asensio, 2000).

Meanwhile, Di Gregorio (2000) in her paper discusses the use of NVivo for literature reviews which are often overlooked as a form of qualitative analysis. She acknowledges the benefits of bibliographical software such as EndNote, Reference Manager, ProCite, and their unique bibliographical tools. "Of all the qualitative analysis software packages, only NVivo has a particular set of tools that is ideal for analyzing literature". She uses "proxy documents"

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(documents created in NVivo) to summarize the particular authors' argument or quotation which may be retrieved later. "Memos" attached to proxy documents can be used to write reflections on a particular paper and then use these first reflections to build one's critique. "Document" and "node links" of NVivo may be used as reference to other works. Di Gregorio (2000) also suggests the use of "attributes" and "sets" as organizers of the existent documents since these are also useful for restricted searches to particular documents by author, date, or discipline.

Finally, Video Intervention/Prevention Assessment (VIA) is used in the study done by Rich and Patashnick (2002) which investigates health conditions from the patient's perspective. Participants use the device by creating a personal "video diary" of living with their medical condition. Rich and Patashnick (2002) adopt constructivist theory in their study by asking patients to interview their own family members or friends to capture the whole picture of their condition (multiple perspectives and holistic approach). They found NVivo as the software package that responds best to the nature of VIA data. Data can be coded easily in NVivo and the software supports analysis of different types of data.

The above-cited researches utilising NVivo afford us an eye opener on the advantages and efficiency of using computer aided software data analysis.

NVivo in an Actual Classroom Setting. In the previous section, some studies are cited to exemplify how a qualitative software package such as NVivo may be used in the analysis of qualitative classroom data. In order to address a more open approach[?] and to help researchers better understand how NVivo is used as an analytic tool, we are sharing some of our experiences on how it was done in an actual classroom study we recently [?] conducted. In the following sections, this article gives a backgrounder for the classroom study mentioned and why NVivo is chosen for the data analysis. Finally, the researcher in this paper shares her experiences with the readers on the use of NVivo software to achieve rigor and efficiency during data analysis.

Because the above-mentioned classroom study is about the quality of learning environments, qualitative inquiry best fits in this framework. Qualitative method is considered best for this

particular study because it meets the descriptive nature of the research problem and gives the best picture of the learning environment in question. Eisner (1998) states that "qualitative experience depends on qualitative forms of inquiry. We learn to see, hear, and feel." We may summarize the research methodology by describing it as an effort to develop a rich, thick description of creative IL enhancing innovative classroom, with data drawn from different sources.

Data is gathered in several ways including classroom observations, informal and formal interviews of students and teachers, field notes, work completed by students including projects, student self assessments, reflective journal logs, teacher's comments and notes. The tasks are each described briefly as follows:

Interviews and Observations: Information about students' responses is gathered through interviews and observations. Focus groups interview among student [interviews?] are conducted at the conclusion of school visitations and also instructional leadership (IL) opinions' about the constructivist-learning environment are gathered through in-depth interviewing. IL and student interviews are done during the school visitations especially after classroom observation. In addition to these formal interviews, informal questions are asked of IL and students during observations in the classrooms as well as videotaping them working on the learning tasks.

Field Notes: During each classroom observation short notes are taken and later expanded into long and reflexive notes written to clarify what is observed in the classrooms (Kirk & Miller, year?) Researchers' observations in the classrooms may be considered an example of nonparticipatory observation.

Student Products: A sample of student products (reflective journals, concrete products such as computer print-outs, pictures, and self or peer evaluation rubrics) are collected and used in the data analysis.

With regards to the data analysis approach, the interpretivist research paradigm is used as a guide. This holistic approach of data analysis and a strategy that could be termed “reflective-interpretive” fits well with the use of NVivo. The software package does not force the use of certain data analysis strategies, but provides various tools for the researchers which they can choose based on their research goals and ways of approaching their data[citations?].

II. NVivo as an Analytic Tool

The data are analyzed using a qualitative data analysis program, QSR NUD*IST (Nonnumerical Unstructured Data Indexing Searching and Theorizing), also called NVivo (Note: the screenshots used in this paper are from versions 8 and 9. Now, NVivo has updated to version 9). NVivo is chosen as best fit for the study as well for the researcher’s ease of use of the program. More specifically, the rationale for this in the design to the software, to wit:

The structural design of the software. Anyone who sees NVivo’s main menu for the first time may assume that this is a very smart program to deal with. Some of the terms used in NVivo help to create a faster learning curve, the case in most of the other qualitative data analysis software reviewed[like what?]. NVivo, nonetheless, requires some time to understand its basic concepts like links, nodes, memos, and attributes, sets, classification, queries with the terminology, and learning how to use some important functions like coding, searching, uncode or developing a model using graphic features of the software. However, once the basic features are understood, the process of analyzing large amounts of qualitative data becomes much easier and more powerful than manual approaches.

As mentioned, NVivo is a powerful way to do sophisticated data coding and supports several ways to build theories, either local or more general. These capabilities fit well with this study’s research goals and the approach to data analysis. NVivo also enables the researcher to look at coded segments of the data in context so that it is possible to explore coded passages without separating them from the material before and after. NVivo is also very helpful in organizing

different data types and sources used in the study. Let us now go into the basic and advanced features of NVivo.

A. NVivo Basics

NVivo has three main menus, viz: a) Navigation menu; b) detail and; c) list view menu. Please note where the icon lays in the snapshots.

Snapshot 1. Navigation menu is the place where one can create, edit, view, manage, archive and explore project documents. It is possible to create and work with different kinds of documents, either from internal or external source. For example, documents can be created or imported from a computer hard disk into NVivo. Documents are converted into rich text or plain text format before they are worked on in NVivo. But the process is now simplified in NVivo 8 and 9.

All types of documents can be coded in NVivo including memos. Writing memos is, however, not merely support to the memory of the researcher. It is important because it forces the researcher to reflect, to make explicit all the ideas, perceptions and decisions that have arisen during observation and analysis. Writing down and recording these in memos is an important tool for making analysis cumulative. In the Navigating menu all the documents can be viewed in a database with short descriptions of each document, the time it is created or modified, and how many other documents are linked to each document. (See Appendix i)

The second menu in *Snapshot 2* is **List view** where we can add new items, open existing items and edit item properties. When we open an item from List View it is displayed in **Detail View**. These three main menu are interconnected as a working platform of the data being coded (Appendix i).

Coding reliability. There are ways of establishing the reliability of interpretation through coding of the same data by many researchers or researcher one over time. Qualitative researchers rarely expect identical coding across coders or across time, because the goal is to learn from the data,

but differences, especially gross differences in coding require discussion, interpretation, and often concept development. Software can assist the researcher with this task, though it is almost impossible to do manually. (NVivo provides for automating viewing of areas of difference and similarity, within specified tolerance, between 2 researchers' coding of the same document or 2 coding processes by the same researcher at different times.) Comparison of coding patterns provides a firm basis for concept clarification and team training and is necessary for a claim that coding is reliable.

In other words, a node is coded to a related data in the study. In NVivo there are options to code data: nodes (coded but not categorized nodes), tree codes (codes in a hierarchical mode), and case nodes (codes categorized under different cases). Using NVivo, it is also possible to search the documents or nodes in the project. In fact, NVivo incorporates a very sophisticated search tool which might be very useful while working with a group of researchers or while dealing with very large data files.

The next logical step is to utilize the model's feature and draw visuals based on the patterns or any other relationship researchers wish to see pertaining to their data. This is further explained below:

1. Relationships Development. It is very useful to look at the data and their relationship to each other. By the use of NVivo, it is easy to: (a) do cross-case analyses, (b) re-order the codes and add memos about potential relationships to files, and (c) "play" with the data. Its advanced features help to develop concepts and do complex thinking about the data. The sophisticated search option of NVivo, for example, allows the researcher to explore complex ideas and connect them in a quick and easy mode. Even the data being coded may be automated into a model feature or be displayed in many forms like Tag cloud, clusters, 3-Dimension features (one of new innovative features in NVivo).

2. Time Sa ver. Qualitative research requires patience, perseverance and tolerance. It is an evolving and time consuming process especially during the development of the pattern of the

phenomenon studied. As the research progresses, analysis of data occurs and in a “to and forth” process often as a nonlinear and recursive activity. Under these conditions, NVivo helps to automate and speed up many data management and analyses tasks. This can be the most important feature of any computer program to some researchers. Most QDA programs provide tools to organize data, help shape the data in ways researchers reflect upon it, and give opportunities to see data from different angles - and all these happening in seconds.

3. Rigor and Thoroughness. Overall, NVivo is very helpful while building a rigorous database for the data analyzed. It demonstrates very clearly all the data coded and the way it is coded. The relationships explored by the researcher among the data sources can be seen easily in the menus of NVivo. Also, the management of these long data files is very easy. These are the things that helps increase the rigor of the entire data analysis process. Welsh (2002) emphasizes yet another important feature of NVivo in terms of adding rigor to the qualitative studies: a search facility that enables researchers to interrogate their data. “However, the software now is also a useful tool addressing issues of validity and reliability in the thematic ideas that emerge during the data analysis process.”

Most researchers have no problem with the idea of rigor. A rigorous study is regarded as thorough, as opposed to sloppy, and purposively complete, as opposed to haphazard. Qualitative researchers, however, commonly avoid the term, because of overemphasis on rigidity of the study, which resists adaptation to discovered meanings. Rather than being thorough, “rigorous” may be seen as meaning indiscriminating, treating all experiences as the same. Rather than ensuring completeness, a fixed research design may impede discovery from the data.

III. Requirements of Qualitative Rigor

Qualitative researchers, on the other hand, are very alert to the risks of inadequate and unpersuasive research. They evaluate their work for qualitative rigor usually expressed in terms different from those for a survey or experimental study. In our own classroom study, we localized the analysis process in such a way that it adds rigor, and that the data meet its validity

as suggested by Meriam (2009). To enable the researcher to be “experience near,” the data are collected through multisource or multi-technique, such as:

- Data-collection through triangulations of non participation observation, face to face depth interviews and documentation that include vignettes, reflection, memo writing and daily lesson plan.

Triangulation is a ways of showing data from different sources and technique but lead to the same conclusion. This is a (much misused) term for “sighting” a phenomenon by different methods. It requires the dovetailing of studies, very difficult or taking too long to achieve by manual methods. The software supports coding and is always faster than if done manually. Thorough comparison or detailed searching of focus-group transcripts is supported by import and export of tables from any table-based software. The researcher “tells” NVivo what the statistics package “knows” about a case or site and can then use that information in seeking and verifying patterns in the qualitative data. Export of tables permits the output of qualitative analysis to be “told” to the statistics package for further pursuit. Merging of two (2) or more qualitative projects for comparative analysis or collaborative work is supported by software that investigates all aspects of the databases being merged and allows the researcher to construct the best fit of projects. With Merge, this ability is extended to aligning projects in great detail for thorough comparison of their emerging analyses.

- Peer check from the view of participants themselves on the verbatim of the transcript being conducted to validate the data continuously.
- Collaboration with the participants set from the initial phase of the project till the data meet the saturation point.
- By always being in the researcher’s framework, the validity aspects are placed in front of every step of the fieldwork. This is done so that the researcher remains unbiased during collection of data, whereby the data being stored are specifically picturing the events in the field.

Auditing and log trails are ways of accounting (or the step-by-step analysis) the crucial processes of theory emergence and theory construction. Most qualitative research claims to reliability rely on the ability of the researcher to: show clearly how a concept is developed and discovered, its recurrence in the data traced and placed in a growing theory and how its significance is investigated. By using computer software the researcher can log emergence of a category, date memos or other documents, archive images of analysis at each stage. In NVivo, the researcher may create and edit a memo, citing its history and trailing its occurrence in other data by hyperlinking documents and coded data. This can provide full documentation of how the category grows in significance and is tested through the data.

Since much of the work described above are archived, managed and blended into NVivo files, the software is a big help in breaking down the data into their specific themes under Nvivo navigator's icon/button

IV. Some Techniques to Ensure Qualitative Rigor

1. Ongoing Assessment of Framework scope. In qualitative research, principles of rigor require ongoing assessment of the scope of study (which changes constantly, unlike a predetermined sample), as well as the fabric of the data (the sources, richness, adequacy, persuasiveness, and complexity of the records studied). By analogy, analysis is just like a loom that facilitates the knitting together of the tapestry - it reduces and limits the weaver's error [MAY NEED ACTUAL EXAMPLES OF NVIVO APPLN HERE].

2. Assessment Completeness. Rigor often involves reliable, strict application of a prior design but with persistent, thorough revisiting of a problem or theme by constant comparison of cases. A QR study needs to look at every angle of the phenomenon within the theoretical framework. [MAY NEED ACTUAL EXAMPLES OF NVIVO APPLN HERE].

3. Establishing saturation. Perhaps the most dramatic development of qualitative coding is the ability of the software to support exploration of context and dimensionalizing. These methods enhance the rigor of code-based analysis, supporting claims that the themes adequately represent the data and “dimensionalizing” of a concept. Saturation is accomplished by:

- Exhaustion of sources - little relevant information gained by prolonged engagement of source data.
- Saturation of categories- continuing data collection only gathers tiny increments of new information.
- Emergence of regularities – sufficient consistencies in the data and the phenomena is represented or observed.
- Overextension- any new information does not represent the phenomena and is far removed from the central core of viable categories that emerge.

[MAY NEED ACTUAL EXAMPLES OF NVIVO APPLN HERE].

Wolcott(1994,b) and Geertz (1973) claim that working closely through *emic* [?] perspective ensures the real picture from the perspective of the participant because it describes feeling that they experience to produce a rich thick description. Merriam (2009) writes that rich, thick description provides enough description so that readers will be able to determine how closely their situations match the research situation and hence findings can be transferred.

[THE FF. SECTIONS ARE PORTIONS OF THIS REPORT THAT ARE MERE REPETITIONS OF ASSERTIONS MADE OF NVIVO MADE ELSEWHERE IN THIS REPORT. THEY ARE RECOMMENDED TO BE DELETED. THEY ARE IN RED FONT AND BRACKETED].

[Computer Solutions to the Time Challenge

Time framework : Speed and Qualitative Research

Such challenges require not the condensing or dodging of analytical processes, but the efficient handling of those that qualitative researchers, however, are very alert to the risks of inadequate and unpersuasive. Qualitative research faces 3 particular challenges of speed:

Data collection. Computer tools cannot remove the time required to conduct a narrative interview, but they can support rapid assessment of the adequacy of records and automate processing. An indicator of the relevance of questions asked or the appropriateness of sites studied can be rapidly obtained as documents can be viewed, reported on, and profiled.

Data preparation For the researcher in a hurry, the labor of qualitative data “collection” are high compares dramatically with data-collection methods that are not face-to-face. Any of the methods of making qualitative records, focus groups, in depth interviews, field research, take substantial time, even for small scale research. Even the first generation of qualitative computer tools remade qualitative coding for many researchers. Coding on paper was boring, burdensome work, more clerical than creative. All computer software for qualitative research supports coding, and it is always faster than the same task done manually. Some software can effectively remove descriptive coding tasks (autocoding by command file or section coding in NVivo codes all the answers to a question, or everything said by a respondent). Demographic or other background data can be input by table import from spreadsheet or statistics package. Interpretive coding is easier, swifter, and more visual.

Pursuit and validation of conclusions. :Arrival at conclusions in qualitative research is rarely rapid, and in most studies undue haste risks superficial or incomplete analysis. Significantly, qualitative software has met resistance from researchers to the sorts of searching is supported. But the processes of pursuing conclusions and establishing their robustness are helped by software tools that provide ways of gaining rapid access to data. Text search or keyword search are mechanical processes that can support interpretative goals by providing all relevant data for consideration. In NVivo 9, an innovative tools to display the excessive work done and looking at the themes’ frequency of the data gathered by clicking the button and the display in either at matrices, three dimension feature, three charts or tag cloud and data cluster. It means the fear for not finishing aren’t happen in NVivo because the anxiety in looking at the finishing parts is high. As conclusions are pursued, researchers can command iterative searches through different areas of the data to hasten assessment of explanations or create live matrices offering a new sort of

assessment of patterns. These and all other profiles of data can be exported to statistical software or spreadsheet in Excell if this is appropriate.

Computer-aided Reliability

Reliability

Reliability in social research usually refers to the assertion that a measurement procedure yields consistent scores when the phenomenon being measured is not changing. If reliability requires exact replication, this will be difficult, arguably impossible, to achieve in a qualitative study, because all qualitative methods require situated study of changing ideas and behaviours. Not surprisingly, therefore, qualitative researchers frequently express concern at the concept.

Positivist notions of reliability assume an underlying universe where inquiry could, quite logically, be replicated. This assumption of an unchanging social world is in direct contrast to the qualitative/interpretative assumption that the social world is always changing and the concept of replication is itself problematic. Such negativism about positivism has branded qualitative research in some areas as defiantly unreliable. What is reliability in qualitative research?

Qualitative Reliability

Qualitative researchers have clear standards for reliability. Reliable studies have methods of making and interpreting data that are transparent, properly documented, and clearly adequate to the question asked and the claims made. However the concept (like "validity") has been seen as problematic, and there are few texts in which techniques for establishing reliability are set out

CONCLUSION

Therefore, it can be said that the NVivo package provides tremendous help in the data analysis process and that the software helps increase rigor and promote efficiency in terms of data management. The terms "validity and reliability" are appropriate for qualitative research as many

scholars in QR have been using them for decades (Merriam 2009, Creswell 2005). The validity of the conclusions in this research study such as triangulation of data sources, extended or long term collaboration experience in the environment, and researcher journaling was conducted by the researcher using NVivo as a rigorous and efficient analytic tool.

The use of NVivo for qualitative data analysis provides strong standards and positive mechanisms of rigor and efficiency. On the other hand, the difficulty of achieving these standards and unevenness in research depends upon the user and how she deal with them. If steps and procedures are used properly and systematically it will lead to a successful work. This paper has identified computer assisted techniques, but it was beyond its scope to assess and critique them or to discuss the unanticipated consequences of rapid methodological change. These include dramatic increase in the acceptability of qualitative research in areas where it is not taught and hitherto has not been widely accepted. The need for appropriate literature in these areas is urgent. So too is the need for a full and critical discussion of the impact of these changing techniques and the directions of software development. Thus, outreaching software user in qualitative research should be done continuously.

[NOTE: References have not been reviewed by me and is left as is – nene]

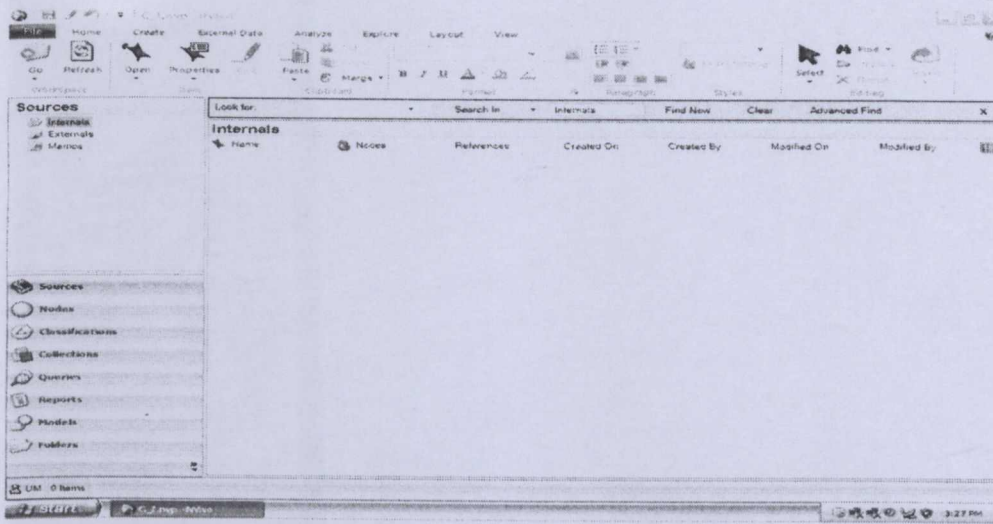
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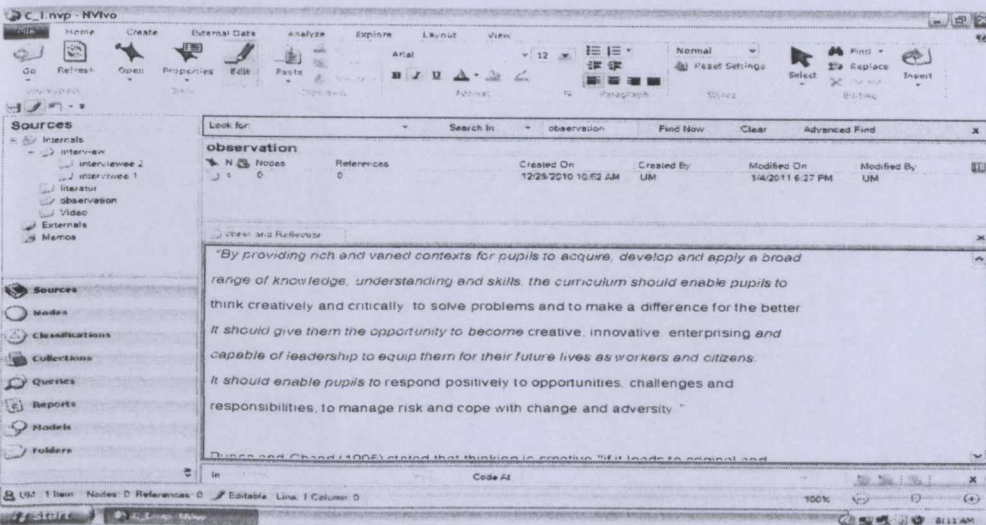
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Navigating View (above)



List View dan Detail View (above)