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Bringing Rigour in Qualitative Social Research: The Use of a CAQDAS

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Abstract

Computer Aided Qualitative Data Analysis Software (CAQDAS) is becoming an essential tool for a number of social scientists. Particularly, CAQDAS allow for a more rapid and rigorous qualitative data analysis. Over the past few decades, a variety of software that falls under the CAQDAS umbrella has emerged in the market. In this context, this paper focuses on one of the software - Atlas-ti 5.0- to describe its use as a tool for enhancing rigour in qualitative social research. The paper describes why and how Atlas-ti 5.0 has been used for data analysis in an exemplar qualitative social research on the ecology of the Mauritian early adolescents' Internet-mediated dating/romance. It also considers some critics related to the essentials of rigour in qualitative social research. Finally, it outlines the use of Atlas-ti 5.0 for bringing rigour in the exemplar research.

Keywords: Qualitative Social Research, CAQDAS, Atlas-ti, Rigour

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1. INTRODUCTION

Qualitative research methods emerged from what is known as the interpretive traditions, as opposed to the positivist traditions. The positivist approach is based on the theoretical paradigm with an ontological stance, which assumes that truths can be explained and predicted; and holds an epistemological belief in objectivity guided by the quantitative methodology (Lee, 1992). Whereas, the interpretive traditions are based on the belief that human beings create meanings that could be observed and studied through qualitative inquiries (Silverman, 2000). Qualitative researchers therefore tend to espouse a constructivist ontological view of the world (Broom, 2005). Qualitative approach to social research has long been recognised as having its own specificity and uniqueness in making important contributions to the understanding of social phenomena (Newman et al, 2006). However, during the last few decades, qualitative approach to social research has witnessed a remarkable evolution within the social research discourses.

Today, qualitative research methods are no longer relegated to the marginalia of exploratory stages, or questioned for subjectivity. In fact, qualitative approaches to social research have been gaining recognition in domains traditionally inclined to more positivistic methods (Alttride-Stirling, 2001; Barnes et al., 1999; Black, 1996). Ezzy (2002, p.57) argues that, "qualitative research is biased to a degree, but then again all research is inherently political and thus contains a degree of bias. To suggest that something can be biased is to by default suggest that there is an unbiased truth that we could access. This is simply not true". In particular, quantitative and qualitative research methodologies are based on different paradigms and they are mutually exclusive. However, even quantitative and qualitative views added together do not provide a total view of the reality (Lee, 1992). Social researchers therefore try to enhance the quality of their research through different rigorous strategies, in order to have a better picture of the reality (Mays and Pope, 1995; Audet and d'Amboise, 2001).

Debate around the quality of qualitative research has often been overshadowed by a kind of 'disciplinary tribalism' (Pawson, 2001), whereby polemics between quantitative v/s qualitative theory eclipse the needs of researchers trying to effectively apply their findings (Meyrick, 2006). Contemporary debates on quantitative and qualitative social research are gradually shifting towards enhancing rigour through technological tools (Mays and Pope, 1995; Barry, 1998; Lewis, 2004; Meyrick, 2006; Bhowmick, 2006). Particularly, the invention of new technological tools such as digital recorders (graphics, audio, and video) and CAQDAS (computer aided qualitative data analysis software) such as NUD*IST, Nvivo and Atlas-ti, have an enormous potential to contribute towards bringing more rigour to qualitative social research.

In this context, this paper discusses how Atlas-ti 5.0 as a CAQDAS has been used to bring rigour in a study on the ecology of the Mauritian early adolescents' Internet-mediated dating/romance. To begin with, the paper provides by a brief description on why and how Atlas-ti 5.0 has been used to analyse the gathered data in the exemplar qualitative social research on the ecology of the Mauritian early adolescents' Internet-mediated dating/romance. Then, it considers some critics related to the essentials of rigour in qualitative social research. In the final part, the paper outlines the use of Atlas-ti 5.0 for bringing rigour in the exemplar research.

2. THE USE OF ATLAS-TI 5.0 AS A CAQDAS

Manson (1996, p.7) describes qualitative data analysis as "a range of techniques for sorting, organising and indexing qualitative data". Within the process of qualitative data analysis, researchers should develop the expertise in data interpretation and coding. In fact, qualitative data analysis is a complex process and requires a lot of knowledge, skills, and experience. In a similar vein, Smith and Short (2001) argue that qualitative data analysis is often a time-consuming and laborious process involving the management of large quantities of textual data. In addition, a proper knowledge and a correct application of skills are important in making rigorous data analysis. In this relation, Broom (2005, p.7) opines: "The process of qualitative data analysis is a difficult skill to develop. It is a skill that comes from rigorous, high quality social science training and experience". Thus, it is important that novice

researchers develop the qualitative data analysis skills through regular courses and practices, especially on the use of latest available technological tools such as the CAQDAS.

CAQDAS has allowed for more rapid, rigorous and scientific qualitative data analysis. According to Barry (1998, p.1) in making use of CAQDAS the hope is that it will: "help automate and thus speed up and liven up the coding process; provide a more complex way of looking at the relationships in the data; provide a formal structure for writing and storing memos to develop the analysis; and, aid more conceptual and theoretical thinking about the data". Basically, there are a variety of software that falls under the CAQDAS umbrella; these are Atlas-ti, NUD*IST, The Ethnograph and so on. However, it is worth noting that CAQDAS do not analyse data, they simply help us to manage them. In particular, computer-aided techniques for qualitative data analysis offer some shortcuts for coding, sorting, and integrating the data (Charmaz, 2000). In fact, it is through facilitating researchers to manage large quantities of qualitative data that CAQDAS brings its added value to qualitative data analysis. As Smith and Short (2001, p.401) point out: "Computer programs …have made it possible for qualitative data analysts to manage large volumes of textual data. Such programs offer an immense improvement in the efficiency and ease with which qualitative data analysis can be done and they continue to be improved in scope and function". However, the decision whether or not to use CAQDAS is based on the individual researcher's educational and research background, as well as his/her comfort, skills and experience with computers (Webb, 1999)

2.1 Choosing CAQDAS

In choosing CAQDAS social researchers have to consider several important aspects. According to Lewins and Silver (2004, p.5) some of the general questions that researchers need to reflect on while deciding which CAQDAS to use are as follows: kind(s) and amount of data to be handled; preferred style of working; theoretical approach to analysis; time to 'learn' the software and for analysis of the project. But, most of the time it is the type of qualitative analysis that dictates which software is best to use (Williams et al, 2004). According to Tesch (1990) there are three main methods of qualitative data analysis; language based – e.g. discourse and content analysis; descriptive/interpretive- e.g. thematic analysis; and finally, theory building – e.g. grounded theory analysis. In particular, Atlas-ti 5.0 is seen as the software that is user-friendly with different types of primary data format (text, graphic, audio and video), and it also has most of the essential capabilities for different types of analysis (Barry, 1998; Lewis, 2004; Lewins and Silver, 2004).

Atlas-ti 5.0 is considered to be the most popularly used software for theory building (Barry, 1998; Lewis, 2004). Bhowmick (2006, p.7) states: "Atlas.ti is ideal for making linkages between different elements of the data. It is helpful for theory building and making different hierarchical connections between data elements". In addition, Lewis (2004, p.439) writes: "ATLAS.ti 5.0 and NVivo 2.0 are among the best available and potentially most useful qualitative data analysis tools. Both products enable the researcher to associate codes or labels with chunks of text, sounds, pictures, or video; to search these codes for patterns; and to construct classifications of codes that reflect testable models of the conceptual structure of the underlying data. Both are tremendously flexible programs that can be readily applied in a wide range of applications. Nevertheless, ATLAS.ti is clearly the more versatile of the two". Comparing Atlas-ti to NUD*IST, Barry (1998, p.6-7) states: "I would agree that Atlas-ti and

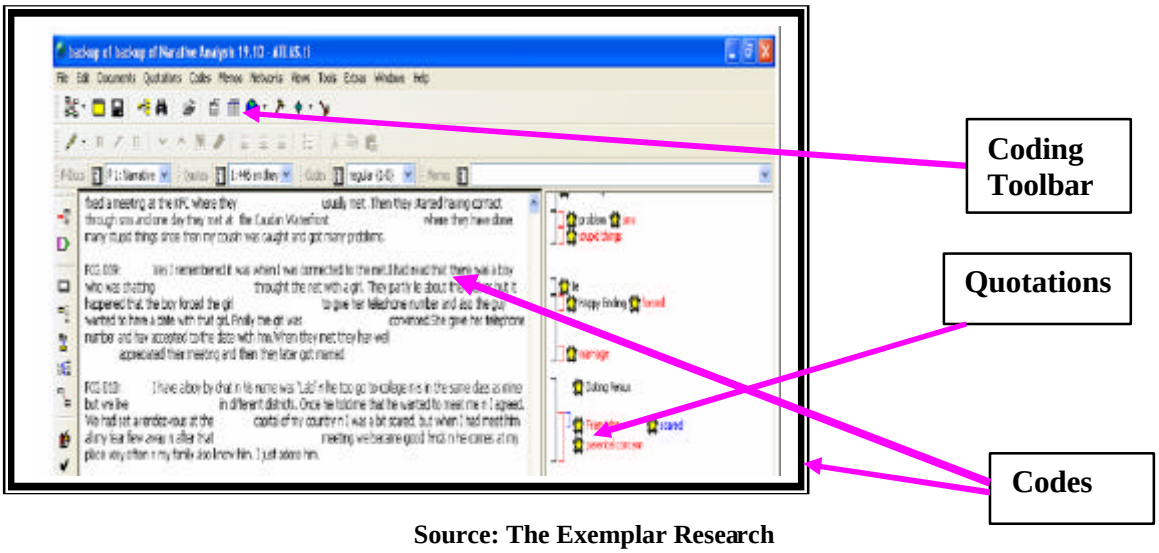
NUD*IST appear to be two of the most serious contenders, in meeting the requirements of researchers…Whilst both NUD*IST and Atlas-ti are relatively sophisticated in terms of software development, Atlas-ti seems to be further along this continuum. It has a more complex inter-connected, hypertext structure and it is more intuitive and easier to learn".

2.2 Atlas-ti 5.0: With an Exemplar Research

In this part of the paper, an exemplar research on the ecology of the Mautitian early adolescents' Internet-mediated dating/romance is used now and then for illustration. The exemplar research is based on a grounded theory analysis of data gathered through Narrative Interviews (NIs) and Focus Group Discussions (FGDs) from Mauritian early adolescents (10-14 years old). For the grounded theory analysis, the gathered data were subjected to a rigorous coding process with the help of Atlas-ti 5.0. In qualitative research there are a variety of coding techniques, such as open coding, axial coding, and selective coding. Open coding begins with the examination of each data line, naming the actions or events found within (Boychuk Duchscher and Morgan, 2004). Axial coding is based on the open coding. After the open coding is completed the researcher regroups the data from which the relationships for major codes are developed. The purpose of axial coding is to answer questions about the phenomena such as when, where, why, who, how and with what consequences, thus giving the concept greater explanatory power (Strauss and Corbin, as quoted in Boychuk Duchscher and Morgan, 2004, p.608). Finally, selective coding is about selecting the core code that emerged from the axial coding.

For the exemplar research, the data analysis process started with open coding. Say for example in a NI the following quotation was gathered from a research participant: "*Alan first chatted with Nella on Servihoo. Days went by and both chatted more and more. They learned more about each other. They decided to meet after a month of chatting with each other*"**.** Then, based on this particular quotation several open codes such as '*Building Relationship*', '*Learning*', '*Face- to-face Meeting*' were selected with the help of Atlas-ti 5.0 as shown in Figure 1.

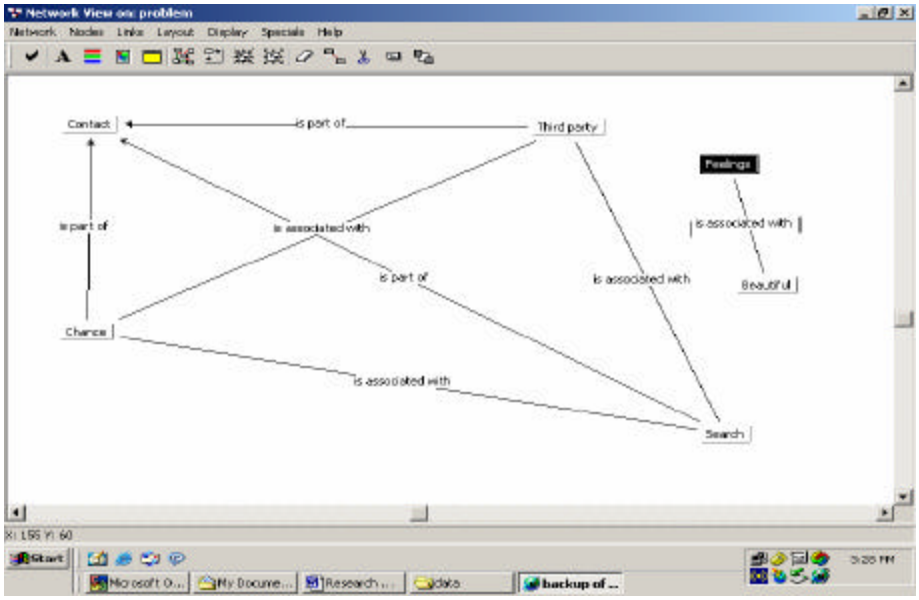
Figure 1: Example of Open Coding from Textual Data in Atlas-ti 5.0



Source: The Exemplar Research

In the theory building process with Atlas-ti 5.0, the codes were grouped under specific concepts. For examples, the following codes '*Access by Mistake*', '*E-mail from a Stranger*'; '*Contact by Accident*' were grouped under one concept labelled as '*Chance*'. The specific concepts were then carefully considered for the emerging categories from the data. For example from the data, *'Contact'* emerged as a single category for the following concepts that regroup several different codes such as '*Search*', '*Chance*', and *'Third-party'*. Finally, the emerging categories were classified and re-arranged with a view to analyse the conceptual relationships through a feature called network building in Altas-ti, as shown in Figure 2. Atlas-ti 5.0, therefore, helps researchers to explore the complex phenomena, hidden in the gathered data, through analysing the conceptual relationships (Atlas-ti, 2004). The conceptual relationships from the exemplar research were written in the form of theoretical memos. Thus, the emerging theory on the ecology of the Mauritian early adolescents' Internet-mediated dating/romance was built, as shown in Figure 3, by looking at the conceptual relationships. Within this process, it was made sure that the theory was conceptually dense (Strauss and Corbin, 1994). In other words the theory was made with many conceptual relationships that were embedded in a context of descriptive and conceptual writing.

Figure 2: Network Building with Atlas-ti 5.0



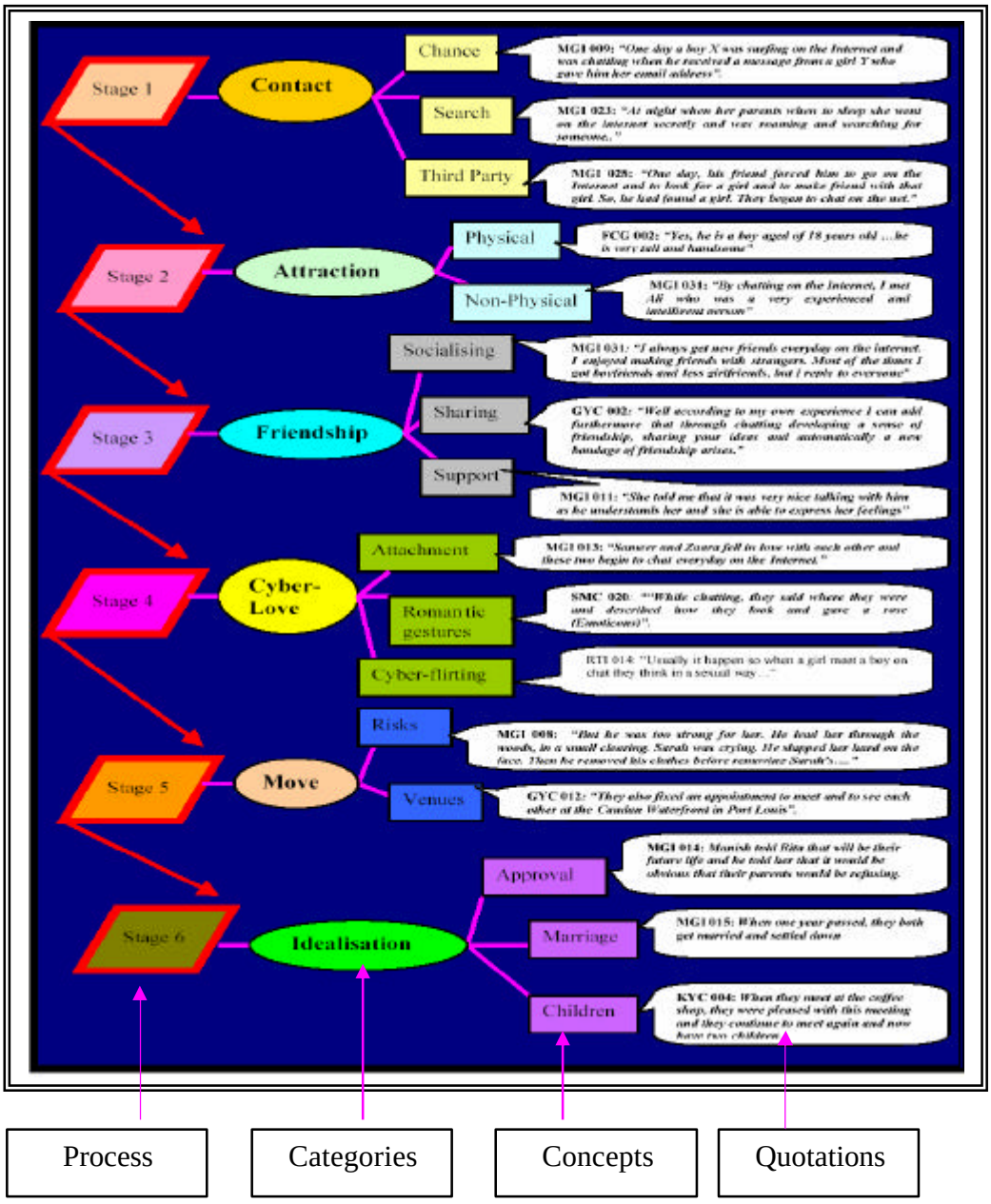
Source: The Exemplar Research

In particular, different types of qualitative data analysis might be carried out and presented in different ways. Given that the exemplar research is based on a grounded theory data analysis, the recommendations of Glaser (1998) were applied. According to Glaser (as referred in Backman and Kyngäs, 1999, p.150 grounded theory data analysis has three phases. The first phase is called the 'input', where the data move as part of the researcher's thinking (Ibid). In the second phase the data is in the researcher's mind. He/she has a lot of different ideas concerning the theory, but nothing seems clear. This is called a 'drugless trip' (Ibid). The last

phase, called 'saturation', is the most important for theory development (Ibid). In this phase the researcher writes down the results of the analysis and makes his/her conclusions.

Now, having briefly explained how Atlas-ti 5.0 was used in the exemplar research, the following section focuses on how rigour can be achieved with the help of Atlas-ti 5.0. However, before embarking on the description, a brief discussion about the essentials of rigour in qualitative research is made.

Figure 3: Example of Data Analysis Presentation from Atlas-ti 5.0



Source: The Exemplar Research

3. RIGOUR IN QUALITATIVE SOCIAL RESEARCH

Within social research discourses, there is a general agreement that studies should be carried out rigorously. In this sense, rigour dominates as an essentiality for quality in qualitative research. Tobin and Begley (2004, p.390) write: "Rigour is the means by which we demonstrate integrity and competence, a way of demonstrating the legitimacy of the research process. Without rigour, there is a danger that research may become fictional journalism, worthless as contributing to knowledge". However within social research discourses, there is a never-ending debate on how to achieve the rigour in qualitative studies.

3.1 The Essentials of Rigour in Qualitative Research

Perhaps at this stage it would be wise to provide a brief definition of the following terms - validity, reliability, and generalisability – that are commonly used when discussing about rigour in social research. Validity refers to the best available approximation to the truth of propositions (Parry, 1998). In relation to qualitative research, Hammersley (as quoted in Long and Johnson, 2000, p.31) argues that: "An account is valid or true if it represents accurately those features of the phenomena that is intended to describe, explain, or theorise". In particular, external validity refers to how far the research findings could be generalised to other populations. In some research papers, generalisability is preferably used instead of external validity. Generalisability therefore means that the results of the research apply to a wider group of people, social situations and settings than just the ones investigated in the original study (Taylor, 2005). Reliability refers to the accuracy of a measuring instrument over repeated measures (Parry, 1998).

Some researchers argue that quantitative and qualitative approaches to research are fundamentally different; therefore, rigour in qualitative research should not be focused on concepts such as validity, reliability, and generalisability (Guba and Lincoln, 1989; Webb, 1999; Thompson, 1999; Hamberg et al, 1994). For example, Webb (1999, p.324) states: "…there has been more widespread agreement that concepts of validity, reliability, generalisability and so on, are not acceptable within the terms of qualitative research". In a similar manner, Thompson (1999, p.819) argues that, "qualitative research, unlike quantitative research, is not concerned with generalisability from a sample to the population as a whole; instead, it takes as its raison d'être the ability of research to illuminate concepts and social phenomena in their real-world contexts". Hamberg et al. (1994) opine that because the standards for scientific strictness in quantitative research cannot be applied to qualitative studies, it is important to discuss alternative indicators for rigour in qualitative research.

Lincoln and Guba (1985) and Guba and Lincoln (1989) propose credibility, transferability and dependability as the major criteria for ensuring rigour in qualitative paradigm. According to them, credibility is to return data to the subjects for verification (Ibid). Rolfe (2006) argues that the term 'credibility' corresponds roughly with the positivist concept of internal validity. It is worth noting that, credibility is very closely related to participants' validation; hence, it is a form of validity. Gulba and Lincoln (1989) define transferability as generalisation of the theory. The term transferability is closely related to external validity (Rolfe, 2006). However in Guba and Lincoln (1989), instead for external validity of the sample, emphasis is on the external validity of the theory that emerges from data analysis. Nevertheless, it is still validity that has been referred to in Guba and Lincoln (1989). Finally, dependability is referred as

auditability of decisions, choices, and analysis and so on (Guba and Lincoln, 1989). For example, independent verification of coding by different people forms part of dependability. Once again, this term is used to replace reliability, or precisely speaking inter-coder reliability. As Long and Johnson (2000, p.31) opine: "…the concern at root of dependability is the same as that for reliability: to ensure that data collection is undertaken in a consistent manner free from undue variation which unknowingly exerts an effect on the nature of the data".

Therefore, can we reject validity and reliability as essentials of rigour in qualitative research just because of their interpretations in discourses? Such rejection undermines the value of qualitative research. Tobin and Begley (2004, p.388) state: "it is argued that the transference of terms across paradigms is inappropriate; however, if we reject the concepts of validity and reliability, we reject the concept of rigour". Thus, for rigour in qualitative research 'reliability' and 'validity', as the basic essentials, persist as a legacy of scientific method (Koch and Harrington, 1998). In fact, how rigour is maintained through validity and reliability in qualitative social research should be a vital part for consideration in writing about the research process (Mays and Pope, 2000). Basically, rejection of rigour through reliability and validity undermines acceptance of qualitative research as a systematic process that can contribute to the advancement of knowledge.

However, much more important for rigour in qualitative social research is reflexivity. Reflexivity is an important part of qualitative research (Long and Johnson, 2000). Basically, reflexivity in qualitative research is about the researcher/s making reflection on his/her/their own values and beliefs at the same time as that of the respondents are being analysed. "Reflexivity refers to active acknowledgement by the researcher that her/his own actions and decisions will inevitably impact upon the meaning and context of the experience under investigation" (Horsburgh, 2003, p.308). Mays and Pope (2000, p.51) state that: "reflexivity means sensitivity to the ways in which the researcher and the research process have shaped the collected data, including the role of prior assumptions and experience, which can influence even the most avowedly inductive inquiries".

In other words, researchers acknowledge that neutrality and detachment in relation to data collection, analysis, and interpretation are impossible. Therefore, by adopting the reflexivity techniques, researchers prevent their own influences on the study population. In particular, Mauthner and Doucet (2003) argue that the 'reflexive turn' in the social sciences has contributed towards demystification and greater understanding of theoretically and empirically based knowledge construction process. Thus, the construction of theory is based on the cultural, social, historical, and personal environment of the researcher and the research participants. Therefore, neutrality can only be brought by reflexive actions of researcher's personal thoughts, values, beliefs and so on.

After a brief discussion on the essentials of rigour in qualitative social research, the following subsections explain how validity, reliability, and reflexivity were enhanced in the exemplar qualitative social research through the use of Atlas-ti 5.0 as a CAQDAS. However before embarking on the depth of the explanation, a short description of the advantages achieved through the use of Atlas-ti is considered next.

As mentioned earlier, the use of Atlas-ti 5.0, just like any other CAQDAS, provides the advantage in terms of time saving to social researchers. In the exemplar research, this is achieved through the following: First of all, data were collected in written text formats for the NIs, and digital voice recorder for the FGDs. Given that the two format of data (text and audio) were directly plugged into Atlas-ti 5.0 for the purpose of analysis, no time has been spent in transcribing the raw data (as it is the common practice in manually carried out qualitative data analysis. Secondly, coding through the use of Atlas-ti 5.0 was carried out much more rapidly in comparison to manual coding. According to Lewis (2004), coding is easily done in Atlas-ti as compared to other CAQDAS. Thirdly, managing a large amount of codes was much easier with the use of Atlas-ti 5.0 as compared to the manual process. In particular, Atlas.ti 5.0 offers various tools to search the coded texts, to find similarities and dissimilarities, to explore the whole project (usually referred as the 'Hermeneutic Unit') or to retrieve specific quotations in order to support theory building (Atlas-ti, 2004). The time saved through the use of Atlas-ti 5.0 was therefore effectively used in enhancing the rigour of the exemplar research. Similarly, John and Johnson (2000) state that the advantages of using qualitative data analysis software include being freed from manual and clerical tasks, saving time, being able to deal with large amounts of qualitative data, having increased flexibility, and having improved validity and reliability of qualitative research. Moreover, reflexivity is an integrated part of the data analysis process with Atlas-ti 5.0 (Gibbs et al., 2002).

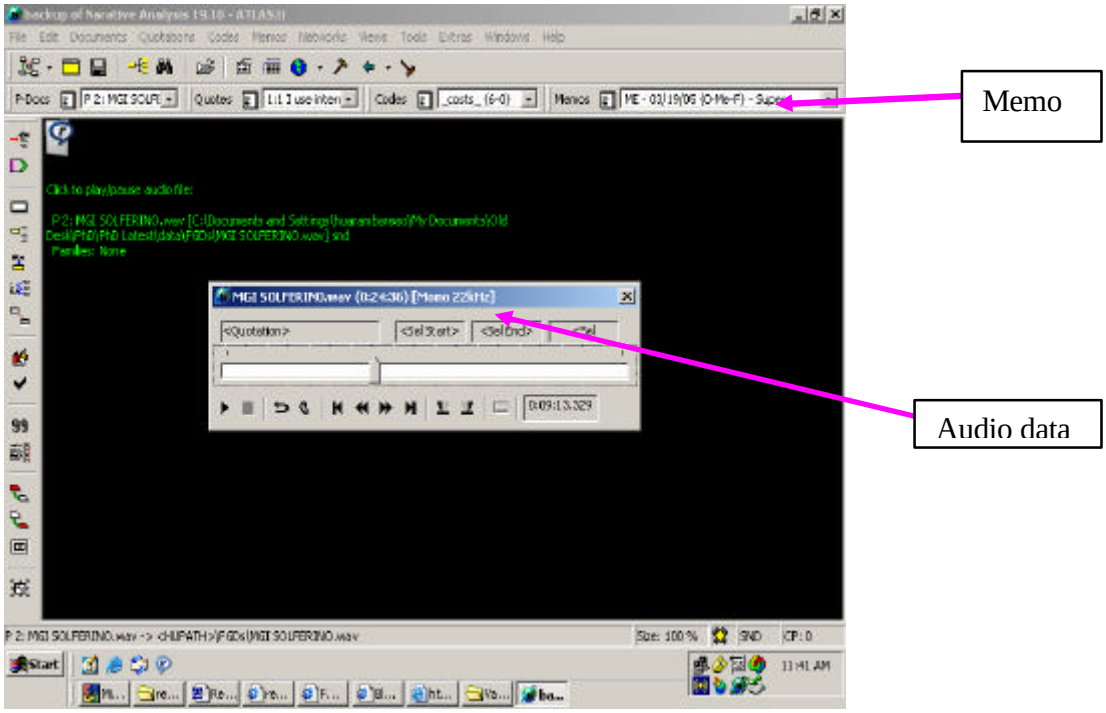
3.2 Validity with Atlas-ti 5.0

In order to bring rigour to the exemplar research through enhancing the validity, the findings from the NIs were brought back to the research participants, in the form of FGDs. This strategy was to check whether the participants would agree, in a collective setting, to the findings that have been gathered in an individualised manner. Johnson (1997) describes this as 'interpretive validity' where effort is put to ensure that the participants' viewpoints, thoughts, intentions, and experiences are accurately understood and reported by the qualitative researcher. In fact, participants' validation strategies feed the findings back to the participants to see if they regard the findings as a reasonable account of their experience (Mays and Pope, 1995). However, there are several researchers who have questioned whether such a strategy is always appropriate (Barbour, 2001; Mays and Pope, 2000). For example, Horsburgh (2003, p.310) argue that, "such an approach is, however, problematic because the participants and the researcher will, to a greater or lesser degree, have different agendas and perspectives". Nevertheless, it is imperative that data that has been collected in an individualised manner is subjected to validation through the participation of the research participants in a collective manner where issues, points, and concerns can be raised, discussed, and challenged more openly. According to Brink (as referred in Long and Johnson, 2000) the use of respondent validation ensures for stability. For Long and Johnson (2000) stability in research is established when asking identical questions of an informant at different times produces consistent answers. In the exemplar research, the research participants' validations (gathered in audio format through FGDs) were directly plugged in for analysis as another layer of primary data (See Figure 4). Thus, through participants' validation, the validity of the research has been enhanced.

Moreover in grounded theory, maximum internal variety in subjects is important for enhancing the external validity (Parry, 1998; Glaser, 1978). In other words, to ensure

external validity, one has to collect data from a very diverse population. In the exemplar research, the list of potential participants (individuals and groups) were drawn with the view to have early adolescents from diverse settings, such as in and out of schools, urban and rural, and mixed and single-sex schools from all around Mauritius. Given that no transcription of the data was required and the process of data analysis went quicker with Atlas-ti 5.0, more effort was therefore put in the diversification of the samples. Perhaps, such range of diverse sample would have been impossible to achieve if the data analysis was going to be carried out manually.

Figure 4: Audio Format and Text Format Data under same 'Hermeneutic Unit'



Source: Exemplar Research

Payne and Williams (2005) argue that external validity depend on 'thick description' of the fieldwork; richness of the data collected and full reportage of the care used in its collection serving two purposes: firstly, to demonstrate reliability and internal validity in the researcher's account and; secondly, to provide the reader with information necessary to decide whether the findings might be transferable to other settings. Thus, it is imperative for social researchers to provide at least a full description of how data collection and analysis has been carried out in qualitative research. Johnson (1997) refers this as 'descriptive validity', where the researchers have to provide factual accuracy of the account to promote rigour. In the exemplar research, the 'Memo' feature of Atlas-ti 5.0 (See Figure 4) was used to record all descriptions while the data was being analysed; and this activity, made a remarkable contribution to ensuring for both validity and reliability. In addition, the descriptions are kept in the 'Memo' in Atlas-ti 5.0 as a data set that could be used for some further or additional analysis by the same or other researchers.

3.3 Reliability with Atlas-ti 5.0

In the exemplar research, two main strategies were used to bring rigour through enhancing the reliability. Firstly, a triangulation of two different techniques for data collection (FGDs and NIs) was employed. Garson (2006) defines triangulation as an attempt to increase reliability by reducing systematic error, through a strategy in which the researcher employs multiple methods of measurement. Through such triangulation in the exemplar research, the researcher has therefore avoided some potential biases in data analysis by reducing the uncertainties associated with the interpretation of the collected data. Moreover, triangulation allows for 'thickness' in the data collected, which contributes towards validity. In fact, the utilisation of multiple tools for data collection leads to a better understanding of the phenomena being studied by giving a more holistic view. In addition, the FGD has been a useful forum to probe further information on certain unclear aspects and issues that had emerged from the NIs in the exemplar research.

In particular, the use of Atlas-ti 5.0 facilitates the triangulation of different data collection techniques, mainly through its capability of assigning different primary documents under the same 'Hermeneutic Unit'. As mentioned earlier, in Atlas-ti 5.0 several formats of data (text, graphic, audio, video) could be plugged in under the same 'Hermeneutic Unit'. According to Lewis (2004) ATLAS.ti import rtf-format files containing a mix of text, tables, and photos with a high degree of success. In addition, Atlas-ti 5.0 allows the exportation of codes and code families as an SPSS syntax file that could be analysed in a quantitative way. Using Atlas-ti 5.0 is therefore suitable in trying to enhance reliability through triangulation of methods and techniques of data collection. In the exemplar research, the FGDs in the audio format were plugged into Atlas-ti 5.0 under the same 'Hermeneutic Unit' as shown in Figure 4.

Secondly for the data analysis in the exemplar research, the contributions of other qualitative data analysis experts were sought as a strategy for enhancing reliability. In qualitative data analysis, two types of reliability that researchers should focus on are: Intra-coder reliability – which consists of consistency between the codes within a single coder; and Inter-coder reliability – which consists of consistency between the codes when two or more data analysts are involved in the process. In the exemplar research, part of the gathered data was given to an expert on qualitative data analysis for separate coding. A comparison of the coding carried out by the researcher and with that of the expert was then made. A third person, another expert in qualitative data analysis, was afterward used to carry out an expert check on consistencies and agreements on the codes. In this endeavour, Atlas-ti 5.0 has been useful. First, of all the whole data set with the codes is portable. In addition, Atlas-ti 5.0 allows for flexibility of merging and managing the coding carried out independently by several researchers. Such capabilities are of great importance in enhancing reliability. In a similar vein, Mays and Pope (1995, p.110) write: "the analysis of qualitative data can be enhanced by organising an independent assessment of transcripts by additional skilled qualitative researchers and comparing agreement between raters".

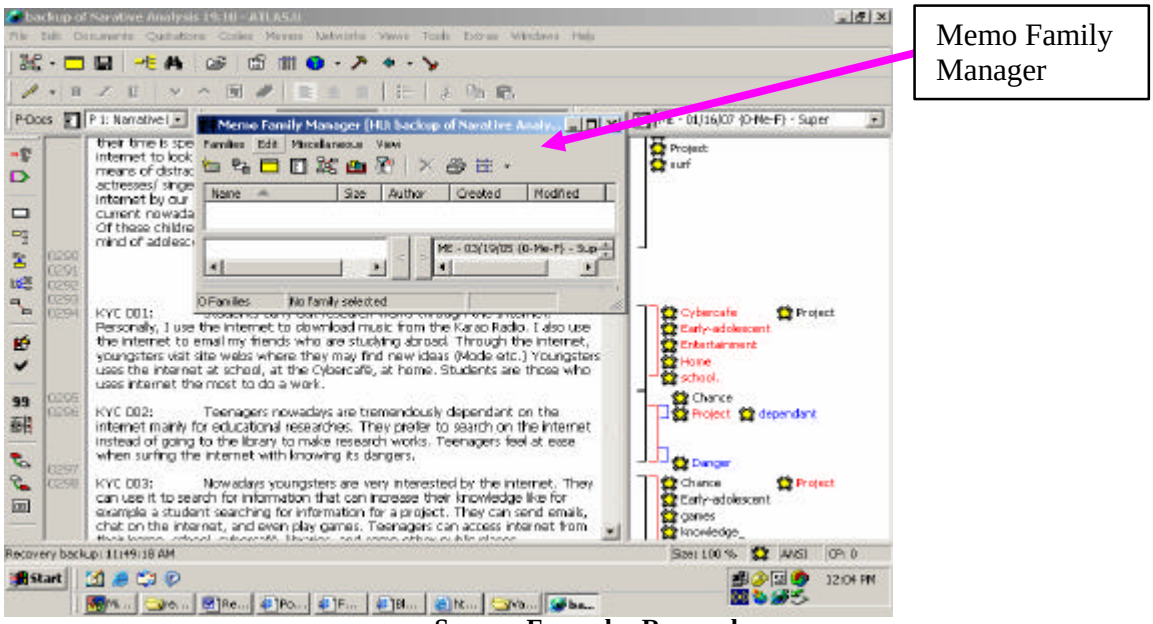
One of the important advantages of using Atlas-ti 5.0 as a CAQDAS is that it is easy to ensure for both intra-coder and Inter-coder reliability. While carrying manual qualitative data analysis, researchers have to prepare a master list to check at a regular stage for consistency;

but with Atals-ti 5.0, several features are available within the software for this purpose. In particular, Atlas-ti 5.0 has a feature called 'flat code migration'. According to the Atlas-ti (2004, p.248): "The method of flat code migration is useful when working in teams and when a code list is first developed on one computer. This way, other team members can easily import the agreed upon list of codes into their 'Hermeneutic Units'. Other potential applications for this function include testing reliability, or starting deductive structural theory work from scratch. When testing for reliability, a given code base can be used on the same material by different authors". The Atlas-ti 6.0, which is soon to be released, has even a feature called 'Inter-rater Reliability'. "With this feature, the reliability of an analysis project and thus the validity of its results can be verified. Based on sophisticated measures such as Krippendorff's Alpha, this new feature provides accurate and reliable comparisons of the coders' work in a team or in longitudinal settings" (Atlas-ti, 2006).

3.4 Reflexivity

One of the most useful features of Atlas-ti 5.0 is called the 'memo'. The 'memo' feature can be used to make reflexive actions on each small part of the data. In particular, the 'memo' feature is designed to capture the researcher thoughts regarding the data and is an important device for reflexivity (Atlas-ti, 2004). In addition, Atlas-ti 5.0 has the memo Family Manager' feature (as shown in Figure 5), which is useful for sorting, filtering, and managing the researcher's written reflections about the project, data, participants, and self (Ibid). In this sense, this particular feature allows for an analysis of the reflexive actions for the whole project. In other words, researchers can make an additional analysis of their own reflexivity.

Figure 5: The Memo Family Manager in Atlas-ti 5.0



Source: Exemplar Research

In the exemplar research, the researcher ensured that all thoughts and experiences were carefully noted as 'Memos' in Atlas-ti 5.0. During data collection, notes on observation concerning the context and constraints under which research participants were providing

their data; and the researcher's thoughts were also meticulously kept on record and used as additional memos in Atlas-ti 5.0 under the same 'Hermeneutic Unit'. In this way, the researcher tried to be critical of the social and cultural environment under which the research participants have been providing the data. Indeed, the social and cultural environment does affect the data. For example during the FGDs, girls from single sex school were found to be more at ease in voicing out personal experiences, opinions, and beliefs on sexuality related issue than in mixed sex schools.

While carrying out data analysis for the exemplar research, the memos of the researcher's personal thoughts, interpretations, and beliefs were also written for further considerations while making theory from the collected data. In principle, researchers are encouraged to reflect on and record their interpretations, and they are reminded that the validity of their interpretations is dependent on being able to demonstrate how they were reached (Mauthner and Doucet, 2003; Mason, 1996). This sort of reflexive actions are vital for rigour in qualitative social research. Using Atlas-ti 5.0 therefore brings its added value for rigour by providing in-built features that could be easy and simple to use.

4. CONCLUSION

To sum up, this paper outlines the important contribution of CAQDAS in bringing rigour to qualitative social research. In particular, the paper describes why and how Atlas-ti 5.0 has been used in an exemplar research on the ecology of the Mauritian early adolescents' Internet-mediated dating/romance. The paper also provides a brief justification for three essentials of rigour - validity, reliability, and reflexivity - in qualitative social research. Finally, the paper explains the various advantages obtained by using Atlas-ti 5.0 for brining rigour in qualitative social research through enhancing the validity, reliability, and reflexivity.

As a general conclusion, it can be said that one of the ways in building trust in social research is through explaining the steps in making the study rigorous. A well-written description of the rigour in research analysis should convince readers that the study findings are credible and trustworthy (Belgrave et al., 2002). Thus, it is imperative that social researchers engaging in qualitative studies develop a habit of providing full description of how data analysis has been carried out, just as it is the case with quantitative research. In the past, qualitative have been preferred to quantitative research methods, because of cost and time saving. However, these presumed savings might be illusory, rigorously carried out qualitative social research takes time and is not necessarily inexpensive (Kidd and Parshall, 2000).

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