

Qualitative data analysis: A primer on core approaches

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Discovering the threads that constitute actual interactions is an essential means of making sense of the world. But perception of overall patterns of things that are contextually related is equally important.

Richard J. Borden (2014) *'Ecology and Experience'*

INTRODUCTION

Conducting qualitative data analysis can be daunting to any novice (and even experienced) researcher. There are multiple different approaches to qualitative analyses ranging from Content, Thematic, Grounded Theory to Narrative, Conversation and Discourse. To add to this complexity, analyses no longer need be conducted manually; you can now make use of any one of a host of different Computer-Aided Qualitative Data Analysis (CAQDAS) software, available either commercially or as open source software. With all these different approaches and tools available it is necessary to have an overarching understanding of what qualitative data analysis really is and how to conduct it. This will assist us with making informed decisions about the particular analysis approach and tools which would be appropriate to use for our study.

Most qualitative data analyses are based on the same fundamental principle: identifying the common themes or patterns. These analyses thus incorporate a process of breaking down all the data into their smallest component parts (the codes) and then re-structuring and grouping these codes into units or categories known as themes. This is known as the thematic approach and usually forms the foundation for most other types of analyses. Each of the other analysis approaches adds additional or different lenses to the Thematic Analysis.

This chapter will start with an explanation of the fundamental principles of data analysis, highlighting the differences between inductive and deductive coding. The approach will be illustrated with examples of its application in the South African context. The various analysis approaches will then be introduced, making references to

the key authors that may help your further reading and exploration once you have chosen the appropriate approach for your research. The chapter concludes with a short section providing guidance on how to select the right software for your study (or when to use manual processes).

FUNDAMENTAL PRINCIPLES

Fundamentally, both qualitative and quantitative data analysis revolve around summarising, describing and analysing masses of data (Lacey & Luff, 2007; Schurink, Fouche, & De Vos, 2013). In the case of quantitative research the data are numerical with various statistical techniques employed to examine patterns and seeking relationship. Qualitative research also demands the same summation, description and analysis, with the main aim of seeking relationships and examining themes or patterns, discrepancies and links (Flick, 2014b; Schurink et al., 2013). In the case of qualitative research the data are mainly textual, graphic, audio or other non-numerical data (Flick, 2014b; Schurink et al., 2013) . The tools used are also not statistics but various qualitative data analyses techniques. (Lacey & Luff, 2007) Both qualitative and quantitative data analysis thus recognises that humans struggle to relate to vast amounts of unstructured data, and the need to bring some order to the chaos of data (Bazeley, 2013; Evers, 2016; Reichertz, 2015; Saldana, 2015). This is true for both the researcher and the ultimate readers or consumers of the research. This chapter is aimed at helping you prepare and arm yourself for the skirmish ahead.

Qualitative data analysis (QDA) is the tool employed by researchers to makes sense of the vast quantities of data so that the data can be presented in a systematic manner to their readers. In general, QDA starts with a coding process, firstly identifying sections of text which are of importance in qualitative data (the quotation¹) and then providing these with identifying names (codes). This data are, however, still unstructured. To synthesise and make sense of these data the various highlighted concepts are grouped together in meaningful units, by examining which of these concepts relate to each other

¹ When coding on paper (manual coding), the quotation would often be represented as the text that you have highlighted with a marker pen. This represents the identified original quotation which is to be named or tagged through a code. The text may be a word, phrase, sentence or several paragraphs. The quotation must represent a meaningful unit of text in relation to the particular research.

(grouping the codes into themes). This is generally termed Thematic Analysis which is the corner stone of most QDA. A reader or researcher trying to make sense of the phenomenon under investigation would then be able to very quickly first make sense of the overall phenomenon, by just reading the themes. The themes can then be examined more closely by looking at which codes were employed to construct the theme. The codes thus represent the main aspects represented in the theme. Detailed interrogation of that code can then be made by consulting the original quotations (highlighted section) related to each of these codes.

Excellence in QDA thus requires that the researcher always keep the audience and final product (aimed at answering the research question) in mind (Bazeley, 2013). The ultimate purpose of any research is to be consumed. A particular audience should always be envisaged as factors such as the audience's field, the purpose of the research, the research paradigm and the background of the researcher and intended audience, for instance, may influence the approach to analysis and presentation of data (Willig, 2014b). The audience is always first and foremost human and requires the researcher to deal with a mass of unstructured data present it in a manner that allows the reader to quickly come to terms with the phenomena and meaningfully interrogate the researcher's analysis and interpretation. "[L]ogic and logical thinking [is] deeply human, rooted in the human constitution, and ultimately arising from human needs" (Reichertz, 2015, p. 123). Chenail (2012) describes this as a process of knowledge management to transform data in to information, then knowledge and finally wisdom. It thus required the combination of both scientific rigour and artistic ability (Bazeley, 2013; Lacey & Luff, 2007) to deliver a clear, concise, systematic and creative product². QDA is a tool the researcher employs to make this possible and requires a wide range of skills and self-management (Chenail, 2012).

² A parallel for this qualitative sense making of vast amounts of data for users can be seen in the quantitative arena where dashboards are employed to enable stakeholders engage with the data effectively through various visualisations. The emphasis is on consolidating and relating a vast amount of data in a manner that allows users to make sense of the data as quickly and meaningfully as possible (Abd-elfattah, Alghamdi, & Amer, 2014; Archer & Barnes, n.d.; Few, 2007; New Media Consortium, 2013)

BOOTCAMP

QDA resembles a therapeutic process with humans at its core, both as producers of research, participants and consumers. As humans, certainty and knowledge provide us with a sense of security. Unfortunately, qualitative research textbooks and articles are littered with various terms, often referring to the same concept. Even specific methodologies have various flavours as researchers start out working together, disagree, new players enter the arena and new schools of thought are born. This can be daunting to deal with, whether you are a novice not knowing which expert is 'right' or an academic too afraid to ask questions or admit that you don't know or are confused. Even the seasoned researcher Patti Lather (1991, p. 149) described data analysis as "the 'black hole' of qualitative research".

Too often we hear: "It is not personal! But qualitative research is personal". You are the instrument (Schurink et al., 2013), part of the process (Bazeley, 2013; Saldana, 2015) and who you are is inherent in your analysis, interpretation and writing, a product of hours of intensive labour. It is human to feel that every comment and review speaks to your personal abilities, skill and standing or that the amount of data are too daunting or that you have failed (Schurink et al., 2013). If you however re-frame your process with QDA as a journey and have the willingness to ask and be vulnerable, you will find some others eager to contribute, empathise, share their own experience and provide support. As your confidence builds, you will be able to identify the approach that best suits you, the particular research problem you are working on and your intended audience. When all falls into place, you develop the ability to exercise the freedom within that approach whilst remaining true to the principles of the chosen approach. Secure in the knowledge that there is no one, right way of approaching QDA and there is always more to learn and explore (Bazeley, 2013; Campbell, Quincy, Osserman, & Pedersen, 2013; Chenail, 2012; Denzin & Lincoln, 2011; Eberle, 2014; Flick, 2014a&b; Huberman, 2014; Schurink et al., 2013; Willig, 2014a)

Part of why learning to conduct QDA is such a challenge is that there are several diverse areas which you need to master. When attempting QDA, we often confound and conflate these or, even worse, attempt to master them simultaneously. In this chapter I will deal with three distinct skill-sets: Thematic Analysis, some Research Designs (Methodologies) and Computer Assisted Qualitative Data Analysis (CAQDAS). I will

thus start with the foundational skill of Thematic Analysis, touch on some qualitative research designs and then end off with CAQDAS³. Whilst I tackle these skills starting with Thematic Analysis, please always keep in mind that the process is not just about technical proficiency in coding, but the final aim is meaning-making (Flick, 2014b; Reichertz, 2015)

Thematic Analysis

Our first foray into QDA boot camp involves Thematic Analysis. Braun and Clarke (2006, p. 78) state that “...there are methods that are essentially independent of theory and epistemology, and can be applied across a range of theoretical and epistemological approaches”. I, along with other authors (Flick, 2014a; Huberman, 2014; Saldana, 2013, 2015; Willig, 2014b), could not disagree more strongly with this statement, it is as impossible to not have a stance in research as it is to believe you could raise a child without the child picking up on at least some of your values and beliefs. As Archimedes stated: “ΕΛΕΓΕ ΔΕ ΚΑΙ ΔΩΡΙΣΤΙ ΦΩΝΗ ΣΥΡΑΚΟΥΣΙΑ, “ΠΑ ΒΩ ΚΑΙ ΧΑΡΙΣΤΙΩΝΙ ΤΑΝ ΓΑΝ ΚΙΝΗΣΩ ΠΙΑΣΑΝ” or “Give me a place to stand and with a lever I will move the whole world.” (From the Book of Histories 2 by Chiliades, 12th century AD, Tzetzes, n.d., p. 129–130, translated by Francis R. Walton). You have to stand somewhere.

I do however support the view (Braun & Clarke, 2006; Saldana, 2013; St. Pierre & Jackson, 2014; Vaismoradi, Turunen, & Bondas, 2013; Willig, 2014b) that Thematic Analysis is an essential foundation for entering the complex, diverse and nuanced world of qualitative data analysis. Thematic Analysis⁴ provides the opportunity to develop coding and thematising skills which are the basis for multiple research methodologies. Once these base skills are in place it needs to be contextualised in a theoretical and philosophical stance (Bazeley, 2013; St. Pierre & Jackson, 2014). Data do not simply speak for themselves (Willig, 2014b). For the purposes of this chapter I will however discuss the process of Thematic Analysis as an important generic skill to develop, an

³ Please note that using a computer to aid you in your analysis is by no means necessary, it has many benefits, but if your computer literacy is a challenge you may well conduct a much more meaningful analysis manually, allowing you to focus on meaning-making.

⁴ Thematic analysis can be employed as a standalone analysis approach, at the same time, it also constitutes the foundation for most other advanced analysis techniques.

approach employed to introduce students to analysis, by other authors such as St. Pierre and Jackson (2014, p. 715) who state that “we teach [thematic] analysis as coding because it is teachable”.

Thematic analysis is in essence a process of breaking a multitude of data (mostly text, although this may be images, sound, video etc) into meaningful sections and then recombining them into groups of concepts and ideas which fit together. In research language⁵ this is referred to as coding (breaking up the text and naming each section) and creating themes (grouping the codes together and naming the groups). For the purpose of this chapter we will employ the following definition:

Thematic analysis refers to the process of identifying themes in the data which capture meaning that is relevant to the research question, and perhaps also to making links between such themes. In this way Thematic Analysis helps the researcher identify patterns in the data ... (Willig, 2014b, p. 147)

Coding

Coding is a process inherent in how we naturally tend to approach any large quantities of texts. Studying for my final examinations, I would often highlight sections of text which I thought were important and, in the margin, scribble a note to remind myself what that particular section dealt with. This is essentially the coding process. The highlighted or selected text is generally referred to as a quotation while the summarising note would be referred to as a quote. What you select to highlight in research is however not informed by what you think will be important for the exam, but which sections you feel relate to your research question and approach. Someone approaching a text for linguistic purposes (language focused) will have very different codes than the same text analysed for anthropological purposes (study of various aspects of humans within societies). Of course just to confuse any novice coder, methodologists will often use various terms to refer to something as basic as coding e.g. data extract, data item,

⁵ Language is very important in research, you need to use the language that is consistent with the philosophical stance and approach you are using. Seeing terminology from one approach in another is often a red flag to examiners and reviewers immediately signaling to them that something is suspect even if it is a very rigorous study.

meaning unit, condensed meaning unit (Braun & Clarke, 2006; Saldana, 2015; Vaismoradi et al., 2013).

The following will serve as a working definition for coding in this chapter:

Coding provides a means of purposefully managing, locating, identifying, sifting, sorting, and querying data. It is not a mechanistic, data reduction process, but rather one designed to stimulate and facilitate analysis. Either explicitly or implicitly, it is a necessary step in most approaches to qualitative analysis, yet forms of coding, approaches taken to coding, and specific purposes for coding vary enormously. (Bazeley, 2013, p. 125)

A study conducted on the possible introduction of Open Educational Resources (OER) at a particular tertiary institution will be used to illustrate the various processes of QDA in this chapter. Below you will see an example of such coding of an interview using Atlas.ti one of a range of available CAQDAS programs. The only difference from a manual process is that the selected text is not necessarily shown with highlighting, but bars or brackets in the margin showing the quotation that was selected and associated with a particular code.

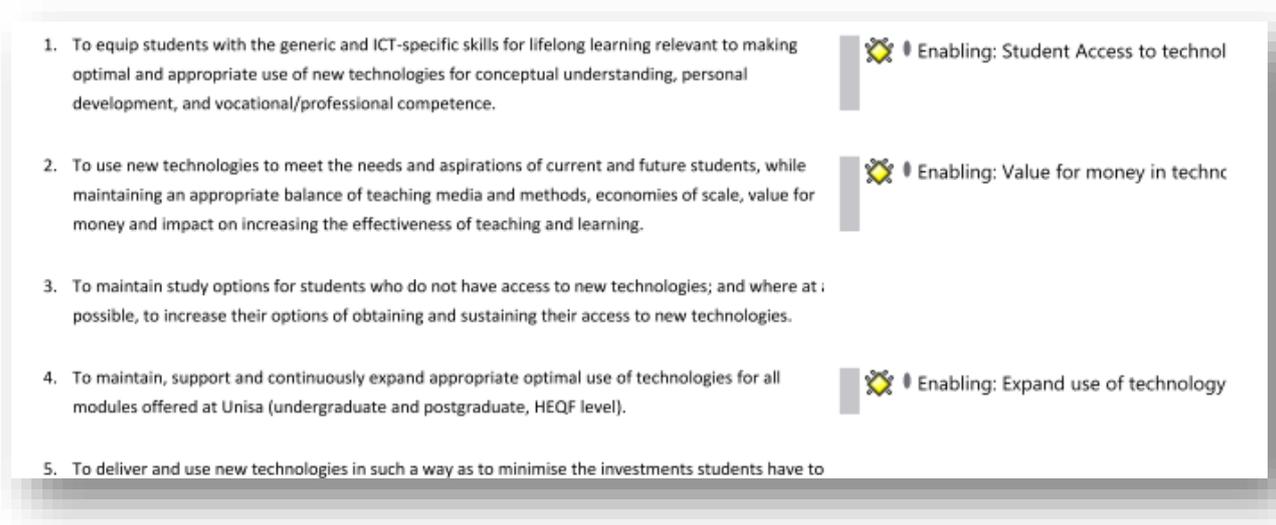


Figure 1. Example of coding

Students ask how much text should I highlight as my quotation? The short answer is, as much as would allow the quotation to make sense once removed from the original text,

or decontextualised as St. Pierre and Jackson (2014) refer to it. This means that the amount of text needed to be highlighted for a quotation may be a word, sentence fragment, paragraph or may even need to include the question text, in order to make sense (Bazeley, 2013). Researchers also disagree about how detailed codes must be and therefore, how many codes you should have in order to reach data saturation, suggestion include anything from 25-300 codes per research project (Saldana, 2013). In reality it is a nonsensical debate, as the granularity of coding and number of codes required for thorough analysis really depends on the particular study and requirements.

Once you have created a code it is imperative that you use the code on other units of text (quotations) relating to the same concept or idea. That is the entire purpose of QDA, to make the repetition overt so that you can identify themes or patterns.

Theme

For the purpose of this chapter a theme is defined as clustering of seemingly disparate codes into groups sharing similar characteristics which on some level represents meaning or a pattern in the text (Braun & Clarke, 2006; Lacey & Luff, 2007; St. Pierre & Jackson, 2014; Vaismoradi et al., 2013) . The aim is to, on some level, provide meaning from the dataset relating to the research question.

Many textbooks discuss this process stating that you ‘immerse’ yourself and somehow the themes will ‘miraculously appear’, an idea that is ridiculed by St. Pierre & Jackson (2014). The process of generating themes and finding the patterns is one of blood, sweat and tears. Sometimes you are stuck for days, need to speak to colleagues and supervisors and sometimes inspiration and insight may strike at the strangest times, like when you are singing in the shower. It is a conscious and sub-conscious process, a culmination of your involvement and commitment to the research project right from the start.

Themes are generated once you have completed the coding process, you will be confronted with a number of codes that you have generated or applied to the text. You may be faced with so many codes that it seems to not facilitate your sense making process. That is why there is a follow-up process known as creating themes to help identify underlying patterns. Themes generally refers to the grouping of codes into

meaningful units (codes that seem to relate to each other) (Saldana, 2015). From our example on the possible introduction of OER codes such as International Funding, Corporate Collaboration, Grants, etc. could all be grouped together. We would then name that grouping, in this case: *Funding*, this collection of codes in a named group constitutes a theme.

This is the basic Thematic Analysis process described by many authors (Braun & Clarke, 2006; Huberman, 2014; St. Pierre & Jackson, 2014, p. 716; Vaismoradi et al., 2013). Of course just to ensure a little confusion the academe has used terms such as category, domain, unit of analysis, phase, process, consequence and strategy interchangeably in various publications to denote the same concept as a theme (DeSantis & Ugarriza, 2000; Vaismoradi et al., 2013).

Process

Multiple authors (Bazeley, 2013; Braun & Clarke, 2006; Saldana, 2013; Vaismoradi et al., 2013) have attempted to map thematic analysis. I present a very simplified version below:

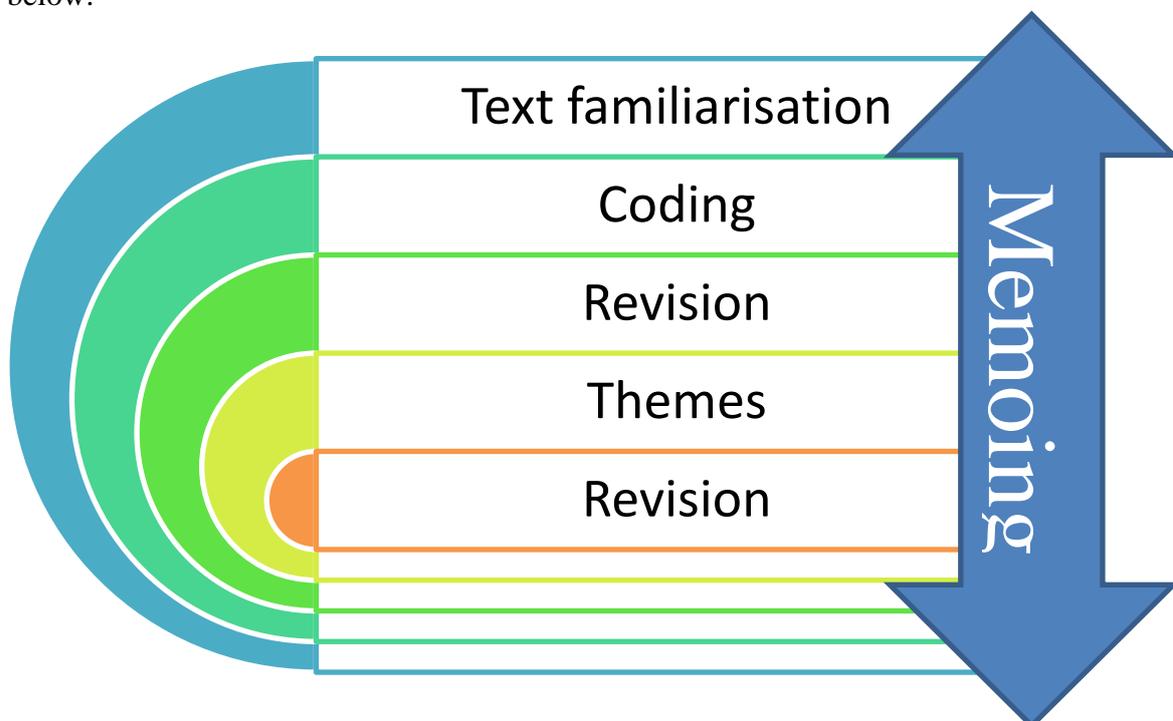


Figure 2. Thematic Analysis

Thematic Analysis is a very personal process and you must stamp your own personal style on it (Bazeley, 2013). However, you have to familiarise yourself with the text,

whether you listen to interviews on your mp3 player or re-read transcripts; you have to *code*, whether you use a computer, or highlighters, or colourful post-it notes; and you have to create *themes* and name them, whether you do it on the computer screen or shift code cards in groups on a table top. Most importantly in all of this is *revision*, it is not a linear process, but an iterative, recursive one, you constantly move between analysis, data collection and sense-making (Bazeley, 2013; Evers, 2016; Saldana, 2013; Schurink et al., 2013; St. Pierre & Jackson, 2014; Vaismoradi et al., 2013; Willig, 2014b). Bazeley (2013) describes this as *read and reflect, explore and play, code and connect, review and refine*.

One of the most practical guides for coding is the *Coding manual for qualitative researchers* by Johnny Saldaña (2013) in which he describes dozens of different ways to code. Gee (as cited in Huberman, 2014, pp. 27–28) refers to 27 analytical strategies for discourse analysis alone. Reading these texts are invaluable for exploring the options for coding open to you. There is, however, no text which gives you a clear route, which allows no deviation, they all provide options as no research or analysis is devoid of context. Whilst remaining in your research framework of the specific philosophy you may find yourself combining analytical approaches or expanding from pure thematic analysis in order to answer your research question as best possible. The only constant for all these authors (Saldana, 2013, 2015; St. Pierre & Jackson, 2014; Willig, 2014b) is that you will not get your coding ‘right’ the first time, you will have to reflect, recode and refine throughout.

You are also not a computer algorithm, you will start thinking of themes even while you are conducting the interview, or codes or think of codes while you are seeing patterns (Saldana, 2013; Schurink et al., 2013). Memos are a very important tool to keep note of these thoughts. Schurink et al. (2013) states that memos can be relate to reflections on analysis, the method, ethical dilemmas and conflicts as well as the researchers frame of mind. Thornberg and Charmaz (2014, p. 163) reiterate the importance of memos, emphasising the analytical value for grounded theorists who use memos to grounded theorists step back and ask, ‘What is going on here?’ and ‘How can I make sense of it?’” It is these higher level concepts that will significantly contribute to the final write-up (Bazeley, 2013). While I do not have time to expand on memos and reflexivity in this chapter, it is essential for rigorous qualitative analysis.

Then of course, as this is boot camp you have to be aware of the booby trap that awaits all Qualitative Data Analysts – the ‘coding trap’ (Bazeley, 2013; Gibbs, 2014). Not knowing when to stop coding. Many novices will, once they have the hang of coding, hold on to it and just keep going, afraid of the next unknown step. So the question is when to stop coding? The short answer is when you reach data saturation. There are expansive works on various types of saturation, we will stick to a straightforward definition here. Data saturation is the point at which no new themes and codes are emerging, you have sufficient data to support all your themes (Bazeley, 2013; Bowen, 2008; Morse, 1995). In other words, you are seeing no new patterns, only more examples of the same patterns.

Logical reasoning

As discussed previously, data analysis is a human endeavor designed to discover patterns of human consumption as such, it rests solidly on human reasoning. The American author Pierce wrote extensively on humans need for logical reasoning and expanded on several types of reasoning (Reichertz, 2015). He highlights various good forms of logical reasoning or cognitive thinking skills such as induction, deduction and abduction which form the basis of QDA (Reichertz, 2015). I will very shortly introduce these three types of cognitive thinking skills. Many others exist and can be explored in books such as *“Thinking Qualitatively: Methods of Mind”* (Saldana, 2015)

Induction

Inductive logic is an open ended approach, attempting to minimise assumptions and attempting to identify emergent ideas and themes strongly linked to the data themselves (Braun & Clarke, 2006; Saldana, 2015). Inductive approaches are most useful where there are few previous studies dealing with the phenomenon (Vaismoradi et al., 2013)

Deduction

Deduction implies approaching a study with a very specific agenda in mind (Saldana, 2013). Deductive approaches are generally employed to examine a previous theory in a different context. What particular aspects of the data are being examined is much more specific and often a pre-designed framework and codes are applied to the data. The approach doesn’t mean a blind commitment to stay within the frame, but focuses the

study (Vaismoradi et al., 2013). Data is thus mainly examined in terms of the extent to which and to how very specific aspects are included in the texts.

Abduction

Abduction is a type of logic applied where a number of possible reasons may explain what you are witnessing. The aim of this type of reasoning is to identify and justify a particular choice of tentative explanation which seems the most worthy of further investigation. (Saldana, 2015; Thornberg & Charmaz, 2014) No study purely relies on only one type of logic. More often than not all these cognitive skills will be employed in a research study.

Thinking about data presentation

I often tell my students that if you start writing an article before deciding on the journal you wish to publish in, you have already failed. This is an over-statement, but it reflects logic of thinking of how you wish to present your data to support you in your coding process. There are various approaches to data display ranging from narratives with detail levels of codes to matrices (tables or frameworks) and networks (figures) or graphs (frequencies) (Huberman, 2014; Lacey & Luff, 2007; Schurink et al., 2013).

For this section I wish to discuss writing up your argument based on the QDA as a narrative. If you imagine the final report writing phase it can improve your analysis process. You may consider your themes as the main subheadings in your discussion section, while each code represents a point to discuss in that section. Returning to the quotations attached to the codes allows you to gain access to the rich content of what participants contributed to each section. In such a way it supports your writing process. In the case of our OER example:

Table 1. Example of Themes with codes

Theme	Codes
Funding	Alumni Collaboration with other institutions Corporate/private Government

	Invest for delayed returns
	National and international bodies
	Own Institution
	Work integrated Learning
Barriers	...
Implementation	...
Enabling factors	...
Choice of materials	...
Role of the student	...
Join the OER movement?	...

In this example you can see that our report will deal with possible barriers, funding, implementation ideas, enabling factors already in place, which materials would be most suited to employ as OER, the role of the student and whether or not the institution should join the OER movement. Under the funding section the following possible funding avenues will be explored: alumni, collaboration with other institutions, corporate/private collaboration, government funding, invest for delayed returns, national and international bodies, own institutional funds and aligning the project with the existing work integrated learning programme. Some authors prefer to use more descriptive names for the themes, whilst others as in the example will use concise themes with a full description for each as part of the analysis. The choice of approach depends on you as the researcher. In this case the funding theme would relate to the possible sources of funding to support the development and sustainability of OER in the institution.

If you envision your output in this way, deciding on code and theme names becomes easier. A code or theme name that will not immediately act as a route marker in your write up process will be of little or no use.

COMMITTING TO A BATTLE PLAN

In this section I will provide a short paragraph introducing some qualitative designs or methodologies at your disposal. These are discussed more fully in other textbooks and chapters within this book.

This represents the second phase of your training. Now that you have mastered the basic skills of Thematic Analysis, you need to choose an approach grounded in a research philosophy. I succinctly introduce Content Analysis, Narrative Analysis, Discourse Analysis and Grounded Theory, as these are some of the most common approaches employed by students. I discuss the fundamental principles of each, but all have various schools of thought with different emphases and different application of terminology for the same concepts within the same methods (Vaismoradi et al., 2013). A basic conceptualisation of the landscape and possibilities is however essential so that you can explore the most suitable approach for your study.

Content Analysis

Some authors refer to content analysis in both a qualitative and a quantitative sense (Schreier, 2014; Vaismoradi et al., 2013). For the purposes of clarity, I will only refer to the quantification of data here as content analysis as qualitative content analysis strongly resembles thematic analysis with a deductive approach employing a pre-designed coding framework (Schreier, 2014). In this type of quantitative content analysis (which bares much similarity to framework analysis) the frequency of some theme or code appearing in one case vs another is compared (Lacey & Luff, 2007).

Table 2. Numerical content analysis (absolute numbers)

Understanding of OER	Case 1	Case 2	Case 3
Low	12	345	564
Average	31	1245	78
High	63	234	63
Total	106	1824	705

The type of analysis shown in Table 2 is deceptive and misleading as absolute numbers are shown, as opposed to a proportional distribution. Also remember that QDA is always tentative and while frequency may be an indicator of the importance of a theme or code, it is not the only or in many cases, the most important indicator relating to the code or theme (Vaismoradi et al., 2013). A presentation of the same numbers, such as seen in Graph 3 as relative percentages, would be much more meaningful, but should

never be presented in isolation. Such an analysis should be accompanied with a discussion and supplemented with the content provided within the themes, providing a rich description of the data.

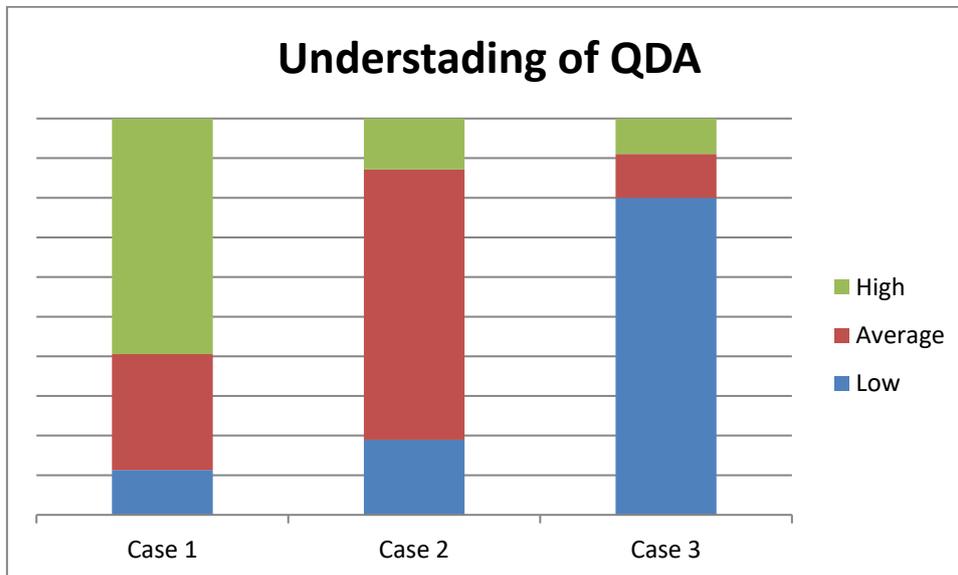


Figure 3. Relative understanding of OER across cases

Narrative Analysis

As the name implies, stories lie at the heart of Narrative Analysis. The stories we tell about ourselves, define us, provides a sense of history and continuity and a means of conveying this to others (Willig, 2014b). Even with this seemingly intuitive basis of Narrative Analysis, there is complexity and various approaches. Particular types of narrative analysis exist and various researchers may focus on different aspects, be it the content, structure, form, organisation, or linguistic features, to name but a few (Esin, Fathi, & Squire, 2014). A multitude of analytic tools are also available for all these varied narrative approaches, opening up a vast trans-disciplinary domain (Esin et al., 2014; Willig, 2014b). Narrative analysis mostly takes a strong constructionist approach focusing on the co-construction between speaker and audience, taking into account the interpersonal, social and cultural space (Esin et al., 2014). This approach places a responsibility on the researcher to analyse their own personal, social, cultural and methodological positioning and be critical of how these impact across personal and cultural resources of both the narrator (researcher) and the audience (Esin et al., 2014).

Discourse Analysis

There is a wide variety of approaches to discourse analysis, although all share a perception of language being constructive and performativity (Willig, 2014a). The language has a particular purpose within a social context, constructing a particular version of events (Huberman, 2014). Language empowers, prevents and constrains (Willig, 2014a). Discourse analysts thus have various tools to move beyond the face value of language, driven by a particular theory, making it a diverse interdisciplinary arena (Huberman, 2014; Willig, 2014a).

Grounded Theory

Grounded theory is a highly inductive approach, usually employed where little or nothing is known about a particular field (Bowen, 2008). It employs a process of constant comparative analysis between theoretical codes, data, empirically generated codes and categories, and memos in order to generate theory (Bowen, 2008; Schurink et al., 2013; Thornberg & Charmaz, 2014). As Willig (2014b) explains, this is not a theory driven approach, it encourages rigour within flexible guidelines in order to construct new theories. The approach is highly iterative with data collection and analysis taking place simultaneously and informing each other (Cho & Lee, 2014; Thornberg & Charmaz, 2014).

As can be seen in Figure 4 below there are many branches and flavours of grounded theory (often because of disagreements between academics) as is the case with all research approaches. This is part of the confusion that is created. The best tactic is to choose the specific approach you intend to use and work within those guidelines.

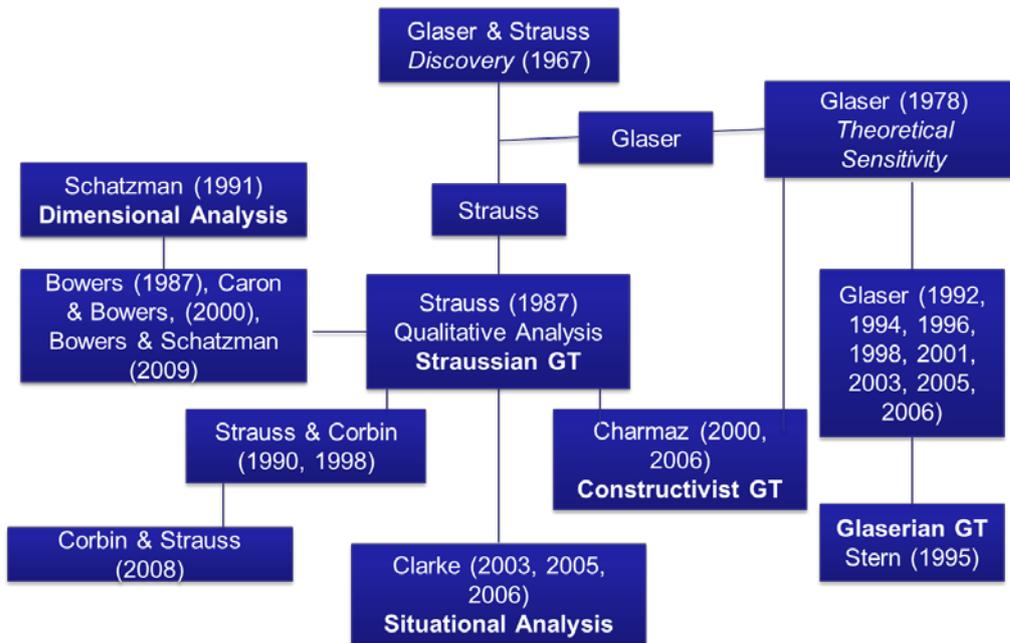


Figure 4. Genealogy of Grounded Theory - Major Milestones (Morse, 2009, p. 17)

ARMING YOURSELF

Computer software to assist with qualitative data analysis (QDA) has become established as an essential tool for many researchers in the last 20 years. One of the most commonly used acronyms for this software, [Computer-Assisted Qualitative Data Analysis] CAQDAS, [was] introduced by Fielding and Lee following a 1989 conference on the programs...

(Gibbs, 2014, p. 277)

While software brings you closer to the data and allows for more nuance, with multitudes of tools for reviews, sorting, sifting and even quantification (Bazeley, 2013; Schurink et al., 2013), the emphasis is on *assisted*. The program does not conduct the analysis for you any more than my word-processing software is writing this chapter for me (Bazeley, 2013; Flick, 2014b; Gibbs, 2014; Lacey & Luff, 2007; Saldana, 2013). Fortunately, or unfortunately, you as researcher remain the brains of the operation. You need to be able to conduct solid QDA and know which Research Design and paradigm you are working in before even starting on the CAQDAS route. Contrary to the assertions of Denzin and Lincoln (2011) who describe CAQDAS as a ‘method of analysis’ in the *SAGE Handbook of Qualitative Research*. I agree with many other

authors that it is only an analytic and organisational tool to facilitate a philosophically sound research project and analysis (Bazeley, 2013; Gibbs, 2014; Saldana, 2013).

There is a vast array of CAQDAS software available, all generally supporting at least code lists; coding and retrieval. Today CAQDAS software may also allow for comparison; memos; networking; querying; revision and non-linear processes; transparency and the ability to deal with a range of document from text, to audio, to video etc. (Evers, 2016; Flick, 2014a; Gibbs, 2014; Saldana, 2013). Some of the most popular tools include: ATLAS.ti, NVivo, MAXQDA, AnSWR, HyperRESEARCH, QDA Miner, Qualruss, Transana and Weft QDA and new players are entering the market every day (Gibbs, 2014; Saldana, 2013). There are even free, Open Source Software available such as Weft, Open Code, AnSWR and TAMS Analyzer (Gibbs, 2014; Saldana, 2013).

So how do you choose the right tool for your research project? Gibbs (2014) states that you should consider the following:

- What programs are available?
- What support and expertise are available?
- What can I afford?
- Are the materials in digital form?
- How big is the project? (the bigger the project, the more important to employ CAQDAS)

In many cases the decision is not yours, but a result of an institutional decision or the requirements of a funder. Much information about all these programs and even demonstration versions can be accessed to support your decisions on sites such as <http://caqdas.soc.surrey.ac.uk/> (University of Surrey, n.d.).

The Dutch KWALON experiment is elucidating in relation to CAQDAS. The experiment tasked researchers from five different software teams to analyse a common data set using various CAQDAS programs. The results indicated that it was not the program, but the user's way of making sense of the data that was reflected in the analysis. (Flick, 2014a; Gibbs, 2014)

ETHICS IN THE MIDST OF BATTLE

Ethics is often discussed in terms of data collection and designing research. Ethics are however important in analysis as well. The responsibility of a researcher has been thoroughly document and explored in literature. In 1981 Clifford Geertz (as cited in Czarniawska, 2004, p. 108) poignantly described the researcher's responsibility: "[this burden] cannot be evaded, however heavy it may have grown; there is no possibility of displacing it onto 'method', 'language', or... 'the people themselves' redescribed ... as coauthors". There is no one on one correlation between the voices of your participants and the analysis or the work you will deliver. It is impossible to represent each voice equally and explore each pattern which emerges. As you are conducting the analysis and forming interpretations in order to present the data, you are constantly making decisions. There is great power inherent in this, embodied in the choices of which themes to include and which to omit. Our choices are influenced by how we wish to represent ourselves and the participants to others.

As we cannot avoid making these choices, we need to be clear about our theoretical and paradigmatic grounding, as well as how our own personal history has may have influenced our research and be transparent about this with our readers (Bazeley, 2013; Willig, 2014b). This is not a once of action during the research, but a constant meta-process, where we as researchers try to ensure that we are ethically representing our participants (Bazeley, 2013; Lacey & Luff, 2007). Much of this ethics is embedded in a rigorous and trustworthy research process itself. Documented self-interrogation (reflexivity) must however also be our constant research companion in order to remain loyal to the voices of our research participants.

THE REALITIES OF THE BATTLE FIELD

There is no such thing as perfect research and even the most detailed and well-thought out plan will go awry once it meets the realities of the field and bureaucracy of higher education institutions. As Bazeley (2013) explains there is an awful lot of posturing in methodology and some reviewers and examiners take pleasure in destructive instead of constructive criticism. Some of the traps to try and avoid are:

- Striving for perfection (trying to please everyone)
- Not using advanced linking (not applying your mind thoroughly in the interpretation)

- Not knowing when to stop coding ‘the coding trap’
- Ignoring that which doesn’t fit the pattern (negative cases) or if there are multiple patterns depending on some demographics or other indicators

Novices often complain that analysis and interpretation have not received enough attention be it in classes or texts, these are however a skill that is learnt by doing, participating in the application of the technique (Schurink et al., 2013). The process is no different than learning to drive. No matter how many books you read on driving a car, you will never master the skill until you are sitting behind the wheel and have even made some mistakes, hopefully under the guidance of someone with experience. What are required are bravery, persistence and practice.

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