

Grounded Theory: A Research Methodology for E-Learning

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Abstract

Grounded theory is a qualitative research method that is explicitly different from other methods in that it does not test a hypothesis but seeks, rather, to understand the research situation. In a recent study of the experiences of Arab students studying in online or blended courses in which the language of instruction was English, a grounded theory methodology was used to discover the main concern of these students. The research looked at the identity of the students, their motivation, attitudes, achievements and approaches to studying online and how these students characterized their learning experiences. Data were gathered via surveys, interviews, focus groups and observations and were coded and analysed. The main concern of the students was discovered and stated in their own words.

Abstrak

Teori *Grounded* merupakan suatu kaedah penyelidikan kualitatif yang berbeza secara eksplisit daripada kaedah-kaedah yang lain kerana ia tidak menguji sesuatu hipotesis, tetapi mengarah terhadap mencari kefahaman suatu keadaan penyelidikan tersebut. Di dalam kajian baru-baru ini tentang pengalaman para pelajar Arab yang mengikuti kursus *blended* atau *online* yang menggunakan Bahasa Inggeris sebagai bahasa instruksi, kaedah Teori *Grounded* telah digunakan untuk menemui masalah utama para pelajar tersebut. Penyelidikan memerhati identiti para pelajar, motivasi, sikap, pencapaian dan pendekatan mereka terhadap pembelajaran *online* dan bagaimana mereka mencirikan pengalaman pembelajaran mereka. Data dikumpul melalui soal-selidik, temubual, kumpulan fokus serta pemerhatian yang dikod dan dianalisa. Kekhuatiran utama para pelajar ditemui dan ternyata di dalam kata-kata mereka sendiri.

Introduction

Grounded theory (GT) originated in the discipline of sociology with the publication of Barney Glaser and Anselm Strauss in 1967. It was based on the attempt to make qualitative research as precise as quantitative research. Prior research had been dominated by the quantitative paradigm in which the researcher used “scientific reality” to study the “subjects” and then used statistics as a tool to measure and quantify phenomena. Qualitative researchers on the other hand look for meaning in non-experimental processes.

Essentially GT is theory that emerges from the data, and has as its goal the development of an inductively based theory of phenomena. The intention is to develop an account of some phenomenon that identifies the major constructs, their relationships, the context and process and is much more than a descriptive account (Becker, 1993). Grounded theory is the development of theory not a test of a pre-determined theory. The qualitative process of enquiry acquires data from the context in which events occur and attempts to describe these occurrences. All research is grounded by definition but only research that follows the grounded theory methodology (GTM) belongs to the “orthodox” credo.

The lexeme grounded theory comes from the practice of generating theory from research that is grounded in data that has been systematically gathered and analysed. The fundamental formulae of grounded theory are constant comparison, theoretical sampling, coding, memoing, finding guidelines for achieving conceptual density, variation and integration of data until theory that is without pre-conception or influence emerges. (Denzin and Lincoln, 1994:204).

After 1967, the individual publications of Glaser and Strauss began to take divergent paths, a fact that may not be well known to researchers. Each author began to develop GT in his own unique way until two rather distinct methodologies emerged. Glaser espouses an inductive, more positivist approach; Strauss a more deductive, objectivist one. Charmaz (1995, 2000) continued the evolution of GT with her objectivist and constructivist ideology.

Strauss and Corbin emphasised the validation and verification of theory and the proving or disproving of hypotheses as ongoing throughout the

research process (Strauss and Corbin, 1998). Both Glaser and Strauss believed that an external reality could be discovered and that the systematic application of GT strategies could lead to reliability, validity, replication and that the testing of hypotheses was possible.

Process of Grounded Theory

In contrast to the linear process of other research, the GT approach gives preference to the data and the field under study as opposed to theoretical assumptions. Theoretical assumptions are not applied to the study but are “discovered” and formulated in dealing with the field and the empirical data to be found in it. The aim is not to reduce the complex to the simple by breaking it down into variables, but rather to increase complexity by including context (Flick, 1998). The following account of the GT process is based on the lifelong work of Barney Glaser.

GT tries to discover the action in an area from the point of view of the participants. It is a question of discovering the core variable that accounts for the actions of those directly involved in the situation or process (Glaser, 1996). The main concern of the participants is always present. The GT researcher starts with an area of interest not a preconceived hypothesis or problem. The aim of the researcher is to “discover” a core variable that leads to a theory accounting for the main matter of interest to the participants.

Data

Data can be of any type, quantitative or qualitative or any combination of the two. Emerging hypotheses are continually checked by the constant comparison method of GT, thus interpretation of data precludes conjecture or supposition. The interpretations of surveys or experiments that tend to be treated with preconceived notions, personal assumptions or literature bias are repeatedly examined to let the concepts emerge.

Coding and Theoretical Sampling

In his process, Glaser declares that the analysis of the data begins as soon as the data are collected with what he terms open coding. Open coding follows the rules of asking questions of the data in a line-by-line analysis conducted by the researcher and is always interrupted to write memos on the emergent ideas. Selective coding refines the open coding by delimiting

the open coding to a core category and its properties. The researchers do not know in advance what they should be sampling for in the data, so it is only by discovering codes and comparing them with other groups, that they begin to understand what further data to collect by theoretical sampling to elaborate codes and the emergent concepts.

Generating Concepts

Glaser (1992) defines concepts as the underlying, meaning, uniformity and, or patterns within a set of descriptive incidents. Charmaz (1994) more simplistically labels concepts as conceptual categories derived from theoretical sampling.

Memoing

One of the hard and fast rules of Glaser's (1998) package is that the coding, analyzing and sampling must always be interrupted to memo, that is to capture an idea that emerges from those activities. If this is not done then it is possible that the moment of capture may be lost. GT researchers must constantly stop their activities to ensure that the idea is written down: a not insignificant dictum to follow. Memos are used to keep track of the emerging, codes, concepts and theory. They are ad hoc notes of what the researcher is seeing, experiencing and reading into the data while coding. It is these memos that provide the clues about and direction of the emerging theory and when sorted form the basis of the writing of the theory discovered.

Memo Maturation

As memos mature, they substantiate two things: firstly, the researcher can note the similarity of concepts and their properties and secondly the fact that no new concepts are emerging from the data. It is the 'not finding of new concepts' that signals confirmation of the core category i.e. the main concern of the participants and that signals the need to sort the memos and proceed with the writing of the theory (Glaser, 1998).

Writing

The research work will finally come together with the writing up of the “memo sorts”. One begins with a large problem that is systematically delimited to the core concern of the participants.

Summary of the GT Phases

GT begins with the collection of the data. Notes are then made concerning the data collection and on any observations made by the researcher, such as initial impressions of interviews or focus groups. The data is then open coded and memos are written on the emerging codes. Memos may produce additional questions for the theoretical sampling. The theoretical sampling produces more data for coding and memoing and possibly even more questions for theoretical sampling. Constant comparison is made on the basis of the codes generated and the memos that were written. Thus all data are checked for identical codes and essential memos written on the findings. The initial codes were subjected to a more focused coding to group them into categories. The memos on the focused coding are sorted and analysed for emergent themes or variables. The final stage is the writing up of the findings. The GT phases can be summarized as follows:

Data collection – making notes – initial (open) coding – memoing – theoretical sampling – collecting more data – coding – memoing – constant comparison – focused coding – categorising – memoing – sorting memos – writing up.

Using GT to Study Arab Students Learning Online in English

This part will focus on the recent research into the main concern of Arab students learning online in English. The participants were Emirati students studying at the Higher Colleges of Technology. These students were taken courses that ranged from distance online courses to blended or hybrid courses in different disciplines in which the language of instruction was English.

Data Collection and Instruments

Both quantitative and qualitative data were collected. The quantitative data were from questionnaires and surveys. The qualitative data were collected from interviews, field notes, focus groups, field observations, assessment documents, online bulletin boards, classroom observations, field notes, the feasibility study and a personal research journal.

Coding

Open coding (also called initial coding) assigns ideas, labels and questions to the data. Initial codes were done in italics so that they could be quickly picked out of the pages. Secondary codings and in vivo codes were noted in different colours. The memos and questions for theoretical sampling were done in separate documents. The colour coding and font style indicated the process. It was possible to look at a page of data and quickly pick up the level of codes, memos and additional questions for theoretical sampling.

Memo-writing

At the same time as the data were being coded, memos were being written on the findings and additional questions formulated. Each code was taken as a topic or category, given a title and a description. Concrete categories were given a precise and immediate definition while more abstract categories were left to be mulled over and later identified.

Selective or Focused Coding – Developing Categories

After the data had been coded several times, the codes were sorted into families or concepts. These selective or focused codes (selective codes is Glaser's term: focused, mine) were then applied to large amounts of the data to gather them into concepts. The purpose of focused coding was to identify and consolidate the open codes into categories and to define each category, its characteristics and demonstrate its development. The focused coding outlined the relationship between categories in ways that explain the issues and events. The open coding assigns labels to events; the focused coding develops categories, rather than labels.

The focused coding was more selective and conceptual. The open codes were used as indicators of the concepts – in other words the open codes were able to be included as a necessary condition or consequence of categories. Focused coding was also used to break up the categories into properties or as Glaser calls them indicators. These indicators defined the categories, described their characteristics and revealed the conditions when it develops (Charmaz, 1994).

In vivo Codes

Categories were also developed from the in vivo codes or the exact words of the respondents. The write-in comments on the questionnaires and the interview tapes and notes provided a number of these in vivo codes which eventually came to be used as the indicators of concepts. Charmaz (1994) states: “research participants sometimes describe their experiences with imagery and power that far transcends their individual situations”. These types of codes are of great value since they represent not only the language of the participants, with insights into their command of the English language, but best express the main interests of the participants.

Theoretical Sampling

Additional data were collected during the study by a process known as theoretical sampling. Theoretical sampling is a technique that allows the researcher to return to participants with questions that derive from the coding. It is usually the memos that point to what additional data should be collected to answer questions that come to mind while coding. An illustration of how this was done follows. In this case, the GT phases can be summarised as follows:

For instance, suppose I had asked participants about the ease of access to the course or materials and one group complained that the connection was too slow and problematical. This might lead to tentative codes of “service reliability” and “connectivity”. Then I would ask other groups and individuals if they experienced this problem. Additional responses were added to the data under codes called “service reliability”, “ease of access” and “connectivity problems”.

Constant Comparison Method

During the coding and memo writing, the indicators were constantly being compared with other data that resulted in more data being coded into as many categories as possible. If a code was generated in one set of data, the other data sets were checked for the same code. This, then, led to more memos being written. The memos were written in a word document, then an index card was made for it to facilitate the sorting of memos in the next step. Sometimes there were several memos on the same code or concept but each one had a different focus.

Sorting of Memos

Memos were grouped on the basis of the similar categories and indicators they characterised in order to differentiate the categories and clarify the relationships. As mentioned above, all the memos were tracked by their labels and numbers and these were transferred to index cards which were then physically laid out and sorted into piles. Sometimes I found that one memo belonged in two different piles so it was necessary to make a duplicate index card. In the end almost all of the memos belonged to one sorting pile or another with few memos left out.

Delimiting Memos

The sorting of the memos set the limits of the categories. Once the memos were sorted, their limits were set and any relationships between categories could be explored. It was this ordering of the memos that determined the core of the discussion in the findings. The logic of the ordering comes from either the ordering of the experiences the data represent or from the researchers sense of the logic found in the data.

The next step was to prioritise and then sequence the memos. In this study memos were sorted and limited by the researcher's ordering of the data on the basis that participants had focused on different aspects of their learning processes.

The Generation of Concepts

The generation of concepts happened simultaneously with the coding and memo writing. Concepts were clearly stated in the words of the

participants as in vivo codes or became obvious to the researcher when the categories created by the focused coding fell naturally into concepts that subsumed the codes and their indicators.

Emergent Themes

The outline of the study emerged from the data analysis and undeniably fell into three main themes: computers, learning and second language. Further exploration showed that the dominant concept in this study was learning (the main concern of the participants) and not the researcher's concern with computers or language. Constant comparison showed that students tended to dismiss the variable of computer competence by down playing its importance to lack of connectivity. Likewise, apart from what they considered minor inconveniences with English vocabulary and grammar they also dismissed language as an important factor.

Findings of the Study: The Main Concerns of the Participants

The objective of a GT study is to determine the main concern(s) of the participants. The participants were most concerned with their learning. With the exception of the concepts of language and technology, the remaining major concepts can all be subsumed as elements of the learning process.

Categories were also developed from the in vivo codes or the exact words of the respondents. The write-in comments on the questionnaires and the interview tapes and notes provided a number of these in vivo codes which eventually came to be used as the indicators of concepts. These types of codes are of great value since they represent not only the language of the participants, with insights into their command of the English language, but best express the main interests of the participants.

The example in Table 1 is from one page of coding and notes on in vivo codes.

Table 1 *In vivo* Code and Memo

| | |
|---|---|
| <p>Codes <i>Teaching one's self interest in the phenomena awareness of a personal role in learning</i></p> | <p>Statement "An interesting way of teaching myself."</p> |
| <p>Memo This student believes that he is teaching himself. He is both the teacher and the student. He views the course as self-teaching. He also finds it interesting. A powerful description of this student's main interest. <i>Do any other students feel this way?</i></p> | |

After discovering this code, I was able to some theoretical sampling by asking a focus group this question: "When you are working online in a classroom, who is doing the teaching?" Invariably, the answer was: "Me".

The eloquence of the in vivo codes is obvious. Not only do they strongly buttress the codes or labels assigned to the data but they support the main concern of the participants: learning by self-teaching.

The two lesser concerns of the participants were language and technology. The findings also support the participants' language comfort and computer competence.

Rationale for Choosing the Grounded Theory Methodology to Investigate E-Learning

Since GT does not begin with a hypotheses, it is nearly impossible to frame the research questions at the beginning of the project because that would presuppose that the data would answer the question(s), when in fact it may not and may even answer questions not asked. In my opinion the GTM provides a way to focus on a group of participants, a methodology and a set of methods and analytical tools to investigate and report on what is happening within a specific context.

Trusting Grounded Theory

The sources of trust in grounded theory are the four criteria for its evaluation.

Fit or validity: the concept(s) stated represent the patterns found in the data.

Relevance: the concepts will relate to the true issues of the participants.

Work: the concepts and their theoretical coding are tightly related to what is going on. It works thus instilling trust that allows us to understand and apply a theory about a substantive area.

Modifiability: this criterion is very important because the theory can be modified by constant comparison. In other words, the theory gets modified by subsequent data (Glaser,1998).

The fact the GT is the best method for investigating e-learning resides in the following:

1. *Theory is grounded in data:* the grounding of theory in the data gives the best possible insights into the students and their experiences.
2. *Flexibility:* the flexibility of Glaser's approach allows for the formulation and discarding of hypotheses as the data analysis progresses. In other words it is not limited to "proving or disproving" a theory. The research problem itself is discovered through emergence as a natural by-product of the process of open coding, theoretical sampling and constant comparison.
3. *Familiarity with the substantive field:* the fact that researchers may be familiar with the field under study, does have some influence. Declaring the exact role of the researchers in the research helps to ameliorate bias. Minns (1985) supports the notion that a researcher can only understand what is happening when he or she is immersed in the data experienced in context.
4. *All is data:* the fact that both quantitative and qualitative data could be collected and analysed using GTM, was an advantage because it allows the researcher to use a variety of texts and materials such as questionnaires, interviews, submissions to group discussions on bulletin boards, focus groups, reports generated by administration, field observations and a research journal.

5. *The importance of the process:* GT is not logical, it is empirical, that is it seeks out what is going on (Glaser, 1998). It studies process to develop new theoretical interpretations of data. It is not final and is never complete.

All of the above arguments can best be summarised by the declaration that GT is an appropriate methodology for e-learning because it ascertains the main concern(s) of the participants in the most open, flexible, appropriate and in as thorough a manner as possible.

Critique of Grounded Theory

Learning and doing grounded theory is complex. It requires almost as much time to learn how to do the methodology as it does to conduct the study. Another factor that contributes to the frustration with the methodology can be the isolation factor. Most researchers are unable to learn GT in formal research methodology courses as few universities teach the subject per se, thus researchers are left to teach themselves the process. There is a certain amount of uncertainty associated with the process and I was well into the research before I even had enough confidence to feel that I was going to discover something. The research journal is full of my frustration and doubt. Even when the theory emerged it took a while before I could actually accept the findings.

On the brighter side , there were some very positive aspects to doing GT that emerged during and after my study. The data had resolved into clear-cut findings with the actual words of the participants echoing loudly. When it came time to do the writing up (i.e. write the thesis), I was convinced that my findings were in fact grounded.

As a methodology, GTM is not to be undertaken lightly. Nevertheless, GT was a challenging opportunity to learn something new and at the same time discover some pedagogical implications of what it is like to learn online in a second language.

No doubt its main drawbacks are the amount of time required to learn the method and the amount of time it takes to do the coding and analysis. It could be that these factors account for the few studies that have been done using GTM. Yet, from a more positive viewpoint, GTM does produce trust in a study. A researcher who conducts a research project following the

GTM can be assured that the outcome will have validity, relevance, instil trust and can be modified by subsequent data: all the hallmarks of painstaking research.

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