Appendix A

Grounded Theory:
Methodology

Introduction

Appendix A presents the methodology of the research used for this study. It includes the research design, sampling, data-collection methods and procedures, data analysis, and validity issues. The most important consideration in the design of the study was the author/researcher’s interest in exploring the experience of teachers involved in online postsecondary education and his personal agreement with the qualitative paradigm of inquiry.

Background

This book builds on a study that set out to explore the teachers’ experiences in the online environment, with a focus on the experience of teaching online. The research follows the qualitative inquiry paradigm and grounded theory methodology for answering the research questions posed.

The theoretical perspective is suited to explore the views of the participants and is therefore adequate for the purpose of this study. The researcher follows closely the
principles and methods of grounded theory, from simultaneous data analysis and theory development to inductive analysis and constant comparison of the emerging theory across constructs derived from data (Strauss & Corbin, 1990, 1998).

The goal of grounded theory is to provide a framework used for theory generation. Grounded theory is concerned with generating theory following a meticulous, scientific approach. The goal is not to verify theory. Rather, it is to make sure the theory was generated following a methodological approach. As such, its purpose, procedures, sampling, and results are different.

### Research Methodology

**Grounded Theory**

Grounded theory as a qualitative method involves theoretical sampling, constant comparison analysis, data coding (open, axial, selective), and memos. It is a method for building theory inductively, through a process of systematic coding and analysis. The theory is “grounded” in data, is integrated, consistent, and close to data (Charmaz, 1994; N. K. Denzin & Lincoln, 2000; B. G. Glaser & Strauss, 1967; Strauss & Corbin, 1998). A theory, in general, must explain something that is not well known. A formal theory is one that is developed for a formal conceptual area. In contrast, a substantive theory is one that is developed for a substantive area. It fits a certain reality and is relevant to a specific context (Barney G. Glaser & Strauss, 1995).

A good grounded theory is applicable to the substantive area of research; it provides an understanding that makes sense within the context of the study; it is abstract enough yet it includes sufficient variation so that it is applicable to other contexts related to the phenomenon; it aims at providing a degree of control over the phenomenon studied. Grounded theory is useful and appropriate for creating a substantive, mid-range theory that has explanatory utility (Strauss & Corbin, 1990).

In grounded theory research, data collection and analysis take place simultaneously. Data are coded into categories in a systematic, rigorous yet flexible approach. The researcher interprets the categories and evolves them into broader concepts. Through constant comparison, the concepts and categories are continually revised against the data. Characteristics of the data, category dimensions and relationships are (re)evaluated until no new meaning can be derived from the data. It is at that point that the study ends. The theory emerges from the research, at each of the steps (N. K. Denzin & Lincoln, 2000).

Grounded theory emphasizes inferences that result in a good explanation of the behavior observed. The rich details, well grounded in data, are useful in predicting
human behavior. In an inductive manner, grounded theory arrives at hypotheses following an iterative, incremental approach that starts with collection of raw data, which is then coded qualitatively, to yield an initial theory. The major variables emerge from this preliminary coding, and lead to new questions; new data are collected and coded. Thus, theory generation involves a constant comparison with the new data collected. The theory matures with the integration of the data elements and the relationships identified.

*Theoretical sampling* is the term used to describe the data-collection process that involves collection, coding, and the analysis of data, with the researcher determining what data to collect next in order to develop a theory (Barney G. Glaser & Strauss, 1995). In Glaser’s view, theoretical sampling is at the core of grounded theory research. Theoretical sampling is defined as:

> the process of data collection for generating theory where the analyst jointly collects, codes and analyzes his data and decides what data to collect next and where to find them in order to develop the emerging theory, whether substantive or formal. The initial decisions for theoretical collection of data are based only on a general sociological perspective and on a general subject or problem area [...] The initial decisions are not based on a preconceived theoretical framework. (B. G. Glaser & Strauss, 1967, p.45)

While representative sampling seeks to gather accurate data on a sample representative of the larger population, theoretical sampling seeks to discover categories of the phenomenon studied and their relationships. The scope of theoretical sampling is determined by the researcher, based on what is needed to enrich the theory. At the point where no new categories or relationships emerge from data, the theoretical sample is “saturated.” *Saturation* means the sampling is complete, and the generation of theoretical categories has been completed (B. G. Glaser, 1993).

**Sampling**

According to Robson (2002), sampling in grounded theory is purposive:

> We do not seek a representative sample for its own sake... sampling of people to interview or events to observe is undertaken so that additional information can be obtained to help in generating conceptual categories ... the persons interviewed ... are chosen to help the researcher formulate theory. (Robson, 2002, p.193)
Purposive sampling allows for the selection of information-rich items that contribute to the overall quality of the investigation. The selection of the sample for a qualitative study typically involves small groups of people nested in their context and studied in depth. The samples are usually not pre-specified; rather, they evolve with the study. The sample should consist of respondents who are reasonably informed and knowledgeable of the phenomena being investigated. The initial choice of informers may change and lead to new and different ones (Miles & Huberman, 1994).

In grounded theory, theoretical sampling allows the researcher to choose respondents so that categories become saturated, in effect broadening the scope of the emerging theory.

According to Glaser and Strauss (1967), theoretical sampling involves the researcher engaging in data collection, coding, and analysis and deciding what data to collect next. Theoretical sampling helps maximize the opportunities to compare events and consolidate and saturate the categories (Strauss & Corbin, 1998).

For this study, the researcher used purposive sampling to achieve controlled comparison across an array of sub-contexts within the larger context of the online teaching experience. Accordingly, the primary sample involved instructors who teach both online and offline (traditional, classroom based) courses in postsecondary settings.

The population of interest for this study is teachers who teach online. Specifically, teachers that are teaching postsecondary education online, at the undergraduate or graduate level. No other specific constraints (e.g., subject matter, age, gender) were set. The only constraint was that the teachers had online experience and wanted to discuss it. The population of interest was later enlarged to include teachers who taught traditional classroom-based courses yet may have either taught online, or considered teaching online. The intent was to establish a certain baseline to help evaluate and assess the online experience of the teachers.

An initial group of 57 teachers was identified, from which interview participants were selected. The researcher interviewed the teachers in person. The interviews allowed the researcher and respondents to co-research—collaborating and creating meaning together. While in quantitative research small sample sizes lead to difficulties in generalization and validation, the size of the sample is not that significant in qualitative research. The researcher engaged in qualitative research strives for balance and variety, while using his special knowledge when identifying the sample and selecting information-rich participants (Patton, 2002). The researcher’s focus is on selecting a sample that is likely to produce the rich data necessary for theory development (Norman K. Denzin & Lincoln, 1998).
Procedures and Data Collection

The choice of the data-collection methods determines the type of data collected during the research. For this study, rich data were needed in order to produce a theory to explain how teachers experience online teaching. Interviews allowed for collecting the most suitable data.

Grounded theory is an emergent process that develops gradually, as the research unfolds. The researcher constantly moves among data collection, coding and analysis. Grounded in data, new categories develop and lead the researcher to ask new questions to test them. This involves an inductive process. The study proceeds in an iterative, incremental manner centered on a process of constant comparison between data and emerging constructs and theory.

The constant comparative analysis allows the researcher to identify gaps in the data. With coding and data analysis started shortly after data collection begins, the researcher strives to create a thick description of the phenomenon, highlighting meanings, motives, and processes revealed by respondents. The researcher returns to the field for follow-ups and more data collection to confirm the emerging theory and fill in the gaps found during the data analysis.

In grounded theory, the sampling process evolves during the research process. From the initial pool of potential subjects, the researcher reached out to include several more academic faculty members. The collection of data continued until all of the categories were fully developed, achieving data saturation. The sample size was not predetermined, according to the recommendations of several authors (Miles & Huberman, 1994; Patton, 2002; Strauss & Corbin, 1998). At times, a snowball approach may be used to help enlarge the sample, as the goal of the researcher is to obtain as differentiated a view as possible. Saturation occurred naturally during the progress of the study, once a specific number of interviews, 44 in this case, was reached.

Data Collection

Grounded theory relies on a process where data collection and analysis occur simultaneously. The researcher attempts to collect rich data through interaction with the respondents. Interviews allow respondents to offer their own views in an active manner (Holstein & Gubrium, 1995). Follow-up questions help clarify ideas and explain concepts identified during initial interviews. These additional questions formulated by the researcher and the subsequent interaction with the participants are instrumental in developing a theory about the phenomenon of interest (Maxwell, 1996; Patton, 1990, 2002; Strauss & Corbin, 1998).
Data-Collection Instruments

In this study the following data-collection instruments were used: interviews, field notes, and memos. Qualitative research interviews are appropriate in situations in which the focus of the study is on the meaning of a particular phenomenon, as construed by the participants (King, 1994). This was clearly the case with this study. An interview protocol was prepared and used for conducting each interview. The interviews were recorded using a digital audio recorder.

Interviews

Data were collected through in-depth, phenomenological interviews (Gubrium & Holstein, 2002; Van Manen, 1990). The interviews contain predetermined open-ended questions that have a defined wording and sequence. The questions were presented in the same order to all respondents (Patton, 2002). Strauss and Corbin (1998) suggest that the initial interview questions or area of investigation may be supported by literature. The literature review helped the researcher prepare the initial interview questions. Data were collected from the interviews using codification techniques. The informers were asked to talk about their online and offline experience—about their “in-situ” experience.

Before the interviews were conducted, confidentiality assurances were provided to respondents. All the interviews followed the same interview protocol. As suggested by Fowler (1995), the interview protocol was tested in a pilot allowing for its refinement and for increasing the researcher’s sensitivity. The pilot involved interviews with four online teachers for the purpose of testing the interview protocol and refine the formulation of the interview questions. The interview pilot took place informally, as the researcher met other teachers at different occasions and sites during the fall of 2004.

Consistent with Seidman’s (1998) model, each participant was to be interviewed several times. The intent of the first interview was to provide a context for understanding the participant’s perspective. The interview focused on the participant’s academic career, particularly on the online teaching experiences. The researcher focused on the concrete details of the participant’s experience teaching online. The subsequent interviews were follow-ups to seek clarification of specific points brought up during prior interview(s).

The researcher relied on an interview protocol to ensure that the interviews followed a generic structure. The interview protocol helped the researcher stay focused on the issue he wanted to explore while allowing the freedom to explore, in depth, the thick descriptions provided by the respondents. Each interview was expected to last between 60 and 90 minutes in order to allow for establishing rapport between
the researcher and the respondents and for detailed, intricate descriptions of the experience to emerge. The interviews started with nonthreatening questions that allowed the researcher to build rapport with the respondents. The use of open-ended questions allowed the participants to provide rich reports of their experiences. The researcher remained in control throughout the interview and followed through the interview protocol with rigor. Still, he adapted to each interview style and used follow-up questions to further probe for rich data. The ordering and wording of the questions were not changed from one interview to the next.

The interview questions were constructed based on the researcher’s prior personal communications with online faculty members. What started as a vague inquiry into the online education realm led gradually to a set of themes that seemed to reoccur across the discussions. The questions were further refined to avoid any possible threatening formulation based on the findings from the interview pilot.

Field Notes

The researcher created handwritten yet copious field notes during the interviews. The field notes were used to record the account of the process. They include descriptions of settings, people, events, and activities together with personal comments, reflections, and ideas for further investigation. Mental notes made during interviews were written on paper immediately after each interview.

Memos

Memos written by the researcher during coding helped document germane views and ideas in the interviews. Memos allow the researcher to document the thinking about data and expand on the codes by providing descriptions, comparisons, and analyses. They help the researchers grasp the complexity of the data, refine categories and potential relationships, and highlight possible gaps that need further investigation (Charmaz, 1994). The very nature of the theoretical sample used in grounded theory requires the researcher to be sensitive to gaps in data. Data gaps require the researcher to return to the field to seek clarification. The memos offer an ideal format for documenting these travails.

After each interview, the researcher took the time to review the audio recording and began to reflect on what was discussed by the participants. He wrote memos describing his reflections and the emotions, reactions, and meaning that could be identified from the interview. Emerging concepts and themes, and possible relationships were documented in the memos.
Data Analysis

The researcher used word-processing software (Microsoft Word\(^1\)) to transcribe the interviews, which were recorded on a digital recorder (Panasonic\(^2\) RR-US360). The recordings were converted to Windows Audio files (.wav) using Panasonic Voice Studio 2.0 voice processing software. Speech recognition software (Dragon Naturally Speaking\(^3\)) was used for several interview transcripts. However, the relatively large amount of data required the researcher to rely on several human transcribers to help transcribe the interviews.

As the interviews were transcribed and became available for analysis, interview data were analyzed for concepts and categories. Theoretical sampling guided the data collection. The preliminary analysis of the transcripts generated a number of concepts. Those with similar characteristics were grouped in categories. For each category, properties were identified by analyzing statements associated with that particular category, as per the transcripts. Similarly, dimensions were derived for each category. Categories were developed in a flexible manner, with the only goal being to reach saturation. Several concepts emerged from discussions with the respondents. Further examination followed in order to refine and revise the initial concepts and categories.

Data were coded from the interview transcripts and research field notes. The search for patterns involved building data categories, followed by a second analysis of the interviews and field notes. Records were kept of each category. The researcher sought similarities and differences across the interviews, and used pattern coding to identify common themes. Data analyses were conducted, together with brief descriptions of the participants. The common as well as the uncommon themes identified were illustrated using quotes from the interviews. It was determined that computer software was required for the data analysis and to help manipulate what was expected to be a large amount of data collected in the study. The researcher selected the ATLAS.ti\(^4\) software (version 5) for analyzing the data obtained during the course of the study.

One important rule the researcher observed throughout the study was to be careful not to ignore or discard data that might run contrary to initial expectations. Consequently, when the researcher came across data that did not appear to fit comfortably in the emerging categories for analysis, the data were neither ignored nor discarded; rather, the emerging categories were revised, in deference to the constant comparison precepts at the core of grounded theory.
Coding

Data analysis was conducted according to the precepts of grounded theory. Codes emerged from the data through an interactive process where the researcher actively questioned and reviewed data. Codes and data were continuously revised to explore variations and achieve concept saturation. During the coding process, the researcher was concerned with developing an emerging theory, rather than testing it. In a creative, systematic manner, the researcher sought to identify, develop, and relate categories that became building blocks for the theory that was emerging from the data.

Grounded theory development involves three types of coding: open, axial, and selective (Strauss & Corbin, 1998). In grounded theory, coding begins immediately after the first interview, and continues in parallel with data collection.

Open Coding

During open coding, categories are identified from the data. Their dimensions are carefully evaluated, as they help establish and develop relationships. At this stage the researcher seeks to fully understand those data, through a process of constant comparisons. The researcher stays close to data. For each category, the researcher identifies properties and their respective dimensions (Strauss & Corbin, 1998).

Axial Coding

Axial coding involves assembling categories identified during open coding to allow for a more complete explanation of the phenomena to emerge. It helps to relate categories and detail their properties. It makes connections between categories and subcategories, presenting the data in new ways. At this stage categories continue to develop allowing the researcher to identify factors affecting the phenomena, contextual conditions, and outcomes, gradually evolving toward a more complex model (Strauss & Corbin, 1998).

Selective Coding

Selective coding involves selection of a number of categories that help integrate the categories and concepts. The researcher focuses on relating categories, validating relationships, and “filling in the categories that need further development and refinement” (Strauss & Corbin, 1998, p. 236). A central core category is eventually selected, which provides an explanation of the phenomenon in its entirety. Its related
categories and subcategories form patterns as the analysis moves from description to conceptualization.

As concepts are validated against data, the emergent theory becomes grounded in the data. The theory is generated by linking categories, their properties and dimensions. The theory is validated against the data and presented in a narrative form that incorporates states of transition as well as intervening conditions (Brown, Stevens, Troiano, & Schneider, 2002).

Qualitative Issues and Trustworthiness of Data

The trustworthiness of findings from qualitative, flexible design research continues to be a subject of debate (Robson, 2002). Three broad categories of validity threats specific to qualitative research are reactivity, respondent biases, and researcher biases (Lincoln & Guba, 1985). Reactivity refers to the researcher’s presence causing interference. Respondent bias and researcher bias refer to, among other things, assumptions and preconceptions (Robson, 2002). In order to minimize common threats to validity, certain steps were taken. First, the researcher minimized the potential for personal bias toward the subjects by seeking to interview individuals whom he had not met before. Second, the researcher considered, in detail, possible influences stemming from his life experiences. Third, by conducting multiple interviews over time and by employing multiple data-collection strategies, the researcher minimized the likelihood of any findings being due to chance.

In grounded theory, the theoretical sensitivity of the researcher, defined as the ability to recognize relevance in data and give it meaning, is important to the study. Theoretical sensitivity stems from the researcher being aware of the literature, from personal and professional experience, and through the interactions of the researcher with data throughout the study (Eason, 2000). The researcher brings theoretical sensitivity to this proposed study as follows: through an exhaustive literature review; through more than 5 years of teaching in postsecondary education; through his intimate involvement with the research study and data for the entire duration of the study.

The study includes detailed methods. The researcher verifies the accuracy of the account given. Rigorous data collection procedures are used. Data are adequately summarized and details are given about how data were collected (Robson, 2002). Grounded theorists advise that data collection must stop once no new information can be derived from the interviews. When things start to make sense, and meaning can be derived from collected data, at that point the theory is deemed to be acceptable.
Theory Development

The integration of the concepts identified during the coding phase was done by using a combined approach. The theory emerged as a storyline, vague at first, yet shaping up with each iteration. Emerging concepts were organized in a table and were continuously revised and reassessed in light of new data that was collected. The memos written by the researcher were reviewed and offered additional insight. The emerging theory was compared to the data to review internal consistency. The accuracy of the theory was ensured by the process of constant comparative analysis characteristic of grounded theory research. The emerging theory was continuously compared with the raw data. Once a suitable theory was identified, respondents were asked to confirm the theory as correct and point out possible discrepancies. This increased confirmability, and validity of the findings (Miles & Huberman, 1994).

Verification

Data saturation, where no new categories, relationships, or concepts emerge from coding, marks the point where the grounded theory has emerged. The constant comparative analysis at the core of the research design leads to a solid grounded theory (Strauss & Corbin, 1998). The researcher relies on field notes and memos to further increase the validity of the theory produced. A narrative form of the theory draws from across the multiple data-collection methods employed and is further validated with the respondents. If it makes sense, then it is a good theory. The grounded theory resulting from the study documented in this book explains teachers’ experience teaching online.

Validity

Validity in the context of qualitative research centers on confirmability rather than reproducibility of the findings (Lincoln & Guba, 1985). Confirmability refers to validity that is associated with the particular data set. Given the same site, sample, data-collection method, and research protocol, the same findings (i.e., grounded theory) are produced. Validity increases when triangulation is used. Triangulation involves the use of multiple data-collection techniques in conjunction and leads to better findings and understandings. In this study, interview data were corroborated with field notes and memos to increase the validity of the study.
Transferability

The goal of researchers is to produce findings that are applicable to other situations that are similar to the one studied. While in general no theory will apply exactly to another context, other than the one it was originally developed for, the theory should still be broad enough to offer some applicability.

The specific data collection and analysis involved in this study ensure the study is confirmable and that a certain degree of transferability to other similar situations exists.

Strauss and Corbin (1998) emphasize the quality and quantity of the data used for creating the theory as well as the analysis involved:

*If the data upon which [the research] is based are comprehensive and the interpretations conceptual and broad, then the theory should be abstract enough and include sufficient variations to make it applicable to a variety of contexts related to that phenomenon.* (Strauss & Corbin, 1998, p. 23)

In order to ensure a degree of transferability, the results have to make sense to both those being studied and those practicing in the area (Lincoln & Guba, 1985).

Credibility and Dependability

According to Lincoln and Guba (1985), *credibility* refers to the description of the phenomena studied being accurate. Trustworthiness of a study is correlated with validity and transferability of the results. Furthermore, the study’s settings, population of interest, sample, and theoretical framework have to be explained in detail for the study to gain credibility. Having study participants validate the findings helps lessen the chance for introducing researcher bias which is a common, significant threat.

*Dependability* is retained when the changes in the research design and overall conditions of the study are accounted for, and documented by the researcher. In grounded theory such dependability checks are built in by design. Namely, the constant-comparative analysis of data encourages the researcher to be responsive to the phenomenon studied. The explicit pursuit of thick descriptions pushes the researcher to review interview questions as needed and to revisit the research site and the ongoing dialogue with the theoretical sample involved (Charmaz, 1994; Strauss & Corbin, 1998).
Conclusion

The research questions explored for this book required a qualitative method. Grounded theory was selected, as it offers the means for building a substantive theory grounded in data. Data collection required interviews with participants in a theoretical sample. Coding (open, axial, selective) generated rich data, suitable for building theory. These steps are described in detail throughout this appendix. Validity, transferability, credibility, and dependability of the results of the study were discussed as appropriate.

The study that is at the foundation of this book established validity by connecting its results to the research literature. Generalizability was pursued through a number of different processes. This appendix highlights the rigorous research methodology as operationalized and the approach that was followed in order to ensure the trustworthiness of the results.

References


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**Endnotes**

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3 Dragon Naturally Speaking is a registered trademark of Nuance Communications, Inc.

4 The ATLAS.ti™ software is widely utilized by qualitative researchers for qualitative multi-media data analysis, document management and theory building. More information about the software is available on the Internet at http://www.atlasti.com.