CHAPTER III: METHODS

"Diffusion scholars ... can more thoroughly describe the organization's innovation behavior ... though a multiple-respondent data gathering process."

(Rodgers, 1983, p. 358)

Chapter Overview

Chapter III presents the method for the study. The review of method includes a chapter introduction, research questions, study design, the case study description, methods and procedures, subject selection, the conduct of interviews, data analysis and interpretation, the researcher's role, validity and reliability, and the researcher's biases.

Introduction

The purpose of this study was to better understand how the diffusion and adoption of SkillSoft® (an e-learning program) occurred among employees within one military organization. An additional goal was to explore the influences (personal, organizational, and technological) on the individual that may have affected the diffusion and adoption process.

Research Questions

(1) How did the diffusion (spread) and adoption (acceptance) of SkillSoft® occur among individuals within one military agency as perceived by members of the agency?

(2) How did various influences (personal, organizational, and technological) affect the process?

Study Design

Qualitative Research

"Qualitative inquiry is a style of research based upon the assumption that reality is constructed by individuals in interaction with their social worlds…thus there are many 'realities' rather than the one, observable, measurable reality" (Merriam and Simpson, 1995, p. 97). This qualitative study presents reality from the perspective of employees who participated in or observed the diffusion and adoption of SkillSoft®. I explored their views of reality via in-depth interviews. Through analysis and interpretation of participants' descriptive narratives I made sense of the data to uncover patterns or themes. In qualitative methods, "the researcher is the primary instrument for data collection and data analysis and is more concerned with process

rather than outcome" (Merriam and Simpson, 1995, p. 98).

The Case Study Approach

I selected the case study approach because it enabled me "to describe and analyze a phenomenon or social unit such as an individual, group, institution or community" (Merriam & Simpson, 1995, p. 108). According to Merriam (1998), the four essential properties of any case study are:

(1) *Particularistic.* Case studies focus on a particular situation, event, program, or phenomenon (This case study focused on one organization that was implementing SkillSoft®, an E-learning product). The case study method enabled me to focus on one social unit and consider the influences affecting the introduction of an innovation (SkillSoft®) within that organization.

(2) *Descriptive.* The end product of a case study is rich descriptions of reality. (The end product of my case study takes the form of individual perspectives of how diffusion and adoption of SkillSoft® occurred).

(3) *Heuristic.* Case studies illuminate the researcher's understanding of the phenomenon under study. They can bring new meaning, extend the researcher's experience, or confirm what is known. (This study was designed to provide a more detailed understanding of how diffusion and adoption occurred by listening to and understanding individual perceptions of how events occurred and how various influences—personal, organizational, and technological—affected the process. My "subjects" allowed me to illuminate what occurred.)

(4) *Inductive.* Qualitative case studies rely upon inductive reasoning for the formulation of concepts, generalizations, or tentative hypotheses. (pp. 11-13)

My analysis and interpretation occurred throughout the process of conducting the interviews, transcribing the data, and analyzing the results.

Case Study Description

Selection of the Military Organization

I selected one military organization to study. I conducted one-on-one in-depth interviews to gain a perspective on how the spread and acceptance of SkillSoft® occurred within the organization. The criteria used to select an organization for study were:

(1) An agency that implemented SkillSoft®.

(2) An agency that was accessible for study through qualitative methods.

Selection Criteria of Study Participants

My selection criteria for a study participant were that the employee (military or civilian) had been assigned to the organization during selection and implementation of SkillSoft® and had at least once, attempted to Logon and begin a course in SkillSoft®.

Subject Selection

In December 2000, the military agency provided me with a list of names of 176 military and civilian employees as possible interview subjects. These employees had been granted access, via a user ID and password, to the SkillSoft® program. The Training Branch provided me a SkillSoft® Usage Report that contained the names of thirty-nine employees that had logged on and started a course in SkillSoft®. According to Training Branch personnel, based upon SkillSoft® Usage Reports, the remaining one hundred thirty seven employees (n=176 – 39 = 137) had not logged on or attempted to try SkillSoft®. I selected my study sample participants from the n=39 employees.

I explained the purpose of the study to each potential participant. I asked the potential subjects if they were willing to participate in this study, then provided them with a list of study questions (Appendix E), and asked them to sign a letter of informed consent. See Appendix C for a copy of the letter. Of the 39 potential participants a total of 24 agreed to be interviewed.

Table 1. Selection of Study Participants

Number of Employees	**Explanation**
176	Total Employees
- 137	Employees that did not attempt SkillSoft®.
39	Employees that attempted SkillSoft®.
-15	Employees declined to be interviewed
24	Employees agreed to participate in my study

The 15 employees who declined to be interviewed said that: (a) they did not want to participate despite being assured that names would not be disclosed (b) they did not have time to participate, or (c) they could not remember their experience with SkillSoft®.

Methods and Procedures

Qualitative Research Approach

My qualitative research approach was guided by three themes:

(1) An understanding of the organization's culture.

(2) A realization that interviewers are not neutral actors, but are participants in an interviewing relationship.

(3) An understanding that the interviewer's purpose is to hear and understand what the interview subjects think and to give them public voice (Rubin and Rubin, 1995, p. 19).

I used my ability to listen, hear, and understand how the participants described their experiences with SkillSoft®. I sought to learn more about the influences (personal, organizational, and technological) that affected their awareness, trial, acceptance, or rejection of SkillSoft®. As a qualitative interviewer, I questioned participants to learn about events or influences that contributed to their views of reality. My role was to gather data that would enable me to describe participants' experiences as they related to the diffusion and adoption of an innovation. My interviewing process was flexible, iterative, and continuous in design.

I employed Rogers and Shoemaker's (1971) stages of adoption (awareness, interest, evaluation, trial, and adoption) to develop topical areas to organize my approach to this study. My specific topical areas were: description of the organization, selection of SkillSoft®, SkillSoft® implementation objectives, audience for SkillSoft®, awareness of SkillSoft®, interest in SkillSoft®, trial - first log on experience, evaluation of SkillSoft® (likes and dislikes of SkillSoft®), and influences on the diffusion and adoption of SkillSoft®. These topical areas organized my approach to the interviewing process, my analysis, interpretation and presentation of the data. My method included: conducting the interviews, obtaining permission to record the participant's response, writing my field notes and observations, transcribing the data, coding the data by topical areas, and key words or phrases, sorting the data by categories of response, analyzing and interpreting the data as it was received.

Interviews

I conducted the one-on-one interviews on-site at the military agency in a private reading room. The interviews were scheduled throughout the duty day (7 a.m. to 5 p.m.) at a convenient time agreed upon by each participant. Each interview lasted between 60 and 90 minutes in

length. I followed up with an interviewee when I was unclear about terminology or his or her comment.

I began with "a topical interview format with preplanned main questions to cover the overall subject" (Rubin and Rubin, 1995, p. 42). These broad preplanned questions both guided the discussion and allowed me to describe the events or influences as they were related to me by the participants. (Appendix D contains the original interview questions while Appendix E contains the final list of interview questions discussed with all participants). When I failed to obtain sufficient details or description during the initial questioning, I followed up with more focused, purposeful questioning to gently guide the interview. I sought more detailed descriptions on how events occurred or why participants reacted to events in a certain way. I continued probing until I had a clear understanding of the activities or influences affecting their experiences. I pretested the format, style, and content of my questions during my first interview. This pretest enabled me to evaluate my questions and interviewing techniques to determine how the questioning process contributed to my understanding of the diffusion and adoption of SkillSoft®. As a result of the pretest, I modified my approach, the questions, and interview style to best elicit information from each category of participant. For example, I used language (including jargon and acronyms) that was familiar and comfortable for military employees.

I continuously reviewed my style and interview techniques to obtain the most detailed responses possible. My conversational style and ability to customize my interview techniques and tailor questions for each participant allowed me to establish rapport and create a non-threatening atmosphere that improved the focus of my inquiry. I asked permission to record the interviews so that I could transcribe the data at a later date. Upon completion of each interview, I reflected upon the discussion and recorded my thoughts in a research journal.

Researcher's Data Collection Tool

I created a data collection tool to obtain demographic data on participants and added to the validity and reliability of the data obtained during the interviews (Appendix F contains a copy of the tool I used).

Research Journal

I kept a research journal to record my thoughts and observations. I reviewed my journal daily and maintained a record of the activities occurring during this study. I incorporated the information from my journal into my findings.

Agency Records

I reviewed records and reports from the military organization including SkillSoft® Usage Reports, Unit Manning Reports, and organization charts and diagrams. This information was incorporated into my explanation of how diffusion occurred, identifying whom to interview and reporting on adoption of SkillSoft®.

Conducting the Interviews

Challenges to the Original Research Plan

The original research plan included 10 in-depth interviews and two focus groups, consisting of 8 to 10 participants in each group. As a result of the events of September 11, 2001, the management and staff of the military organization became deeply involved in the war on terrorism, forcing the cancellation of the originally planned focus groups. The war caused the employees of this military organization to go on 24-hour alert after September 11, 2001. All employees worked 10- to 15-hour days, making it difficult to obtain the interviews and impossible to find time to conduct focus groups. I decided to increase the number of interviews from 10 to a minimum of 24 to provide a better description and understanding of the nature and character of the diffusion and adoption process going on in the military agency.

Mix of Study Participants

The range and number of interviews conducted within each employee category and rank was E-5 through E-8 (enlisted), 03 through 05 (officer), and GS-9 through GS-14 (civilian). A total of 24 interviews were conducted consisting of 13 military and 11 government service personnel.

Table 2 Categories of Interviews

Military -Enlisted Soldiers	**Military - Officers**	**Government Civilians**
E-5 = 2 participants	03 - Captain = 2 participants	GS 09 = 1 participant
E-6 = 1 participant	04 - Major = 1 participant	GS 11 = 1 participant
E-7 = 5 participants	05- Lieutenant Colonel = 1 participant	GS 12 = 1 participant
E-8 = 1 participant		GS 13 = 7 participants
		GS 14 = 1 participants
Subtotal = 9 military (enlisted)	Subtotal = 4 military (officers)	Subtotal = 11 civilians

As I mentioned previously, the military agency was composed of approximately 50% military and 50% government civilians. The range of grades and ranks included in this study was representative of the agency, since it included the mixture of grades and ranks within the organization. The range included enlisted personnel, officers, and civilians. The mix of personnel in my sample provided different views of how diffusion and adoption occurred from different perspectives (military and civilian employees, supervisors, and senior management) within the organization. These different views of reality contributed to my understanding and presentation of the findings.

Among the 24 individuals who agreed to be interviewed was one Division Chief responsible for bringing the SkillSoft® to the organization, one Project Leader responsible for supervising the implementation of SkillSoft®, one Training Branch employee responsible for implementation and monitoring the initiative, one team leader of the enlisted personnel, and one civilian team leader.

I was aware that I did not interview every employee in the agency. Interviewing only those who had attempted the SkillSoft® training program provided greater insights into and understanding of the various influences on the diffusion and adoption process within the organization. It was important to interview those employees most familiar with the implementation process, because SkillSoft® represented the first organization-wide attempt in this particular military agency to introduce an e-learning product. The individuals interviewed described their perceptions of what occurred, what did not occur, and explained why they perceived things happened.

The interviews took place during a 5-month period from January to May 2002. (Appendix G contains a complete calendar of research activities.) The first interviewee was a civilian employee. The interview lasted approximately 90 minutes, which allowed time for an in-depth exploration of her perceptions, her opinion about the efforts to make employees aware of SkillSoft®, her perception of the reaction of her peers to the program, her feelings about the program and its value, and her thoughts on the factors that influenced her decision to try the program and/or not continue with the program. Based on this pilot interview, I refined the interview questions to elicit more detail about influences on the diffusion and adoption process.

Data Analysis and Interpretation

Data Analysis and Interpretation Approach

Qualitative inquiry involves the simultaneous processing of description, analysis, and interpretation. A description seeks to construct data out of people's experiences and their views of reality. The descriptive process begins by asking the question, "What is going on here?" Data analysis is an ongoing process that begins with data collection. Data analysis provided the opportunity to further refine interview questions and synthesize the data. Analysis is often referred to as "transforming [the] data" (Wolcott, 1994, p. 7). Analysis identifies and describes the features, concepts, and systems of the topic under study and its interrelationship to other key topics or events. Analysis seeks to address the question of how things work or do not work. Data analysis has been described as the process of making sense out of one's data (Merriam, 1998). Interpretation is closely associated with the word "meaning." Wolcott (1994, p. 12) noted that interpretation begins with the questions, "What is to be made of this? What does all this mean?" In qualitative research, "meaning is derived from understanding the context in which the data or conversation was derived" (Rubin and Rubin, 1995, p. 31). I interpreted the data by sorting the responses into groups (military, civilian, leaders) identifying similar responses and noting unique responses. Then I searched for meaning of words and phases. I grouped the individual responses into the topical areas I had established to identify patterns of responses. The sorting, grouping and deriving meaning assisted me in making sense of the data.

Coding

"Coding is generally used to break up and segment the data into simpler, general categories and used to expand, tease out the data in order to formulate new questions and levels of interpretation" (Coffey & Atkinson, 1996, p. 31). My structured coding model was based upon the literature while my unstructured coding model was based upon keywords and phrases identified from the data. My coding of the data into structured and unstructured coding models enabled me to manage large quantities of data and to make sense of the data.

My structured coding model was based upon influences derived from the data, Rogers and Shoemaker (1971) stages of adoption and the various influences that have been identified by past theorists including, Schein, (1985), and Sherry, (1997/98). Influences were grouped into five topical areas of personal, organizational, technological, mandated policy and change. Structured

coding saved me time and enabled me to focus my analysis of how and why events occurred and the influences on the events.

NVIVO, a qualitative software tool, allowed me to organize data responses by stages of adoption, groups (military, civilian, age, education, or gender), and to search the data by groups, stages, individual responses or influences. NVIVO queries made it possible to determine the frequency with which a word, phrase or influence occurred either by a group of employees or by individual respondent. Using NVIVO, I was able to display either specific phrases or complete passages where the respondent used the selected word or phrase in context. I used the qualitative software tool to create branches or subcategories under the main categories of responses. The procedure allowed me to group major influences on the diffusion and adoption of an innovation into three broad topical areas of personal, organizational, and technological influences and two specific categories of mandated policy and change. Subgroups were created under each main category, which included personal (age, gender, level of education), organizational (communication channels, decision-making), and technological (relative advantage of innovation, complexity of innovation). Grouping data into these five categories (personal, organizational, and technological, mandated policy and change) was an effective way to identify and categorize an influence on the adoption of SkillSoft. Grouping of responses made it easier to uncover patterns in the data and present the findings. See Appendix H for my structured coding model.

I also used unstructured coding methods to analyze the responses. A free node was a word such as e-*learning, uncertainty, benefit.* A phrase node was a phrase such as *channels of communication, optempo nature of unit,* or *best time to train*. These words and phrases allowed me to code unplanned or common responses in the data. I reviewed the data as I received it, looking for keywords or phrases (*diffusion (spread), adoption (acceptance), implementation of SkillSoft®; participant's frustrations, fears, perceptions, feelings, influences on individuals, individual likes or dislikes with SkillSoft®; agency's persuasion techniques; communication methods or channels; barriers to implementation; benefits of SkillSoft®; and influences on innovative decision- making processes*). Once I identified a word or phrase, I coded these as free nodes. See Appendix I for my unstructured coding model and Appendix J for my data queries.

Interpretation of Reality

My data analysis and interpretation was ongoing. I began by listening to the words and phrases used during the interviews. As I transcribed, read, and analyzed the data, I looked for keywords, phrases, recurring themes and patterns.

Data for this study came from the employees of the military organization who experienced the spread and acceptance of SkillSoft®. I became the public voice to capture and present the participants' descriptions of their reality.

The Researcher's Role

I had a dual role in this research project: I was an analyst employed by the military organization and an individual serving as a researcher for this study. As a consultant to the organization, I conducted studies on training-related issues, reported the findings, and made recommendations to management. Because of that experience and expertise, it was logical for me to also serve as a researcher to study the diffusion and adoption of SkillSoft® within the organization and report the findings.

I was in a unique position as the researcher in this case study. As a consultant to this organization for the past four years, I served as a training coordinator, training evaluator, project leader, researcher, and strategist. In my various roles, I assessed and described the internal and external environment of the organization; defined leadership and management issues; documented individual training needs; evaluated training opportunities; assessed new e-learning products, concepts, and technologies; and made recommendations. The previous working relationships I had developed afforded me the opportunity to obtain interviews with key personnel. I was able to solicit rich narratives and descriptions from interview subjects because of the trust that I had already established with most study participants.

Validity and Reliability

The issues of validity and reliability are important concerns in any research study. According to Merriam and Simpson (1995, p. 101), the question most often asked in qualitative research is, "How congruent are one's findings with reality?" I constructed the different views of reality based upon descriptions from my study participants. I used the participants own words to describe how SkillSoft® was diffused and adopted and how personal, organizational, and technological, mandated policy and change influences affected their adoption of SkillSoft®. "In

qualitative research it is the rich, thick descriptions, the words (not numbers) that persuade the reader of the trustworthiness of your findings" (Merriam & Simpson, 1995, p. 101)

I considered the trustworthiness of my data by making sense of the data during the analysis phrase. As I transcribed, read, reviewed, coded, and entered my data into NVIVO, I looked for consistency in the data and searched for any unusual comments or descriptions. Ideas or perceptions presented by the participants that seemed unreal and out of place caused me to ask follow up questions and conduct further inquiry to better understand that participant's reality. The validity of this study was based upon my understanding and presentation of the findings because I was the primary instrument for data collection, analysis, and interpretation. My continual questioning of how and why events occurred clarified my understanding and enabled me to construct the participants' different pictures of reality.

Reliability is another concern in qualitative research. Reliability is based on the extent to which one's findings will be found again (Merriam and Simpson, 1995, p. 102). I used multiple sources of data to ensure consistency in my findings. I compared the data from each source to look for consistency and confirm the reliability of that data. I kept a research journal and took field notes to capture relevant and related information. All these data sources were reviewed to validate the reliability and consistency of the findings.

In addition to these multiple sources of data, I met separately with and discussed my findings with both the Chief of the Training Branch and the Project Leader in charge of implementing SkillSoft® in the agency. Both individuals assisted me in my developing the description of events as they occurred, concurred with my findings, and corroborated my factual presentation of the data collected from the study participants.

The Researcher's Biases

Defining my biases was an important part of the qualitative inquiry process. I became part of the design. I realized that my presence affected my presentation of the situation because of the decisions I made about what to attend to and what to ignore.

One of my biases was my belief that some type of e-learning product should have been incorporated into this organization's training program because employees require continual updating of knowledge and skills and the cost of training is increasing. Another bias was my perception that the introduction of SkillSoft® required a tolerance for change (i.e., inclination of the individual to accept and incorporate SkillSoft® into their normal way of obtaining new

knowledge and skills) in order for the change to be successful. I also believed that the organization had to change the way in which it was providing training to its employees. Because of these biases, I expected to find references to organizational or personal change in participants' responses.

I did not interview every member of the military agency so my findings reflect only the perceptions of my study group and may not reflect the perceptions of the whole population.

I remained aware of my biases and kept them in mind as I conducted my research and analysis. I used open-ended questions (using opening words or phrases like "how" or "tell me about") to encourage participants to respond honestly. This method of questioning limited my biases in this study by soliciting open, unbiased responses from participants. I probed individual responses to obtain a clearer view of what was meant by an individual's comments or how the participant came to feel that way. Remaining open to individual responses helped me to minimize my biases and decrease my impact on the study and the study participants, as did sharing my findings and conclusions with other members of the agency.