

DEVELOPMENT AND EVALUATION
OF A COMPUTER-BASED TRAINING
MODULE FOR UTILITY XYZ

By

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ABSTRACT

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Computer Based Training For Utility XYZ Business Solution Center Representatives			
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Utility XYZ is a multi-state corporation with concentrated specialty departments located across large geographical distances. Approximately one half of Utility XYZ's customer service personnel are located in Wisconsin and the other half is located in Denver. Both of the offices perform identical functions. The customer service personnel that interact with commercial and industrial accounts are known as Business Solution Center Representatives (BSC Reps.).

The job functions of Utility XYZ's BSC Reps. require specialized knowledge of multiple customer programs and services. Some of the commercial and industrial programs are static in nature from year to year; other programs are more fluid and require constant change and training. The BSC representatives must understand the programs and be able to transfer information accurately and efficiently to Utility XYZ's customers as it relates to those programs. The customer programs are also regulated by state and federal agencies which monitor the accuracy and efficiency with which information and services are delivered.

The purpose of this research was to develop a computer based training module for one of the aforementioned programs. The program in question deals with seasonal contracts between Utility XYZ and the commercial industrial customers who agree to lower or eliminate electric consumption for short periods of time when requested by Utility XYZ. In exchange for controlling and reducing energy consumption the customer receives a discounted rate for electrical use throughout the year.

The enforcement season for the energy control contracts is administrated in the summer months of June-September. The seasonal nature of the program means that there are several months of inactivity concerning contract writing and enforcement followed by a rush in the spring to reestablish and update contract information as well as signing new customers to the program.

The BSC Representatives require training yearly to serve as a review of contract requirements as well as highlighting any changes that may be implemented for the upcoming season. In past years this information was gathered and delivered in sporadic classroom training sessions or passed on from worker to worker as needed.

In order to create a training module for this program the researcher compiled Peak Control Program data from many sources. The researcher then created a menu driven computer-based module which enabled the training to occur in a self-directed fashion. The computer-based module format also allows for quick updates to maintain the materials integrity. The course was approved by several subject matter experts and piloted in the Wisconsin office.

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Chapter 1

INTRODUCTION

The purpose of this research was to develop and evaluate the degree of effectiveness provided in creating and implementing micro training sessions through computer based delivery to Business Solution Center Representatives (BSC Reps.) for Utility XYZ. The ability of the BSC Reps. to deliver high quality and timely services to Utility XYZ's customers depends heavily on the consistent delivery of standardized information.

The Business Solution Center was created out of need in early 2002 as a result of a merger between two large utilities. The merger that created Utility XYZ was based on the ability of the joining parties to develop various synergies which would result in streamlining services across several states culminating in significant future savings for millions of customers within the Utility XYZ's footprint. A large portion of the plan to capture savings was based on a design to decrease duplication of duties and virtually eliminate the position of Field Representative.

The job objectives for the Business Solution Center Representative's are to perform the same functions as the traditional Field Representatives but with a greater degree of efficiency. The Business Solution Center Representatives have the ability to access technology instantaneously through the internet, intranet, custom energy programs, and phone contacts. This in turn enables the BSC Reps. to service several more customer contacts per day.

Computer-based training delivered through short micro sessions was designed to update the Business Solution Center Representatives in a fast paced environment where

information can be reviewed at the convenience of the Representative and applied in a Just-in-Time format. As many of the Business Solution Center Representatives job functions are seasonal in nature, computer-based training gives the Representatives valuable information refreshment immediately prior to the need.

The micro training modules allow the Business Solution Center Representatives to provide standardized information to customers and enhance their ability to respond quickly to seasonal problems and questions. The training modules should also provide the Representatives with the ability to train and review at their own pace as the volume of inbound calls allow.

This study was conducted using a sample size of 20 BSC Representatives located in the Wisconsin office. The training was formatted prior to the study using interactive Microsoft PowerPoint® slides and including multimedia enhancements to greater illustrate graphically many of the seasonal training concepts.

The study was concluded with an evaluation to determine the effectiveness of the training given to the entire study population. The results were analyzed to determine if the computer-based training created a more consistent and effective method of responding to seasonal program information review and then did the current method of delivering information to Business Solution Center Representatives through classroom delivery.

Statement of the Problem

The purpose of this study is to create a Peak Control Program training module for Utility XYZ to enable the Business Solution Center Representatives within Utility XYZ to have the

ability to review current program requirements as well as program updates through self-directed study via menu driven computer based-training with the added feature of Just-In-Time reference resource material.

Scope of the Study

Utility XYZ has offices in several locations throughout the United States. There are two concentrated areas where Business Solution Centers exist, one in Denver and one located in Wisconsin. The scope of this study included three main objectives which are as follows:

1. Determining learner preference of delivery methods.
2. Developing a computer-based training module.
3. Analyzing the participant's evaluation responses.

Significance of the Study

Utility XYZ has just started tapping into technology as a method of delivering training. Traditional classroom delivery has been the prevalent method for delivering information to employees. Traditional classroom delivery is effective in many circumstances and will continue to be a mainstay within the Utility industry and at Utility XYZ. There are significant benefits associated with instantaneous classroom feedback. Often the content of training material is closely related to other closely related information that can be discussed in a traditional setting.

This study addresses the learner's preference for information transfer and the effects of computer-based training in respect to the Utility XYZ's customer programs. If Business Solution Center Representatives are receptive to Computer-based delivery and if this method of

delivery is preferred then in certain situations the training may become a cost effective alternative in Utility XYZ's training arsenal.

Assumptions of the Study

Assumptions of the study were identified as follows:

1. All study audience subjects had sufficient abilities related to the use of computers.
2. All study subjects had significant background in Utility XYZ program structure and characteristics.
3. Utility XYZ's management would allow program materials to be utilized via computer-based training delivery.
4. All study subjects had a positive attitude toward computer-based instruction.

Methodology

The research problem was designed to ascertain the effectiveness of computer based-training as an alternative to classroom only delivery. A learner preference survey was developed and administered to all Wisconsin Business Solution Center Representatives. The findings of this initial survey were analyzed to determine learner characteristics and to determine the participant's attitudes towards self-directed learning.

The research was developed using Microsoft PowerPoint® software and delivered to study subjects through Utility XYZ's Business Solution Center's department email. The development of the training module was coordinated through the department manager and a lead BS C Representative who assumed the role of subject matter expert. The information was then given to the Peak Control Program Manager for final approval of the content.

The Peak Control Program module was released to all participants simultaneously via department e-mail. The study subjects were asked to complete the training within a five day period in March of 2003. The participants were also given an evaluation form for the course which was used to determine the effectiveness of the program and to develop enhancements to the program for future use.

A total of 23 Representatives from the Wisconsin Business Solution Center were targeted to participate in the pilot program. Of the 23 potential Business Solution Center Representatives, 17 subjects responded within the 5 day time frame of the study. Upon completion of the 5 day period a reminder was sent to participants in an attempt to increase the return rate. An additional 3 surveys were returned following the reminder time period increasing the total response for the pilot program to 20 responses. The data received in the evaluations was then compiled for beta testing and analyzed for this project.

Limitations of the Study

Some of the limitations that may apply to this study are as follows:

1. The low number of participants in the study may limit the effectiveness and accuracy of the data collected.
2. Some participants of the study may have greater initial experience with the information contained in the Peak Control Program module.
3. The study subjects may have experienced technical difficulties manipulating the computer based training module.
4. The study subjects may have had learner characteristics and learning preferences that decreased the effectiveness of information transfer.

Definitions

Androgoy: The science of adult education

Beta testing: “The formal test of under-developed courseware and draft documentation by selected users before external testing or distribution users test the functionality and determine whether operational or utilization error still exist” (Trainers Dictionary p. 21-22).

BSC: Business Solution Center

CBT: Computer-Based Training

Likert Scale: “A type of instrument commonly constructed and used to measure opinion. It is characterized by requiring the participant to answer questions by selecting from among choices that range from strongly agree to strongly disagree” (Trainers Dictionary p. 134).

Microsoft PowerPoint®: A multi purpose presentation software product developed by Microsoft Corporation

SME: Subject Matter Expert

Chapter 2

LITURATURE REVIEW

Introduction

The literature review section of this project discusses research topics that relate directly to the development of this field problem. The categories that were chosen by the researcher were included as a means of focusing the study project. Topics discussed are as follows:

Computer-Based Training

Adult Education

Learner Characteristics

Computer-Based Training

Computer-based training has emerged over the past decade as a training tool that is widely used in many industries. The method of delivering information to learners via the computer and other technologies is still in the infancy stage compared to the long history of professional training as a whole. The tools that are available to educators and trainers today are vast. The array of software that is now available is not only large, but the technical requirements have been minimized to the point that nearly anyone familiar with the current common operating systems can create at the very least a simple training program (Katz and Katz, 1996).

Palloff and Pratt (1999) stated that computer-based training designs require the designer to consider many characteristics of the learner and the environment in which the training will be delivered. MacDonald, Gabriel, and Cousins (2000) address the fact that workplace learning is one of the fastest growing areas of adult learning due to the need for greater cost effectiveness and training efficiencies. Workplace learning has become a critical area of concentration for most commercial and industrial organizations. Rogers (2002) argued that computer-based

training using multi-media and hypertext can in fact enhance learning. The nature of the hypertext found in computer-based multimedia is beneficial in that it is non-linear and allows the learner to choose information freely. Computer-based training can also be designed in such a way that it is more interactive than traditional classroom instruction.

A primary focus for establishing computer-based training is to allow the learner to work at his or her own pace and to control the learning sequence (Kearsley, 1983). Computer-based training, when used properly can reduce corporate costs by eliminating the need for some classroom based learning. With the creation of more cost effective software for designing and delivery of instructional materials the need to take students out of the work setting can be minimized and the time requirements for training are streamlined.

Computer-based training will become a part of most learning experiences in the future however there is still some question as to the effectiveness compared to traditional classroom instruction. The learner's background or experiences utilizing computers and software systems can be a major detractor or an enhancement depending on the learner's individual situation. The learner's individual experiences require the instructional designer to proceed carefully taking the participants current abilities into consideration. Even if the training material is exceptional the audience may give it poor marks based on pre-conceived attitudes toward computer-based delivery. (O'Connell (2002)

Though there are many financial reasons to consider computer-based training the instructional designer or creator of learning must give consideration to the characteristics of the students and choice of delivery method. Berman and Tinker (2000) explained that designers who develop computer-based instruction should consider the following four concepts for more effective transfer:

1. Asynchronous Communication

The idea is to deliver the instruction remotely but with the assistance of some other means of communication at the training delivery point. The learner can then communicate immediately with the instructor or with other students thereby increasing the level of engagement felt by the student. This method of training can be beneficial in many ways, however it also defeats the ability of the learner to approach the training at a self-determined pace.

2. Seminar Model

The seminar model is a modified version of the above method. In this case the learner will have orchestrated communications with others in the group regarding instructor lead topics and within a specified timetable.

3. Technology-Rich Instruction

This method of instruction is designed for programs where the goal is to be able to access information in many forms via the internet. It is utilized when text-based instruction will not keep the learner engaged.

4. Project-Based Learning

Project-based learning is a method of incorporating computer-based instruction with very specific assignments for the participants to complete. The assigned responsibility can aid in the transfer of instructional material and also keep the student engaged in the learning experience.

According to Eagan and Gibb (1997) active learning is critical to obtaining transfer. The instructor must find methods to keep the students attention and avoid creating a “talking head” situation in which there is little or no interaction between students and instructors. It is also important to provide feedback to the student in some manner. This can be accomplished through self-testing within instructional designs or direct communication between instructor and student.

Bork (2001) describes the process of computer-based training in terms of traditional tutoring with technology. Bork (2001) explains that learning with today's technology means looking past formalized school settings and developing a new paradigm where there are multiple stages of learning that are lifelong in scope.

Adult Education

The concepts of adult learning under the term andragogy are mainly attributed to Malcolm Knowles and his body of work. Andragogy relates to the art and science of adult learning (MacDonald, Gabriel, and Cousins, 2000).

Pratt (1993) concentrates on three basic concepts as they relate to andragogy. The three concepts are:

1. What is learning?
2. What are the antecedents to adult learning?
3. How can we facilitate adult learning?

What is learning?

Early theories on learning were based on behaviorism and empiricism. Pratt (1993) describes one major component of Knowles theories as the belief that the world is independent of the learner and that if learning is not observable than it is inaccessible, unworthy or insignificant. Knowles developed his theory in a completely different light. He established five assumptions about self-concept, prior experience, readiness to learn, learning orientation, and motivation to learn.

Pratt (1993) explained that what are most important are the individual's experiences and how those experiences influence the learning process. The learner constructs meaning through prior

experience and learning is subjective with the individual being responsible for translating information into knowledge.

1. What are the antecedents to adult learning?

Knowles based his theory of andragogy on five basic assumptions that are directly responsible and related to antecedent requirements to adult learning. In other words for an adult to have an effective learning experience these five assumptions must be conducive to providing the learner with the ability and the environment to succeed (Pratt, 1993).

Each learner brings something individually unique to the learning process as no two people have had the exact same life experiences and no two individuals have the same cognitive abilities. It is important to recognize that genetics and environment are contributors to the learner's ability to interpret, translate, and store information in the form of learning or experience.

2. How is adult learning facilitated?

Adult learning is facilitated by recognizing the learner as an individual with experiences and pre-conceived ideas gained through a constant monitoring of messages from the outside.

Pratt (1993) lists seven elements that are important in design concepts and teaching techniques according to Knowles theories. The seven concepts are climate setting, involving learner in mutual planning, involving learner in diagnosing their own needs for learning, involving learners in formulating their own objectives, involving learners in designing learning plans, helping learners carry out their learning plans, and involving learners in evaluating their learning.

Pratt (1993) goes on to establish that if you look at Knowles' work on andragogy a little closer there is another concept that is just as important as the above elements. There is a relationship between the facilitator and the student which in turn can determine the degree of effectiveness that the learner will experience.

Learner Characteristics

There are three basic categories that should be evaluated when considering a specific performance gap or instructional need. The three characteristics are as follows: (Rothwell, Kazanas, 1998).

1. Situation-related characteristics
2. Decision-related characteristics
3. Learner-related characteristics

Situation-related Characteristics

Situation-related characteristics deal with the exploration of the learner in relationship to the performance gap. The goal of analyzing situation-related characteristics is to focus only on the learners that pertain to the problem. The objective is to avoid expense and time related to delivering training to non-problem areas. Determining the actual group of learners within the environment that can specifically benefit from additional training while avoiding the delivery of information to those who will not benefit will enhance the performance or close the gap for the organization (Rothwell, Kazanas, 1998).

Decision-related Characteristics

Decision-related characteristics pertain to the learner selection process and specifically who has the final say as to who will participate in the learning scenario. If training materials are designed based on characteristics of the learners directly involved with the performance issue

and then non-performance issue learners are thrown into the mix by organizational decision makers then the training is not truly representative of the analyzed need. Bork (2001) also describes the need for attention to be placed on the learners abilities and not solely on the information being transferred. Overriding the initial performance analysis will most likely lead to inefficiencies in the training and a lower the return on the training investment (Rothwell, Kazanas, 1998).

Learner-related characteristics range widely in scope. These characteristics can relate to the learner's knowledge and skill base or to the physical attributes necessary to perform at the highest levels. Learner-related characteristics must be carefully considered before the creation of training materials and also before choosing training delivery methods (Rothwell, Kazanas, 1998).

In the last twenty years there has been much more consideration given to individual learning techniques and how those characteristics affect the ability of students in the learning process. In 1983 Howard Gardner published his theories concerning multiple intelligences. Gardner concluded that there is not just one intelligence that dominates learning and problem solving, that students possess there are as many as seven. The seven intelligences are as follow: verbal-linguistic, math-logic, spatial, bodily-kinesthetic, musical interpersonal, naturalist. The strength of the learner in each of these intelligence areas determines the level of ability to comprehend information and whether the information will be assimilated. (Gardner, 1983)

Summary

The contents of the literature review found in this chapter examined areas directly related to the subject of this study. These included the use of computer-based training, concepts of adult learning theory, and learning characteristics. Chapter 3 will discuss the methodology for this study.

CHAPTER 3

METHODOLOGY

Introduction

The objective of this field problem was to develop and evaluate the effectiveness of a computer-based training module for Utility XYZ. This chapter addresses the design of the project along with the audience and instrument characteristics, as well as the delivery procedures and pilot class.

Research Design

The research design involved a multi-step process. In the preliminary stages of the design the researcher developed a learner preference survey to establish the learner characteristics of the Business Solution Center Representatives. The questions in this phase of the study were directed at the learner's attitudes toward technology and self directed learning. Data was compiled and analyzed for continuity and to aid the researcher in the development of the Computer-based learning module for the Peak Control Program within the Utility XYZ organization.

The Peak Control Program learning module was developed using Microsoft PowerPoint® software and delivered to Utility XYZ employees in the pilot class using department e-mail. The students were then asked to complete and return an evaluation form to the researcher. The evaluation data was compiled and analyzed to determine the effectiveness of the learning module.

Study Participants

The study participants consisted of all available Business Solution Center Representatives stationed at the Utility XYZ Wisconsin office. At the time of the study the Wisconsin Business Solution Center consisted of 23 Representatives. Of the 23 Representatives, 20 were available to

participate in the test pilot of the Peak Control Program module. The study participants were given a one week window for completion of the module and the participants were instructed to return the study evaluation form at the end of that period.

Instruments

A learner preference survey, a computer-based learning module, and an evaluation form were the research instrument for this study. The learner preference survey was developed using questions related to self-directed learning attitudes and to determine the participant's attitudes towards learning delivery methods. The scope of this preliminary step was to gauge the participant's predispositions toward computer-based delivery of learning.

The Peak Control Program learning module was developed through the following steps:

1. All written information currently available describing the Peak Control Program including internal company procedures and state legal requirements were compiled into an outline to create a rough draft for electronic conversion.
2. The information was reviewed by the researcher with a Business Solution Center Lead Representative to determine if there were any gaps or omissions in the information base.
3. The course was placed into the Microsoft PowerPoint® software format as a self paced slide show which was menu driven and broken into smaller categorized chunks. This process included developing graphics, links, action settings, and menus to create a user friendly design that was basic and intuitive.
4. The module was then given to the Peak Control Program Manager at Utility XYZ for review of the content and refinement.
5. Minor changes were implemented into the module where needed to ensure the accuracy of the information.

6. The module was edited by a Utility XYZ Corporate Administrative Assistant for any potential vocabulary, spelling, or grammatical problems.

7. The researcher then released the module to one Business Solution Center Representative to perform the training and evaluate the operations to provide feedback.

8. The module was then released to the remainder of the Business Solution Center Representatives along with the evaluation form.

The final instrument used in the study was the evaluation form. The evaluation form was structured in such a way as to measure reactions to the training content and usability. The evaluation form was developed using an instrument from a Master's thesis written by Bruce R Baumgarten concerning the development and analysis of Microsoft Outlook Forms Training.

The form was designed to evaluate four main categories for learner reaction. The four categories were: reaction to the class, ability to perform skills covered in class, background of the student, and comments. Responses were measured on a Likert scale of 1 through 5 with the exception of the comments section. There were 15 total items included on the evaluation form. The evaluation items were edited from the original form to better reflect the content of the Peak Control Program information and requirements.

The reaction section of the evaluation form contained four questions that related to the participants level of approval of items such as: informational content, ease of use, appropriate data chunk size, and application potential of the information.

The section addressing the abilities was developed from the content of the module and was based on subject matter expert (SME) inputs. The researcher included key skill requirements embedded in the Peak Control Program written procedures and asked the subjects to evaluate understanding levels within those competencies after completing the course.

The student background category was included to determine the participant's perceptions as they relate to individuals pre-training knowledge of the subject matter. The data gathered from this category would enable the researcher to better determine the appropriateness of the skills being presented in relationship to the experience and knowledge that the participants brought to the training. This section of the evaluation was designed to gauge the participant's level of agreement in determining if the training was advanced enough to warrant continued use. Disagreement in this section would warrant further refinement of the information.

Procedures

The Computer-based Peak Control Program learning module was constructed and administered as part of a yearly review process for Utility XYZ's Business Solution Center. The preliminary learner preference survey was administered in January of 2003. The results were tabulated and reviewed during the month of February of 2003. The Peak Control Program training module was released to the study participants in March of 2003.

A total of 23 potential study subjects were sent the training module via email. At the end of the one week timeframe a 17 responses had been gathered. At this time a reminder was dispatched to study subjects asking for compliance and the return of evaluation forms. Participants were given an additional 3 days with the subsequent reminder. Upon the completion of the reminder time period an additional 3 responses were generated increasing the overall responses to a total of 20 participants or 86.9%.

Data Analysis

The data gathered from the participants was analyzed to determine mean, standard deviation frequency count, and percentage. The data analysis information was then compiled and

summarized to determine the effectiveness of the study. A summary of the findings is reviewed in the following chapter.

Summary

The objective of this field problem was to develop and evaluate the effectiveness of a computer-based training module for Utility XYZ. The subject matter of this study was designed to create an effective self-paced learning module for the purpose of reviewing Peak Control Program information as required by Utility XYZ. The participants were Business Solution Center Representatives in Utility XYZ's Wisconsin office. An evaluation instrument was created and administered to determine the effectiveness of the training module. The design of the project along with the audience, instrument characteristics, as well as the delivery procedures were presented in Chapter 3.

CHAPTER 4

FINDINGS

Introduction

Chapter 4 reports the data findings of this study. A learner preference survey was developed to establish the study participant's attitudes toward technology-based and self-directed learning. A computer-based training module was designed and administered to the Business Solution Center Representatives at Utility XYZ. The data gathered from the learner preference survey and the computer-based training module evaluation forms were compiled and the findings of the analysis are discussed in this chapter.

Learning Preference Survey

The object of the learner preference survey was to determine trends and or correlations among 19 Business Solution Center Representatives at Utility XYZ to determine how they perceive their current level of self-directed learning and preferences for computer-based learning. The survey that was administered was created using a Likert scale with a range of responses from 1=Strongly Disagree 2=Disagree 3=Not Sure 4=Agree 5=Strongly Agree.

Group Demographics

The group that was surveyed consists of 19 co-workers who perform identical functions at Utility XYZ. The female to male breakdown is as follows.

Males = 12

Females = 8

An age scale was developed in such a manner as to maintain anonymity while still effectively collecting valid information. It was broken down into groups that would hide the respondent's identity. The age groups are as follows:

G-1	G-2	G-3	G-4	G-5	G-6	G-7	G-8
20-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60
0	2	2	4	7	2	1	2

The datum in this survey was gathered through two unrelated studies. The main purpose of this section of the study was to develop an understanding of the Business Solution Center Representative's attitudes toward computer-based learning or technology as it relates to learning. The second purpose of this survey was to investigate any possible correlations between the Business Solution Center Representative's ages as it relates to technology-based learning attitudes. The age correlation data from this survey was used to complete a separate study not related to this field problem and will not be discussed in any depth.

The following tables show the questions asked of the Business Solution Center Representatives and a summary of responses. Some of the questions were designed to elicit responses that are the focus of this project while others were meant to get the group thinking in terms of learning motivation and behaviors. Responses varied greatly from question to question but overall there are common threads that run through the group and its attitudes. The questions that were related to computer or technology-based learning have been included in this study and are contained in the following tables.

I would rather learn new concepts in a traditional classroom setting.

Study participants were first asked to rate attitudes related to traditional classroom instruction (see Table 1). Over half of the twenty participants (55%) or eleven participants agree with the statement and one additional student (5%) strongly agreed in favor of statement. Of the remaining participants two (10%) had no opinion and six participants (30%) disagreed with the statement. The mean for this item was 3.45 and the standard deviation was .945.

Table 1

I would rather learn new concepts in a traditional classroom setting.

Value	Frequency (n=20)	Percentage (100)
1=Strongly Agree	1	5
2=Agree	11	55
3=No Opinion	2	10
4=Disagree	6	30
5=Strongly Disagree	0	0

Mean = 3.45

Standard Deviation = .945

Computer-based learning will likely be the method I use most in the future.

This survey statement dealt with the participant's perceptions of future training situations. Study subjects overwhelmingly agreed that future personal learning opportunities will consist of computer-based delivery methods.

Table 2 shows that eleven participants (55%) agreed with the statement while four study participants (20%) strongly agreed. Of the two remaining students (10%) had no opinion and three participants (15%) disagreed with the survey statement. The mean for this item was 3.8 and the standard deviation was .951

Table 2

Computer-based learning will likely be the method I use most in the future.

Value	Frequency (n=20)	Percentage (100)
1=Strongly Agree	4	20
2=Agree	11	55
3=No Opinion	2	10
4=Disagree	3	15
5=Strongly Disagree	0	0

Mean = 3.8

Standard Deviation = .951

I prefer to use new learning technology as soon as it is available.

Table 3 examines the participant's willingness to work with new technologies. Of the twenty participants in the survey ten (50%) disagreed with the statement. The remaining participants rated the statement in the following way: three participants (15%) had no opinion and seven participants (35%) agreed with the statement. The mean for this statement was 2.85 and the standard deviation was .933.

Table 3

I prefer to use new learning technologies as soon as it is available.

Value	Frequency (n=20)	Percentage (100)
1=Strongly Agree	0	0
2=Agree	7	35
3=No Opinion	3	15
4=Disagree	10	50
5=Strongly Disagree	0	0

Mean = 2.85

Standard Deviation = .933

I am more successful when I determine the pace of my learning.

Table 4 reveals that the majority of the participants agreed with the survey statement. Of the 20 participants for this survey, fourteen (70%) agreed while three participants (15%) had no opinion and three participants (15%) disagreed with the statement. The mean was 3.55 and the standard deviation was .759.

Table 4

I am more successful when I determine the pace of my learning.

Value	Frequency (n=20)	Percentage (100)
1=Strongly Agree	0	0
2=Agree	14	70
3=No Opinion	3	15
4=Disagree	3	15
5=Strongly Disagree	0	0

Mean = 3.55

Standard Deviation = .759

Course Evaluation Summary

The evaluation returned by the study participants was designed to analyze the participant's perceptions as they related to three categories of the Peak Control Program learning module. The three evaluation categories were: reaction, knowledge, and student background. The researcher also used mean and standard deviation to analyze the evaluation data. The mean calculations illustrate where the average response was located on the Likert scale. The standard deviation was calculated to establish the variety of answers for each question. The tables below show a summary of the responses as well as a breakdown of the three categories established in this study. Each item was evaluated by utilizing a Likert scale with a 5 point rating range that

was defined as follows: “1 (Strongly disagree),” “2 disagree),” “3 (no opinion),” “4 (agree),” “5 (strongly disagree).” The following tables consist of the findings and include: means, standard deviations, percentages and frequency counts.

Participant Reaction

The reaction category of the evaluation form contained four items for participants to rate on the Likert scale. The responses for the reaction category were all quite high. The mean responses for the questions fell in a range between 4.5 and 4.8. The reaction questions are as follows:

1. The information was presented in manageable chunks.
2. I can apply this information directly to my job.
3. The training module was easy to navigate.
4. I will refer to this information as a reference tool.

The information was presented in manageable chunks.

The first reaction statement on the evaluation form asked students to give a rating as to the level of agreement or disagreement concerning the module information and if it was delivered in manageable chunks. Table 5 reveals that sixteen participants (80%) strongly agreed with the statement. The remaining four participants (20%) out of the twenty total participants selected “agree” for a rating on this statement. The mean response for this statement was 4.8 and the standard deviation was .410.

Table 5

The information was presented in manageable chunks.

Value	Frequency (n=20)	Percentage (100)
1=Strongly Agree	16	80
2=Agree	4	20
3=No Opinion	0	0
4=Disagree	0	0
5=Strongly Disagree	0	0

Mean = 4.8 Standard Deviation = .410

Information Application

The second statement in the reaction section of the evaluation asks the study participants to rate the effectiveness of the training as it relates to bringing the information back to the actual job setting. In Table 6 the results of this statement showed that sixteen of the study participants (80%) strongly agreed with the statement. Table 6 also identifies three participants (15%) agreed with the statement and one Participant (5%) had no opinion. The mean was 4.8 and the standard deviation was .410.

Table 6

I can apply this information directly to my job.

Value	Frequency (n=20)	Percentage (100)
1=Strongly Agree	16	80
2=Agree	3	15
3=No Opinion	1	5
4=Disagree	0	0
5=Strongly Disagree	0	0

Mean = 4.8 Standard Deviation = .410

Ease of Navigation

The participants were also asked to rank reactions as they pertained to the ease of navigation. The responses to this statement were similar to previous reaction ratings. A substantial majority of the twenty total participants rated the statement as strongly agree. Table 7 details a total of sixteen participants (80%) that rated this item as “5 (strongly agree)” while the remaining four participants (20%) rated the question as “4 (agree).” The mean for this statement was 4.8 and the standard deviation was .410.

Table 7

The training module was easy to navigate.

Value	Frequency (n=20)	Percentage (100)
1=Strongly Agree	16	80
2=Agree	4	20
3=No Opinion	0	0
4=Disagree	0	0
5=Strongly Disagree	0	0

Mean = 4.8 Standard Deviation = .410

Reference Tool

The final statement within the reaction category asked the participants to rate the training module as a potential reference tool for future use. Once again the overall satisfaction with the training module was high. Table 8 reveals that twelve of the participants (60%) rated the statement as strongly agree. Table 8 also shows that six of the participants (30%) rated the statement with agree and two participants (10%) reported no opinion. The mean for this section was 4.5 and the standard deviation was .688.

Table 8

I will refer to this information as a reference tool.

Value	Frequency (n=20)	Percentage (100)
1=Strongly Agree	12	60
2=Agree	6	30
3=No Opinion	2	10
4=Disagree	0	0
5=Strongly Disagree	0	0

Mean = 4.5 Standard Deviation = .688

Participant Knowledge

The second category addressed by the evaluation survey was the area of knowledge. Participants were asked to give ratings to the next 10 items on the survey as they related to the amount of knowledge that they gained from the training module. The questions were perception measurements only as the participants were not required to prove knowledge through skills testing.

Basics of Peak the Peak Control Program

The first knowledge statement was designed as an overview of the learning to gauge what the participant reaction was to the scope of information presented. Table 9 reveals that after completing the Peak Control Program training fifteen participants (75%) strongly agreed with the statement. The remaining participants included four students (20%) who agreed with the statement and one student (5%) that disagreed with the statement. The mean for this statement was 4.65 and the standard deviation was .745.

Table 9

Describe the basics of the Peak Control Program.

Value	Frequency (n=20)	Percentage (100)
1=Strongly Agree	15	75
2=Agree	4	20
3=No Opinion	0	0
4=Disagree	1	5
5=Strongly Disagree	0	0

Mean = 4.65 Standard Deviation = .745

Customer Benefits

The next item in the knowledge category dealt with the participants rating perception of skills in terms of the ability to explain the benefits to customers that enroll in the Peak Control Program. All students reported positive responses to this statement. Sixteen participants (80%) responded with a rating of “strongly agree” to the statement while four participants (20%) responded with “agree” to the statement (see Table 10). The mean was 4.8 and the standard deviation was .410.

Table 10

Explain customer benefits of the Peak Control Program.

Value	Frequency (n=20)	Percentage (100)
1=Strongly Agree	16	80
2=Agree	4	20
3=No Opinion	0	0
4=Disagree	0	0
5=Strongly Disagree	0	0

Mean = 4.8 Standard Deviation = .410

Program Charges

Table 11 reveals the responses reported for the statement that asks participants to rate knowledge levels gained and the ability to describe the basic charges involved with the Peak Control Program. Table 11 shows that fourteen participants (70%) in the study strongly agreed to the statement. Table 11 also shows that four participants (20%) reported a rating of agree to the statement and two participants (10%) had no opinion for the statement. The mean for this statement was 4.6 and the standard deviation was .680.

Table 11

Describe the basic charges for the program.

Value	Frequency (n=20)	Percentage (100)
1=Strongly Agree	14	70
2=Agree	4	20
3=No Opinion	2	10
4=Disagree	0	0
5=Strongly Disagree	0	0

Mean = 4.6 Standard Deviation = .680

PDL Information

This statement was a gauge of the participant's understanding as it related to providing the customer with PDL information. Table 12 reveals that thirteen participants (65%) strongly agreed and six participants (30%) agreed with the statement. The remaining one participant (5%) had no opinion about the statement. The mean for this item was 4.55 and the standard deviation was .759.

Table 12

Provide PDL information to the customer.

Value	Frequency (n=20)	Percentage (100)
1=Strongly Agree	13	65
2=Agree	6	30
3=No Opinion	1	5
4=Disagree	0	0
5=Strongly Disagree	0	0

Mean = 4.55 Standard Deviation = .759

Explain Performance Factor

For this knowledge statement the study participants were asked to evaluate post training understanding of the Peak Control Program Performance Factor. Table 13 shows that eleven participants (55%) rated the statement with strongly agree. Of the remaining participants eight (40%) rated the statement with agree and one participant (5%) reported disagree as a response to the knowledge statement. The mean for this item was 4.45 and the standard deviation was .680.

Table 13

Explain Performance Factor.

Value	Frequency (n=20)	Percentage (100)
1=Strongly Agree	11	55
2=Agree	8	40
3=No Opinion	0	0
4=Disagree	1	5
5=Strongly Disagree	0	0

Mean = 4.45 Standard Deviation = .759

Contract Requirements

This knowledge statement examines the participant's perceived understanding of the Peak Control Program contract requirements. Table 14 illustrates the responses that were reported. Of the twenty total Business Solution Center Representatives involved in the study ten participants (50%) reported a rating of strongly agree and eight participants (40%) reported a rating of agree for the statement. The remaining two participants (10%) had no opinion in regards to the statement. The mean for the item was 4.4 and the standard deviation was .680.

Table 14

Understand contract requirements.

Value	Frequency (n=20)	Percentage (100)
1=Strongly Agree	10	50
2=Agree	8	40
3=No Opinion	2	10
4=Disagree	0	0
5=Strongly Disagree	0	0

Mean = 4.4 Standard Deviation = .680

Contract Cancellation

The study participants were also asked to rate this knowledge item which concerns contract cancellation criteria. Table 15 shows that ten participants (50%) responded to the statement with the strongly agree rating and seven (35%) participants reported the rating of agree for the statement. Two of the respondents (10%) rated the statement with a no opinion rating and while one participant (5%) rated the statement with a disagree response. The mean for this item was 4.3 and the standard deviation was .864.

Table 15

Explain contract cancellation criteria.

Value	Frequency (n=20)	Percentage (100)
1=Strongly Agree	10	50
2=Agree	7	35
3=No Opinion	2	10
4=Disagree	1	5
5=Strongly Disagree	0	0

Mean = 4.3 Standard Deviation = .864

Control Day Procedures

The next knowledge based statement asks the study participants to rate understanding of Peak Control Program control day procedures. Table 16 reveals the responses reported as they related to this concept. Thirteen participants (65%) reported a rating of strongly agree while five participants (25%) reported a rating of agree for this statement. Two participants (10%) reported no opinion for this statement. The mean for this item was 4.55 and the standard deviation was .686.

Table 16

Describe control day procedures.

Value	Frequency (n=20)	Percentage (100)
1=Strongly Agree	13	65
2=Agree	5	25
3=No Opinion	2	10
4=Disagree	0	0
5=Strongly Disagree	0	0

Mean = 4.55 Standard Deviation = .686

Hotline Information

This knowledge statement asks the participants to report perceptions related to the ability to locate hotline information within the Peak Control Program training module. Table 17 shows that fourteen participants strongly agreed with the statement. Five of the participants rated the statement with “agree” and one participant rated the statement with a no opinion response. The mean for this item was 4.65 and the standard deviation was .587

Table 17

Locate hotline information.

Value	Frequency (n=20)	Percentage (100)
1=Strongly Agree	14	70
2=Agree	5	25
3=No Opinion	1	5
4=Disagree	0	0
5=Strongly Disagree	0	0

Mean = 4.65 Standard Deviation = .587

Penalties and Waivers

The last knowledge category statement asked for the participants to evaluate the effectiveness of the training module to provide information dealing with the Peak Control Program penalties and waiver criteria. Table 18 reveals that ten participants (50%) strongly agreed and eight participants (40%) agreed with the statement. Two of the participants (10%) had no opinion for the statement. The mean for this item was 4.4 and the standard deviation was .680.

Table 18

Explain penalties and waiver criteria.

Value	Frequency (n=20)	Percentage (100)
1=Strongly Agree	10	50
2=Agree	8	40
3=No Opinion	2	10
4=Disagree	0	0
5=Strongly Disagree	0	0

Mean = 4.4 Standard Deviation = .680

Pre-Training Skills Assessment

The participants were asked to assess perceptions of pre-training knowledge. Table 19 reveals that one participant (5%) strongly agreed and eight participants (40%) agreed with the statement. Two of the participants (10%) had no opinion for the statement. Seven of the participants (35%) disagreed with the statement while two participants (10%) strongly disagreed. The mean for this item was 3.05 and the standard deviation was 1.19.

Table 19

Explain penalties and waiver criteria.

Value	Frequency (n=20)	Percentage (100)
1=Strongly Agree	1	5
2=Agree	8	40
3=No Opinion	2	10
4=Disagree	7	35
5=Strongly Disagree	2	10

Mean = 3.05 Standard Deviation = 1.19

Summary

Utility XYZ administered a computer-based training module for the Peak Control Program within the organization's Business Solution Center. The Business Solution Center Representatives completed a survey prior to the training which established learning preference. An additional evaluation form was completed after the training to measure the effectiveness of the training. The results of this study were reported in chapter 4 and researcher's conclusions and recommendations are discussed in Chapter 5.

CHAPTER 5

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

Chapter 5 summarizes the field problem and discusses the conclusions that have been reached by the researcher. The researcher will also discuss possible recommendations for improvement in this chapter.

Summary

The Peak Control Program administered by Utility XYZ and the Business Solution Center Representatives is very complex in nature. Business Solution Center Representatives are required to comprehend and retain large chunks of information that pertain to many programs sponsored by Utility XYZ. Training within the Business Solution Center must be delivered in a cost effective manner and must also meet ridged time criteria as the Business Solution Center Representatives are required to maintain a strict adherence to a phone availability schedule.

The purpose of this research was to develop a computer-based training module for the Business Solution Center and to measure the responses given for the training. The program was developed using Microsoft PowerPoint® software and e-mailed to participants in March of 2003. The training module was accompanied by an evaluation form that was used to collect data from the participants. The data was then analyzed to acquire mean, standard deviation, percentage and frequency counts.

Conclusions

In order to fulfill the requirements of the objectives of this study the researcher was required to collect and process information from many areas. Chapter 2 illustrates a

small portion of the available resource that were tapped for the advancement of this project. The literature review allowed the researcher to focus attention on the key concepts that were most closely related to this project.

The training module that was delivered to the Business Solution Center at Utility XYZ was readily accepted and received relatively high marks in all areas.

Recommendations

Based on the results of this study, certain areas of the computer-based training module should be addressed to enhance the training in the future. The researcher's recommendations based on this study's findings are as follows:

1. The evaluation findings were encouraging in that the scores reported by the participants were very high. All areas on the evaluation form had mean measurements over 4 and low standard deviations. This shows two possibilities. The training was appropriate and right on target, or that the training may have been lacking challenge in the knowledge area of the content. The researcher recommends that the information content be reviewed with the Peak Control Program Manager and the SME within the Business Solution Center to determine if additional detail should be added to the learning module.

2. The use of Microsoft PowerPoint® software was simple and effective for the training requirements of this study; however some consideration should be given to converting the information to a more sophisticated software package that would allow more in terms of testing and data gathering.

Recommendations for Further Study

This study included a survey given prior to the training design that asked the study participants' to evaluate learning preferences. The survey objective was to determine the participant's attitudes toward computer-based learning as well as self-directed learning and the results were included in this study. As part of the learner preference survey participants were also asked to provide age and gender information in an anonymous format. The researcher recommends that further study should be given to this information as it relates to learning preference. Additional research in this area would allow instructional designers and instructors to better understand learner characteristics and student needs prior to creating training experiences.

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Appendix A

Example of Computer-Based Training Program

PEAK CONTROL



Peak Control Menu

PROGRAM OVERVIEW

CONTROL DAYS

RATES

PENALTIES

CONTRACTS

FAQ's

END



Program Overview

- What is the Peak Control Program?
- Qualifying a Customer
- Customer Benefits
- Benefits
- Self Test



MENU

END



Self Test

To be eligible for the peak control program a customer must have registered Demand in one of the summer months of June, July, August, or September, for a minimum of _____kW of Demand?

30 KW

50 KW

70 KW

MENU

END

CORRECT!



To be eligible for the peak control program a customer must have been billed in one of the summer months of June - September for a minimum of 50 kW controllable of load.

MENU

END



Rate Characteristics

- Overview
- Customer Charge
- Energy Charge
- Demand Charge
- Controllable Demand
- Performance Factor
- Annual Minimum Demand Charge

MENU

END



Contracts

- PDL
- Contract and Worksheet
- Signatures
- Meter Exchange
- Generator
- Approvals
- Contract Cancellation
- Change Existing Contracts

MENU

END



Control Days

- Test Calls
- Control Season
- Hotline

MENU

END



Penalties and Waivers

- Penalties
- State Penalties
- Waivers

MENU

END



Appendix B

Learning Preference Survey

Learning Preference Survey

Circle the group that best represents your age.

20-25 26-30 31-35 36-40 41-45 46-50 51-55 56-60

Please circle answer. Male Female

For the following question please circle a number 1-5 where
1= strongly disagree 2= disagree 3= not sure 4= agree 5= strongly agree

1. I would rather learn new computer software by myself.

1= strongly disagree 2= disagree 3= not sure 4= agree 5= strongly agree

2. I like to learn new things in a traditional classroom setting.

1= strongly disagree 2= disagree 3= not sure 4= agree 5= strongly agree

3. In the last six months I have intentionally sought out new information not required by my job.

1= strongly disagree 2= disagree 3= not sure 4= agree 5= strongly agree

4. On-line learning experiences will most likely be the method I will use most in the coming years.

1= strongly disagree 2= disagree 3= not sure 4= agree 5= strongly agree

5. It has become more difficult in the last few years to keep up with changes than ever before.

1= strongly disagree 2= disagree 3= not sure 4= agree 5= strongly agree

6. I like to use new technology as soon as it is available.

1= strongly disagree 2= disagree 3= not sure 4= agree 5= strongly agree

7. When faced with new work related systems I am more successful when I determine the method and pace of my learning.

1= strongly disagree 2= disagree 3= not sure 4= agree 5= strongly agree

8. Classroom situations although helpful, often waste my time.

1= strongly disagree 2= disagree 3= not sure 4= agree 5= strongly agree

9. Hands on or on the job training is the best method for transferring new information.

1= strongly disagree 2= disagree 3= not sure 4= agree 5= strongly agree

10. In the last year most of my learning experiences were work related.

1= strongly disagree 2= disagree 3= not sure 4= agree 5= strongly agree

11. In the last year I feel that I have experienced pressure to keep up with changes.

1= strongly disagree 2= disagree 3= not sure 4= agree 5= strongly agree

12. I do not feel the need to actively learning that is non work related.

1= strongly disagree 2= disagree 3= not sure 4= agree 5= strongly agree

Appendix C

Course Evaluation Form

Course Evaluation

	Disagree				Agree
1. The information was presented in manageable chunks?	1	2	3	4	5
2. I can apply the information to my job?	1	2	3	4	5
3. The training module was easy to navigate?	1	2	3	4	5
4. I will refer to the information as a reference tool?	1	2	3	4	5
5. I can do the following?					
Describe the basics of the Peak Control Program?	1	2	3	4	5
Explain customer benefits of Peak Control?	1	2	3	4	5
Describe the basic charges for the program?	1	2	3	4	5
Provide PDL information to customers?	1	2	3	4	5
Explain Performance Factor?	1	2	3	4	5
Understand contract requirements?	1	2	3	4	5
Explain contract cancellation criteria?	1	2	3	4	5
Describe control day procedures?	1	2	3	4	5
Locate Hotline information?	1	2	3	4	5
Explain penalties and waiver criteria?	1	2	3	4	5
6. I had a strong understanding of the Peak Control Program prior to this training?	1	2	3	4	5
7. Comments					

Appendix D

Cover Letter e-mail

To: Business Solution Center Representatives

My name is Richard Jaenke. I am currently enrolled in the Training and Development Program at the University Wisconsin-Stout. As part of the requirements for my graduate studies for this program I am in need of your assistance. I have created a computer-based training module for the Peak Control Program for Utility XYZ.

The purpose for creating this training is to determine the effectiveness of computer-based training as it pertains to seasonal programs at Utility XYZ. The program content has been reviewed for accuracy by the Peak Control Program Manager and a subject matter expert within the Business Solution Center.

I would ask that you please complete the computer-based training at your earliest convenience within the next 5 business days. Upon completing the training module I would also ask that you return the evaluation form which has been attached via inter-company mail.

Your cooperation is greatly appreciated.

Rich Jaenke