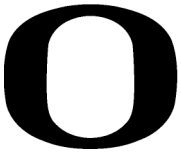

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Conducting a Needs Assessment for the Implementation of Computer Based Training within a Corporate Environment

CAPSTONE REPORT

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Abstract

for

Conducting a Needs Assessment for the Implementation of Computer Based Training within a Corporate Environment

Computer Based Training (CBT) can fail to deliver real business value if implemented on the basis of assumptions alone (O'Connor, 2006). A training needs assessment can determine if CBT will address needs prior to implementation. Using content analysis, this study, structured in four steps, provides a guide to conducting a CBT needs assessment. Steps include: (1) conducting a gap analysis, (2) identifying priorities, (3) identifying performance problems, and (4) identifying solutions. CBT benefits and drawbacks are included.

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CHAPTER I. PURPOSE OF STUDY

Brief Purpose

The purpose of this study is to develop a needs assessment (Kusy & Rouda, 1995) for planning (CBT) Computer Based Training (Cronan, Kreie, & Merchant, 2001; Jacoby, 2005; Wokosin, 2004) within the corporate environment. Kusy and Rouda (1995) define a needs assessment as "a systematic exploration of the way things are and the way they should be. These "things" are usually associated with organizational and/or individual performance" (para. 2). McClelland (1993) says that a needs assessment is used in order to ensure all aspects of training are addressed prior to the implementation of solutions, which is critical to successful implementation of training projects (Cline, Pennie, & Seibert 1993). By conducting a thorough needs assessment, organizations can determine if CBT will address "every aspect of training design, development, delivery and evaluation" (Del Gaizo & Georgenson, p. 42, 1984). Focus of this study attempts to answer the following question in relation to the context: what questions and categories of information need to be reviewed for conducting a needs assessment (Bates, Holton, & Naquin, 2000; Kusy & Rouda, 1995) for the implementation of CBT (Allan, 1996; Wokosin, 2004; Jacoby, 2005), specifically as training may support closing of performance gaps (Bates, Holton, & Naquin, 2000; Kusy & Rouda, 1995).

For the purpose of this study, training is defined as "an acquisition system by which people acquire knowledge and skills they didn't previously possess" (Laird, p. 18, 1980). The framework of this study explores knowledge and skill delivery (Laird, 1980)

using CBT as a tool. In this study, Computer Based Training is defined as an interactive learning experience (Lawson, 1999) between a learner and a computer in which the computer provides the majority of the stimulus (Lawson, 1999; Marriott; 2006; Wokosin, 2004), the learner must respond, the computer analyzes the response and provides feedback to the learner (Lawson, 1999).

The audience for this study is the group of professionals known as technical trainers (Laird, 1980; Wokosin, 2004) who work on human resource development in organizations that train policies and regulations as well as processes for the use of complex software systems. Specifically, this study endeavors to aid technical trainers who are considering implementation of information systems technology in support of training needs designed to close performance gaps within a SMB (Small to Midsize Business) (Coffee, 2006). This study particularly focuses on training options known as CBT (Wokosin, 2004). Among other categories for consideration, deployment of a CBT program requires a significant investment in terms of resource allocation, including up-front and maintenance costs (Allen, 1996). Therefore, this paper may also be of interest to those in upper level management who oversee budgeting of training programs.

Marriott (2006) states that "rather than the conventional classroom and instructor or professor setting, computer based training involves learning using software applications installed in computers" (E-Learning, para. 1). Once implemented, CBT can often remove the instructor from the classroom, freeing up time for other pressing matters (Jacoby, 2005). Additionally, since CBT allows employees to learn at their own pace

(Jacoby, 2005), it can often be the "best and most cost-effective approach to education" (Jacoby, p. 45, 2005). However, there are some situations in which CBT is not the most appropriate strategy (Wokosin, 2004; Jacoby, 2005). O'Connor (2006) suggests that the implementation of CBT can fail to deliver real business value if those implementing the technology do so on the basis of assumptions alone (O'Connor, 2006). Aspirations of cost savings or other perceived values may not always be achieved through CBT (O'Connor, 2006). O'Connor (2006) states "despite all the advances, technological and pedagogical,…[many] …in the corporate community still struggle to bring e-learning into the mainstream" (p. 28).

The larger method of this study is literature review (Leedy & Ormrod, 2005). Literature used in this study includes peer reviewed works, journal articles, white papers, and trade publications published on the topics being examined. Two areas of literature are collected, addressing: (1) the requirements of conducting a needs assessment, and (2) information relevant to determine if CBT is a viable solution for training needs. Content analysis is used to structure the data analysis process for this study. Content analysis is defined as "a detailed and systematic examination of the contents of a particular body of material [in this case literature] for the purpose of identifying patterns, themes, or biases" (Leedy & Ormrod, p. 142, 2005). Analysis is designed to address two parallel questions: (1) what categories of information need to be collected while performing a needs assessment, and (2) what information needs to be reviewed pertaining to the implementation of CBT to meet training needs.

The results of this content analysis process present the range of questions and information categories that are addressed within the selected and coded literature related to a training needs assessment and CBT. This data are organized into categories of information framed by the two topics being explored in this study: (1) how should technical trainers construct a needs assessment (i.e., what categories of information should be gathered), and (2) what information is relevant when considering the implementation of CBT as a solution for performance gap training needs (i.e., what questions need to be asked).

The results of this content analysis provide components that can be used to develop the final outcome of this study— a larger CBT Action Plan. An Action Plan is defined as "a description of what needs to be done, when and by whom" (Babylon, p. 1, 2006). The Action Plan is intended to provide technical trainers with a framework to guide them in conducting a needs assessment for the implementation of CBT as a way to address training needs.

Full Purpose

The purpose of this study is to provide the group of professionals known as technical trainers (Laird, 1980; Wokosin, 2004) with a process for conducting a needs assessment (Brown, 2002; Bates, Holton, & Naquin, 2000; Kusy & Rouda, 1995; Cline, Pennie, & Seibert, 1993) to be used for planning the implementation of CBT as a way to address performance gap training needs within a SMB (Small to Midsize Business).

The larger method directing the design of this study is literature review (Leedy & Ormrod, 2005). Literature selected for this study is related to two areas: (1) how to perform a needs assessment, and (2) what factors impact the decision to implement CBT. Literature regarding conducting a needs assessment is vast and can apply to many contexts (Lan, 2001, McClelland, 1992). This study reviews literature in order to determine what categories of information are commonly recommended when conducting a needs assessment in relation to the overall context of training. Additionally, this study reviews literature regarding CBT in order to gain an understanding CBT benefits and drawbacks.

Cline, Pennie, and Seibert (1993) say that "a needs assessment is the first step in almost any training project. You can't design training without knowing the requirements of trainees and the organization" (p. 99). McClelland (1993) says that a needs assessment is a systematic approach to determining training needs (McClelland, 1993) which is critical to the success of any training endeavor (Cline, Pennie, & Seibert 1993). Opinions vary regarding what exactly constitutes a needs assessment (McClelland, 1992), but a majority of literature (Brown, 2002; Bates, Holton, & Naquin, 2000; Kusy & Rouda, 1995; Cline, Pennie, & Seibert, 1993) discusses the same basic principles that Bates, Holton, and Naquin (2000) summarize:

> "The purposes for conducting a needs assessment include finding and disseminating information about: (1) optimal performance, (2) actual performance, (3) how key sources feel, (4) what is causing the problem, and (5) solutions to close gaps between optimal and actual performance." (p. 250).

This study proposes the use of CBT as a means to address training needs examined through a needs assessment. This study examines basic information relevant to technical trainers considering the implementation of CBT as a means of addressing performance gaps. A 'performance gap' can be defined several ways. Bates, Holton, & Naquin, (2000) define it as finding the difference between optimal performance and actual performance in order to close the gaps between the two; Kusy & Rouda, (1995) define it as current status versus new status; Bates, Holton, & Naquin, (2000) discuss it in relation to a problem cause and solution. Regardless of the definition, the goal is to bring the organization from one point to another.

The goal of this study is to provide information necessary about CBT so technical trainers can determine if the technology will meet their needs. Allen (1996) and Wokosin (2004) claim that many benefits can be achieved through CBT, such as increased efficiency (Allen, 1996), reduced training time (Allen, 1996; Wokosin, 2004), and cost savings (Allen, 1996; Wokosin, 2004). According to O'Connor (2006), the assumption that investing time and money into a CBT program will yield a (ROI) Return on Investment (Allen, 2007) is not enough to move forward with implementation. "Untested assumptions are no basis for investing employee time and organizational budget" (O'Connor, p. 28). Often those attempting to implement CBT within their organization focus "too much attention on the ball…" [and] "…have not paid enough attention to the field of play" (O'Connor, 2006, p. 30). By conducting a thorough needs assessment, organizations can determine if CBT will "address every aspect of training design,

development, delivery, and evaluation" (Del Gaizo & Georgenson, p. 42, 1984). Organizations must fully analyze their situation before implementation if they want CBT to deliver real business results (O'Connor, 2006). Therefore, the focus of this study does not only look at CBT as a possible solution to training needs, it also provides the framework to evaluate what the training needs are.

This study uses conceptual content analysis (Palmquist et al., 2005) as the selected strategy for data analysis. According to Palmquist (2005), conceptual content analysis uses selective reduction to reduce literature into categories to aid in answering the research questions being asked. In this study, there are two major research questions addressed. The first question being asked pertains to information needed to conduct a needs assessment. Selected literature in the topic area of needs assessment is examined in order to determine what categories of information are most commonly addressed. An initial set of coding concepts are formed, using four categories defined by Kusy and Rouda (1995). This approach is selected as a way to begin the coding process since Kusy and Rouda's step-by-step guide provides an outline that summarizes themes discussed across a number of references examined during a preliminary review of the collected literature (Brown, 2002; Bates, Holton, & Naquin, 2000; Kusy & Rouda, 1995; Cline, Pennie, & Seibert, 1993). The specific set of phrases used for coding the needs assessment literature are: (1) performing a gap analysis, (2) identifying priorities and importance; (3) identifying cause of performance problems and/or opportunities, and (4) identifying possible solutions and growth opportunities (Kusy & Rouda, 1995).

The second question being asked pertains to the factors that impact the decision to implement CBT as a way to address performance gaps. An initial set of coding concepts formed is designed to identify: (1) CBT benefits, and (2) CBT drawbacks. This approach is selected as a way to begin the coding process because a preliminary review of selected literature reveals that benefits and drawbacks are discussed across a number of references (Allan, 1996; Lawson, 1999; Wokosin, 2004).

The process of this content analysis strategy is guided by the pre-selected sets of coding phrases. The final results of data analysis are expected to produce a detailed list which is presented in the form of two tables. The first table presents a list of key concepts identified during coding of literature related to needs assessment. The second table presents a list of key concepts identified during the coding of literature related to understanding CBT as a means of closing performance gaps.

The final categories of coded information identified during content analysis are arranged into an Action Plan that lists when and what needs to be done (Babylon, 2006) by technical trainers when conducting a training needs assessment for CBT. The Action Plan organizes the categories of information chronologically so that it can be used as a step-by-step guide for conducting a needs assessment. Bates, Holton, and Naquin (2000) state that providing "layers of elements to identify which components to implement first, second, and so forth" (p. 263) is helpful when conducting needs assessment. Since CBT is presented as a means to closing performance gaps identified during the needs assessment, information needed to understand CBT as a solution, including potential

benefits and drawbacks, is incorporated into the Action Plan. The Action plan ensures that those implementing CBT have information about the technology that is necessary prior to implementation.

Problem Area and Significance of Study

Technical trainers today are becomingly increasingly challenged by the demands put on them by their managers (Mather, S, 2007). Scheduling, record keeping, availability, time, and travel are problems, among others, that technical trainers must contend with on a regular basis (Jacoby, 2005).

In response to increased challenges many are considering implementing CBT within their organization as a means of increasing efficiency (Jacoby, 2005). Cronan, Kreie, and Merchant (2001) state that "advances in technology have made multimedia training material on computers a much touted alternative to traditional training methods" (para. 2, 2001). However, O'Connor (2006) states that we can become sidelined with the structural elements of e-solutions, which can cause us to overlook a "fundamental objective – e-learning is about solutions, results and business impact" (p. 28). In turn, many faced with training problems often rush to implement solutions before fully examining the action they are taking (Nickols, 2000). Those rushing to implement CBT because of a perceived need of urgency can end up with incorrect solutions (O'Connor, 2006). Allen (1996) states that "good multimedia training is too hard to create and too expensive and time-consuming unless it is carefully aimed at overcoming real organizational problems and creating real business results" (para. 19).

Jarventaus (2007) says "most experts agree that learning, training, and performance improvement initiatives should begin by determining the organization's needs and how to address them" (p. 83). Bates, Holton, and Naquin (2000) say that "human resource development and training must be more accountable for delivering performance results" (Bates, Holton, and Naquin, p. 264, 2000). A needs assessment helps trainers determine three basic things in relation to performance: "(1) to identify gaps between current results and desired ones, (2) to prioritize gaps, and (3) to select the most important ones to be addressed" (Bates, Holton, & Naquin, p. 251, 2000). Jarventaus (2007) says that the problem with conducting a needs assessment is that "there is no consensus on a definition of needs assessment or the best way to conduct one" (p. 83). Technical trainers face this problem when attempting to conduct a thorough needs assessment since there is no single model used (Bates, Holton, & Naquin, 2000). Although most needs assessments have many similar components, the mere fact that there are so many variations to choose from explains why most needs assessments are not conducted correctly, if at all (Del Gaizo, & Georgenson, 1984). More specifically, there is no literature that addresses the issue of conducting a needs assessment with CBT in mind as a solution.

The assumption underlying this study is that through a needs assessment, technical trainers should be able to address gaps in performance. Bates, Holton and Naquin (2000) define a performance gap as finding the difference between optimal performance and actual performance. Kusy and Rouda (1995) say that organizations can determine the gap in performance by comparing the current situation to the desired or

necessary situation. Guthrie, Olian, and Schneier (1988) discuss this concept in relation to deficiencies in performance in relation to current training content. By assessing performance gaps through a needs assessment, and by reviewing the CBT fundamentals of benefits and drawbacks, organizations can optimize training dollars by addressing things that provide the most impact (Guthrie, Olian, & Schneier, 1988).

Limitations to Research

This study specifically focuses on CBT as a training solution within the SMB context; therefore, this study does not examine training alternatives to CBT.

This study specifically focuses on CBT as a training solution to address performance gaps within the SMB context. Therefore, this study does not examine other potential uses of CBT in an organization. This study focuses on closing performance gaps since a main component of a needs assessment is to find solutions that bridge optimal performance and actual performance (Bates, Holton, & Naquin, 2000) through solutions.

Literature used in this study is obtained through the University of Oregon's catalog of online journals and publications. Although this study uses various publications to draw from, a large portion of material is obtained using the Business Source Premier and the MasterFile Premier databases. The Business Source Premier portal contains the most relevant information related to CBT since publications within the database focus on business related content. MasterFile Premier also has a heavy emphasis in business, but at the same time is more general and interdisciplinary. Therefore, this portal is particularly useful for obtaining content related to conducting a needs assessment.

Although this study reviews various types of CBT, specific software applications are not reviewed since the popularity of specific software titles changes over time.

The publication date range of literature found most useful for this study is 1980-present. More current publications regarding CBT were found to be most relevant since technology changes render some of the older literature obsolete.

This study uses a set of coding concepts formed using four categories defined by Kusy and Rouda (1995): (1) performing a gap analysis, (2) identifying priorities and importance; (3) identifying cause of performance problems and/or opportunities, and (4) identifying possible solutions and growth opportunities (Kusy & Rouda, 1995). This approach is used because it is directly related to Human Resource Development, unlike some other forms of needs assessments found. Additionally, the four categories are used because they summarize themes discussed across a number of references examined during a preliminary review of the collected literature (Brown, 2002; Bates, Holton, & Naquin, 2000; Kusy & Rouda, 1995; Cline, Pennie, & Seibert, 1993).

Material reviewed for this study includes peer reviewed works (Ahmad, Ives, & Piccoli, 2001; Bates, Holton, & Naquin, 2000; Bhattacherjee, & Premkumar, G., 2004; Guthrie, Olian, & Schneier, 1988) and non-peer reviewed works identified in journals, including scholarly and trade (Brown, 2002; Cronan, T., Kreie, J., & Merchant, S. 2001; Del Gaizo & Georgenson, 1984; Jacoby, 2005; Rossett 1989; Swanson, 2001). Other

sources used for this study include those collected on the World Wide Web (Bellinger, G. 2006; Kusy & Rouda, 1989; Palmquist et al., 2005) and books (Leedy & Ormrod, 2005) related to the topics being examined.

CHAPTER II. REVIEW OF REFERENCES

This study is framed and supported using selected references in the form of literature. The Review of References section is developed as an annotated bibliography of key references used to support this study. The Review of References is presented in three sections related to this study. The first section relates to literature used to develop the Method of this study. The following sections relate to content (used to build the larger study as well as to form the data set for coding during data analysis), including needs assessment literature and CBT literature. Within each of the three sections, content is organized alphabetically by citation.

Methods Literature:

Leedy, D. & Ormrod, J. (2005). *Practical Research Planning and Design.* Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.

This reference is chosen as a supplemental guide to conducting Content Analysis since it looks at this method in relation to the overall context for research planning and design. The book is currently in the 8th revision by the two authors. Ormrod is a professor of Educational Psychology at the University of Northern Colorado (NCU Website, 2007). She specializes in Human Development; Learning and Cognitive Processes; and Research Statistics and Measurement (NCU Website, 2007). Leedy was a Professor at the American University until his death in 2002 (Leedy & Ormrod, 2005).

Palmquist, M., Busch, C., De Maret, P., Flynn, T., Kellum, R., Le, S., Meyers, B., Saunders, M., White, R. (2005). Content Analysis. Retrieved April 14, 2007 from Colorado State University website: http://writing.colostate.edu/guides/research/content/

This reference is chosen as the primary guide to conducting Content Analysis because it provides a systemic process for the approach used in this study. It is used to help limit subjectivity, and problems of reliability and validity within this study (Palmquist et al., 2005). This reference provides an eight step guide that ensures that each of the components of Conceptual Content Analysis are included in this study. The guide is also chosen because of the creditability of the literature, which has been written and revised several times over the past several years by Palmquist et al. (2005).

Palmquist is a Professor of English and University Distinguished Teaching Scholar at Colorado State University (CSU Website, 2005). He directs the university's Institute for Learning and Teaching as well as the Center for Research on Writing and Communication Technologies (CSU Website, 2005). Palmquist has also been published in numerous journals, and has published several books as well.

Needs Assessment Literature:

Bates, R., Holton III, E., and Naquin (2000). Large-Scale Performance-Driven Training Needs Assessment. *Public Personnel Management*, *29*(2), 249. Retrieved Tuesday, April 17, 2007 from the MasterFILE Premier database.

This case study is taken from Public Personnel Management which is a peer reviewed journal in publication since 1972 (Ulrich's Periodical Directory, 2007). This case study is conducted for Louisiana State Government employees at Louisiana State University by Bates, Holton, and Naquin (2000). Although this study specifically focuses on a large-scale needs assessment in relation to governmental organizations, it is selected for data analysis because of its academic reliability and because it supports the Purpose of this study by providing an understanding to the larger context for a training needs assessment; specifically since this study is performance oriented. This article is important to the Purpose of this study since the outcome "parallels similar forces in the private sector" (Bates, Holton, and Naquin, p. 264, 2000). The article also supports the Significance of this study since the authors find that there is "no single model of needs assessment that can be applied in every situation" (Bates, Holton, & Naquin, p. 251, 2000) and that more hybrid methodologies are needed.

Bates, Holton, and Naquin (2000) develop a method for their study that supports the chosen model for data analysis in this study. The model is used to "identify the gaps between what is and what should be in terms of valued organizational

goals or results" (Bates, Holton, & Naquin, p. 253, 2000); these gaps are then prioritized as a means of closing those gaps. Bates, Holton, and Naquin (2000) further support this study with their conclusion that "human resource and development and training must be more accountable for delivering performance results" (p. 264).

Holton is a Distinguished Professor of Human Resource, Leadership, and Organization at Louisiana State University and holds an Ed.D, and M.B.A (LSU Website, 2007). Bates is currently an Associate Professor of Human Resource, Leadership, and Organization at Louisiana State University where he teaches needs assessment and HRD courses. Naquin is a Research Associate Professor at Louisiana State University (LSU Website, 2007) and holds a Ph.D. in Human Resource Development and Adult Education from Louisiana State University (Bates, Holton, & Naquin, 2000).

Brown, J. (2002). Training Needs Assessment: A Must for Developing an Effective Training Program. *Public Personnel Management*, *31*(4), 569. Retrieved Tuesday, April 17, 2007 from the MasterFILE Premier database.

This article is taken from Public Personnel Management which is a peer reviewed journal in publication since 1972 (Ulrich's Periodical Directory, 2007). This article is selected as an item in the coding data set for data analysis since it supports a limitation of this study by providing a step-by-step guide to conducting

a needs assessment. The step-by-step guide is used to compare and contrast ideas present in other literature during the analysis of data (Palmquist et. al,, 2005). In a preliminary review of literature, themes in this article are found to be present in other literature, including Kusy and Rouda's (1995), which is used as a basis for the initial categories for analysis. Brown (2002) discusses steps similar to Kusy and Rouda (1995) such as identifying gaps and priorities.

Brown is the Director of Research for the International Personnel Management Association (Brown, 2002) and is listed as participant of the United Nations Third Session of the Committee of Experts on Public Administration (UN, 2004). Brown holds a Masters Degree in Human Resource Management (Brown, 2002) and has continued her education in pursuit of a Ph.D. in Adult Learning and Human Resource Development (Brown, 2002).

Cline, E., & Seibert, P. (1993). Help for First-Time Needs Assessors. *Training & Development*, *47*(5), 99. Retrieved Tuesday, April 17, 2007 from the MasterFILE Premier database.

This article is taken from Training & Development which is a journal published by the American Society of Training and Development. This article is selected as a basis for data analysis because it supports the Purpose of this study: Cline and Seibert (1993) state that "a needs assessment is the first step in almost any training project. You can't design training without knowing the requirements of

trainees and the organization" (p. 99). This article also supports the Problem and Significance of this study since the authors state that "needs assessments don't come in one size fits all" (p. 99). The authors find that there are many things you can do to tailor a needs assessment to fit just about any training project (Cline & Seibert, 1993).

The Boise State University Website states that "Dr. Seibert received her Ph.D. in Experimental Cognitive Psychology from the University of New Mexico at Albuquerque in 1990. She joined the Boise State University Psychology Department in 1990. In addition to being a Professor, Dr. Seibert serves as the Idaho Neurological Institute's Director of Research at Saint Alphonsus Regional Medical Center" (BSU, 2007).

Hobbs, D. (1990). A Training-Appropriations Process. *Training & Development Journal*, *44*(5), 109. Retrieved Tuesday, April 17, 2007 from the MasterFILE Premier database.

This article is taken from Training & Development which is a journal published by the American Society of Training and Development. This article is selected as one item in the coding data set for data analysis because it supports two areas of this study; the first area is the Problem of this study. Hobbs (1990) states that "many trainers have a natural tendency to seek solutions before they fully understand the problem. That can lead to the all-too-familiar ready-fire-aim syndrome" (p. 109). The second area this article supports is the final outcome of

this study. The Data Presentation Plan is supported because this article provides various steps that can be taken in order to assess training needs. Topics discussed within this article include: a front-end analysis, taking inventory of needs, assessing needs, and developing a training plan. Additionally, this article contains a detailed worksheet for analyzing training needs.

Kusy, M. & Rouda, R. (1995). Development of Human Resources Parts 1-5: Needs Assessment the first step. Retrieved April 12, 2007 from the Cal Tech website: http://alumnus.caltech.edu/~rouda/T2_NA.html

This article, taken from the Cal Tech website, is the second in a series of six articles which were originally published in the Tappi Journal during 1995-1996 (Kusy and Rouda, 1995). This article is used as an item within the data set for content analysis because it supports the purpose of this study by endorsing a needs assessment as the first step to understanding training needs prior to a selected intervention (Kusy & Rouda, 1995). Additionally, the article is significant because it explores a training needs assessment in the larger context of HRD (Human Resource Development) (Kusy & Rouda, 1995). This article is also relevant since it supports the initial coding categories chosen for analysis of data and provides the model chosen for data presentation— a step-by-step guide. Kusy and Rouda (1995) outline a needs assessment in four steps: (1) Performing a gap analysis, (2) Identifying priorities and importance, (3) Identifying cause of performance problems and/or opportunities, and (4) Identifying possible solutions

and growth opportunities. These four steps focus on concepts found present in other literature reviewed in this study.

Rouda is a consultant for Simulation Software who specializes "in instructional systems design for individuals and organizations" (Rouda, para. 1, 1996). Rouda has been involved in education and training for 20 years (Kusy, & Rouda, 1995). Rouda's educational background includes a B.S. from the California Institute of Technology, a M.A. focusing in HRD for organizational development from the University of St. Thomas, and a Ph.D. from the University of Wisconsin Madison (Rouda, 1996).

Kusy is a Registered Organization Development Consultant (Kusy, 2007) that has been published in countless peer reviewed journals, trade publications, books, and other publications (Kusy, 20007). Kusy is a professor in the Ph.D. program for Leadership and Change at Antioch University in Santa Barbara, California (Kusy, 2007). Kusy has a B.S. in Psychology from Providence College, a M.S. in Psychiatric Social Work from the University of Wisconsin, a M.S. in Industrial Relations from the University of Minnesota, and a Ph.D. specializing in Organizational Development from the University of Minnesota (Kusy, 2007).

McClelland, S. (1993). A Systematic Approach to Determining Productivity Improvement Training Needs. *Industrial Management*, *35*(4), 15. Retrieved Monday, April 16, 2007 from the Business Source Premier database.

This article is taken from Industrial Management which is a bi-monthly trade publication that has been in circulation since 1952 (Ulrich's Periodical Directory, 2007). This article is selected for data analysis because it supports the Purpose of this study by examining the aspects necessary to conducting a training needs assessment (McClelland, 1993). This article supports the Purpose and Data Presentation of this study because it lists several components to conducting a training needs assessment. Of these components, many are found to be similar to those of Kusy and Rouda (1995). Additionally, this article further supports the Problem examined by this study because it states that opinions vary regarding what exactly constitutes as a needs assessment (McClelland, 1993).

McClelland has served as Program Director at the Center for Professional Education at Georgia State University's College of Business Administration. McClelland has been published in Industrial Management numerous times and has also written for Training & Development Journal. Additionally, the author has published a book on needs assessment called 'Organizational Needs Assessments: Design, Facilitation, and Analysis' (1995).

McClelland, S. (1992). A Systems Approach to Needs Assessment. *Training & Development*, *46*(8), 51. Retrieved Tuesday, April 17, 2007 from the MasterFILE Premier database.

This article is taken from Training & Development which is a journal published by the American Society of Training and Development. This article is selected as a means of understanding the larger context of conducting a training needs assessment. The article is selected for data analysis since it directly supports the Data Presentation Plan because it provides seven "flexible" steps to conducting a training needs assessment. This article examines a training needs assessment from a systems perspective. McClelland (1992) states that a systems approach allows those conducting a needs assessment the opportunity to integrate their overall organizational needs. By examining the entire system, this approach "can emphasize consistent and flexible ways to achieve ongoing analysis of the organization's human resources and the skills that will be required as a result of changes in the long-range plan" (p. 51). By examining training needs from a systems perspective those conducting the analysis can meet needs "brought about by future changes" (McClelland, p. 51, 1992).

McClelland has served as Program Director at the Center for Professional Education at Georgia State University's College of Business Administration. McClelland has been published in Industrial Management numerous times and has also written for Training & Development Journal. Additionally, the author has

also published a book on needs assessment called 'Organizational Needs Assessments: Design, Facilitation, and Analysis' (1995).

CBT Literature:

Desai, M., Eddy, J., & Richards, T. (2000). A Field Experiment: Instructor-Based Training vs. Computer-Based Training. *Journal of Instructional Psychology, 27*(4), 239. Retrieved Saturday, March 24, 2007 from the MasterFILE Premier database.

This study is taken from the Journal of Instructional Psychology, which is a peer reviewed journal in publication since 1974 (Ulrich Periodical Directory, 2007). This literature is selected for data analysis because of its academic reliability and because the experiment supports the Purpose of this study by comparing traditional instructor based training to CBT within the corporate setting. Desai, Eddy, and Richards (2000) find that CBT is an effective means for training and that overall knowledge retention is greater when using the technology. The study does find that employee satisfaction with CBT is far lower than traditional instructor based training and that learning styles, among other things, should be taken into consideration when implementing CBT.

Jacoby, R. (2005). Computer Based Training: Yes or No?. *Journal of Health Care Compliance, 7*(3), 45-80 Retrieved Friday, March 23, 2007 from the Business Source Premier database.

Although this article relates to the specific context of the health care industry, the information within the literature is applicable to this study. This literature is selected as an item in the coding set for analysis of data because it supports the Method section of this study. Jacoby (2005) discusses a long list of advantages to CBT— such as flexibility, individually paced learning, reduction in training time, etc, and disadvantages to CBT— such as accessibility problems, lack of human interaction, etc. The literature also supports the Problem of this study since it states that advantages may outweigh the disadvantages, but that not all things are appropriate for CBT.

Jacoby is a Compliance Manager and Privacy Officer at St. Vincent Medical Center in Los Angeles, California (Jacoby, 2005). He has written multiple articles for the Journal of Health Care Compliance, several of which relate to education.

Lawson, R. (1999). Computer-Based Training: Is It the Next Wave?. *Professional Safety, 44*(6), 30. Retrieved Friday, March 23, 2007 from the Business Source Premier database.

This article is selected as an item in the coding set for analysis of data because it supports the Purpose and Outcome of this study by providing basic CBT information, including benefits and drawbacks to the technology. Pros and cons described within this literature provides information necessary for the data analysis section of this study. Lawson "holds a B.S. in Mechanical Engineering

Technology form Purdue University and an M.S. in Occupational Safety and Heath Management from Indiana State University" (Lawson, p. 33, 1999).

O'Connor, J. (2006). Blurring the boundaries. *e.learning age,* Retrieved Saturday, March 24, 2007 from the Business Source Premier database.

This article is taken from the E-Learning Age publication because of its currency of information related to CBT. This literature is included as an item for data analysis because it helps explain a larger context of CBT. This literature supports the Problem and Significance of this study because its central theme expresses the idea that CBT is often used as a solution with little or no planning up front. O'Connor (2006) states that CBT has failed to come into the mainstream of most corporate environments because of inaccurate assumptions by those implementing the technology. O'Connor (2006) also states that untested assumptions, "such as employees will love CBT" or that "CBT will save money," may not materialize if careful planning is not conducted prior to implementation. This article is also of relevance because it lists factors that can cause CBT to fail.

O'Conner received a doctorate from Florida State University in Instructional Systems and is managing director of O'Connor Consulting (Connor Consulting, 2007). O'Connor's company focuses on solving business problems related to employee performance. Currently he is also the Director of the International Board of Standards for Training, Performance, and Instruction and is currently

heading a study related to successful online learning (Connor Consulting, 2007). O'Conner has also been published over twenty times in various journals and trade publications.

Wokosin, L. (2004). FAQs About Your First CBT. *Intercom, 51*(9), 21-23. Retrieved Saturday, March 24, 2007 from the Business Source Premier database.

This article is taken from the Intercom trade journal which has been published by the Society for Technical Communication since 1968 (Ulrich Periodical Directory, 2007). The journal publishes articles for professionals involved in producing technical documents, such as trainers and writers, as well as their managers. This source is used because of the real world explanation of CBT. The article describes the basics of CBT such as feasibility, content, technical considerations, and student experience in relation to the business world, whereas a majority of literature relates to academia. This piece of literature is used as one item for coding within the data set for analysis because it supports many parts of this study. In explaining the basics of CBT, including benefits and drawbacks to the technology, this article helps support the Data Analysis and Presentation section of this study. Additionally, this literature supports one of the key definitions of this study: CBT. Wokosin, (2004) describes CBT as "any training that is delivered electronically, which gives the student some kind of control over the training program. CBT is delivered electronically through computer

programs" (p. 21). This article is of particular importance because of its currency (2004) and it relation to business.

Wokosin (2004) is currently a Technical Specialist for CitizensFirst Credit Union in Oshkosh, WI. "Linda Wokosin is a senior member of the Society for Technical Communication and has been involved with the implementation of CBT, web design, and software user guides for several years. Wokosin has also spoken at various trade conferences and has been published numerous times" (Wokosin, p. 4 2002).

CHAPTER III. METHOD OF STUDY

Literature Review

The method directing the design of this study is literature review (Leedy & Ormrod, 2005). Taylor and Proctor (2005) say that literature review should be used to provide "an account of what has been published on a topic" (para 1) . . . . . "according to the guiding concept of your thesis or research question" (para. 6). In this case there are two questions being asked: (1) what categories of information need to be collected while performing a needs assessment, and (2) what factors impact the decision to implement CBT to meet training needs. Literature related to each of these questions is collected for analysis. Selected concepts are then aligned in the Conclusion of this study to show relationships within the sets of literature.

Literature Collection Strategy

Literature collected for use in this study is generally concentrated in two major areas: conducting a needs assessment (Brown, 2002; Bates, Holton, & Naquin, 2000; Kusy & Rouda, 1995; Cline, Pennie, & Seibert, 1993) and CBT as a solution to training needs in organizations (Allan, 1996; Lawson, 1999; Wokosin, 2004).

Several databases are used for the literature search in this study; the bulk of items found are from the following databases: MasterFile Premier, Academic Source Premier, and Business Source Premier. The multidisciplinary MasterFile Premier database yields

the best results for needs assessment and the Business Source Premier database yields the best results for CBT.

Literature regarding the topic of conducting a needs assessment is readily available and spans a broad set of contexts (Ahmad, Ives, & Piccoli, 2001; Bates, Holton, & Naquin, 2000; Bhattacherjee, & Premkumar, G., 2004; Guthrie, Olian, & Schneier, 1988; Del Gaizo & Georgenson, 1984; McClelland, 1992).

Literature regarding the topic of CBT is far more difficult to locate. Additionally, trade journal articles are more prevalent than scholarly material or case studies.

When searching for literature, the terms "CBT," "Computer Based Training," and "needs assessment" are used in multiple databases. Boolean operators are used to narrow the search and tie the initial terms to other areas that might possibly be related. Once relevant literature is found, search terminology is pulled from the metadata associated with that literature to refine and conduct additional searches. When a significant piece of literature is found, the references cited within that work are then used to conduct additional searches.

Google and Google Scholar are useful in helping determine new search terms since the algorithms used through these portals allow a more natural language approach to searching, whereas the University of Oregon's portals do not. Google and Google Scholar produce results for some literature that is used directly from the World Wide

Web. Much of the literature found through Google Scholar however is available by subscription only, and is not used in this study. A limited number of articles returned by Google Scholar are accessible though the University of Oregon database.

The following is a list of key terms used while searching:

- Business
- Computer
- Computer Assisted Instruction
- Computer Based Training
- Computer Based Training and CBT
- Computer Managed Instruction
- Corporate
- Efficiency
- Gap Analysis
- Human Resource Development and HRD
- Learning Management System and LMS
- Learning Strategies
- Managed Instruction
- Management
- Needs Assessment
- Organization Learning
- Organizational Learning
- Performance Gap

- Tutorials

Data Analysis Plan

This study uses conceptual content analysis (Palmquist et al., 2005) as the selected approach to data analysis because the process focuses on the examination of concepts found in existing literature (Palmquist et al., 2005). Each set of literature is individually coded and analyzed as detailed further in this section. The goal of this approach is to design a strategy that identifies the major aspects of conducting a needs assessment (Kusy & Rouda, 1995) for HRD (Human Resource & Development) (Swanson, 2001) and to provide information necessary to understanding CBT (Computer Based Training) (Wokosin, 2004) as a solution to address performance gaps in training.

The conceptual analysis process is designed in two stages. The first stage examines the set of literature related to conducting a needs assessment in order to determine what categories of information should be addressed when conducting a needs assessment for training. The second stage examines CBT as a training solution in order to provide information necessary to determine if CBT is a practical solution for training needs, in relation to performance gaps. Information categories related to CBT pertain to benefits and drawbacks.

Conceptual content analysis allows identification of key concepts within the selected literature by following a systematic eight step process as defined by Palmquist et al. (2005):

Coding Strategy for the Needs Assessment Literature:

1. **Decide the level of analysis.**

Since coding for a single word or phrase would produce little value in a review of this type, this study codes for concepts related to conducting a needs assessment. The concepts are based on the steps to conducting a needs assessment as defined by Kusy & Rouda, (1995).

2. **Decide how many concepts to code for.**

The literature is coded using an interactive set of concepts. Palmquist et al. (2005) states that an interactive approach allows for new concepts, not originally coded for, to be added as necessary. The predefined concepts used to guide the specific coding process are based on the four steps to conducting a needs assessment that Kusy & Rouda (1995) outline:

- Performing a gap analysis, (i.e. determining the gap between how things are and how things should be;
- Identifying priorities and importance, (reviewing things such as organizational goals and cost effectiveness, how strongly key sources feel, etc.);
- Identifying cause of performance problems and/or opportunities (i.e. are they training related?, are there other factors involved?, efficiency gains, etc.);
- Identifying possible solutions and growth opportunities (i.e. cost savings, reduction in training time, etc.).

3. **Decide whether to code for existence or frequency of a concept.**

This study records the existence of concepts found throughout the literature and not the frequency.

4. Decide how you will distinguish among concepts.

This study codes similar concepts together even though the words used are not identical, as long as the meaning is the same. For example, a preliminary review of needs assessment literature reveals that many documents discuss the concept of conducting a "gap analysis." A gap analysis is defined by Kusy and Rouda (1995) as determining the current state of skills, knowledge and abilities and then identifying what is desired or necessary for success. On the other hand, Bates, Holton, and Naquin (2000) discuss gaps in performance in relation to optimal and actual performance without using the term "gap analysis."

5. Develop rules for coding your texts.

This study codes content based on explicit and implicit meaning in relation to a set of pre-selected coding concepts (Palmquist et al., 2005). For concepts that are more implicit, the context of the concept is taken into consideration and compared to the set of operational definitions selected for use in this study in order to determine whether or not the concept should be included in the analysis.

6. Decide what to do with "irrelevant" information.

Information found to be irrelevant to this study, meaning it does not pertain to either of the questions being asked, is not analyzed.

7. Code the texts.

Literature is coded by hand using the predefined concepts and tracked using a computer spreadsheet.

8. Analyze your results.

The results of the data analysis process are presented in a table that describes each of the necessary stages of conducting a needs assessment (see Table 1: Analysis of Needs Assessment Literature in Appendix A of this paper).

Coding Strategy for the CBT Literature:

1. Decide the level of analysis.

Since the goal of the CBT analysis is to provide broad generalizations about CBT, vast overreaching categories are selected for coding. Coding is guided by these concepts.

2. Decide how many concepts to code for.

Two concepts are used in the coding process in order to identify ways that CBT might be used to address performance gaps:

1. CBT benefits (i.e. cost savings, quicker training time, better memory retention, etc), and
2. Drawbacks (i.e. expense, slower training time, less memory retention, etc).

3. Decide whether to code for existence or frequency of a concept.

This study records the existence of concepts found throughout the literature and not the frequency.

4. Decide how you will distinguish among concepts.

Since this portion of the study is intended to provide technical trainers with a basic understanding of CBT benefits and drawbacks, only these two broad concepts are coded for. Literature is coded in a flexible and interpretive manner, by comparing potential text selections to the two broad concepts.

5. **Develop rules for coding your texts.**

This study codes content based on explicit meaning and implicit meaning (Palmquist et al., 2005). For concepts that are more implicit, the context of the document is taken into consideration and compared to the set of operational definitions selected for use in this study in order to determine whether or not the concept should be included in the analysis.

6. **Decide what to do with "irrelevant" information.**

Information found to be irrelevant to this study, meaning it does not pertain to either of the questions being asked, is not analyzed.

7. **Code the texts.**

Literature is coded by hand using the predefined concepts and tracked using a computer spreadsheet.

8. **Analyze your results.**

The results of the data analysis process are presented in a table that describes each of the necessary stages of conducting a needs assessment (see Table 2: Analysis of CBT Literature in Appendix A of this paper).

Data Presentation Plan

The results of the data analysis process are integrated as a way to frame the final outcome of the study, an Action Plan (Babylon, 2006), presented as part of the Conclusion chapter of this paper. The Action Plan relates applicable components within the needs assessment coded categories of information directly to CBT. The needs assessment questions are presented as a step-by-step guide, chronologically, in order to provide an easy to follow tool for conducting a needs assessment for CBT. For example,

if one of the needs assessment questions relates to economic costs and benefits, the Action Plan specifically poses the question within the context of CBT.

CHAPTER IV. ANALYSIS OF DATA

This chapter details the results of the analysis of data, as described in the Methods chapter of this study. Twelve pieces of literature are analyzed using the eight steps of conceptual content analysis (Palmquist et al., 2005). Each piece of literature is reviewed for the predefined concepts detailed in the data analysis section of the Methods chapter; the predefined concepts are based on two types of literature: (1) needs assessment literature, and (2) CBT literature. The first section reviews seven references related to needs assessment (see Table 1: Analysis of Needs Assessment Literature in Appendix A of this paper). This table is framed around the following headings, based on concepts for which the literature is coded: (1) performing a gap analysis, (2) identifying priorities and importance, (3) identifying cause of performance problems and/or opportunities, and (4) identifying possible solutions and growth opportunities. The second section reviews five references related to CBT (see Table 2: Analysis of CBT Literature in Appendix A of this paper). This table is framed around the following headings, also based on the concepts for which the literature is coded: (1) benefits, and (2) drawbacks.

Literature is reviewed for the predefined concepts and text is manually highlighted based on the concepts. The highlighted concepts are then individually reviewed to ensure that they properly fit into the coded category chosen. For concepts that have an implicit meaning, the context of the document is taken into consideration. Since this study examines the existence of certain concepts and not the quantity, duplicate concepts within the same document are not recorded more than once unless the context

makes the concept significantly different. If concepts appear more than once among multiple documents, they are recorded once for each document.

The data is then formatted into two tables (see Table 1: Analysis of Needs Assessment Literature and Table 2: Analysis of CBT Literature in Appendix A of this paper) representing each set of literature. Within these tables concepts are summarized into bulleted points. Since each piece of literature contains a citation, a reference is stated along with page number only when a concise quotation adequately describes the concept listed.

Outcome

Content analysis of the needs assessment and CBT literature show that there are many similarities found among the twelve pieces chosen for coding. The following section highlights the similarities found in both sets of literature. Each summary is based on the concepts used for coding as described in the Methods chapter of this study.

Needs Assessment Literature

Performing a Gap Analysis

All but one author (Cline & Seibert, 1993) refer to some sort of examination that can be classified as a gap analysis. Kusy and Rouda (1995) state that a gap analysis is performed to compare actual performance of an organization as it currently exists against a set of new standards. Brown (1992) states that the analysis is used to determine "gaps or discrepancies between employee skills and the skills required for effective job performance" (p. 571). Bates, Holton, and Naquin (2000) state that a gap analysis is used

to compare optimal performance to actual performance or to "identify gaps between current results and desired ones" (p. 251). McClelland (1993) states that a gap analysis is used as a systematic approach to understanding present skills and knowledge levels compared to levels required. Additionally, the gap analysis can be performed to determine current skill levels in relation to organization goals, climate, and internal and external constraints (Kusy & Rouda, (1995). The gap analysis also allows an organization to differentiate between actual and perceived needs in order to bring the organization to a desired or necessary situation (Kusy & Rouda, 1995).

Identifying Priorities and Importance

Two major areas of discussion within the literature fall under the category of identifying priorities and importance: (1) cost/benefit analysis, and (2) reviewing organizational goals. Kusy and Rouda (1995) state that a needs assessment is used to conduct a cost/benefit analysis for addressing training needs (i.e. the cost of doing nothing versus the cost of taking action). Hobbs (1990) and Brown (2002) state that a cost/benefit analysis helps an organization calculate how much the performance problem costs compared to the cost of a training intervention (i.e. what is the value of training intervention). Bates, Holton, and Naquin (2000) and McClelland (1993) state that determining what training needs exist allows an organization to prioritize what training can produce the most benefit.

The literature also discusses the importance of taking organizational goals into consideration. McClelland (1993) states that you should determine "strategic as well as

short-term plans and goals of the organization in an effort to determine where it is currently positioned in regards to the attainment of those goals" (p. 15). Bates, Holton, and Naquin (2000) state that you should examine key organizational and strategic goals to ensure that training solutions address these aspirations. Hobbs (1990) similarly states that you should review long term and short term organizational goals though the needs assessment.

Identifying Cause of Performance Problems and/or Opportunities

Kusy and Rouda (1995) state that you should determine if employees are able to effectively do their jobs and if they have the necessary training to do so. Virtually all of the literature (Bates, Holton, & Naquin, 2000; Brown, 2002; Cline & Seibert, 1993; Hobbs, 1990; McClelland, 1992, 1993) shows that a needs assessment should use a variety of "interview" methods to determine the cause of performance problems. Cline and Seibert (1993) state that it is necessary to use hard data, such as performance reports; and soft data, such as questionnaires, discussion groups, and focus groups, to determine the cause of performance problems. By using a variety of methods to determine training needs, you are able to get multiple perspectives on the problem (Bates, Holton, & Naquin, 2000). Additionally, many authors (Hobbs, 1990; Brown, 2002; Bates, Holton, & Naquin, 2000) state that it is important to determine what problems cannot be addressed through training.

Identifying Possible Solutions and Growth Opportunities

The final step in conducting a needs assessment is a point where the trainer must make recommendations to address the needs identified (Cline & Seibert, 1993). Hobbs (1990) states that one should commit to a training plan that addresses the issues identified through the needs assessment. Brown (1992) states that the final step should involve the preparation of a training proposal that lists the benefits and consequences of action versus inaction. Bates, Holton, & Naquin (2000) state that a final step in the needs assessment is to determine "conditions under which the training and development activity will occur" (p. 571). McClelland (1992) further explains that the final step to a needs assessment involves presenting your findings and recommendations to upper level management. In general, the literature reviewed for conducting a needs assessment consistently states that a training plan must be documented and should include the findings of the assessment along with possible solutions.

CBT Literature

Benefits

Jacoby (2005) states that there are many benefits that can be achieved through the use of CBT: such as gains in efficiencies, time savings, and flexibility. CBT allows for consistent training of a large number of people, which can be conducted twenty-four hours a day. Additionally, "CBT offers the distinct advantage of facilitating the record keeping process" and "in most cases eliminates the need for the organization to train instructors" (p. 46). Additional benefits include the elimination of travel time (Jacoby, 2005; Wokosin, 2004), and the ability for users to learn at their own pace (Eddy, Desai,

& Thomas, 2000; Jacoby, 2005; Lawson, 1999). Other benefits to CBT include better knowledge retention (Eddy, Desai, & Thomas, 2000; Lawson, 1999), a reduction in training time (Lawson, 1999), and interactivity (Lawson, 1999), including immediate feedback (Wokosin, 2004).

Drawbacks

Although CBT provides many benefits, there are also drawbacks to the technology. Jacoby (2005) states that not all training is suitable for CBT. For example, CBT requires a large initial investment of time and money (Wokosin, 2004); infrequently used material (Wokosin, 2004), such as highly technical (Jacoby, 2005) or specialized training for small groups (Jacoby, 2005) may not be worthwhile. Another drawback found consistently throughout the CBT literature (Eddy, Desai, & Thomas, 2000; Jacoby, 2005; Lawson, 1999; Wokosin, 2004) is that most users report that they are uncomfortable with this training method and prefer a traditional classroom setting. Jacoby (2005) succinctly states that "traditional classroom instruction offers face-to-face learning that many people are more comfortable with" (p. 46). Although self-starters may enjoy the self-paced approach to CBT, a lack of human interaction can be a major concern.

CHAPTER V. CONCLUSION

The Conclusion of this study provides an Action Plan (Babylon, 2006) built upon Kusy and Rouda's (1995) guide. This plan integrates information by posing questions raised from both sets for data analyzed in this study. This plan is proposed as a step-by-step guide that can be used by technical trainers conducting a needs assessment for CBT.

Step 1: Perform a Gap analysis

- Determine Actual Performance.
    - Assess company readiness, in relation to "skills, knowledge, and abilities" (Kusy & Rouda, 1995).
    - Ask where the training deficiencies exist, through observations and interviews (Hobbs, 1990).
- Determine Desired or Optimal Performance (Bates, Holton, & Naquin; Hobbs, 1990; Kusy & Rouda, 1995).
    - Clarify where the company wants to be.
    - Clarify the desired place that the company needs to be (Hobbs, 1990; Kusy & Rouda, 1995).
    - Distinguish between actual needs and perceived needs (Kusy & Rouda, 1995).

- Determine the Gap Between Actual and Desired Performance.
    - Define and measure the "gaps or discrepancies between employee skills and the skills required for effective job performance" (Brown, p. 571, 2002).
    - Produce a list of ways to address the gaps (Kusy & Rouda, 1999).

Step 2: Identify Priorities and Importance within Organization

- Conduct a cost/benefit analysis.
    - Determine the cost of action versus inaction (Kusy & Rouda, 1995).
    - Clarify if there is a benefit to using CBT over traditional training methods. Ask:
        - How will your organization respond to CBT?
        - Are employees computer literate?
        - Do employees require a preliminary orientation to CBT methods?
    - Clarify the cost and appropriateness of current training methods compared to CBT.
        - Is training going to be used on a mass scale?
        - Is training needed for multiple locations?
        - Are computers available?
        - Is the type of training suitable for CBT?

- Review organizational goals.
    - Does the implementation of CBT help achieve organizational goals?
        - Current needs?
        - Future needs?
- Prioritize CBT training needs based on importance to organizational goals.

Step 3: Identify Cause of Performance Problems and Opportunities

- Use hard data such as performance reports or statistics to determine training needs.
- Use soft data such as interviews, discussion groups, surveys, focus groups, etc. to get as much input on the cause of problems or deficiencies and the goals for improvement.
- Determine if training is needed or if some other form of organizational development is needed (Kusy & Rouda, 1995).

Step 4: Identify Solutions

- Prepare a report of training needs identified (Cline & Seibert, 1993).
- Make recommendations to address the training needs identified (Cline & Seibert, 1993).
- Specify exactly how CBT could help address the training needs.
    - State the advantages to using CBT versus traditional training methods?
    - State the disadvantages to using CBT. Will CBT create more problems than it solves?

- Make recommendations to upper level management regarding a training plan that addresses the training needs (Cline & Seibert, 1993).
- Secure commitment from upper level management for a specific training plan.
- Prepare a back-end analysis to measure the success of CBT solutions once training is implemented (Hobbs, 1990).

APPENDIX A

Results of Data Analysis

Table 1: Analysis of Needs Assessment Literature

Reference	Performing a Gap Analysis	Identifying priorities and importance	Identifying cause of performance problems and/or opportunities	Identifying possible solutions and growth opportunities
Kusy & Rouda (1995)	• "Check actual performance of our organizations and our people against existing standards, or to set new standards" (para. 6). • Determine current level of skills in relation to organizational goals, climate, and internal and external constraints. • Determine desired or necessary situation in relation to critical tasks. • Distinguish between actual needs and perceived needs.	• Conduct a cost/benefit analysis of identified problems/needs to determine if the solution costs more than not taking action, or vice versa. • Review legal mandates to determine if a solution must be implemented. • Ask if executive pressure is requiring action. • Determine how many people are affected. • Determine how customers affect	• Determine if employees are able to effectively do their jobs. • Determine if employees have the training necessary to do their job.	• Determine if training is needed or if some other form of organizational development should be used as an intervention technique.

Reference	Performing a Gap Analysis	Identifying priorities and importance	Identifying cause of performance problems and/or opportunities	Identifying possible solutions and growth opportunities
	• Produce a list of needs.	solutions.		
Cline & Seibert (1993)	N/A	• List expectations of data you want your assessment to find.	• Identify "hard" factual data using things such as performance reports. • Identify "soft" data obtained using various discussion methods such as questionnaires, discussion groups, one-on-one interviews, and focus groups. • Provide statistics that can be used to measure the effectiveness of change.	• Compile data so that information relates to what you want the assessment to address. • Prepare a report that lists the needs that have been identified. • Make recommendations to address the needs identified.
Hobbs (1990)	• Determine what measures or observations suggest there is a training deficiency. • Describe the performance that is desired.	• Review long term and short term organizational goals. • Identify future organizational needs. • Calculate how much the performance problem costs	• Identify major issues or concerns through various interview methods, including surveys and analysis of historical data. • Validate that addressing items	• Commit to a training plan that addresses issues identified though the needs assessment. • Conduct a "back-end analysis" to determine the

Reference	Performing a Gap Analysis	Identifying priorities and importance	Identifying cause of performance problems and/or opportunities	Identifying possible solutions and growth opportunities
		compared to the cost of a training intervention. • Value the result of training intervention (i.e. will a training intervention cost less than the problem).	viewed as issues, problems, and needs can be addressed with training.	effectiveness of training.
Brown (2002)	• Determine "gaps or discrepancies between employee skills and the skills required for effective job performance" (p. 571).	• Determine "what is the difference between the cost of no training versus the cost of training?" (p. 570). • Determine organizational goals. • Determine future organizational skills needed.	• Gather data to identify needs using various interview methods such as focus groups, surveys, interviews, tests, observations, etc. • "Identify specific problem areas in the organization" (p. 569). • Determine what problems may not be solved with training solutions.	• Develop data for evaluation in order to measure effectiveness of training. • Determine "conditions under which the training and development activity will occur" (p. 571). • Propose solutions to the problems. • Prepare a training proposal that lists the benefits/ consequences if training is/is not conducted.
Bates, Holton, & Naquin	• Define optimal	• Prioritize gaps based	• Determine what is	• "Find solutions to

Reference	Performing a Gap Analysis	Identifying priorities and importance	Identifying cause of performance problems and/or opportunities	Identifying possible solutions and growth opportunities
(2000)	performance and actual performance. • "Identify gaps between current results and desired ones" (p 251).	on the most important deficiencies. • Determine key organizational goals. • Determine strategic organizational goals.	causing the problem through performance analysis. • Determine cause of problem using "felt needs" methods (i.e. interview). • Determine problems using multiple data collection methods. • Get multiple perspectives on problems. • Separate problems that cannot be addressed with training solutions.	close gaps between optimal and actual performance" (p. 250). • Prepare a needs assessment plan that details what should be done.
McClelland (1993)	• Design a systematic approach to understanding present skills and knowledge levels compared to the levels required.	• Determine "strategic as well as short-term plans and goals of the organization in an effort to determine where it is currently positioned in regards to the attainment of those goals" (p. 15). • Define goals for	• Determine the cause of problems through various interview techniques, including surveys, observations, interview, and focus groups,	• Analyze data and feedback from interviews using a consistent process.

Reference	Performing a Gap Analysis	Identifying priorities and importance	Identifying cause of performance problems and/or opportunities	Identifying possible solutions and growth opportunities
		undertaking improvement efforts. • Determine which training solutions have the greatest positive impact on productivity.		
McClelland (1992)	N/A	• Define the goals of the assessment.	• Select an appropriate methodology for determining the cause of problems such as focus groups or interviews.	• Analyze the results of the data you collect. • Present findings and recommendations to upper level management.

Table 2: Analysis of CBT Literature

Reference	Benefits	Drawbacks
Jacoby (2005)	• Can schedule training 24 hours a day. • Able to train at multiple locations simultaneously. • Travel, room/board costs associated with sending employees to training sessions are eliminated. • Self paced training allows employees to move quickly through sections they master and spend more time on sections they struggle with. • "CBT offers the distinct advantage of facilitating the record keeping process" (p. 46). • "CBT in most cases eliminates the need for the organization to train instructors" (p. 46) which saves time and money. • Updates can be provided quickly and easily. • Consistency in content delivery – all employees get the same training. • "Ability to train a substantial number of people in a short time" (p. 46).	• Lack of CBT accessibility for all employees or situations can limit the successful use of the technology. • Lack of human interaction o "Traditional classroom instruction offers face-to-face learning that many people are more comfortable with" (p. 46). o Lack of instant clarification on unclear concepts. • Not all people are computer literate. • People are often uncomfortable having a computer train them. • Not good for training of small groups of people on a very specific topic. • Highly technical training is not best suited for CBT.
Wokosin (2004)	• Can save time and money once CBT is implemented. • Travel time associated with sending employees for training can be eliminated. • Less productivity loss with CBT since employees can attend training from their normal location. • Portions of hands-on training not involving	• Initial cost can be high. • Hands-on training is not suitable for CBT. • Not all employees know how to use computers. • Employees resist using CBT. • Knowledge that changes frequently (daily, weekly, or monthly) is not suitable for CBT because of the effort involved in putting CBT together.

Reference	Benefits	Drawbacks
	hands-on learning can be done using CBT. • Computer software training is a win-win since users are already using the computer. • Immediate feedback on responses. • Mass training can be cost effective even if developed training is only used once. • CBT can integrate existing training documentation. • Linear approach to training requires students to review information they may "think they know." This allows users to learn things that they may not have known. • Integrated learning management systems allow for tracking of student progress.	• Infrequently trained material may not be cost effective unless you are training masses of employees. • Subject matter experts may be required to ensure that documentation is correct. • Outdated computers may not be compatible with some types of CBT. • Users can't complete all training on their own and always require some help from an instructor to use the CBT system. • Topics over 30 minutes should include review and quizzes to ensure knowledge retention.
Lawson (1999)	• CBT allows trainees to actively participate with questions and responses which allows for greater memory retention of the content. • Integrated testing allows employees to answer questions that test and report their progress to management. • CBT can segment employees and target them for the training they need. • CBT can allow employees to stop and pick up their training at a later time. • Training dates and scores are tracked for compliance reasons. • Generic programs can be customized for each location by inserting relevant policies and procedures. • Self-paced learning allows users to quickly pass	• Lack of peer or human interaction. • CBT may require the use of computer developers that have little or no knowledge of course material. • Negative employee reaction due to fear of automation.

Reference	Benefits	Drawbacks
	areas they are competent in and review areas in more depth that they are not competent in. • Reduced training time. • Better knowledge retention.	
O'Connor (2006)	• Learning management systems create efficiencies by tracking progress.	• CBT implementation often fails due to untested assumptions about the benefits of the technology. • Incorrectly implemented CBT can be an "overly monotonous, unwelcoming medium" (p. 29) which is often no more than electronic text.
Eddy, Desai, & Thomas (2000)	• CBT training is more effective for knowledge retention as compared to instructor based training for computer software training. • CBT is good for self-starters or people that prefer self-paced training.	• CBT training can have lower enrollment rates for non-mandatory training. • Employees prefer instructor based training. • It is difficult to "sell" CBT to employees. • Not all learning styles are compatible with CBT.

APPENDIX B

Definition of Terms

Action Plan – "a description of what needs to be done, when and by whom. A plan that describes what needs to be done and when it needs to be completed. Project plans are action plans. A sequenced and prioritized chronology of intent, commitment, and tactics: what one is going to get done and some of the key activities involved." (Babylon, 2006).

Computer Based Training (CBT) – an interactive learning experience (Lawson, 1999) between a learner and a computer in which the computer provides the majority of the stimulus (Lawson, 1999; Marriott; 2006; Wokosin, 2004), the learner must respond, the computer analyzes the response and provides feedback to the learner (Lawson, 1999).

Content Analysis – an approach to data analysis, in an effort to provide "a detailed and systematic examination of the contents of a particular body of material [literature] for the purpose of identifying patterns, themes, or biases" (Leedy & Ormrod, 2005, p. 142, 2005).

Gap Analysis— is a comparison between the current state of "skills knowledge and abilities"... against the "necessary conditions for organization or personal success (Kusy & Rouda, para. 6, 1995).

Human Resource Development (HRD) – "a process of developing and/or unleashing human expertise through organization development (OD) and personnel training and development (T&D) for the purpose of improving performance (Swanson, p. 304, 2001).

Literature Review – "to look at what others have done in areas that are similar, though not necessarily identical to, one's own area of investigation" (Leedy & Ormrod, p. 64, 2005).

Needs Assessment – Kusy and Rouda (1995) define a needs assessment as "a systematic exploration of the way things are and the way they should be. These "things" are usually associated with organizational and/or individual performance (para. 2).

Performance Gap – Bates, Holton and Naquin (2000 define a performance gap as finding the difference between optimal performance and actual performance. Kusy and Rouda (1995) say that organizations can determine the gap in performance by comparing the current situation to the desired or necessary situation. Guthrie, Olian, and Schneier (1988) discuss this concept in relation to deficiencies in performance in relation to current training content.

Technical Trainers – professionals necessary or relevant to technical and skills training including "hands-on crafts, techniques, methods, arts and professional ability" (Laird, 1980).

Training – "an acquisition system by which people acquire knowledge and skills they didn't previously possess" (Laird, p. 18, 1980).

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