

Chapter 17

Some Key Success Factors in Web-Based Corporate Training in Brazil

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ABSTRACT

Brazilian companies are increasingly turning to web-based corporate training by virtue of the fact that they need to train their employees within tight budget constraints in a country of continental dimensions. However, most of these companies do not know what the critical success factors in these endeavors are. Therefore, this chapter seeks to investigate some key success factors associated with such digital enterprises. In order to achieve this, the multiple case study method is used, whereby two cases, both conducted within the same Brazilian company, leading to opposite outcomes – a success and a failure – are analyzed in depth. Accordingly, the two aforementioned cases are investigated by using quantitative data analysis based on bi- and multi-variate linear regressions, as well as t-tests. The conclusions were that “Goal Orientation”, “Source of Motivation”, and “Metacognitive Support” were the three critical dimensions in these two web-based corporate training programs under analysis.

INTRODUCTION

Nowadays, market dynamics are becoming increasingly intense due to new strategic orientations and the pressing need for organizations to adapt themselves to new business models and regulatory frameworks. For this reason, it is of paramount importance for companies to become agile, as well as achieve low costs and high returns on investment associ-

ated with their employee training programs. On the other hand, the increasing speed of obsolescence in training content, plus the high costs of face-to-face training programs, as well as the logistic hurdles linked with their deployment - mainly in firms operating in countries of continental dimensions - like Brazil - are major barriers to the implementation of such face-to-face training programs.

Another aspect is that Information Technology (IT) is changing the way people search, locate, access and retrieve available knowledge, as well as

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altering the learning process and the way training is conducted (Hodgins, 2000). While employees take charge of their own learning process and professional development, the employers face new challenges in training and retaining teams with in-depth knowledge about their business (Hodgins, 2000).

It is in this context of rapid change, with massive information loads and the search for training programs, that web-based corporate distance training comes into its own. Information Technology can solve most of the problems associated with the hitherto existing employee training undertakings, enabling the implementation of corporate distance training programs (Rosemberg, 2001).

Despite being a key factor for developing feasible training programs, Information Technology *per se* is not a guarantee of success for these endeavors. Most of the time, it must be linked to pedagogical and didactical issues related to them. The specific characteristics of each training program must be analyzed in depth and considered as relevant as the implementation costs throughout the decision-making process (Clark, 1983).

The structuring of web-based training programs is no easy task as according to several scholars various critical success factors must be taken into consideration (see, for instance, Carey *et al.*, 1998; Penuel & Roschelle, 1999).

In line with this, this article seeks to investigate what these critical factors are through the analysis of two distinct web-based training programs conducted within the same Brazilian company. Hence, the research question in this paper is: “What are the critical success factors associated with the implementation of these two web-based corporate training programs?”

In order to achieve this goal, this work is structured as follows. First, there is a section addressing the theoretical references used in this article. Then, the research method is outlined. After that, the two cases under analysis are described, and in the next section the results accrued from them are compared. Then, in the last two sections, the

authors discuss the outcomes of the research and present some final comments.

BACKGROUND

In order to analyze the theoretical aspects related to distance training, it is necessary to examine three interrelated topics: psychology, education and information technology (Wilhelmsen *et al.*, 1998). More specifically, it is necessary to examine the main pedagogical approaches and the aspects of utilization of information technology as a way of applying same.

Pedagogical Approaches

With respect to pedagogical approaches, the two paradigms that became fundamentally influential from the 20th century onwards will be tangentially analyzed. These paradigms do not only include the vision of how the learning process is achieved, but also offer an insight into the very nature of knowledge – essentially, if knowledge exists in an absolute form, or if it is something that is constructed and relative. These two approaches are traditionally referred to as *instructivism/behaviorism* and *constructivism/cognitivism* (Wilhelmsen *et al.*, 1998).

The basic distinction between *instructivism/behaviorism* and *constructivism/cognitivism* lies in the concept of knowledge. For the former, knowledge is passive – automatic responses to external factors – whereas for the latter, knowledge is seen as an entity constructed by each student throughout the learning process. Knowledge from the *constructivist/cognitivist* standpoint does not have absolute characteristics as in *instructivism/behaviorism*, and cannot therefore be simply passed on from one person to another (Wilhelmsen *et al.*, 1998).

For the purposes of this article, the most important aspects of the *instructivist/behaviorist* approach are the concepts that the student must adapt

to the environment and that learning is a passive process in which there is no explicit treatment or interest in the mental processes. The student, in this case, merely responds to the demands of the environment (stimuli). Knowledge is therefore seen as something absolute and immutable (see, for example, Skinner, 1968; Wilhelmsen *et al.*, 1998).

Thus, an *instructivist/behaviorist* approach to a given training program works well, provided that it has clearly defined objectives and its results are easily measurable. By way of example, the training videos of the American army used in the Second World War for repetitive tasks such as assembling a rifle could be presented (Rosemberg, 2001, p.20).

Unlike the *instructivists/behaviorists*, the theorists of *constructivism/cognitivism* are of the opinion that learning is an active process. *Constructivism/cognitivism* is based on the concept that students construct their own knowledge, rather than the idea that the teacher passes on information and knowledge to the students (see, for example, Piaget, 1952; Papert, 1993).

For the *constructivists/cognitivists*, the learning plan should always place emphasis on the student – rather than the content and format of the program – and on the instructor (University of Dayton, 2003). In this way, one progresses from a model in which the instructor is the center of the teaching program to a model in which the student is the center of same.

Assessment of Web-Based Corporate Training Programs

In many cases, the departments of a company need to develop corporate distance training programs via the web. More often than not, these programs are oriented by technical imperatives, namely the obligation to use Internet technology. In some organizations, the web-based training programs were designed specifically to justify the costs of the corporate intranet (Powell, 2000). However,

the use of technology *per se* cannot be considered a justification for implementing any kind of training, as stated by Rosemberg, (2001), Bregman & Jacobson (2000), Bates (1995) and Kay *et al.* (1970), to name but a few.

In order to assess two web-based training programs conducted by the same company later in this work, with a view to establish what the critical success factors associated with these endeavors were, it is necessary to adopt a specific framework. In this paper, the model proposed by Reeves & Reeves (1997) will be applied to identify and evaluate the distinct dimensions involved in web-based training, as explained below. This model has applications in the research, implementation and evaluation of web-based training programs such as those analyzed in this paper.

It is important to stress that the model developed by Reeves & Reeves (1997) does not propose to evaluate either the outcome of a web-based training program, or its success or failure. Indeed, the overriding purpose of this model is to assess the different aspects and facets of this kind of program (Reeves, 1997).

The adopted model includes ten dimensions of interactive learning on the World Wide Web, namely: (1) pedagogical philosophy, (2) learning theory, (3) goal orientation, (4) task orientation, (5) source of motivation, (6) teacher role, (7) metacognitive support, (8) collaborative learning, (9) cultural sensitivity, and (10) structural flexibility.

Each of the ten dimensions in this model is presented as a two-ended *continuum* with contrasting values at either end, ranging from a fully aligned *instructivist/behaviorist* approach at one end of the spectrum to a fully aligned *constructivist/cognitivist* approach at the other. Needless to say, the world is rarely dichotomous and there is more complexity involved in training than any of these dimensions suggest. However, the individual dimensions themselves are not as important as the interplay among the ten dimensions that represent the major pedagogical approach of various web-

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based training programs. These dimensions are detailed below.

a) Pedagogical Philosophy (Instructivist \Leftrightarrow Constructivist)

The debate over instructivist and constructivist approaches to teaching and learning persists to this day (Kafai & Resnick, 1996). Instructivists stress the importance of objectives that exist separately from the learner. Little emphasis is placed on learners themselves, who are viewed as passive recipients of instructions or treated as empty vessels to be filled with learning (Sherry, 1996). By contrast, constructivists emphasize the primacy of the learner's intentions, experience and cognitive strategies. According to constructivists, learners construct different cognitive structures based upon their previous knowledge and what they experience in different learning environments. It is of paramount importance for constructivists that learning environments be as rich and diverse as possible. Instead of an empty vessel, the learner is regarded as an individual replete with pre-existing motivations, experiences, aptitudes and knowledge. Tasks to be accomplished and problems to be solved must have personal relevance to the learner. The constructivists believe that what we know is constructed – both individually and socially – based on prior experience.

b) Learning Theory (Behavioral \Leftrightarrow Cognitive)

According to behaviorists, the critical factor in learning is observable behavior, and instruction involves shaping desirable behavior through the arrangement of stimuli, responses, feedback, and reinforcement. A stimulus is provided (e.g. a short presentation of content), then a response is elicited - often via a question. Feedback is given as to the accuracy of the response, and positive reinforcement is given for accurate responses. Inaccurate responses result in a repetition of the

original stimulus, and the cycle begins again. Cognitive psychologists place more emphasis on internal mental states than on behavior. Cognitive taxonomy of internal learning states includes simple propositions, schema, rules, skills, mental models and so forth. They claim that a variety of strategies – including memorization, direct instruction, deduction, drill and practice, and induction - are required in any learning environment, depending upon the type of knowledge to be created by the learner.

c) Goal Orientation (Sharp \Leftrightarrow Broad)

The goals for education and training can range from sharply focused goals to general higher-order goals. Hence, the goal orientation of web-based training systems varies in degree of focus from sharp to broad (Cole, 1992).

d) Task Orientation (Academic \Leftrightarrow Authentic)

The context of learning is enormously important to adults (Merriam, 1993; Giardina *et al.*, 2002). Academic design depends heavily on having the learners carry out traditional academic exercises, whereas authentic design engages adults in practical activities such as preparing job applications, thereby situating practice and feedback within realistic scenarios. If knowledge, skills, and attitudes are learned in a practical context, they will be used in that context in similar situations.

e) Source of Motivation (Extrinsic \Leftrightarrow Intrinsic)

Motivation is a primary factor in any theory or model of learning (Amabile, 1993). All new educational technology promises to be intrinsically motivating. This dimension ranges from extrinsic (i.e., outside the learning environment) to intrinsic (i.e., integral to the learning environment). Motivation instruction is intrinsically elusive,

irrespective of the delivery system.

f) Teacher Role (Didactic \Leftrightarrow Facilitative)

The teacher role continuum ranges from didactic to facilitative. In the former role, the teacher presents information and asks learners to memorize information and recall it later in tests. The latter role assigns cognitive responsibility to the learners, for them to be responsible for recognizing and judging patterns of information, organizing data, constructing alternative perspectives, and presenting new knowledge in meaningful ways, with the teachers being tutors of this process.

g) Metacognitive Support (Unsupported \Leftrightarrow Integrated)

Metacognition refers to a learner's awareness of objectives, ability to plan and evaluate learning strategies, and capacity to monitor progress and adjust learning behavior to accommodate needs (Flavell, 1979). The metacognitive support dimension is unsupported at one end of the continuum and integrated at the other. Recapitulation of the students' strategies at any point in the problem-solving process, as well as construction of web-based portfolios (Nevado *et al.*, 2004) are examples of how support for reflection and metacognition might be provided in web-based corporate training.

h) Collaborative Learning Strategies (Unsupported \Leftrightarrow Integral)

The Collaborative Learning dimension ranges from a complete lack of support for collaboration to the inclusion of collaborative learning as an integral feature. Cooperative and collaborative learning refers to instructional methods in which learners work together in pairs or small groups to accomplish shared goals (Kirschner *et al.*, 2004).

i) Cultural Sensitivity (Insensitive \Leftrightarrow Respectful)

All instructional systems have cultural implications. In an insensitive approach the training is developed irrespective of the culture and diversity of the learners it is intended to address. On the other hand, a respectful approach is based on the diversity in the populations in which the system will be used so that the overall learning environment is enhanced. It is unlikely that web-based training can be designed to adapt to every cultural norm, but sites should be designed to be as culturally sensitive as possible (Brown & Voltz, 2005).

j) Structural Flexibility (Fixed \Leftrightarrow Open)

"Fixed" systems, still dominant in education, are usually limited to specific places, e.g., a classroom or laboratory, at specific times, e.g., 50-minute class period. Irrespective of time and/or location constraints the learner can use "Open" systems. The World Wide Web provides opportunities for more asynchronous (open) learning, although some web-based learning tools are temporally fixed (synchronous), such as chats, video-conferences, etc.

Table 1 below depicts the ten dimensions defined for analyzing web-based training programs, as supported by Reeves & Reeves (1997). For each dimension (in the central column of the table), the opposite poles of the adopted ratio scale, ranging from 0 (a fully *instructivist/behaviorist* approach) to 10 (a fully *constructivist/cognitivist* approach) are described and their meanings explained.

RESEARCH METHOD

The multiple case study method as described by Yin (1994) was adopted in this research, in which two web-based distance-training programs developed within the same Brazilian company

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Table 1. Dimensions to evaluate the characteristics of web-based distance training (Adapted from Martin, 1998 and Joia, 2001).

0 ←	Dimension	→10
Instructivist Knowledge is imparted by the instructor	Pedagogical Philosophy 0 - 10	Constructivist Knowledge is constructed – both individually and socially – by the students
Behavioral Emphasis on observable behavior	Learning Theory 0 - 10	Cognitive Emphasis on internal mental states
Sharp Direct instruction focusing on desired behavior	Goal Orientation 0 - 10	Broad Simulations encompassing more than just a solution for the problem
Academic Emphasis on traditional academic exercises	Task Orientation 0 - 10	Authentic Emphasis on practical activities
Extrinsic Motivation lies outside the learning environment	Source of Motivation 0 - 10	Intrinsic Motivation lies in the student and the learning environment
Didactic The teacher is considered to be a knowledge repository	Teacher Role 0 - 10	Facilitative The teacher is a mentor and tutor for the students
Unsupported There are no student progress tracking mechanisms or adjustments to individual needs	Metacognitive Support 0 - 10	Integrated Student progress tracking mechanisms are implemented, as well as adjustments to individual needs
Unsupported Students work alone	Collaborative Learning 0 - 10	Integrated Students work together in pairs or in small groups
Insensitive Training is prepared regardless of the culture and diversity of the learners it seeks to address	Cultural Sensitivity 0 - 10	Respectful Training is based on the diversity of the populations where the system will be used
Fixed Program limited to specific places at specific times	Structural Flexibility 0 - 10	Open Program independent of time and/or location constraints

were analyzed in-depth.

Case studies are particularly suitable for answering “how” and “why” questions, and are ideal for generating and building theory in an area where little data or theory exists (Yin, 1994), as in this knowledge field. It also enables researchers to use “controlled opportunism” to respond flexibly to new discoveries made while collecting new data (Eisenhardt, 1989), as was done and is presented below in this work.

Notwithstanding having a major exploratory facet, this study also presents explanatory characteristics, as a causal relationship between the dimensions of the programs analyzed (Reeves &

Reeves, 1997) and the respective outcomes are pursued.

Yin (1994, p.46) argues that in the multiple case study method, each case must be carefully selected, so as to generate either similar or opposing results. In line with this, a Brazilian company was chosen (the identity of which is confidential) and two web-based training programs it developed and staged were selected, each one generating contrasting final results.

The first case – hereinafter referred to as “Program A” – was considered a success as it achieved its main objectives. The second case – hereinafter named “Program B” – developed by

the same company, was considered a failure, as most of its targets were not accomplished.

In order to validate the “Key Success Factors in Web-based Corporate Training” construct, multiple data sources were used, and also a chain of evidence related to research questions was pursued. The existing records associated with these projects were analyzed in depth. The managers of both programs were located in the company and submitted to open interviews in January 2006, in order to address their perceptions about the rate of success of the training programs they were in charge of. There was a single manager for the first case (“Program A”) and two managers for the second case (“Program B”).

Questionnaires were prepared and circulated among the training users. These questionnaires were actually the Table 1 (Reeves & Reeves, 1997), whose dimensions were deeply explained to the respondents by the authors, in order they can rate them from 0 to 10, according to their perceptions associated with the training they were submitted to¹. In addition to this, the users also revealed their perceptions about the rate of accomplishment of objectives of each program *vis-à-vis* the actual objectives proposed for the programs in their initial designs.

In line with the ideas proposed by Reeves & Reeves (1997) and, as already said, the minimum value of the scale (0) indicates that a dimension is fully aligned with the *instructivist/behaviorist* paradigm, whereas the maximum value of the same scale (10) proves that a dimension is fully aligned with the *constructivist/cognitivist* paradigm (Joia, 2001). Moreover, the maximum value of the scale (10) associated with the “Accomplishment of Training Objectives” indicates user perception of complete success for the training program, whereas the minimum value (0) points to user perception of total failure for the training program.

The aforementioned questionnaires were answered by all of the 32 users of the first case analyzed (“Program A”) and all of the 31 users of the second case (“Program B”), during the

course of January 2006. These trainings courses were chosen as the researchers had access to the students, as well as to most of the characteristics of the aforementioned training programs.

While having a clear exploratory approach, this work also addressed some explanatory elements used to verify the possible causal effects between the dimensions of the theoretical model and the training outcomes. This was done to support the internal validity of this research, in accordance with the recommendations of Morra & Friedlander (1999).

The first analysis conducted sought to compare user perceptions about the rate of accomplishment of objectives for the two programs, in order to verify whether or not the respective average of these grades could be considered statistically distinct.

Once the difference between user perceptions regarding the rate of accomplishment of objectives for each program was recorded, a statistical comparison of user perception averages associated with each dimension of the theoretical model applied was performed. Since it had already been seen that the two programs presented statistical differences with respect to their outcomes, namely success and failure, the dimensions that didn’t present statistically significant differences within the two programs were discarded as not being critical success factors.

Thus, from this prior comparison, two dimensions of the Reeves & Reeves (1997) model were removed, leaving eight dimensions to be analyzed further. In order to achieve this, a multivariate linear regression was used, where the rate of accomplishment of training objectives was the dependent variable while the grades given by the users to each of the eight remaining dimensions of the model served as the independent variables.

In order to take the specificities of each training program into account, a dummy variable addressing the type of training program (TYPE) was adopted. For Program A, TYPE was considered 1, whereas for Program B, TYPE was made

equal to 0. Thus, the different values found for the intercepts of the linear regression indicated the difference between the programs, with Program B being considered as the baseline (Hair *et al.*, 1998, p. 167-168). The significance level of each coefficient associated with these dimensions (independent variables) was then calculated and analyzed, while the dimensions whose coefficients did not present evidence of linear correlation with the dependent variable (accomplishment of objectives) were discarded.

The above procedure highlighted three dimensions, which could be considered critical success factors for the training programs analyzed.

As a final quantitative validation, a simple linear regression with a dummy variable (TYPE) was performed on each dimension removed from the study for not being related to the accomplishment of training objectives. These simple regressions supported that these factors did not possess a fair linear correlation with the objectives of both training programs.

Lastly, another multivariate linear regression with a dummy variable (TYPE) was run, considering merely the three aforementioned dimensions as independent variables. The outcomes obtained supported the central importance of these three variables as critical success factors.

CASE DESCRIPTION

Internet Users and Web-Based Corporate Training in Brazil: An Outlook

Some developing countries, notably India, Mexico and Brazil, use Information Technology in a highly intensive manner. This fact alone might be construed as a decidedly positive opportunity for Internet-based initiatives. However, as these countries have large populations, absolute figures can lead the reader to draw mistaken conclusions. If, for instance, one compares Canada and Brazil,

it can be seen that while Brazil has almost the same number of Internet users as Canada, nearly 50% of the population of the latter is digitally included (Joia, 2004), whereas less than 20% of the population of the former has Internet access according to the Brazilian Institute of Geography and Statistics (IBGE, 2005).

The number of Internet users in Brazil is estimated at around 32.1 million. This impressive number puts Brazil in first place in the ranking of Internet users in Latin America and fifth in the world. However, when comparing the number of users to the size of the population, the scenario alters considerably. It still represents a very small percentage of the total population of 187 million in a country with a GDP in the order of US\$ 794 billion in 2007 (Afonso, 2001; Neri, 2003; IBGE, 2005; IBGE, 2007).

With 6 million lines in use (e-Marketer, 2007), Brazil is ranked third after the United States and Canada in terms of countries with broadband access in the Americas. Despite the still precarious conditions of technological infrastructure in many regions of the country, corporate training via the web in Brazil has been growing at an annual average rate of 15% per year, in terms of trained professionals (Bastos, 2003). This growth rate is undoubtedly due to the continental dimensions of the country (Bastos, 2003).

Recent research conducted in 120 major Brazilian companies has shown that 70% of them are in some way involved with the inclusion or practical application of e-learning solutions, even though the geographical distribution of these investments has unquestionable correlations with the regional socio-economic model and the consequent investment and income distribution indices of each of the regions analyzed (Bastos, 2003). This research has shown that not only does the Southeast Region have a greater concentration of companies already using e-learning (87%), but also that it serves the largest number of trainees online in Brazil (31%) (Bastos, 2003).

The Company

The company under analysis is a major Brazilian firm in the Information Technology industry. It has more than 30,000 employees with offices throughout Brazil. In 2003, the company posted total revenue of US\$ 865 million and net income of US\$ 76 million.

Due to its nationwide presence, this company faces an ongoing challenge to implement face-to-face corporate training programs, due to budget constraints. So, it is in this context that the two training programs, namely “Program A” and “Program B” were envisaged and implemented.

The name of the company, as well as further details about it, are kept confidential, as agreed with its top executives.

“Program A”

“Program A”, considered a successful case by the company, is a mandatory corporate distance training program for all managers, namely its main target audience. Any employee who is promoted to a managerial function is obliged to take this course within a maximum timeframe of one year.

This training program lasts nine months and consists of three distinct stages that encompass distance and face-to-face training. The focus of this program lies in the development of leadership skills. Accordingly, the following issues are addressed: the attributes that make an effective leader; the different kinds of leadership styles that are best used under certain conditions; the various theories of leadership practice and the pros and cons of each; and the leadership responsibilities related to administrative and management tasks.

The training program is based on the premise that, rather than being an isolated event, learning is a continuous process throughout the professional’s lifetime. “Program A” uses several Information Technology tools, such as intranet that is heavily deployed to provide information considered essential for the managers of the company.

Stage I of this program (Pre-Learning Laboratory) is developed on-line, in a distance-based training format. This stage lasts from five to six months and is an individual activity that demands between 48 and 56 hours of study.

Stage II of this program (Learning Laboratory) is a face-to-face experience lasting five days. The professionals must have successfully completed Stage I before embarking on this second stage. This Learning Laboratory takes place in the Global Learning Center of the company, in the city of São Paulo.

Stage III of this program (Post-Learning Laboratory), like Stage I, is developed on a distance-training basis. This stage focuses on collaborative learning via the company’s intranet, as well as public forums and tools like instant messaging.

Throughout the duration of the course, a mediator is previously assigned and available to take part in the program, both in person and online, in order to resolve any doubts the professionals may have, to supply the students with suggestions, and to help them solve general problems.

According to an interview with the manager of “Program A”, this program is considered a success, having fully achieved its targets.

Furthermore, thirty-two users of “Program A”, who attended the program during 2005, answered the questionnaire developed for this research and evaluated their participation on this training program as a highly positive experience (average of 8.5 and standard deviation of 1.32 on a ratio scale ranging from 0 to 10). Therefore, it may be considered that the objectives were achieved. All of the thirty-two respondents were managers of the company.

“Program B”

“Program B” started at the beginning of 2004, initially as an effort to provide and make information about the company’s productive and administrative processes available to employees located in the various offices of the company nationwide.

The design and development of the program was organized by the company's IT (Information Technology) team, supported by the basic premise of using the corporate intranet to publish all the content considered relevant.

The first version of the program gathered and consolidated the wealth of information about the company's processes already published in the intranet under a single site with a unique index for conducting searches. For this purpose, a team of five employees from two different business units was formed to assist the IT area in the identification and classification of information.

Once the information had been duly identified and classified, the IT area began to configure the program, so as to feature distinct courses categorized by subject. These courses could then be accessed by any employee via the intranet. Consequently, for each course implemented, a "Program Manager" was chosen to be in charge of developing the assessment questions (multiple-choice based), having privileged access to the answers given by the students.

After an initial test period – based on just one course developed for a specific group of employees – three distinct courses were made available – two of them focusing on specific working processes of the firm (Order Fulfillment and Customer Service), and the third addressing administrative content (Employee Performance Assessment and Promotion)

The main target of this training program was to reduce the costs involved in corporate training, as well as to speed up the adaptation and training time for newly hired professionals to become accustomed to the processes used by the organization.

After less than one year, having failed to achieve its objectives, the program was redesigned.

Thirty-one users of "Program B", who attended the program during 2005, answered the questionnaire distributed by the researcher. In essence, they evaluated the experience of taking part in this program as negative since the aims were not

achieved (average of 4.52 and standard deviation of 1.15 on a ratio scale ranging from 0 to 10).

This evaluation from these employees tallied with the opinion of the program managers, as they stressed that the objectives of this program were not achieved.

COMPARISON OF RESULTS

Initially, it is necessary to analyze the differences singled out by both the program managers and users concerning the achievement of objectives of the training programs. According to the assessment of the manager of "Program A", the objectives of the training were fully achieved and in his general evaluation the program was rated as "very good". Conversely, the managers of "Program B" realized that the main targets of this program were not achieved, which led the program to be redesigned. Thus, according to the managers' perceptions, the difference related to achievement of objectives between the two programs becomes clear.

In order to analyze user perceptions related to the programs, it is necessary to evaluate the difference between the average grades given by the students to each one of the programs. The average user evaluation grade regarding the achievement of objectives in "Program A" was 8.50 ($s=1.32$; $n=32$, on a ratio scale of 0 to 10), whereas the same value concerning "Program B" was 4.52 ($s=1.15$; $n=31$; on a ratio scale of 0 to 10). This difference between the averages seems to tally with the opinion of the program managers. However, it is necessary to apply a statistical test (t-test) to compare the average of each program, so as to establish whether or not they can be considered different according to a statistical level of significance.

Table 2 below depicts the results accrued from the comparison of employee evaluation averages related to the achievement of objectives of the training programs.

Table 2. Comparison of Averages related to “Achievement of Objectives” according to the Users of the Training Programs

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	T	df	Sig. (2-tailed) (p)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Achievement of Objectives	.202	.655	12.752	61	.000	3.98	.31	3.36	4.61

From the results presented in Table 2, it is clear that there is a significant statistical difference between user perception averages related to the achievement of objectives of the training programs ($p < 5\%$). Furthermore, it can be observed that the interval of confidence doesn't encompass zero, i.e., it is all positive. Thus, it is possible to support with a 5% level of significance that the averages are different and the average of “Program A” is greater than the average of “Program B” (Sincich, 1995, p.532).

It can be argued that with respect to “Achievement of Objectives”, “Program A” achieved better results than “Program B”.

On the basis of this, the factors that influenced these results were researched, based on the theoretical model adopted in this article. Consequently, the evaluation averages of each dimension of the Reeves & Reeves' (1997) model were analyzed in order to find out which ones actually had an impact on the results depicted above.

Similarly, the dimensions that presented statistical significant differences in the sample averages for each program were examined, as these are the dimensions that can be considered to be influential in the achievement of objectives of each web-based corporate training program analyzed. Table 3 below compares the averages related to each dimension of the programs under analysis, according to the framework of Reeves & Reeves (1997).

As can be seen in Table 3 above, there is no difference in the Pedagogical Philosophy and Structural Flexibility dimensions in the two cases, with a 5% level of statistical significance ($p > 0.05$). Hence, these dimensions can be disregarded as critical success factors in web-based corporate training. Based on this result, a multiple linear regression between the Achievement of Objectives (dependent variable) and the eight dimensions that presented significantly distinct averages (independent variables) was run, in addition to a dummy variable addressing the type of training program involved. The intention was to verify which variables could be considered truly influential in terms of outcomes achieved taking into account the different contexts of the programs.

Table 4 below depicts the summary of results and the statistical values accrued from this multiple regression with a dummy variable. As already said, the dummy variable TYPE was set up equal to 1 for the Program A and equal to 0 for Program B. This summary supports the validity of using the eight dimensions of the theoretical model (*Predictors*) to forecast the achievement of objectives for each case studied (in the summary, the “R” column represents the correlation coefficient and the “R Square” column represents the determination coefficient). From these data, it can be argued that nearly 72% (0.715) of the variance of the “Achievement of Objectives” variable can be explained by the dimensions included in this

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Table 3. Comparison of the Averages of the Sample Dimensions of the Model

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Means Program A	Means Program B	95% Confidence Interval of the Difference	
								Lower	Upper
Pedagogical Philosophy	.010	.919	.511	61	.611	1.96	1.85	-.34	.56
Learning Theory	55.065	.000	2.470	61	.016	2.55	2.03	.09	.94
Goal Orientation	4.285	.043	6.239	61	.000	2.94	1.58	.92	1.79
Task Orientation	16.813	.000	4.963	61	.000	3.03	2.00	.61	1.44
Source of Motivation	8.686	.005	4.951	61	.000	2.41	1.26	.68	1.61
Teacher Role	28.837	.000	6.790	61	.000	4.68	2.12	1.81	3.31
Metacognitive Support	68.946	.000	9.747	61	.000	3.00	1.06	1.54	2.33
Collaborative Learning	129.092	.000	3.760	61	.000	3.88	3.10	.37	1.20
Cultural Sensitivity	20.583	.000	7.756	61	.000	2.23	1.23	.74	1.26
Structural Flexibility	.943	.335	-.751	61	.455	2.69	2.88	-.71	.32

regression.

After validation of the model, an attempt was made to verify which coefficients, namely the dimensions of the model applied, actually influenced the achievement of objectives of web-based training programs. Table 5 below presents the summary of the statistics related to the coefficients of the regression model.

From the results depicted in Table 5, it can be deduced that, with a 5% level of significance, the Learning Theory, Task Orientation, Teacher Role, Collaborative Learning and Cultural Sen-

sitivity dimensions did not reveal evidence of any statistically significant linear relationship with "Achievement of Objectives" (Sig. > .05). It can also be seen that the intercepts (b) related to training programs A and B are: $b^A = 4.960$ and $b^B = .687$, reinforcing the finding that the degree of accomplishment of objectives was greater in Program A than in Program B (4.273 points of difference)

In order to strengthen the results accrued from this multiple linear regression, with respect to the lack of evidence of any linear relationship of

Table 4. Summary of the Linear Regression

Model Summary (sample = 63 respondents; p-value=0.001)				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.868(a)	.724	.715	1.25
a Predictors: (Constant), Cultural Sensitivity, Learning Theory, Source of Motivation, Goal Orientation, Teacher Role, Task Orientation, Collaborative Learning, Metacognitive Support, TYPE (dummy variable)				

Table 5. Analysis of the Statistical Significance of the Coefficients of the Linear Regression of the Dimensions of the Model

Coefficients										
		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		Co-linearity Statistics	
Model		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
	(Intercept) b ^A	4.960	.547		3.950	.000	2.998	6.657		
	(Intercept) b ^B	.687	.356		5.980	.000	.289	1.567		
	Learning Theory	-.0561	.298	-.019	-.254	.859	-.567	.490	.767	1.768
	Goal Orientation	.511	.290	.256	2.334	.035	.076	.998	.589	1.978
	Task Orientation	-.285	.299	-.098	-.901	.478	-.778	.312	.564	2.987
	Source of Motivation	.878	.256	.402	4.342	.000	.489	1.876	.675	1.980
	Teacher Role	.145	.15	.094	.855	.489	-.19	.334	.486	2.235
	Metacognitive Support	.636	.256	.335	2.786	.007	.178	1.345	.345	2.678
	Collaborative Learning	.190	.299	.093	.405	.770	-.556	.778	.556	2.123
	Cultural Sensitivity	.290	.367	.089	.756	.478	-.489	1.098	.390	2.897

Dependent Variable: Achievement of Objectives

the Learning Theory, Task Orientation, Teacher Role, Collaborative Learning and Cultural Sensitivity variables and simple linear regressions with dummy variables of each of these variables *vis-à-vis* the “Achievement of Objectives” were performed. Table 6 presents the summary of the results accrued from these five simple regressions, which was drawn up separately from Table 5 to

make it easier for the reader to fully understand the influence of each discarded dimension in the “Achievement of Objectives”.

As can be observed from analysis of the correlation coefficient (column “R”) and the determination coefficient (column “R Square”) of the five simple regressions, these variables did not effectively have any bearing on the “Achievement

Table 6. Summary of the Models of Simple Linear Regression of the Variables Discarded in the Multiple Linear Regression

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1(a)	.245(a)	.060	.057	2.54
2(b)	.346(b)	.120	.118	2.90
3(c)	.456(c)	.198	.170	2.11
4(d)	.390(d)	.152	.120	2.34
5(e)	.399(e)	.159	.139	2.09

(a) Predictors: (Constant), Learning Theory, TYPE (dummy variable) (b) Predictors: (Constant), Collaborative Learning, TYPE (dummy variable) (c) Predictors: (Constant), Task Orientation, TYPE (dummy variable) (d) Predictors: (Constant), Teacher Role, TYPE (dummy variable) (e) Predictors: (Constant), Cultural Sensitivity, TYPE (dummy variable)

Table 7. Summary of the Linear Regression of the “Metacognitive Support”, “Source of Motivation” and “Goal Orientation” Dimensions

Summary of the Regression (sample=63 respondents; p-value= 0.000)				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.851(a)	.724	.699	1.24

a Predictors: (Constant), Metacognitive Support, Source of Motivation, Goal Orientation, TYPE (dummy variable)

of Objectives” variable (“*Adjusted R Square*” smaller than 0.17).

Lastly, a final statistical analysis was performed. Analyzing the results of the multiple linear regression with dummy variables of the three variables selected as being influential in the achievement of objectives of the training programs – Goal Orientation, Source of Motivation and Metacognitive Support – it can be seen that this model is very similar to the former multiple regression model with dummy variables (Table 4) which took eight variables into consideration. Table 7 portrays a summary of this model. The intercepts are consequently: $b^A = 4.854$ and $b^B = .769$ (a difference of 4.085 points).

DISCUSSIONS

Despite the fact that distance education has been around for over a century (Matthews, 1999), the development of training programs has not achieved its full potential within organizations (Berge, 2002).

Different technologies have been used since the creation of the first distance training program, though web technology is considered a watershed in this realm. While the technological progress has been impressive, the implementation of web-based distance training has only increased at a slow pace. A survey conducted by the interactive magazine *Learning Decisions* (www.learningdecisions.com) in February 2000, based on 1902 respondents, revealed that only 22% of large US organizations were working on the

development of web-based corporate distance training programs.

Besides the hype around Internet technology and its use in the business arena, the first trials using the Internet in corporate training arose at the end of the 20th century. However, most of these initial applications either failed or fell short of the expected outcomes (Cross, 2004).

For over a century, society has been trying to understand precisely how human beings learn. As with most problems in the social sciences, there is no single answer. However, it is clear that some rationale behind this research question must be developed. It must be remembered that western society (mainly the USA) has been heavily influenced by the *instructivist/behaviorist* paradigm, upon which its educational system was designed (Criswell, 2000).

On the basis of theoretical references and case research analysis, it became clear that the deployment of web-based training programs is not merely a technological issue. As in any training program, the inherent objectives and characteristics that it is seeking to achieve must be analyzed by the designers, so as to permit selection of the most adequate learning theory and define the instructional design, as well as develop and deploy the training program adequately.

Based on the comparison of averages, it was concluded with 5% level of statistical significance, that there was no difference between the Pedagogical Philosophy and Structural Flexibility dimensions in the two cases analyzed. The sample averages of the former dimension (1.96 for “Program A” and 1.85 for “Program B”) indicate that

both programs were highly *instructivist/behaviorist*, namely most of the knowledge is imparted by the training, rather than constructed by the students themselves. In other words, most of the learners' prior experiences were not taken into consideration in either case. This tallies with some authors who reveal the hurdles in developing a *constructivist/cognitivist* web-based corporate training program in an environment where efficiency is pursued in order to be attained in a short time frame (see, for instance, Joia & Casado, 2007; Joia, 2001 and Criswell, 2000). Likewise, the sample averages of the latter dimension (2.69 for "Program A" and 2.88 for "Program B") pointed to the fact that "fixed" training programs are still dominant in corporate training, as in neither of the programs could the learners use the systems irrespective of time and/or location.

Thereafter, applying a linear multiple regression between the dimensions of the model developed by Reeves & Reeves (1997) and the achievement of objectives of both training programs, it can be seen that five out of the eight remaining dimensions of the theoretical model did not have a significant influence on the results of either program. Actually, the dimensions that effectively had a major impact on the outcomes of training programs A and B were: Goal Orientation, Source of Motivation and Metacognitive Support.

The low averages observed for the Goal Orientation dimension (2.94 for "Program A" and 1.58 for "Program B") indicate that the objectives of both programs were more specific than generic. However, it is important to note that "Program A" aimed at achieving somewhat higher-order goals (namely leadership skills) than "Program B". Conversely, "Program B" set out to address sharply focused goals (namely the firm's processes). In other words, with respect to this dimension, "Program A" was less *instructivist/behaviorist* than "Program B".

This result duly corroborates the ideas of several authors who argue the need for a broader orientation for the success of a distance training

program, i.e. one that elicits more than the mere solution of specific problems (see, for instance, Dick & Carey, 1996; Kay *et al.*, 1970; Mager, 1972; Sancho, 1998, to name just a few).

"Program B" – with an average of 1.06 – had hardly any Metacognitive Support, whereas "Program A" – with an average of 3.00 – revealed a certain level of implementation of this dimension. Once again, based on data collected from informal interviews, the users of "Program B" declared that there was no tool for students to track their progression during this training program

Moreover, regarding Metacognitive Support, the actual description of the features available in "Program B" to students, from the program managers' perspective, namely access via the intranet and multiple choice questionnaires, reveals and supports the lack of means for users to assess their learning strategies in a timely manner.

On the other hand, "Program A" did indeed provide some opportunities for students to develop the kind of assessment addressed above. The tool upon which this program was built allowed the users to track their outcomes at each stage of training, as well as the percentage of total time available to complete the course, and the estimated total time necessary to accomplish each stage of the program. Furthermore, "Program A" allowed the students to check back on content they had already studied on the course, thereby enabling them to control their learning process, as suggested, for instance, by Nevado *et al.* (2004), Campbell *et al.* (2000) and Costa *et al.* (1998).

Lastly, "Program B" users' assessment concerning the Source of Motivation dimension produced an average of 1.26, indicating that the source of motivation was mostly extrinsic. On the other hand, in "Program A" (average of 2.41), it becomes clear that there was at least some prior intrinsic source of motivation during the training program *per se*, probably due to the fact that these employees had just been promoted to managers. Thus, it can be considered that more than being motivated by the course, the students were sup-

posed to be motivated by the company and their careers – a claim supported by interviews developed with five users of “Program A”.

Conversely, the users of “Program B” did not appear to be motivated to take part in the training program, except for external motivation based on the mandatory nature of the program.

Interestingly, this result complies with the ideas of Carroll (1968), Amabile (1993) and Keller & Suzuki (2004) about the importance of taking intrinsic motivation into account in any pedagogical model.

FUTURE TRENDS

This chapter naturally does not claim to be the ultimate research in this knowledge field. The subject deserves a great deal more study and investigation. Research involving a larger number of companies and focusing on each specific dimension involved in the development of web-based distance training programs might reveal other important issues related to this realm, in order to allow the organizations to better understand, improve and measure the outcomes of these endeavors.

Furthermore, future research can verify whether there are differences between web-based corporate training programs conducted in developing countries (such as Brazil) and developed countries.

CONCLUSIONS

Hence, from the comparison of the two cases, the following items can be considered key success factors in these web-based training programs:

- Clear definition of training content, target employees and objectives of the program, seeking more than merely the solution of specific problems;
- Development of a source of intrinsic, as

opposed to extrinsic motivation;

- Implementation of web-based metacognitive support.

The three key success factors accrued from the analysis of the results of this research *vis-à-vis* the theoretical background enable the selection of the learning theory and the technologies to be used in this endeavor.

It is interesting to note that according to Ertmer & Newby (1993) and Conole *et al.* (2004), the selection of a specific learning theory is not a key success factor by itself. Moreover, the realization that this dimension did not directly influence the outcomes accrued from selected programs A and B (as both presented *instructivist/behaviorist* characteristics) complies with Reeves' (1997) frame, as it does not support the allegation that an *instructivist/behaviorist* program is necessarily better than a *constructivist/cognitivist* one and *vice-versa*.

However, this is a point that must be the subject of in-depth investigation in future research addressing training in virtual environments. “Program A” presented a more *constructivist/cognitivist* approach than “Program B”, as witnessed by the fact that the averages of the three relevant dimensions in the former program were higher than the corresponding dimensions in the latter program. This tallies with some authors who have argued that the *constructivist/cognitivist* approach is best suited for web-based distance training (see, for instance, Costa *et al.*, 1998).

As with all research, this project has a few limitations that are duly set forth below.

First of all, the number of respondents – 32 users of “Program A” and 31 users of “Program B” – led to a sample size limitation, preventing the authors from running one multiple linear regression for each training program. According to Hair *et al.* (1998, p. 166), there should be at least 5 observations for each independent variable. As there were eight remaining variables, a sample of at least 40 respondents for each train-

ing program was required. Accordingly, a linear multiple regression adding a dummy variable for “Program A” and “Program B” had to be run. The outcomes of this latter regression have shown the difference between the degree of accomplishment of objectives of either program (Hair *et al.*, 1998, p. 167-168).

Moreover, as programs A and B are not exactly equal, some other factors associated with their corresponding content and *modus operandi*, just to name two aspects, can also have had an influence on their respective outcomes.

Furthermore, this paper attempted to establish the value perceptions of the employees regarding the outcomes of the two web-based training programs analyzed. There are some limitations in this approach, as some of the variables derived from the Reeves and Reeves (1999) model are not such simple variables as to be clearly understood by the respondents beyond all reasonable doubt, even after various meetings with the author. Indeed, a certain degree of subjectivity and bias from the employees may have occurred (Scandura & Williams, 2000).

Lastly, this is not a cross-cultural research project. Therefore the aspect of whether or not there is any influence accruing from the Brazilian setting in the outcomes of this research is not analyzed. The reason for this lies in the very fact that there are as yet very few works about web-based corporate training in Brazil in existence. In order that one can develop cross-cultural studies, it is important to have information about what is supposed to be compared. Thus, there is still much ground to be covered in this arena.

REFERENCES

- Afonso, J. R. (2001). E-Government in Brazil: Experiences and Perspectives. *Forum of Federations*, April, Montreal, Canada. Retrieved October 9, 2003, from http://federativo.bndes.gov.br/destaques/egov/egov_estudos.htm.
- Amabile, T. (1993). Motivating creativity in organizations. *California Management Review*, 40(1), 39–58.
- Bastos, L. E. M. (2003). *Avaliação do e-Learning Corporativo no Brasil*. Unpublished MBA thesis, Universidade Federal da Bahia, Brazil.
- Bates, A. W. (1995). *Technology, open learning and distance education*. New York: Routledge.
- Berge, Z. L. (2002). Obstacles to distance training and education in corporate organizations. *Journal of Workplace Learning*, 4(5), 182–189. doi:10.1108/13665620210433873
- Bregman, P., & Jacobson, H. (2000). Searching for Answers: Yes, you can measure the business results of training. *Training (New York, N.Y.)*, 37(8), 68–72.
- Brown, A. R., & Voltz, B. D. (2005). Elements of Effective e-Learning Design. *The International Review of Research in Open and Distance Learning*, 5(1). Retrieved may, 2006, from <http://www.irrodl.org/index.php/irrodl/article/viewArticle/217/300>.
- Campbell, D. M., Melenyzer, B. J., Nettles, D. H., & Wyman, R. M., Jr. (2000). *Portfolio and performance assessment in teacher education*. Boston: Allyn & Bacon.
- Carey, T., Mitchell, S., Peerenboom, D., & Lytwyn, M. (1998). *Effectiveness of Learning Technologies: The Costs and Effectiveness of Technology-Based Approaches to Teaching and Learning*. Guelph, Canada: University of Guelph.
- Carroll, J. B. (1968). On learning from being told. *Educational Psychologist*, 5, 4–10.
- Clark, R. E. (1983). Reconsidering Research on Learning from Media. *Review of Educational Research*, 53(4), 445–459.

- Cole, P. (1992). Constructivism Revisited: A Search for Common Ground. *Educational Technology*, 32(2), 27–34.
- Conole, G., Dyke, M., Oliver, M., & Seale, J. (2004). Mapping pedagogy and tools for effective learning design. *Computers & Education*, 43(1-2), 17–33. doi:10.1016/j.compedu.2003.12.018
- Costa, I. T., Fagundes, L. C., & Nevado, R. A. (1998). Projeto TEC-LEC Modelo de uma Nova Metodologia em EAD Incorporando os Recursos da Telemática. *Informática na Educação: Teoria e Prática*, 1(1), 83–100.
- Criswell, E. (2000). The Humanistic Tradition: A Vision for the Future. *Journal of Humanistic Psychology*, 40(3), 74–82. doi:10.1177/0022167800403006
- Cross, J. (2004). An informal history of eLearning. *Horizon*, 12(3), 103–110. doi:10.1108/10748120410555340
- Dick, W., & Carey, L. (1996). *The systematic design of instruction*. New York: HarperCollins Publisher.
- Eisenhardt, K. M. (1989). Building Theories from Case Study Research. *Academy of Management Review*, 14(4), 532–550. doi:10.2307/258557
- eMarketer (2007). *Brazil Online*. Retrieved October 29, 2007, from http://www.emarketer.com/Reports/All/Emarketer_2000459.aspx?src=report_head_info_sitesearch.
- Ertmer, P. A., & Newby, T. J. (1993). Behaviorism, Cognitivism, Constructivism: Comparing Critical Features from a Design Perspective. *Performance Improvement Quarterly*, 6(4), 50–72.
- Flavell, J. H. (1979). Metacognition and Cognitive Monitoring: A New Area of Cognitive-Developmental Inquiry. *The American Psychologist*, 34(10), 906–911. doi:10.1037/0003-066X.34.10.906
- Giardina, M., Oubenaissa, L., & Bhattacharya, M. (2002). Designing a Framework for the Implementation of Situated Online, Collaborative, Problem-based Activity: Operating within a Local and Multi-Cultural Learning Context. *International Journal on E-Learning*, 1(3), 41–46.
- Hair, J. F., Jr., Anderson, R. E., Tatham, R. L., & Black, W. C. (1998). *Multivariate Data Analysis*, (5th Ed.). Upper Saddle River, NJ: Prentice Hall.
- Hodgins, H. W. (2000). Into the future: A vision paper. *Commission on Technology and Adult Learning*. Retrieved October 9, 2002, from <http://www.learnativity.com/download/MP7.PDF>.
- IBGE. (2005). *Pesquisa Nacional por Amostra de Domicílios*. Retrieved October 29, 2007, from <http://www.ibge.gov.br/home/estatistica/populacao/acessoainternet/>.
- IBGE. (2007). *Revisão do sistema de contas nacionais*. Retrieved October 29, 2007, from <http://www.ibge.gov.br/>.
- Joia, L. A. (2001). Evaluation of Hybrid Socio-Constructivist Model for Teacher Training. *Journal of Technology and Teacher Education*, 9(4), 519–549.
- Joia, L. A. (2004). Bridging the Digital Divide: Some Initiatives in Brazil. *Electronic Government*, 1(3), 300–315. doi:10.1504/EG.2004.005554
- Joia, L. A., & Casado, N. (2007). Fatores Críticos de Sucesso em Treinamentos Corporativos a Distância via Web: Evidências Empírico-Exploratórias a partir de um Estudo de Caso. IN: *Proceedings of the 31st. EnANPAD (Brazilian Academy of Management Meeting)*, Rio de Janeiro, September (pp. 23-26).
- Kafai, Y., & Resnick, M. (Eds.). (1996). *Constructionism in Practice: Designing, Thinking, and Learning in a Digital World*. Mahwah, NJ: Lawrence Erlbaum Associates.

- Kay, H., Dodd, B., & Sime, M. (1970). *Iniciação à Instrução Programada e às Máquinas de Ensinar*. São Paulo, Brazil: IBRASA.
- Keller, J., & Suzuki, K. (2004). Learner motivation and E-learning design: a multinationally validated process. *Learning, Media and Technology*, 29(3), 229–239. doi:10.1080/1358165042000283084
- Kirschner, P., Strijbos, J. W., Karel, K. K., & Beers, P. J. (2004). Designing electronic collaborative learning environments. *Educational Technology Research and Development*, 52(3), 47–66. doi:10.1007/BF02504675
- Mager, R. F. (1972). *Objetivos para o ensino efetivo*. Rio de Janeiro, Brazil: SENAI.
- Martin, K. (1998). “WBI or not WBI?” *Issues of Teaching and Learning*, 4(7). Retrieved September 2005, from <http://www.catl.uwa.edu.au/NEWS-LETTER/issue0798/dimensions.html>.
- Matthews, D. (1999). The Origins of Distance Education and its Use in the United States. [Technological Horizons In Education]. *The Journal*, 27(2), 54–66.
- Merriam, S. B. (1993). Adult learning: Where have we come from? Where are we headed? *An Update on Adult Learning Theory*, (pp. 5-14). San Francisco, CA: Jossey-Bass.
- Morra, L., & Friedlander, A. C. (1999). *Case Study Evaluations*. OED (Operations Evaluation Department), Working Paper Series 2, May, World Bank.
- Néri, M. (2003). Mapa da Exclusão Digital. *Centro de Políticas Sociais*, EPGE/FGV, Rio de Janeiro. Retrieved October 9, 2003, from <http://epge.fgv.br/portal/pesquisa/livros/2003.html>.
- Nevado, R. A., Basso, M. V. A., & Menezes, C. S. (2004). Webfólio: Uma Proposta para Avaliação na Aprendizagem: Conceitos, Estudos de Casos e Suporte Computacional. In *Anais do Simpósio Brasileiro de Informática na Educação*. Manaus-AM, Brazil.
- Papert, S. (1993). *The Children's Machine: Rethinking School in the Age of the Computer*. New York: Basic Books.
- Penuel, B., & Roschelle, J. (1999). *Designing Learning: Cognitive Science Principles for the Innovative Organization*. Center for Technology in Learning, SRI International.
- Piaget, J. (1952). *The origins of intelligence in children*. New York: International Universities Press, Inc.
- Powell, G. C. (2000). *Are You Ready for WBT?* Wayne State University. Retrieved September, 2005, from <http://it.coe.uga.edu/itforum/paper39/paper39.html>.
- Reeves, T., & Reeves, M. (1997). Effective dimensions of interactive learning on the World Wide Web. In B. Khan (Ed.), *Web-based instruction* (pp. 59-66). Englewood Cliffs, NJ: Educational Technology Publications.
- Reeves, T. C. (1997). *A Model of the Effective Dimensions of Interactive Learning on the World Wide Web*. The University of Georgia. Retrieved September, 2005, from <http://it.coe.uga.edu/~treeves/WebPaper.pdf>.
- Rosemberg, M. J. (2001). *E-Learning—Strategies for delivering knowledge in the Digital Age*. New York: McGraw-Hill.
- Sancho, J. M. (1998). *Para uma tecnologia educacional*, (Trad. B. A. Neves). Porto Alegre, Brazil: ArtMed.

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Scandura, T. A., & Williams, E. A. (2000). Research Methodology in Management: Current Practices, Trends, and Implications for Future Research. *Academy of Management Journal*, 43(6), 1248–1264. doi:10.2307/1556348

Sherry, L. (1996). Issues in distance learning. *International Journal of Distance Education*, 1(4), 337–365.

Sincich, T. (1995). *Business Statistics by Example*. New Jersey: Prentice Hall.

Skinner, B. F. (1968). *Technology of teaching*. New York: Meredith Publishing

University of Dayton. (2003). *Beginning Instructional Design*. Williams e-Learning Lab, University of Dayton. Retrieved February, 2004, from <http://academic.udayton.edu/elearning/onlineTraining/InstructionalDesign/>.

Wilhelmsen, S., Stein, I. Å., & Øyvind, M. (1998). *Psychological Theories: a Brief survey of the changing views of learning*. Retrieved February, 2006, from http://www.uib.no/People/sinia/CSCL/web_struktur-4.htm.

Yin, R. (1994). *Case Study Research: Design and Methods*, (2nd Ed.). San Francisco, CA: Sage Publications Inc.