Research Article

Determinants of E-Learning Effectiveness: A Tunisian Study

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Abstract

E-learning is advantageous for trainees as well as for organisation. The purpose of this research is to discover determinants of effective online training. The different theoretical currents treating the behaviour of individuals towards the technological innovation utilization permit to identify variables that determine the efficiency of e-learning. In this setting, we have made reference to five theories that are: motivation theory, social cognitive theory, media richness theory, technology acceptance theory and structure theory. This study rests upon a model elaborated by Lim and al (2007). This model contains individual, conception, technological and environmental factors. Empirical study is conducted on Tunisian 410 employees' sample. Factor analysis and structural equations have been used. Results suggest the importance of motivation, face- to- face meeting, e-mail exchange, ease of use, contents of training, seniors' support and continuous learning culture for learning performance. Learning performance, in turn, affects transfer performance.

Keywords: E-learning, effectiveness, structural equations.

Introduction

Today, the obstruction for the knowledge and the training is attached to the problematic of the innovation: « learn because it's necessary to enhance competitiveness". Recently, many organizations have recognized that professional training program is an important means of success procuring competitive advantages in today's economy. In fact, employees are the interior customers of the organization that it's necessary to be careful to satisfy in renewing their knowledge, their knowledge of both what to make and how to be. Such investment in the employees' skill development cannot be provided that by "the reengineering of the training".

Technology information has increased dramatically in the last years and has contributed to the growth in technology – delivered instruction as an important education method.

In recent years, the academic research and reviews have increased. More specifically, the scientific conferences have published e-learning studies in the ambition to understand the impact of learning across different types of delivery on the employees' performance on the one hand, and the competitiveness of organization on the other hand. Moreover, the academic research on e-learning effectiveness becomes one of the current themes (Lim & al, 2007).

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To address the question of e-learning effectiveness, this study examines the variables that contribute to enhance training performance and transfer to job. Specifically, the present research refers to the model developed by Lim & al (2007) to test its validity in the Tunisian context. Thus, this research contributes to the literature on e-learning, by studying the validity of variables of training programs that increases e-learning effectiveness. In this way, we seek to identify their effects on learning performance and transfer performance (Lim & al, 2007). Moreover, we seek to provide employers with a setting of analysis and comprehension of factors that affect employees' training effectiveness.

Conceptual Model and Hypotheses

A review of related research leads to identification of training effectiveness dimensions. These dimensions are " the trainee, training content, level of communication between trainer and trainee, the ease of use of online website resources, and the organizational environment" (Lim & al, 2007, p 23). In this setting, we have adopted the model constructed by Lim & al (2007) in order to test his validity in Tunisian context.

These dimensions are based on motivation theory, social cognitive theory, media richness theory, technology acceptance theory.

Motivation

Motivation has been defined as the degree to which trainees are willing to make efforts to enhance his or her performance of learning and work (Mitchell, 1982; Meyer& Becker, 2004). Moreover, Noe (1986) defined motivation as the specific desire of employee to learn program content. Previous research has demonstrated that the motivation to learn is able to predict learning outcomes and is influenced by both individual and situational factors (Noe, 1986; Mathieu & al, 1992, 1993; Martocchio & Webster, 1992; Quinones, 1995; Colquitt & al, 2000). Moreover, several studies have associated

the motivation to learn to the training effectiveness; we can mention the research of Mathieu, Tannenbaum and Salas (1992), in these study emotional responses to the program, moderate the relation between motivation to learn and learning. In fact, the more trainees express positive emotional responses, the more the relation between motivation to learn and learning will be. Colquitt & al (2000) argued that this construct is correlated to skill acquisition.

Motivation to transfer has been defined as the desire of employees to use program content to work performance after training (Noe, 1986). Therefore, motivation to transfer plays a relevant role in the learning performance and the change of employees' behaviour after training (Noe, 1986; Holton, 1996; Yamnill& Mcclean, 2001).

Self Efficacy

Self efficacy has been shown to influence the behaviours of individuals towards the execution of actions. Moreover, self efficacy is an individual's belief about his or her capacity to mobilize the resources requisite for successful task performances (Bandura, 1986). According to social cognitive theory (Bandura, 1986), self efficacy is postulated to influence performance in interpersonal skills training (Gist, Stevens & Bavetta, 1991), in military training programs (Eden & Ravid, 1982; Tannenbaum & al, 1991), in computer software training (Gist, Schwoerer, & Rosen, 1989), and home page design training course (Chau & Wang, 2000).

Mathieu, Martineau, Jennifer & Tannenbaum (1993) found that individual antecedents of self efficacy (initial performance, achievement motivation and choice) influence self efficacy development. In this context, the authors found that self efficacy influence trainee reactions and performance improvement during training. Hill, Smith & Mann (1987) examined the relationship between self efficacy and the readiness to use computers. Results have indicated that efficacy beliefs predict the behavioural intentions related to learning

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about computers. Moreover, Latham & Frayne, (1989) found the relationship between self efficacy and performance both during training and nine months after the completion of training. In the study, the researchers have shown that training could increase the perceived self efficacy of unionized workers, and that the higher the perceived self efficacy of these unionized workers is, the better their subsequent job performance will be.

Ford, Quinones, Sego and Sorra (1992) examined the effects of individual characteristics on type of tasks performed after four months on the job. The researchers have concluded that individuals with high self efficacy have been more likely to perform more of the tasks for which they have been trained. This study intends to verify the relationships between trainees' learning motivation and computer self efficacy and the effectiveness of e-learning.

The following hypotheses are the same developed by Lim & al (2007).

H1: The higher the trainee's motivation for online training is, the higher their learning effectiveness is.

H1-1: The higher the trainee's motivation for online training is, the higher their learning performance is.

H1-2: The higher the trainee's motivation for online training is, the higher their transfer performance is.

H2: The higher the trainee's computer self efficacy regarding online training is, the higher learning effectiveness is.

H2-1: The higher the trainee's computer self efficacy regarding online training is, the higher their learning performance is.

H2-2: The higher the trainee's computer self efficacy regarding online training is, the higher their transfer performance is.

Conception Determinant: Training Content

Training Content

The content of training has been introduced in the model developed by Baldwin and Ford (1988) as independent variable that influence directly on learning and retention. Training content indicates the instructions, knowledge and skills conceived by inventors of training program to be taught to trainees' during the period of training. Moreover, training content must reflect trainees' knowledge needs for the job performance. In this setting, Moore & Dutton (1978) argued that the training needs analysis is an indispensable function to the development of the training content. Besides, several studies have put the accent on the importance of the trainees' choice of training content to improve learning results. For example, Hicks & Klimoski (1987) conducted a field experiment in which they manipulated trainees' choices concerning whether to perform a training program. The results have shown that trainees who have been given a choice performed better on an achievement test, as compared to trainees who have not been given a choice of whether to perform the program. Similar results have been obtained by Baldwin & al (1991). Holton (1996) specified the importance of the training content for work practices. He further argued that a reason of the failure of the training transfer into workplace is that the content of the program doesn't provide the ability to generalize learning. He argued that the cognitive training can occur well but trainees' cannot have the opportunity to practice what they have been taught to perform job tasks or they didn't educate the manner with which they exploit what they have been taught at their work.

H3: The more related the online training content is to actual work practices, the greater the effectiveness of the online training will be.

H3.1: The more related the online training content in to actual work, the greater the trainees' learning performance will be.

H3-2: The more related the online training content is to actual practices, the greater the trainees' transfer performance is.

The Technological Determinants of the Training

Communication between Trainer and Trainees

Most of the research on the level of interaction that takes place between the trainer and trainees have demonstrated that the success of training program depends on the qualifications, the attitudes and the efforts of the trainers. A trainer must be competent regarding the knowledge and skills required to provide the training program. Therese & al (1985) considered the learning process as a function of communication. The researchers have established that the academic success depends on the level of interaction between the trainer and the trainees. Thus, the trainer must be able to mobilize effectively the needs of trainees', provide suitable solutions and create an appropriate atmosphere facilitating the discussion with trainees. Therefore, the respond to trainees' needs leads to greater training effectiveness. Piccoli & al (2001) find that virtual training environments provide materials that facilitate interaction between the trainer and trainees that reinforce their training effectiveness. Daft & al (1987) classify communication media in order to decrease richness, face-to-face, telephone, personal documents (e.g., letters or memos), impersonal of unaddressed documents (e.g., reports, bulletins, etc), and numeric reports (e.g., spread sheets). Face to face is considered the richest medium; it provides immediate feedback between trainer and trainees'. Moreover, face to face provides the opportunity of a simultaneous communication of multiple cues via tone of voice, message content and eye contact. Lim & al (2007) suggested that face to face communication permits better problem-solving, sincere interest and immediate feedback without ambiguity. E- mail communication allows trainees to receive immediate feedback at any time and any place. Besides, Leidner & Jarvenpaa (1995) mentioned the importance of e-mail communication between the trainer and trainees. Specifically, the researchers considered e-mail to be a very useful method when the number of trainees is roughly 30 more.

Ease of Interaction Process

The investment in applications of information technology (e.g. e-learning) can derive from productivity gains if they are accepted and used by the end-users (Venkatesh, 1999, 2000). Several theoretical models have put the accent on the importance of trainees' perceptions of ease of use, which have proven to be successful in predicting and explaining the actual intention and the usage behaviour across business areas (Davis, 1989; Davis & al, 1989). In the context of the online training environment, Ngai & al (2007) argued that technical support present a meaningful direct influence on the perceived ease of use of learning material. Moreover, Zhang & Zhou (2003) developed a system "e-learning" based on the multimedia. They found that this system is interactive, facilitating the communication between trainees and virtual trainers. Authors argued that, to improve training effectiveness, online training environment must provide a structural support to multimedia instruction and predict the learning performance. Piccoli & al (2001) suggested that virtual training environment must facilitate communications between physically and geographically separated trainees. They suggested, text, hypertext, graphics, computer animations, dynamic content as a part of ease of interaction design between system and trainees. Similarly, Leidner & Jarvenpaa (1995) proposed debate rooms, three dimensional virtual rooms and simulations as a part of ease of interaction between training material and trainees. Zhang & al (2006) argued that trainee performance can be captured when they can use an interactive video system providing an appropriate interaction. Therefore, the following hypotheses are:

H4: The more frequent face to face interaction between the trainer and trainees is, the more effective online learning performance will be.

H5: The more frequent e-mail exchanged between trainer and trainees is, the more effective online learning performance will be.

H6: The Online training programs that are perceived to be easy to use will contribute to greater learning performance.

Training Environment Determinants

Supervisor Support

Supervisor support for training has been introduced as a key learning environment variable affecting the training effectiveness. Thus, supervisor support refers to the extent to which supervisors reinforce and support learning program achievement and transfer to the job. Supervisors are usually responsible for assistance, control and the means encouraging the trainee to learn and transfer trained skills to the job. Much research suggests that supervisors and managers support have a direct impact on trainees' behaviour. Thus, trainees look to their supervisor for guidance on how to learn and transfer new skills to the workplace (Baldwin & Ford, 1988). Baldwin & Ford (1988) argued that trainees who perceived that a training program is important to the supervisor will be more motivated to attend and success training program. In this context, Tracey & al (1995) concluded that social support plays a central role in training transfer. Moreover, Tracey & al (1995) argued that a positif organizational environment predicts the application of behaviours learned by trainees to workplace. As well, when learning occurs during training, the training transfer climate may either support or inhibit the application rate of newly learned skills and knowledge on the job (Mathieu, Tannenbaum, and Salas, 1992). These studies suggest that an environmental factor is essential for supporting the transfer of new skills to the job context.

Continuous Learning Culture

Continuous learning is "one in which organizational members considers learning as an important part of everyday work life" (Tracey & al, 1995, p 241). Tracey & al (1995) argued that perceptions and expectations constitute an organizational value and belief. Value and belief are influenced by a variety of factors like job challenge, social support, competitive work setting, etc. (Tracey & al, 1995). In this way, this idea gives information about the ultimate relation between continuous learning culture dimensions, learning performance and the generalization of newly skills on the job.

Tracey, Tannenbaum, & Kavanagh (1995) examined the influence of transfer climate and continuous learning culture on training and transfer of newly trained skills. Participants were 505 supermarkets managers. Continuous learning culture has been found to be related to post training behaviour. In this study, Tracey & al (1995) concluded that continuous learning culture appears to play a significant role in the learning effectiveness. The argument that organizational learning culture affects training effectiveness has been proven by Bates and khasawneh (2005). The relationship between organizational environment and training effectiveness is significantly central in the e-learning environment and leads to the associate hypotheses (Lim & al, 2007):

H7: The more support trainees receive from their seniors, the better training effectiveness will be achieved.

H7-1: The more support trainees receive from their seniors, the better learning performance will be achieved.

H7-2: The more support trainees receive from their seniors, the better transfer performance will be achieved.

H8: More reliable continuous learning culture will lead to better training effectiveness.

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H8-1: More reliable continuous learning culture will lead to better learning performance.

H8-2: More reliable continuous learning culture will lead to better transfer performance.

Training Effectiveness

Alliger & al (1997) point out the importance of training effectiveness. They argued that the training effectiveness model needs to include many more variables than are typically included in a taxonomy advanced by Kirkpatrick. Lim & al (2007) suggested that trainee reaction and learning are studied as central indicators of training outcomes. However, they considered that these variables are not appropriate indicators of the final outcome of training programs. Therefore, a suitable evaluation of training outcomes is made by measuring the relationships between learning goals achievement and behaviour change on the job (Kraiger, Ford, & Salas, 1993). As well, the integration of training program within an organization must improve the performance of the latter. Therefore, trainees in charge must perform training program and transfer new knowledge, skills and behaviour learned during training (Lim & al, 2007).

Baldwin & Ford (1988) elaborated an integrated model on the process of learning and transfer (Lim & al, 2007).They defined learning effectiveness as the quantity of knowledge , skills and behaviour learned in a training session and their effective application by trainees to their job. According to them, trainees must understand, achieve and remember what has been taught during training, and consequently incorporate their newly knowledge and behaviour learned on the job. Therefore, learning performance (learning and retention) affects transfer performance. Several researchers (e.g. Baldwin & Ford, 1988; Kraiger & al, 1993) suggested that retention score or the maintenance of training content is a good

measure of learning performance. Alliger & al (1997) argued that learning performance has a significant impact on transfer performance. Moreover, Colquitt & al (2000) argued that learning outcomes (e.g. knowledge acquisition, reactions) affect directly knowledge transfer into daily routines. Based on previous research, the relationship between learning performance and transfer performance is hypothesized as associate:

H9: The higher the trainees' learning performance is, the higher their transfer performance is.

Research Method

The empirical validity study of theoretical model of e-learning effectiveness has been conducted close to 410 employees of nine Tunisian enterprises. The choice of these enterprises has been guided by two considerations. For this research, we have used a semi- structured interview format. The result has showed that nine enterprises are the more advanced concerning e-learning among the contacted enterprises. Moreover, they have displayed a significant budget for training in general and for online training in particular.

Sample and Questionnaire of Research

Participants were 410 employees, which the proportion of males to females is 55.1 percent to 44.9 percent. Participants varied in age between 20 and 29 years. The mean seniority of participants varied between 10 and 20 years with dominance of administrative post (62.9%). The questionnaire include 41 items measured by a five point Likert scale response to determine how strongly respondents agreed or disagreed with each item (1= strongly disagree and 5 = strongly agree). In order to clarify the items, the questionnaire has been pre-tested close to twenty employees. No difficulty of understanding has been found and therefore no modification has been introduced to the questionnaire.

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Definition of Variables and Items for the Measures

Motivation

"Learning motivation of trainees is defined as "a desire or aspiration to acquire the knowledge from the online training program" (Lim & al, 2007, p 28). In order to measure motivation, two items were adopted from Hicks & Klimoski's (1987) survey. Statements such as "I gave 100% effort to learn during online training» has been used. One item was adopted from Holton & al (2000). Participants indicated their degree of motivation to use newly knowledge and skills to job.

Computer Self –Efficacy

"Self efficacy focuses on trainee's perceptions to carry out a series of tasks using a computer and to cope with any difficulties regarding use" (Lim & al, 2007, p 28). In order to measure self efficacy, four items were adopted from Compeau & Higgins (1995). Statements such as "I feel confident in my ability to use a computer", and "I'm sure I can use a computer by referring to the instruction manual" have been used. The fifth item was adopted from Holton & al (2005). Employees were asked to respond to the following statement "I' am confident in my ability to use newly learned skills on the job".

Training Content

Training content refers to knowledge, skills and behaviour which have been taught during the training program. Three items were adopted from Nehari & Bender (1978). For example employees have been asked to respond to statements such as "The online training content included important basis knowledge", and "The online training content covered domains where I have the more need to be formed" have been used. The fourth item was adopted from Holton & al (2000). Employees have been asked to indicate whether the training content helped them ameliorate the job related tasks performance.

Face to Face Meeting

The level of face to face interaction between trainers and trainees was measured through four items adopted from leidner and Jarvenpaa (1995). For example, employees have been asked to respond to statements such as "I was encouraged to have face to face meeting with my instructors out side of online training", and "I met with one or more instructors during training program" have been used.

E-Mail Communications

E-mail communication has been also measured using four items from Leidner & Jarvenpaa (1995). Statements such as "The instructors communicated with me via e-mail", and "I was encouraged to interact with instructors in order to resolve many questions regarding the online training" have been used.

Ease of Use

Ease of use has been measured through three items. Thus one item was adopted from Davis (1989). Participants indicated the degree of easiness and comprehension of online resources. Two items from Leidner & Jarvenpaa (1995) were used. Example of statement includes "The response speed of the educational training system was fast enough to carry out the online training".

Support from Supervisors

Support from supervisors was measured through five items. Thus, four items were adopted from Tracey & al (1995). Statements such as "Supervisors guided me on how to apply the training to my work", and "Supervisors encourage me to attend educational training programs" were used. One item was adopted from Holton & al (2000). Participants have been asked to respond to statement such as "My supervisor sets goals for me that encourage me to apply my online training on the job".

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Continuous Learning Culture

Continuous learning culture has been measured through five items adopted from Tracey & al (1995). Statements such as "Learn new ways to achieve job tasks is valorised in our enterprise", and "Job tasks are conceived to encourage employees' development" have been used.

Learning Performance

Learning performance refers to what degree the trainees learn and improve through the training program in terms of knowledge, skills and behaviour for the job tasks (Lim & al, 2007). Statements such as "I have learned important knowledge through this online training program", and "I believe that I've learned better than the others" have been used.

Transfer Performance

Trainees' performance of transfer refers to how the trainees applied the newly knowledge and skills learned during training sessions to their job tasks (Lim & al, 2007). Transfer performance has been measured using four items from Holton & al (2000). Statements such as "The activities and exercises learned during training program helped me to apply my learning on the job", and "I' am using what I learned from the training in my daily work".

Data Analysis and Results

The Factorial Analysis

For the assessment of dimensionality, reliability and validity, exploratory analysis and confirmatory analysis was performed on each concept using SPSS 15.0 and AMOS 7.0. Reliability and the internal consistency of items have been assessed through crombach's alpha situated between 0.7 and 0.85. Table 1 shows the results of the reliability test.

Table 1: Results of Reliability Test

variables	Number of items	Crombah's alpha value
Training effectiveness		
Learning performance	**4**	**0.761**
Transfer performance	**4**	**0.813**
Individual variables		
Motivation	**3**	**0.845**
Computer self efficacy	**4**	**0.739**
Conception determinant		
Training content	**4**	**0.825**
The technological determinants of the training	**4**	**0.893**
Face to face meeting	**4**	**0.936**
E-mail communication	**3**	**0.766**
Easy to use		
Training environment determinants	**5**	**0.879**
Supervisor support	**5**	**0.741**
Continuous learning culture		

The fitness of the research model has been assessed using AMOS 7.0. Fitness indices can be considered satisfactory and suggests the good fit of the model. Incremental indices are nearly highly acceptable, despite the fact that fitness indices NFI remains slightly lower to 0.9 (= 0.872).

Parsimony indices reaffirm the good adjustment, through a PNFI = 0.771 and X^2 = 2.307 < 5. Besides, the absolute indices confirm an acceptable adjustment resulting in RMSEA = 0.057 nearly 0.05; GFI = 0.857 nearly 0.9; AGFI = 0.829 nearly 0.9; Hoelter.05 index = 197 nearly 200; and

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Hoelter.01 index = 206 > 200. Therefore, the fitness of the research model is considered satisfactory.

Results of Hypothesis Verification

The results of the hypothesized model has been verified and assessed by using AMOS 7.0. Each hypothesis has been verified by measuring values of standard path, being assessed on the basis of statistical significance of the value. From this perspective, the factors influencing trainees' learning performance are motivation (t value = 2.295; standard path= 0.125), contents of training program (t value = 7.890; standard path = 0.728), face to face meeting between supervisors and trainees (t value = 2.080; Standard path = 0.081), e-mail communication (t value = 2.849; standard path = 0.116); ease of use (t value = 3.123; standard path = 0.148); support from supervisors (t value = 5.842; standard path = 0. 386); Continuous learning culture (t value = 3.680; Standard path = 0.224). Factors influencing trainees' transfer performance include learning performance (t value = 4.338; Standard path = 0.9). Final research model is shown in figure 1:
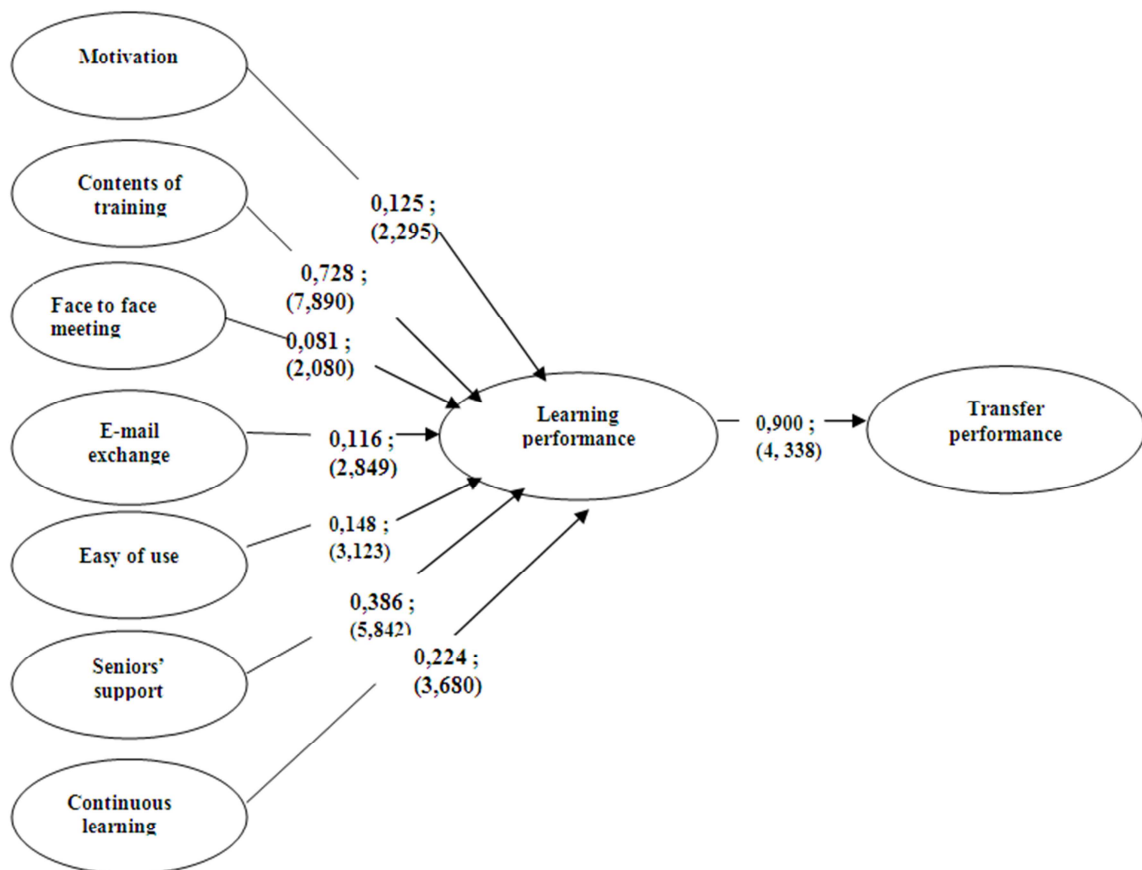

Figure 1: Results of E-Learning Effectiveness Model in the Tunisian Context

Discussion and Conclusion

The aim of this research is to examine online training program factors to improve e-learning effectiveness. Motivation, self efficacy, contents of training, face to face meeting, e-mail exchange, easy of use, senior's support, and continuous learning culture have been all explored as possible factors that explain learning performance and transfer performance. The research results are as follows.

For Tunisian employees, motivation influences learning performance. Nevertheless, trainees' learning motivation

is not a relatively important variable in learning performance (learning motivation – learning performance: standard path = 0.125). This result means that employees can be motivated in being enrolled in an online course by curiosity or to point out themselves (image of one self). Moreover, this result means that trainees' learning motivation can decrease little by little with the advance of training sessions. However, the research result does not suggest any positive relationship between the motivation and the transfer performance. That is trainees' learning motivation has a relatively weak and negative effect in transfer performance (learning motivation – transfer performance: standard path = -0.071). Thus, the use of newly knowledge at work is not explained by the employees' motivation but rather by the need to apply new knowledge, skills and behaviours for the performance of the required tasks. These results contradict those found by Lim & al (2007). The authors showed the important effect of trainees' learning motivation on learning performance (Standard path = 0.427) and on transfer performance (Standard path = 0.509). Moreover, several other researchers have showed that motivation is an important predictor for the training effectiveness (Noe, 1986; Mathieu & al, 1992, 1993; Colquitt & al, 2000). In order to emphasize the positive effect of the trainees' learning motivation on e-learning effectiveness, it would be interesting for the human resources responsible to predict several modes of motivation such as: rewards, evolution in the rank with a certain qualification level.

In addition, the effect of the self efficacy on e-learning effectiveness was not supported. This result means that trainees who believe more in their abilities and aptitudes to use the computer tools to achieve the desired purpose will not be inevitably most likely to perform training tasks to become more operational for the use of newly knowledge and skills in the daily routines of job. By contrast, Lim & al (2007) showed that self efficacy affect partially e-training effectiveness. According to them, self efficacy seem to positively affect online learning performance, but trainees'

computer self efficacy has no effect on transfer performance. The significant relationship between trainees' computer self efficacy and training performance was shown (Compeau & Higgins, 1995; Wang & Newlin, 2002). Moreover, the importance of self efficacy for the transfer performance was shown (Latham & Frayne, 1989; Martocchio, 1994). Thus, the control of the computer tools does not constitute a handicap for the Tunisian employees since they daily use it for the performance of their tasks.

The study also has shown that training content constitute an important variable in learning performance (Standard path = 0.728). Thus, the purpose of a training program is the development of task-related content which satisfy the employees' needs. This result is in accordance with several researchers such as Ford & Baldwin (1988), Hicks & Klimoski (1987), Baldwin & al (1991), Lim & al (2007). However, in this study, task – related content affects negatively and weakly transfer performance. These results differ from several researchers such as Ford & Baldwin (1988), Ford & al (1992), Holton (1996), Alliger & al (1997), Lim & al (2007). In this setting, Holton (1996) suggested that a cause of failure of the application of newly knowledge and skills on the job is that the task related content does not guarantee the capacity to transfer the training. Moreover, trainees can learn contents which are not adapted to the effective execution of the missions required at work.

The social interactivity between trainees and trainers exert a positive effect on the learning performance. Lim & al (2007) point out the importance of face to face meetings between trainees and trainers in increasing learning performance. Moreover, several other authors have showed the importance of face to face meeting and e-mail as rich means of communication and confirmed their impact on the training performance (Daft & al, 1987; Leidner & Jarvenpaa, 1995).

The site's ease of use affects positively learning performance. Consequently the higher online site is clear, comprehensible

and convivial, fewer efforts are required for trainees and better it will tend to achieve learning performance. This result is in accordance with several researchers such as (Piccoli & al, 2001; Zhang & Zhou, 2003; Zhang & al, 2006).

The research has revealed the importance of supervisors' support in learning performance. This result is in accordance with several researchers such as Noe (1986), Baldwin & Ford (1988). However, unlike Baldwin & Ford's (1988) research, this study does not attest the effect of supervisors support on transfer performance. However, this result can show that the effect of the supervisors' support on transfer performance is an indirect effect carried out through the learning performance since the employees are obliged to use new knowledge, skills and behaviours to suitably carry out the missions requested by their supervisors.

The idea regarding continuous learning culture for effectiveness is partially supported. Thus, continuous learning culture does not affect transfer performance, but it rather affects learning performance. Continuous learning culture does not have a direct effect on transfer performance, but this effect is carried out indirectly through learning performance. This result implies the need for the human resources responsible must take care of the fact that the employees develop and share common standards between them.

Finally, the effect of learning performance on the transfer performance is significant (Standard path = 0.9). This result is in accordance with several researchers such as Baldwin & Ford (1988), Holton (1996), Alliger & al (1997), Colquitt & al (2000), Alvarez & al (2004), Lim & al (2007). These results seem to be crucial for e-learning effectiveness since the relationship between the two dependent variables were checked.

Limitations and Future Research

In spite of the lightings brought by the results of this research and the managerial implications which result from this, some

limits are to be announced. The choice of the model of the e-learning effectiveness of Lim & al (2007) seem to be reducing. This choice has been guided by a review of literature on the e-training effectiveness determinants and the analysis of interview content. Thus, the number of evaluated explanatory variables remains restricted by considering the whole of the possible factors. Moreover, regarding the transverse character of the study, the change of the employees' behaviours towards the learning performance and transfer performance through time could not be measured. A longitudinal study could, for this purpose, to better delimit the determinants of e-learning effectiveness and their stability through time. Moreover, the scale measuring the self efficacy could be improved, in order to avoid the elimination of this variable during the confirmatory analyses, and to consequently better determine its role in e-learning effectiveness.

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