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EFFECTS OF THE TRANSFER DESIGN ON POST-TRAINING PERFORMANCE IN ELEARNING

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Abstract

Training in organizations is considered as a key factor for organizational development, and a tool for improving individual and organizational performance. However, training is only effective if knowledge and skills acquired during training are applied to the job, i.e., if the learning outcomes are transferred to workplace. Past research on the transfer of training has focused on various individual, group and organizational factors that before, during, and after training affect the probability that the acquired skills and knowledge are actually implemented in the workplace. Given the extant literature on the Transfer design, practitioners and training managers are prone to focus mostly on the training design itself and on the post-training procedures to enhance transfer. In order to contribute for studying the whole transfer processes in training activities, the main goal of this paper is to contribute for clarifying the effects of the design of learning transfer before and during eLearning training sessions. Results from an experimental study (N=115) show that the presence (vs. absence) of metacognitive orientations for transfer (design) before and during an e-learning session maximizes the effective transfer of learning. Specifically, participants who were instructed to mentally simulate a task in which they applied the skills learned in the training session performed better than those of the control group. This effect is moderated by perception of utility of training, in the sense that individuals who anticipated and that mentally simulated the task of application, and simultaneously perceived a greater utility of training, showed the highest performance. These results seem to highlight the importance of metacognitive dimension in the design of the transfer of learning, and especially of mental rehearsal of the use of skills and knowledge acquired in training. The practical implications of these results for enhancing the level of training transfer to the workplace are also discussed.

Keywords: transfer design, eLearning.

1 INTRODUCTION

1.1 Transfer of training to workplace

Nowadays, the acquisition of new professional skills and the promotion of lifelong learning represent strategic factors to increase competitiveness. In organizations, formal learning is the preferred mechanism for incorporating new knowledge and skills or to improve the existing ones. As organizations strive to enhance performance through their human capital, learning professionals and trainers are increasingly expected to deliver results. Formal learning interventions in the contemporary workplace are designed and delivered with the expectation of improving organizational and employee performance. After all, the main objective of any training program is to promote, obtain and improve the necessary skills to thereby help organizations to achieve their goals and create a competitive advantage adding value to their key resources – the workers.

In order to accomplish this goal, organizations tend to invest heavily on internal and external training, and search for more efficient learning formats. E-learning has become a widely used training method in professional because it overcomes limitations of space and time, customizes the learning environment according to needs and learning styles of the trainees. Another positive point, and not less important, in favor of e-learning is the ease of access, and the reduction in training costs, once it allows training a large number of individuals in a short period of time. Finally, e-learning is growing in popularity because of the high level of control of the learning process, i.e., it allows trainees to access training content whenever they want and depending on their availability and personal pace of learning.

Despite this high level of investment in training, employees' participation in learning activities does not always necessarily turn into new knowledge and skills. Therefore, it is important for organizations to evaluate training to ensure that training leads to desired outcomes such as increases in job performance. Often the training was successful, students have positive reactions, however, back to work, none of the learning outcomes is in fact implemented. So, ensuring that trained skills are used in the workplace, or transferred to the job, remains an issue of critical importance for researchers and practitioners.

Transfer of training is commonly defined as the application, generalization and maintenance over time of the skills acquired during training. It refers to "the degree to which trainees effectively apply the knowledge, skills, and attitudes gained in the training context to the job" (Baldwin & Ford, 1988, p 63). In this definition it is clear that the transfer of learning is a necessary though not a sufficient condition for the transfer of training to the workplace element. Past research on transfer of training has shown that various individual, group and organizational factors affect the probability that the acquired skills and knowledge are actually generalized and maintained in the workplace.

1.1.1 Individual Factors

Individual factors have received attention in the issue of transfer of training, since they will influence not only the motivation and effort of learners to learn, as well as their motivation to transfer knowledge to the workplace. In this list of individual factors are variables such as personality, goal orientation, general cognitive ability, locus of control, self-efficacy, motivational factors, prior preparation of trainees and trainees' reactions.

In what concerns personality, high neuroticism, the general tendency to experience negative affects is negatively related with the transfer of training (Herold, Davis, Fedor & Parsons, 2002). High levels of extroversion are positively associated to transfer, but its influence is weak (Blume Ford, Baldwin & Huang 2010). Openness to experience, i.e., active imagination, aesthetic sensitivity, attentiveness to inner feelings, is related to success in training (Barrick & Mount, 1991; Vinchur et al., 1998). On the other hand, it was found that Agreeableness, i.e., altruistic, sympathetic to others and eager to help them, is related to training success (Naquin & Holton, 2002). Lastly, Conscientiousness, i.e., self-control and the active process of planning, organising and carrying out tasks (Barrick & Mount, 1993), has been shown to have a strong connection with transfer of training.

Goal orientation learning orientation is positively related to learning outcomes, while performance orientation is neutral or negatively associated with learning outcomes (Bell & Kozlowski, 2002; Chen, Gully, Whiteman, & Kilcullen, 2000; Ford, Smith, Weisbein, Gully, Salas, 1998).

General cognitive ability. Studies have shown that cognitive ability has a significant impact on the success of a trainee (Ree & Earls, 1991) and interacts with the motivation to improve learning outcomes (Kanfer & Ackerman, 1989).

Individual expectations and motivation to transfer. The probability of trainees transfer to the workplace will be increased the more the trainees perceive that their effort in implementing the training will result in improving their performance, and the more they believe that this improvement in performance will lead to obtaining favorable results for them (Fontaine, 2005).

Prior preparation of trainees. It has been found that trainees who received intratraining prior to their participation in training sessions, showed higher intentions to transfer and apply in their work what they learned in training (Baldwin, Magjuka, & Loher, 1991).

Self-efficacy. Individuals with a high level of self-efficacy interpret challenges as situations to overcome and develop a greater interest in activities in which they participate, create a high sense of commitment to their interests and activities and recover more quickly from disappointments (Bandura, 1997). Such individuals are more likely to show greater motivation to perform well in training and transferring new knowledge to the workplace

Locus of control. Studies suggest that locus of control (Noe & Schmitt, 1986) may be a factor that increases learning and their subsequent transfer.

Other motivational factors. The investigation of motivation to learn in training context, suggested that individuals who are more enthusiastic to participate in training, are more willing to acquire knowledge and skills and demonstrate higher levels of behavioral change and performance improvement, compared to those who are less motivated and enthusiastic to participate in training (e.g., Noe & Schmitt, 1986).

Reaction of trainees. Individuals who perceive most clearly the relationship between training and the company strategy, that is, exhibit higher perception of utility of training, are more willing to apply learning in the workplace, than individuals who do not have this perception (Montesino, 2002).

1.1.2 Organizational Factors

The organizational environment in which individuals are embedded is an important factor that exerts a great influence on the attitudes and behaviours, and that, in the training context, it is considered that these factors together with the motivation, explain about 15% to 20% of effectiveness of training (Velada, 2007).

Transfer climate. Include performance feedback, peer support, supervisor support and supervisor sanctions (e.g. Baldwin & Ford, 1988; Holton et al., 2000; Tracey & Tews, 2005; Tracey et al., 1995), and is defined, accordingly to Holton (1996), as an important factor affecting motivation to transfer. Quiñones (1996) supported the idea that transfer climate affects training outcomes and transfer mediated by individual variables such as trainees' motivation and self-efficacy. Colquitt et al. (2000) in their meta-analysis of the antecedents and outcomes of training motivation also found support for both a direct and indirect influence of the transfer climate on transfer of training.

Culture of continuous learning. Research has indicated that when employees perceive that the organizational climate is supportive to learning, they are more likely to apply their new knowledge in the work environment (Baldwin & Ford, 1988; Tracey et al., 1995).

1.1.3 Design of Training and Transfer design

Among the myriad of factors affecting transfer of training to the workplace, it is necessary to highlight those who have direct effect on learning during training. In addition to individual variables mentioned above, the way transfer of learning from training to application activities in the real world is designed and structured seems to be crucial.

Transfer design refers to the degree to which training has been designed and delivered in such a way that provides trainees the ability to transfer learning back to the job (Holton et al., 2000). Indeed, trainees are more likely to transfer the training content to the work context when they perceive that the training program was designed and delivered in such a way that maximizes the trainee's ability to transfer the training to the job (Holton, 1996; 2005). Consequently, when trainees have previous knowledge and practice on how to apply the newly learned knowledge and skills to the job and when training instructions are congruent with job requirements, an increased likelihood of transfer should exist.

In line with the well-known finding that demanding and specific goals lead better outcomes than less demanding goals (Locke & Latham, 2002), setting specific goals is a good predictor of motivation to transfer. For example, to set and communicate goals, develop a detailed plan that describes specific situations in which participants can apply what they learned in training (Locke & Latham, 2002), remembering an event of real life, during training, and recall the possible barriers or traps that may arise when applying new knowledge or skills (Gollwitzer & Brandstatter, 1997), provide tools to enhance transfer.

Furthermore, trainers should ensure that trainees receive a sufficient level of control and freedom to do their job. Thus, gaining transparency about contents and training methods beforehand, provide to trainees experiences of mastery and control during training and give them autonomy to carry out and implement the learned skills are tools to enhance transfer.

The implementation intentions (Gollwitzer, 1993) lead the individual beyond the mere intention to achieve the goal. Implementation intentions are plans "if-then" that match a specific situation in the future with a certain behavior directed toward the goal, specifying when, where and how a person takes the goal-oriented measures (Gollwitzer & Brandstatter, 1997). It was shown that implementation intentions facilitate the immediate initiation of a goal-directed behavior, and creates strong mental associations between the desired situations and behaviors: a) the person remembers what has to be done (this includes remembering the action to be performed); b) the person recalls to perform the action at the appropriate time (Einstein & McDaniel, 1990); c) fosters the use of memories, both external (e.g., taking notes, putting something at a specific place) and internal (mental rehearsing, mnemonic strategies that prevent people from forgetting of the task). Thus, forming implementation intentions can be conceptualized as a strategy of internal memory.

1.1.4 *Mental simulation*

Recently, it has been proposed that human consciousness is essential to internal processing, and not only for input (getting information) or output (controlling action). Specifically, it is argued (Baumeister & Masicampo, 2010) to be useful in facilitating the construction of “meaningful sequences of thought, especially simulating events”, (p. 947).

But this attention paid to conscious information processing is not new. Rather, it continues a long tradition in studying “the process by which we envision the future and then regulate our behavior and emotions so as to bring it about” (Taylor, Pham, Rivkin, & Armor, 1998, p. 429). Since long, cognitive scientists have explored the human ability to imagine the future and creating a means for getting there, as one of the most significant aspects of human cognition. Mental simulation, as the ability to plan, organize and set goals and projects to achieve satisfaction throughout this process, mental simulation is a window into the future that helps people perform goal-related tasks effectively. Simply put, imagining yourself doing something leads to an increased intention to do it (Anderson, 1983). When used appropriately, this sort of mental rehearsal can help a person cope with simple tasks of day-to-day, namely the regulation of emotional state and the efficient planning of objectives, but also in mastering problematic situations (e.g. Brownell, Marlatt, Lichtenstein, & Wilson, 1986.). In professional domains, many studies investigating the application of mental practice indicate that people who engage in imagining a task improve their performance on that task, whether in academic work (Pham & Taylor, 1999) or in engineering projects (Christensen & Schunn, 2009), for example.

Emphasis on process simulation seems to be necessary to achieve goals (e.g., Oettingen, 2012) since many studies (e.g., Taylor et al., 1998), found process simulations leading to better performances than outcome simulations.

Mental simulation gives rise to problem-solving activities. For instance, past research showed that imagining how the events are going to happen provides enriched information about them (Hayes-Roth & Hayes-Roth, 1979). Experts have long recognized the role that mental stimulation has in problem solving. For example, sportspeople often use “mental practice”, i.e., mental simulation, to improve performance. Many Olympic and professional athletes say they can actually feel the twinges in muscles associated with their actions when they imagine themselves running a dip, a jump, a service in tennis, and a variety of other skills (Orlick & Partington, 1988). Moreover, mental simulations are “devices” to make goals salient, thus leading to intentions to launch targeted actions to goals (e.g., Gollwitzer, 1993). Specifically, past research has suggested that positive fantasies and daydreaming can determine future goals since they imply anticipated consummation of success (Oettingen, 1996).

In short, there is abundant evidence suggesting that the structuring of future action through cognitive anticipation of action and mental simulation can foster transfer of learning and thus contribute to the transfer of training to the workplace

In this study, we are interested in analyzing the effects of mental simulation on the transfer of learning, as a key element of the transfer of training to the workplace. Specifically it aims to answer the following question: will trainees who have the opportunity to cognitively anticipate the use of the skills and knowledge they are learning, present a higher level of learning transfer than those who have not?.

Additionally we seek to investigate the possible moderating effects of individual variables that were identified in past research as being important in the transfer of training, such as the perception of control, self-efficacy, perception of utility of training, and motivation to transfer.

2 METHOD

2.1 Sample and procedures

One hundred and fifteen students (53.9% were female and mean age of the sample was 19.6 years) participated voluntarily in this study. Since it followed a quasi-experimental method, two groups (control and experimental) were formed. Participants were randomly assigned to the two groups. Data collection was held in person, and anonymity and confidentiality of responses were guaranteed.

All participants of both groups were required to complete an online module (e-learning) on writing techniques. The content of the module mainly included rules and procedures to increase the clarity, structuration and persuasiveness in professional written communication. This module was built by an organization specialized in professional training, and it was technically adapted for use in this experiment.

A pre-learning questionnaire was applied in the first phase of the study, in order to verify the existence of possible differences between participants from the control group and the experimental group with respect to knowledge of the module's subject. No differences, $F(10,114) = .920$ $p = .51$, were observed, i.e., when participants started the e-learning module, they all presented the same level of knowledge on the module's content (writing techniques).

Before starting the e-learning module, participants in the experimental group (but not those in the control group) received instructions about the *application task*: writing a letter to the dean of the university requesting funding for a business project. In addition, they were induced to think about how they could use writing techniques to perform effectively. These instructions to the participants in the experimental group were repeated (appeared on the screen) later during the module, in order to reinforce the induction of mental simulation. Participants in the control group did not receive any of this information, and the very existence of an application task has not been disclosed to them.

Upon the completion of the module, the participants in the two groups answered a final questionnaire, which encompassed measures of moderator variables, and carried out the application task (a letter to the dean).

2.2 Variables and measures

Independent variable. *Transfer design* was operationalized by means of metacognitive instructions for learning transfer, during two phases of the study, as described above, and it has been present in the experimental group only.

Dependent variable. *Transfer of learning* was implemented and measured by evaluating the application task's outcome. Letters to dean were evaluated by two independent evaluators, unaware of the nature of the study, using a 7-point Likert scale across three dimensions: text structure, clarity and persuasiveness of the letter. The reliability of inter-rater agreement was assessed using Cohen's Kappa coefficient: structuring ($\kappa = .51$), persuasiveness ($\kappa = .72$) and clarity ($\kappa = .70$). Given that the three dimensions were significantly inter-correlated ($r \geq .90$), they were aggregated into a single indicator of transfer of learning.

Moderator variables. *Perception of control* was operationalized by five items ($\alpha = .69$) based on three types of control reported by Clark and Mayer (2008): Content sequence, pace and access to learning support. The remaining items were adapted from indicators on control and complexity (Frese, Kring, Soose & Zempel, 1996). All items were measured on a 7 point Likert scale (1 - "Strongly disagree"; 7 to "Strongly agree"). An example of an item of this measure is "I was able to decide the order to access to program content".

Perception of utility of training ($\alpha = .87$) was operationalized by six items constructed by Velada (2007). The items were measured on a 7 point Likert scale, and an example of an item of this measure is "This learning module increased my effectiveness in writing technical reports".

Self-efficacy ($\alpha = .86$) was operationalized through six items, which were measured on 10 point Likert scale (0- "I cannot"; 10- "I can"). An example of an item of this measure is "Indicate your level of confidence... To what extent do you feel able to ... organize your speech".

The motivation to transfer training ($\alpha = .77$) was operationalized through four items of the Portuguese version of LTSI (Holton, Bates, Seyler & Carvalho; 1997; Holton, Bates & Ruona, 2000). Items were measured on a 7 point Likert scale. An example of an item from this scale is "When I finish training, I can't wait to get back to work and apply what I learned".

3 RESULTS

Since we have conducted an ANOVA to analyze the effect of Transfer design in the effective transfer of learning, the assumptions of normality were validated through Adherence Kolmogorov-Smirnov ($p \geq 0,01$ for the dependent variable) and the homoscedasticity of variances, Levene's test ($p \geq 0,01$ for the dependent variable). Results indicate that participants who have known in advance and mentally simulated the application task showed better performance ($M = 4.18$ $SD = 1.07$) than members of the control group ($M = 3.62$, $SD = .88$), $F(1,115) = 9.215$ $p = .003$.

In addition, in order to ascertain whether the observed association between transfer design and transfer of learning was affected by perception of self-efficacy, perception of control, motivation to transfer, and perception of utility, possible moderation effects were analyzed through regression. The

test indicates that there are no moderation effects in what concerns self-efficacy, motivation to transfer, and the perception of control ($p > .05$). However, for perception of utility there is a partial effect of moderation and that it has a positive effect ($\beta = 0.345$) in the transfer of learning, with a low intensity of 3.42% (semi-partial $R^2 = .11$).

4 DISCUSSION, CONCLUSIONS, AND IMPLICATIONS

The present study aimed to analyse the effect of transfer design on the transfer of learning to the workplace. The results allowed support the expected direct relationship between design and the effective transfer of learning. Results suggest that individuals who have access to a structured design of transfer, allowing mental simulation of the application of learned skills and knowledge, show higher level of transfer of learning than individuals in the control group, i.e., in which there was absence of a structured design of transfer. The presence (vs. absence) of metacognitive orientations for transfer design before and during an e-learning session maximizes the effective transfer of learning. This effect is moderated by perception of utility of training, in the sense that individuals who anticipated and mentally simulated task, and simultaneously perceived a greater utility of training, showed the highest level of learning transfer. Moreover, although we have no direct evidence, the robustness of these results allow us to speculate that participants of the experimental group may have been based on the instructions to infer specific goals that are formulated as intentions to implement and apply the learned skills and knowledge

The study also intended to examine the moderating role of self-efficacy perception, perception of control, perception of utility and also the motivation to transfer in the effect of the design of the transfer on the transfer to the workplace. The study results do not support the hypothesis of the moderating role of the perception of self-efficacy, perception of control and motivation to transfer, suggesting that the relationship of these individual variables with the effective transfer of learning does not occur.

As regards to the perception of self-efficacy, a possible explanation for these results is related to the construction of the scale, since it includes general questions that could not accurately measure self-efficacy for this specific task. Regarding the hypothesis that argues that the perception of control moderates the effect of design on the effective transfer of learning, the verification of these results is probably due to the fact that the control given to students was indeed not too high. Although they could stop and start the training when they wished to, the module that they have attended did not always allowed them to plan and organize the lesson in their own way. An active and pragmatic approach to learning seems to imply greater autonomy of the student, who constructively and collaboratively performs their route to skills development (Hokanson & Hooper, 2000; Martin, Massy & Clarke, 2003). In what concerns motivation to transfer, the absence of moderation effects may be related to the fact that the participants were students and participated on a voluntary basis, without any kind of reward or obligation, unlike what happens in an organizational context.

In our interpretation, this absence of moderation effects can also reinforce the importance of distinguishing transfer of learning and transfer of training to the workplace: variables affecting one of the processes may not be the same that affect the other one.

The results of this study may have some potential implications for future research and practice. Firstly, they allow us to recommend trainers and training managers to give trainees the possibility to anticipate their learning goals and to mentally simulate future application of the skills to be learned.

More generally, this study reinforced the determinant role of setting a structured and detailed plan that defines in what situations is that trainees must apply knowledge enhances a more effective transfer of learning. Setting a learning goal and mentally rehearsing the steps to achieve it leads to appropriate changes in behavior, increasing the likelihood of achieving the goal and also increasing the effective transfer of learning. Testing the role of cognitive anticipation and mental simulation of learning processes in organizational settings, can contribute to the improvement of the overall efficiency of training programs in organizations

As a suggestion for future research, we point out the need to design and conduct a study to verify the ecological validity of the main results now obtained (i.e., the relevance of transfer design for learning transfer). Conducting this study in an organizational context may also clarify the importance of individual variables, which in an academic context do not seem relevant.

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