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14. TRAINING FOR INNOVATION IN SPAIN

Analysis of Its Effectiveness from the Perspective of Transfer of Training

INTRODUCTION

Innovation is a need for any organisation that wants to maintain and to improve its current market position, characterised by globalisation and uncertainty. Innovation processes involve creativity, development, change and to take risks, all of which depend on the skills of the people within the organisation. It is therefore interesting to study the role played by human resource development (HRD) in the innovation process, to identify ways to enhance innovation in our organisations through training. "Training for innovation" means training that aims to generate innovations in the organisation, i.e., that develops skills that allow the trainees to innovate in their work. This chapter presents some of the results of a research in Spain, focused on the evaluation of effectiveness of training for innovation.

THEORETICAL FRAMEWORK

Nowadays, innovation is necessary to ensure company's competitiveness, especially in market economies in which competitiveness is a characteristic feature of the economic situation. For companies, innovation is a key strategy to gain a competitive edge on other organisations (Fang et al., 2011). In this context, it is very important that organisations develop knowledge and skills of their employees to drive change and to build innovative capacity (CEDEFOP, 2012). Innovation in organisations is understood as a process whose goal is to develop changes, either in the form of products or processes, which add value and allow the organisation to gain a competitive edge in the market and to ensure their growth and survival (Bruton, 2011; Fang et al., 2011; Ridderstrale & Nordström, 2008).

Ellström (2010) remarks that a new process is considered as an innovation when it is possible to demonstrate its contribution to the objectives of the organisation. The author makes a distinction between real innovation and potential innovation: an innovation is a real innovation when there is evidence of its contribution to the objectives of the organisation. However, if a given innovation has not been shown to contribute to the organisation and therefore lacks legitimacy in terms of results, it is a potential innovation. Results of the innovation process, in any field, must add

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value to the organisation (Knox, 2002). However, to get results, the innovation process should be planned and should involve the acquisition and application of knowledge. According to Smith, Courvisanos, Tuck and McEachern (2011), knowledge and access to knowledge are some of the necessary elements for innovation to take place; therefore, knowledge management is crucial for innovation processes. According to these authors, the innovation capacity of an organisation depends largely on the ability to acquire, develop and exploit new knowledge, with human capital and technology as major factors affecting this process. It is therefore fundamental to develop learning processes within organisations. In their research, they argue that management of human resources and development of learning processes are key factors in promoting innovative capacity.

Some authors, like Nasution, Mavondo, Jekanyika, Matanda and OlyNdubisi (2011), emphasise that the way of measuring the level of innovation in an organisation more accurately is analysing human resource management practices. There is an increased likelihood that innovative processes will take place in an organisation when more attention is given to employees.

Various studies have shown that organisational learning and training play a very important role when it comes to generating innovation in organisations, as it allows constant learning of new skills (Ellström, 2010; Fuente, 2005; Jiménez-Jiménez, 2008; Rasiah, 2011; Yu Yuan, Ya-Hui, Yang, Wu, & Kuo, 2011). For Hoeve and Nieuwenhuis (2006), innovation and development of new skills are processes that are intertwined. This means that knowledge management is a key factor in innovation processes. As it is highlighted by literature, the ability to innovate has a direct relationship with the ability to acquire and apply knowledge (Courvisanos, 2007; Soriano, 2013; Tidd, Bessant, & Pavitt, 2005).

Innovation and training can be understood as two business strategies that must necessarily be related. Training is essential to develop innovation processes because it allows workers to acquire the knowledge needed to develop changes, and the skills needed to create and adapt to new situations arising from innovation (Fuente, 2005; Kontoghiorghes, Awbrey & Feurig, 2005; Shipton, West, Dawson, Birdi, & Patterson, 2006; Walsworth, 2007). Some authors, such as García (2008), emphasise that companies that are characterised by a high degree of innovation are those that offer more training to their workers, and this is where it plays a strategic role. Therefore, training must become training for innovation, whose ultimate goal is to provide adequate skills for workers, and then they can develop an innovation process.

By "training for innovation," we mean training that is intended to generate innovations in the organisation, in other words, that develops the necessary skills to allow trainees to innovate in their work (Pineda, 2013). It is therefore a different concept than innovative training, which is related to methodological innovations. Our study focuses on training that, irrespective of the more or less innovative methods used, generates innovation, that is, changes that generate added value for the organisation and give it a competitive advantage. Training for innovation can

be a key tool to allow organisations to acquire skills according to needs of their economic and financial context.

> Training is crucial for innovation, creating organisational cultures and management capabilities which stimulate and sustain innovation. (Smith et al., 2011, p. 12)

Among the studies on training that generates innovation, Edralin's (2007) contribution is particularly interesting. She considers that innovation takes place if there is an appropriate context in which organisational structure, culture and human resources practices such as training are geared towards innovation processes. The key aspects that stand out among the main features of training for innovation are based on those skills necessary for people to participate in an innovation process, such as critical thinking, initiative, effective communication, access and information analysis (Burton, 2011; Edralin, 2007; Fluellen, 2011).

Organisations invest many resources in training their employees, both for innovation and for regular tasks, but rarely know to what extent the training is effective. It is necessary to conduct an evaluation of the training to verify the effectiveness and cost of training, in terms of transfer of learning.

Baldwin and Ford (1988) were one the first authors to study "transfer of training" as an important training outcome. These authors defined it as the degree to which participants apply the knowledge, skills, and attitudes acquired in the context of training. The evaluation of transfer of training becomes a priority to know the effectiveness of training within the work context. However, an exhaustive process of evaluation of transfer requires many human and financial resources due to the difficulty of measuring changes caused by training in the workplace (Pineda, 2002).

To solve this problem, several authors raised the possibility of evaluating transfer indirectly, through the factors that influence the applicability of learning to the workplace. Such is the case of the models of Baldwin and Ford (1988), Burke and Hutchins (2007), Holton (2000), Noe (1986), Rouiller and Goldstein (1993), Thayer and Teachout (1995), among others. To evaluate transfer indirectly allows having a measurement of transfer factors in all the participants at the end of training, thus avoiding the problems of missing respondents sometime after the training. It offers also the possibility of predicting transfer and of improving those factors that are a barrier to transfer. Pineda, Quesada and Ciraso (2011) created the Model of Factors to Evaluate Transfer indirectly, called the FET model, which we present later.

This chapter has two aims: (1) to evaluate effectiveness of training for innovation, and (2) to compare it with training that is not oriented towards innovation.[1] The study was conducted in the context of Spanish organisations, and the evaluation model used was the FET.

METHOD

The study was correlational, based on a non-experimental and longitudinal design (Hernández, Fernández-Collado & Baptista, 2006) carried out from April to July of 2012.

Sample

We used a non-probabilistic voluntary sampling method based on two criteria: training activities that finished between April and June 2012; and training activities whose final session was performed face-to-face. Some of these training activities were entirely developed face-to-face, while others were blended learning activities, i.e., combined classroom settings and eLearning during the same training programme. 2,708 trainees responded to the first questionnaire (t1) but only 66.7% of them reported an e-mail address to send them the second tool. Subsequently, the second questionnaire (t2) was sent to 1,807 trainees and 446 answered it (24.7%). This chapter uses the sample formed by 2,708 trainees, who participated in 286 training activities in 35 Spanish companies.

Based on the main goal of this chapter, the study is focused on two different types of training: traditional training and training for innovation. Therefore, trainees were classified according to the type of training as Table 1 indicates. This classification was based on a previous questionnaire addressed to the training managers or trainers of these activities, aimed to identify the main characteristics of the training design and whether they were related to innovation processes within the organisation or not.

Table 1. Sample distribution according to type of training

	Traditional training	*Training for innovation*	*Total*
FET trainees (t1)	2,381	327	2,708
CdE trainees (t2)	419	27	446

Note: FET: Factors to Evaluate Transfer indirectly questionnaire. CdE: Efficacy Questionnaire

Table 2 offers a sample description based on profile variables of trainees.

Instruments

We used two self-report questionnaires in our research: the Factors to Evaluate Transfer indirectly questionnaire or FET (t1) and the Efficacy questionnaire or CdE (t2). Both instruments were addressed to trainees who participated in a training activity; the evaluation was therefore based on a self-report.

Table 2. Sample description

Variables	*Sample description*
Sex	Men: 49.2%
	Women: 50.8%
Age	Mean: 39 years (9.52 Standard Deviation)
Type of company	Private: 85.1%
	Public: 14.5%
	Non-profit organisations: 0.4%
Professional category of trainees	Manager: 3.6%
	Middle manager: 21.1%
	Technical: 22.8%
	Skilled employee: 45.4%
	Unskilled employee: 7.2%
Educational level of trainees	None: 0.5%
	Primary education: 7.5%
	Secondary education: 9.1%
	Medium vocational education: 15.3%
	High school: 11.3%
	High vocational education: 19.2%
	Undergraduate: 31.3%
	Graduate or master: 5.1%
	PhD or superior: 0.7%

The FET questionnaire used a paper-and-pencil format, and its goal was to analyse training efficacy; it was applied immediately following the end of training activities with the help of training managers or trainers, following an application procedure. The FET questionnaire was based on two different sections. The first one was formed by variables related to the profile of trainees (gender, age, e-mail address, type of company, professional category, and educational level, among others) and features of training (type of training, features of the innovation process, training features, and trainer profile).

The second section was made up by seven factors that determine transfer of training; this section corresponds to the FET model (Pineda, Quesada, & Ciraso, 2011), which was applied to different samples to achieve a valid and reliable model (Pineda-Herrero, Quesada-Pallarès, & Ciraso-Calí, 2014). The factors that composed the FET questionnaire were: *satisfaction with training*, *motivation for transfer*, *internal locus of control*, *orientation towards job requirements*, *environment opportunities for application, accountability*, and *organisation's support for transfer*. These factors were represented by 42 items based on a 5-point Likert scale (1: no agreement; 5: total agreement). The FET section presents a good adjustment with data (CFI = .90, NFI = .88) and a low error for the model (RMSEA = .47). Moreover, this section of the questionnaire has a high internal consistency (α = .92), a trait that is consistent throughout all of the factors ($\alpha \geq$ .70).

The CdE questionnaire used a web format sent by e-mail to those who answered the FET questionnaire. Its goal was to analyse transfer level three months

after employees finished the training activity. 15 days were granted to answer the questionnaire and two reminders were sent, following the CdE procedure. CdE was formed by 30 items and three sections: 1) seven items that evaluate transfer level under one construct measured by a 5-point Likert scale (1: no agreement; 5: total agreement); 2) 16 items to identify reasons why trainees felt that their transfer level was low or high (trainees only answered a set of seven items based on their response in item number seven), measured by a 5-point Likert scale (1: no agreement; 5: total agreement); and 3) seven items to ask about the main reason why trainees had a low rate of transfer (if they had a low rate of transfer), measured by multiple-choice items.

The first section of the CdE was validated through an Exploratory Factor Analysis (EFA) using the Maximum Likelihood method, an eigen value greater than one, a promax rotation, and a minimum value of .30. Barlett test ($p < .05$) and KMO index (.92) suggested that the model was adequate. The model emerged explains the 63.7% of the variance with one factor, which confirmed that the construct represented one dimension. The factor was named *deferred transfer* and showed a high internal consistency ($\alpha = .92$).

Data Analysis

The data was entered into an Excel database, after which it was analysed using the SPSS v.17 Inc. statistics programme.

Analyses carried out where different according to research goals. We performed a descriptive analysis of data, followed by mean comparison tests (ANOVA), and multiple regressions. However, we started the data analysis by ensuring the normality of the sample, and carrying out a data screening.

RESULTS

The following table illustrates the descriptive analysis of transfer factors based on the type of training (related or not to innovation processes). Results are displayed on a scale from 1 to 5.

Most of the factors scored an average value between 3 and 4: this indicates that they facilitate transfer although that can be improved in order to enhance training effectiveness on the job. However, *accountability* is the lowest factor, and could almost be considered a factor that could possibly hinder transfer. On the other hand, *satisfaction with training* and *motivation to transfer* display quite high values in both cases.

Comparing results of traditional training and training for innovation, a number of differences emerge, although not all of them are statistically significant. One-way ANOVA between subjects were performed in order to highlight the differences in factors values depending on the type of training.

Table 3. Factor descriptive analysis and differences between training for innovation and traditional training

Factor	*Training for innovation*	*Traditional training*	*Difference*
Satisfaction with training	4.21	4.31	-0.10*
Motivation to transfer	4.23	4.08	-0.15*
Environment opportunities for application	3.60	3.47	-0.13*
Organisation's support for transfer	3.57	3.59	0.02
Internal locus of control	3.74	3.52	-0.22*
Orientation towards job's requirements	3.82	3.75	-0.07
Accountability	3.13	3.14	0.01

Note: * $p < .01$

The motivation of trainees to apply what they have learned to the job place is significantly different at the $p < .01$ level [F (1, 2704) = 18.70, p = .000]. *Motivation to transfer* is 0.15 higher in training that is not related to innovation processes in the company or institution.

Other two internal factors in trainees that have significant differences are *locus of control* and *satisfaction with training*. In training for innovation, trainees tend to be less satisfied (0.10) than trainees in traditional training programmes [F (1, 2699) = 8.07, p = .005]. In addition, they tend to have a more external locus of control (0.22) than trainees who participate in training activities that are not related to innovation [F (1, 2702) = 17.31, p = .000].

Finally, there is a difference in a factor that is linked to the institutional environment, as perceived by trainees. *Environment possibilities to apply* obtains a significantly higher score (0.14) in traditional training than in training for innovation [F (1, 2704) = 9.42, p = .002].

These differences show better factors results in traditional training than in training related to innovation processes. However, the second questionnaire (CdE) focused on perceived transfer after three months indicates that training for innovation has a higher degree of *deferred transfer*, with a mean value of 3.35 (on a 5-points scale); while the same variable within traditional training obtained 3.01. One-way ANOVA demonstrated that this difference is significant at the $p < .05$ level [F (1, 409) = 4.42, p = .036].

In order to understand how factors affect transfer and to better explain training effectiveness, two different multiple regression models were performed according to the type of training (related or not to innovation processes). All assumptions were tested beforehand in order to carry out multiple regression models.

First of all, results of FET and CdE questionnaires from those trainees who participated in traditional training were selected. The seven factors were introduced as independent variables, obtaining an adjusted R^2 of .29. However, *satisfaction with training, motivation to transfer, organisation's support for transfer, internal locus of control* and *accountability* were not significant. In the second analysis, these factors were excluded, and a model with two significant factors emerged,

which explains the 27.7% of transfer variance (see Table 4). From the analysis of standardised coefficients, it emerges that the most important factor within this model is *orientation towards job requirements*.

Table 4. Multiple regression model on traditional training transfer

Factors	*Non-standardised coefficients*		*Standardised coefficient Beta*
	B	*Standard error*	
(Constant)	.385	.241	
Environment opportunities for application	.117	.048	.106*
Orientation towards job requirements	.576	.050	.502**

Note: *$p < .05$; **$p < .01$

The effect size of the model on transfer in traditional training is $f^2 = 0.39$; according to Cohen (1992), the interpretation of this value indicates a low effect size; thus, the amount of transfer variance explained by this model is quite low.

Secondly, another multiple regression was performed, only including training activities identified as "for innovation." The introduction method was used with seven factors of the FET model, and it obtained an adjusted R^2 of .71. Once factors that were not significant were excluded, the regression model was re-tested with only *motivation to transfer*, *environment opportunities for application* and *organisation's support for transfer*. This model, displayed in Table 5, explains the 68.2% rate of transfer variance; in other words, the regression model in training for innovation fits the data better than the model analysed for transfer of traditional learning.

Table 5. Multiple regression model on transfer in training for innovation

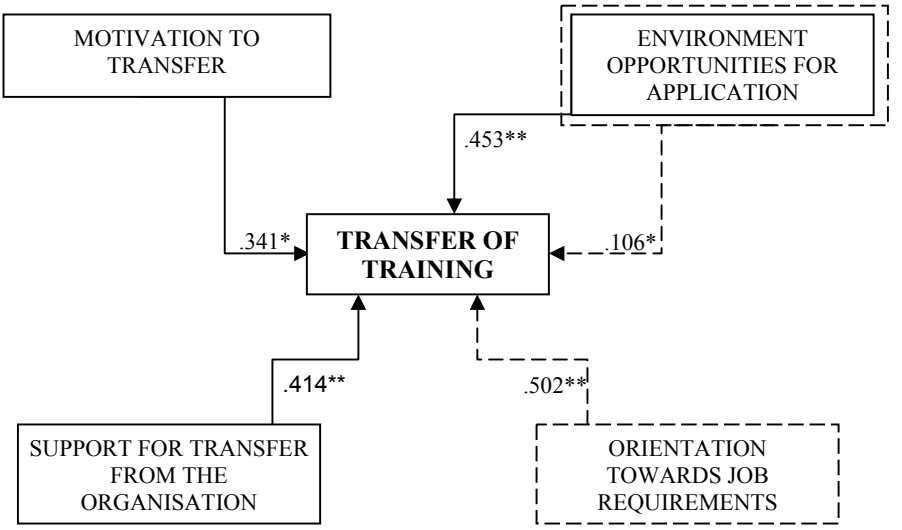
Factors	*Non-standardised coefficients*		*Standardised coefficient Beta*
	B	*Standard error*	
(Constant)	-3.366	.906	
Motivation to transfer	.614	.245	.341*
Environment opportunities for application	.592	.151	.453**
Organisation's support to transfer	.603	.193	.414**

Note: *$p < .05$; **$p < .01$

In this case, the effect size is $f^2 = 2.55$, which means that the amount of transfer variance explained by this model is high. In fact, the effect size is large according to Cohen's (1992) interpretation.

In the following figure, an overview of the two different models is presented, along with the Beta values for each factor. The only factor that has an impact on transfer in both kinds of training (for innovation or not) is *environment*

opportunities for application. However, the standardised coefficient shows that the relative importance of this factor in the model of training for innovation is greater than in traditional training. On the other hand, *orientation towards job requirements* is not significant in the regression model for transfer in training for innovation, whereas it is the most important factor in transfer in traditional training. It is also noteworthy that the only internal factor of trainees that emerges is *motivation to transfer*, and it only has a significant relationship to transfer when training is related to an innovation process in the company.



Note: **p* < .05; ***p* < .01
——— Factor to transfer in training for innovation
– – – – Factor to transfer in traditional training

Figure 1. Overview of the multiple regression models (Beta displayed)

DISCUSSION

Innovation is one of the solutions available to organisations today to overcome the economic crisis, especially in Spain, where production and services are increasingly offshore to other countries with lower salaries or lower taxes (CEDEFOP, 2012). Despite this situation, human resource development and training is one of the best ways to generate innovation in organisations and to help employees cope with changes demanded by innovation (Ellström, 2010).

Training for innovation is a strategy companies can use to gain a competitive edge on other organisations. However, from the perspective of effectiveness, is training for innovation more effective – or more transferred – than other forms of

training? An evaluation of transfer allows us to explore this question, which is why it is the aim of this chapter. The results of FET model show that training for innovation has a higher degree of deferred transfer, in other words, that trainees perceive that they transfer more learning to the workplace when learning is related to innovation than when it is not. This result is significant because it shows that training for innovation is more effective than traditional training; hence, organisations that want to obtain returns on their investments in training should prioritise training for innovation (Martínez-Ros & Orfila-Sintes, 2012).

This result can be explained by considering the results of Pineda (2013): training for innovation tends to emerge from a collaborative process of needs assessment; it is carried out during working hours; it has follow-up sessions; it uses a variety of methodological strategies; it encourages positive attitudes towards change; and the trainer's role is to accompany the trainee, who leads his or her own learning process.

FET model results show significant differences between the transfer factors of both types of training: *motivation to transfer, internal locus of control, satisfaction with training* factors obtain significantly higher scores in traditional training than in training for innovation. These results can be explained by the fact that a significant amount of traditional training is of a voluntary nature, whereas training for innovation is often compulsory, as innovation requires implementation. The compulsory nature of training for innovation may detract to the motivation and satisfaction of trainees. Nevertheless, despite lower scores in these factors, results clearly show that training for innovation generates an increased level of transference, and is therefore more effective.

A number of differentiated models of transference factors in traditional training and in training for innovation have emerged from multiple regression analysis. In traditional training, the two factors that have a significant effect on transfer are *orientation towards job requirements* and *environment opportunities for application.* On the other hand, in the model related to training for innovation, the most significant factor was *environment opportunities for application* followed by *motivation to transfer.* This means that the possibilities of a work environment are a relevant factor in both models, even though they have a greater relative importance in training for innovation. These results are concordant with those of other studies that show that organisations with human resource development policies focused on developing and managing knowledge have an increased capacity for innovation (Smith et al., 2011). Being in an environment with possibilities for application, as well as motivation and support for transfer is typical of environments focused on the development of human resources, environments in which training for innovation is most effective.

Considering that the *motivation to transfer* and *environment opportunities for application* factors often yield lesser scores in training for innovation than in traditional training, it might be necessary to focus on them in order to improve the effectiveness of these training actions. This is particularly true for *environment opportunities for application,* whose average score is insufficient to consider it to be a significant factor in the explicative model on transfer variance. It might be

necessary to carry out changes in the workplace environment and to ensure that workers are in a setting that is appropriate to apply the innovation they have learned to improve this aspect.

The *motivation to transfer* factor also yielded a lower score in training for innovation, and the regression model has revealed that it might be possible to obtain more effective training that results in a greater level of transfer. To this end, it would be beneficial to draw out strategies for workers to become involved in the innovation process and for them to become aware of their importance and, hence, the need to pursue their training. Ideally, workers should not participate in innovation due to its obligatory nature, but rather out of interest in the innovation process, or out of a will to improve their work; this would encourage motivation among workers to apply what they have learned throughout their training.

The factor *organisation's support for transfer* has a significant impact in the transfer model for training for innovation, although scored relatively low; hence, improving this would result in an increased level of application of training in the workplace. For training for innovation to be effective, it is necessary that managers and co-workers support their colleagues when it comes to applying what they have learned.

This study has allowed us to do a first analysis of the effectiveness of training for innovation in Spanish companies and the factors that take part in it. Results reveal that training for innovation generates more transfer than training that is not geared towards innovation. Nevertheless, there is still much to explore; it would be interesting to study the transfer factors that present significant differences between training for innovation and traditional training in-depth in order to understand the motives behind these differences. We hope that those results will cast light on the usefulness of training in innovation processes, especially at a time when innovation is a key factor in improving the competitiveness of our economy.

NOTE

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