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Abruzzese Salute ETS
Via Umberto I, 78/80
65010 Cappelle sul Tavo (PE)
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Knowledge Risk Management in Corporate Training Evaluation. The Knowledge Risk Training Evaluation Model (KRTEM)

Michele Borgia*
Department of Management and Business Administration
University "G. d'Annunzio" of Chieti-Pescara
E-mail: michele.borgia@unich.it

Adalberto Rangone
Department of Law
University of Perugia
E-mail: adalberto.rangone@unipg.it

* *Corresponding author*

Abstract

The aim of this paper is to present the development of the Knowledge Risk Training Evaluation Model (KRTEM), to date one of the few models including risk in training evaluation. A review of the best known and most applied training evaluation models provided support for the construction of KRTEM, that in its final formulation includes five evaluation steps, among which the fifth is dedicated to the measurement of knowledge risks that could compromise training effectiveness, exposing the organisation to possible related damages. The KRTEM is still in its theoretical formulation, to make considerations on its effectiveness must be referred to its application on training programmes of organisations of any type and size.

Keywords – Training evaluation; knowledge risks; training evaluation models; Knowledge Risk Training Evaluation Model (KRTEM).

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1 Introduction

There is broad consensus in the literature that adequately trained human resources can actively contribute to the improvement of both job and organisational performance (Dabale, Jagero, & Nyauchi, 2014; Elnaga & Imran, 2013; Farooq & Khan, 2011; Nkpurukwe, Ozah, & Wali, 2020; Obi-Anike & Ekwe, 2014; Russell, Terborg, & Powers, 1985). Given the positive relationship between human resource training and organisational performace, it is crucial for organisations to asseverate the effectiveness of training, even considering the costs this activity implies. Training evaluation can be a useful activity for assessing the effectiveness and cost-effectiveness of training, although it is often underestimated or poorly applied (Wang & Wilcox, 2006). Nevertheless, there are several models for training evaluation that, over the years, scholars from all over the world have formulated and applied. Among these, the best known and most applied is certainly Donald Kirkpatrick's Four Levels Model (Kirkpatrick, D. L., 1959), a model that has inspired most of the scientific production on training evaluation for decades since the late 1950s (Smidt, Balandin, Sigafoos, & Reed, 2009). Reaction, learning, behaviour change, and organisational results are the levels of evaluation that over time have remained the cornerstone of the evaluation process of so many models that have been guided by Kirkpatrick's work (Tamkin, Yarnall, & Kerrin, 2002), either by updating it to adapt it to the functioning of modern organisations (Kirkpatrick, J. D. & Kirkpatrick, W. K., 2016), or by incorporating new levels of evaluation for improving the accuracy of measuring training outcomes (Hamblin, 1974), measuring the social impact of training (Kaufman, 1981), training design (Brinkerhoff, 1988), or the cost-effectiveness of training investments (Phillips, 1994).

One issue is still largely unexplored in training evaluation research, namely the risks to which training process may be exposed. Therefore, it becomes timely to include risks in training evaluation as well, so that training could be preserved from the potentially negative effects of various types of risks. To the best of author's knowledge, to date, training evaluation models explicitly including risks are scarce (Borgia, 2023) and do not precisely specify types of risk to which training could be exposed (Jasson & Govender, 2017), or only concern specific training programmes adopted by few types of organisations (Borgia & La Torre, 2022). As a knowledge-based activity, training may be exposed, to a greater extent, to a particular type of risks related to knowledge management, namely knowledge risks, "[...] a measure of the probability and severity of adverse effects of any activities engaging or related somehow to knowledge that can affect the functioning of an organisation on any level" (Durst & Zieba, 2019, p. 2). Thus, a model that incorporates knowledge risks into the evaluation process could be a valid support in protecting training from this type of risk strongly related to knowledge management and hence capable of compromising the effectiveness of training in a variety of manners, such as hindering

the efficient design and performance of the training event, or disrupting the training transfer process (Borgia, 2023).

This paper seeks to answer this call by proposing the Knowledge Risk Training Evaluation Model (KRTEM), a model for corporate training evaluation including a level specifically dedicated to measuring knowledge risks to which the training process may be exposed. The KRTEM was presented in a previous publication in Italian (Borgia, 2023) and was built by revising the best known and applied training evaluation models, from which some levels have been borrowed, and to which a level specifically dedicated to knowledge risks was added. The present work holds more than an implication. In its theoretical level, it contributes to the strand of training evaluation models that include risk yet in its infancy. On a practical level, it could be employed by firms seeking to protect their investments in training from the threat of knowledge risks.

The remainder of the paper proceeds with a review of the literature on training evaluation models (Section 2). In Section 3, the methodology KRTEM was structured with is explored, while the fourth section presents the KRTEM, its levels of evaluation, and some indications for its application. The paper ends with Section 5, providing the general conclusions of the work.

2 Literature review

2.1 Past, present and future of training evaluation models

The hierarchical model proposed by Donald Kirkpatrick at the end of the 1950s, the "Four Levels Model", is one of the best known, most criticised, but also most applied models for corporate training evaluation. Kirkpatrick's model states that training evaluation is based on four levels: 1. reaction, 2. learning, 3. behaviour change, 4. organisational results (Kirkpatrick, D. L., 1959, 1996; Kirkpatrick, D. L. & Kirkpatrick, J. D., 2006). The first level aims to assess trainees' reactions to training event. Questionnaires and similar methods are used to assess the level of satisfaction with the programme, trainers and training environment (Kirkpatrick, D. L., 1959, 1996; Kirkpatrick, D.,L. & Kirkpatrick, J.D., 2006). At the learning level, training effectiveness is evaluated in terms of amount of knowledge gained. Questionnaires and other similar tools are applied to assess whether trainee's knowledge increased as a result of training programme (Kirkpatrick, D. L., 1959, 1996; Kirkpatrick, D.L., & Kirkpatrick, J.D., 2006). The third level of Kirkpatrick's model is probably the most critical, as it provides an opportunity to examine whether the knowledge and skills acquired through training are transferred to the workplace by participants, and whether this leads to a positive change in behaviour,

with an indirect positive effect on the organisation as a whole (Kirkpatrick, D. L., 1959, 1996; Kirkpatrick, D.L., & Kirkpatrick, J.D., 2006). The fourth level of evaluation, organisational results, aims to assess the 'value for money' of training, i.e. whether training has contributed to measurable improvements in organisational productivity (Kirkpatrick, D. L., 1959, 1996; Kirkpatrick, D.L., & Kirkpatrick, J.D., 2006). Kirkpatrick's model is hierarchical in the sense that there is a progressive order of information and a causal link between the four levels of assessment (Alliger & Janak, 1989). These features were the most criticised of the four-level model. Reio Jr, Rocco, Smith and Chang (2017), for example, pointed out that although the model is easy to apply, the difficulty of implementing the four levels remains. Bates (2004) highlighted three key limitations of the Kirkpatrick model, namely its oversimplification of the reality to be evaluated, the causal link between levels, and the assumption of an increasing importance of information at higher levels. In Cahapay (2021), criticism is made considering the application of the model in higher education evaluation, while in Moreau (2017) in the context of medical education programmes.

In spite of many critiques, Donald Kirkpatrick's model remains one of the most applied for the evaluation of training programmes in organisations of many different types around the world (Alsalamah & Callinan, 2021; Curado & Sousa, 2021; Mohamed & Alias, 2012; Yaqoot, Wan Mohd Noor, & Mohd Isa, 2017). Continuing the work on training evaluation started by Kirkpatrick were his sons, who in 2009 published a training evaluation model known as "The New World Kirkpatrick Model", which is an update of the original Four Levels Model, retaining the four-level structure but adapting it to the changing characteristics of the environment in which organisations organise and deliver their training programmes. (Kirkpatrick, J. D., & Kirkpatrick, W. K., 2016, 2021).

The hierarchical level structure also inspired other training evaluation models, which Tamkin, Yarnall and Kerrin (2002) describe as "Kirkpatrick plus", in that whilst retaining the basis of the four levels, they implemented or modified the original version, by inserting or modifying one or more evaluation levels. From the early 1970s to recent times, a number of training evaluation models have been proposed that derive from the original formulation of the Four Levels Model. Hamblin's (1974) five-level approach is one of the first of these models, borrowing the initial three levels from the Four Levels Model, and introducing the "organisation" level, in which beneficial effects of the increase in job performance resulting from training are evaluated, and the "ultimate value" level, which is responsible for evaluating the financial effects of training (Lee & Pershing, 2000). Hamblin's model therefore essentially extends that of Kirkpatrick by splitting the outcome level into two parts (organisational and ultimate value), and by defining more explicitly the hierarchical relationship between the five proposed evaluation levels (Clement, 1982; Tamkin, Yarnall & Kerrin, 2002). The Six-Stage Model was proposed by Brinkerhoff in 1988, and compared to the Four Level Model, it comprised two further levels. A level

dedicated to the evaluation of the training objectives, and a level to the evaluation of the training design. These additional levels had the common purpose of supporting the whole training decision making process (Bassi, 1997; Brinkerhoff, 1988). Kaufman and Keller (1994) developed the Organisational Elements Model (OEM), a training evaluation model which, compared to Kirpatrick's model, introduces two evaluation levels dedicated to the social impact of training (Kaufman, 1981; MacGillis, Hintzen, & Kaufman, 1989). HRD Evaluation Research and Measurement Model is instead the evaluation model proposed by Holton in 1996 (Holton III, 1996, 2005). Holton was one of Kirkpatrick's main critics, so much so that his model was formulated in the belief that the Four Levels Model was not even an evaluation model at all, but merely a "taxonomy of outcomes" (Holton, 1996). Holton argued that a serious implementation of Kirkpatrick's model was needed, so structured his model in order to examine the effects of intervening variables on training outcomes, such as motivation to learn, trainer skills, trainee attitudes, personal characteristics of trainees and trainers, and the transfer of knowledge gained from training (Holton, 1996). Jack and Patricia Phillips' model, although derived from Kirkpatrick's, introduced a new level dedicated to evaluate the "value for money" of training, proposing to measure the "ROI of training", i.e. the return on investment in training (Phillips & Phillips, 2016). The extraordinary success of this model is due to the increasing need to demonstrate that training is a good investment for organisations. Measuring the ROI of training is included as a fifth level to the four levels of Kirkpatrick's model and consists of a cost-benefit analysis of training and ROI calculation (Phillips, 1994, 1996, 2012).

Scholarly work on training evaluation continued to produce new models even in more recent times. Pineda, in 2010, proposed an integrated model for training evaluation, which introduced pedagogical elements with the aim to implement training benefits for subjects involved and for the organization as a whole (Pineda, 2010). The Participatory Training Evaluation Method (PATEM) proposed by Kuzmin presented an evaluation process based on the active involvement of all the subjects involved, so that evaluation becomes an "experience" to learn from (Kuzmin, 2012). In 2012, Passmore and Velez contributed to research on training evaluation with the SOAP-M evaluation model. SOAP-M proposed five levels of evaluation, namely: 1. Self, 2. Other, 3. Performance, 4. Potential, 5. Meta-analysis (Passmore & Velez, 2012). The first three levels come from the tradition of hierarchical models and include self-assessment. At the Self level, evaluation by trainers and peers at the Others level, and assessment of progress following training at the Achievements level (Passmore & Velez, 2012). Levels 3 and 4 are the novelty of the SOAP-M model, as they involve the evaluation of training potential and the use of meta-analysis for data analysis in the evaluation process, respectively (Passmore & Velez, 2012). Jasson and Govender proposed, in 2017, the Training ROI and Risk Measurement Model, which adds to the original Kirkpatrick model an evaluation level for measuring the ROI training, and a further

level specifically dedicated to the measurement of risks which could affect training effectiveness as they hinder the training transfer process (Jasson & Govender, 2017). This model was the first to introduce risk into training evaluation, distinguishing itself from all other models inspired by Kirkpatrick's Four Levels Model. A few years later, Borgia and La Torre (2022) also considered risk in training evaluation, proposing the AML/CFT Training Evaluation Model, which provides a specific level for measuring knowledge risks that could affect anti-money laundering training programmes in banks.

This paper belongs to the strand on training evaluation models deriving from Kirkpatrick's Four Levels Model, in particular on training involving the measurement of risks in the evaluation process. The KRTEM is proposed, which can be applied by all organizations, regardless of type and size, interested in evaluating their training interventions considering a particular type of risk connected to knowledge management, i.e. knowledge risks.

3 Methodology

The KRTEM follows a "mixed" approach to evaluation (Borgia, 2023):

- blended, concerning the feeding of the model through data and information of different nature and coming from different sources (Borgia, 2023);
- based on the training stakeholders, i.e. an evaluation that involves all those interested in the training, regardless of the role played in the process (Borgia, 2023);
- systemic, in the sense that the evaluation is considered not an external process but integrated into the organization (Borgia, 2023);
- based on predictions, in the sense that the evaluation takes place before the training, to allow the evaluator to formulate hypotheses on the effectiveness of the training, which are subsequently compared with the actual results, to have an even more accurate picture of the effectiveness and benefits obtained from training (Borgia, 2023). The forerunner of this approach to training evaluation was Basarab (2010), who proposed the predictive evaluation approach, according to which the evaluation process affects not only the new training programme but also the past ones, so that predictions can be made about the value of training to the company by comparing it with past training experiences;
- based on ethical principles, in the sense that the evaluation is in line with ethical principles, as it provides a level dedicated to measuring knowledge risks, potentially very harmful for the entire organization (Borgia, 2023).

The KRTEM was developed by reviewing some of the most well-known and applied training evaluation models, and borrowing from these the levels considered most suitable for effective and efficient evaluation, and in step with the increasingly complex functioning of modern organizations (Borgia, 2023). Table 1 summarizes the KRTEM construction process, representing its formulation in five evaluation levels: 1. Context, 2. Training, 3. Transfer, 4. Convenience, 5. Knowledge risk Management.

Table 1 – KRTEM composition criterion

KRTEM Evaluation Steps	KRTEM Steps' Goals	References
1. Context	Evaluation of the context in which the training takes place to verify whether it supports the success of training activities	Warr, Bird & Rackham, 1970; Tessmer & Richey, 1997
2. Training	Evaluation of training effectiveness in terms of new knowledge and skills acquired following the training intervention	Kirkpatrick. J. D., & Kirpatrick, W. K., 2016
3. Transfer	Evaluation of training effectiveness in terms of transfer to work environment of the knowledge learned and skills acquired through the programme; assessment of changes in trainees' work behavior resulting from training	Kirkpatrick, J. D., & Kirpatrick, W. K., 2016
4. Convenience	Cost-benefit analysis of training, calculation of training ROI	Phillips, 1994
5. Knowledge risk management	Measurement of the knowledge risks to which the training process could be exposed in all its phases, from planning to delivery, to training transfer to the work environment	Jasson & Govender, 2017; Borgia & La Torre, 2022.

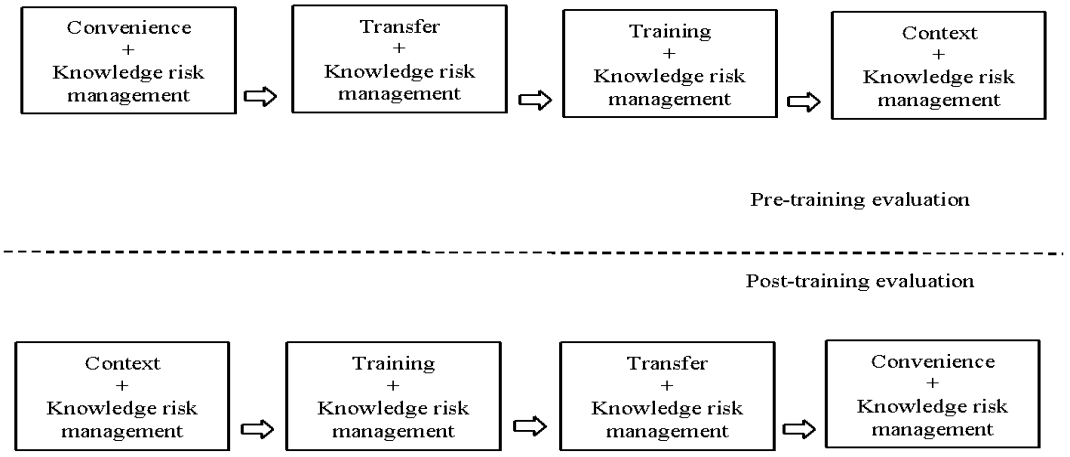
Source: our elaboration from Borgia (2023)

4 Knowledge Risk Training Evaluation Model (KRTEM)

The KRTEM is a training evaluation model that proposes risk measurement in the evaluation process particularly of knowledge risks, since training is a knowledge-based activity, and thus most likely exposed to this category of risks. The structure of the KRTEM includes five steps of evaluation: context, training, transfer, convenience, knowledge risk managemnt, which are carried out, in two different moments, following the reverse order (convenience, transfer, training, context) – in the pre-assessment training – and following the original order – in the post-training evaluation – (Borgia, 2023). These two distinct moments of evaluation should allow to make a pre-evaluation of the training

through an estimation of training expected results (starting from the convenience in terms of investment in training), which evaluators can then compare with the actual results obtained from the post-training evaluation, obtaining a more solid and complete evaluation (Borgia, 2023). The KRTEM also provides that the step dedicated to the management of knowledge risks is transversal to all the other steps of the model: the measurement of these risks takes place at the same time as each assessment step, in order to ensure that these risks are measured with reference to the training process as a whole (Borgia, 2023). Figure 1 below shows a schematic representation of the evaluation process proposed by KRTEM, as well as the relationship between its evaluation steps.

Figure 1 – Training evaluation according to KRTEM



Source: adapted from Borgia (2023, p. 128)

Table 2 also shows a schematization of the KRTEM with particular reference to its evaluation criteria, and the tools that organizations can use if they decide to apply this model for evaluating their training programs.

Table 2 – KRTEM application

KRTEM Steps	Training Evaluation Criteria	Training Evaluation Tools
1. Context	Do orientation, teaching and transfer contexts favour or hinder training?	Questionnaires, checklists. Some examples of possible items: - The classroom environment helped me learn - The course content was easy to understand
2. Training	How much and what knowledge, skills, values and behaviours have been taken from the training? Are such knowledge and skills capable of developing positive attitudes and behaviour positive attitudes and behaviour in the trainee towards of improved job performance?	Questionnaires, interviews. Some examples of possible questions: - What are the main concepts I have learnt from the training programme? - I think it will be useful to apply what I have learnt from the programme in the performance of my work tasks.
3. Transfer	The knowledge and skills acquired from training are transferred to the work environment by improving work performance? Does the transfer of training positively affect work and organisational performance?	Checklists, questionnaires, interviews. Some examples of possible items: - I am able to apply in my work what I have learnt from the training programme - I successfully applied in my work what I learnt from the training programme
4. Convenience	Do the benefits of the training outweigh the costs of its provision?	Cost-benefit analysis and training ROI calculation
5. Knowledge risk management	Is the training environment conducive to the emergence of knowledge risks? Is the training planning conducive to the emergence of knowledge risks? Does the training planning facilitate the occurrence of knowledge risks? Does the delivery of training facilitate the occurrence of knowledge risks? Are the behaviours of those involved in the training due to knowledge risk behaviours?	Checklists, questionnaires, interviews. Some examples of possible items: - I tend to accumulate information in case I might need it - One month after training, I only partially remember the content of the programme

Source: adapted from Borgia (2023, pp. 131-134)

5 Conclusions

The current paper was aimed at presenting the KRTEM, a training evaluation model belonging to the category of hierarchical models organised on evaluation levels/steps, and inspired by the structure of the most well-known and applied training evaluation models proposed, over the years, by scholars and practitioners worldwide. The KRTEM differs from the previous models in that it introduces an

evaluation level specifically dedicated to measuring the possible knowledge risks to which the training process may be exposed at each stage. Knowledge risks are potentially very dangerous risks for organisational training activities, since they concern knowledge management, the core of the training activity itself.

This paper seeks both to contribute to the research strand on training evaluation, by proposing a new model, and to diffuse the characteristics of KRTEM, in order to offer the possibility for human resource management professionals to defend the organisation's investment in training from the threat of knowledge risks. This work is not without limitations, as it essentially concerns the purely theoretical formulation of KRTEM. It is therefore desirable to follow-up on it with a practical application in order to test its effectiveness as a model in its entirety and eventually in very different operational contexts.

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