

## Knowledge Transfer in Training Processes: Towards an Integrative Evaluation Model

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### **Abstract**

*This paper aims to analyze the involved variables in training evaluation through an extensive analysis of the different methodologies or models used in training evaluation and the characterization of all the involved elements during knowledge transfer by training process. It also provides an approach to the solution of evaluation problems through the integration of tools to create custom-made models for each organizational need. 35 training evaluation models and methodologies were identified in the literature. The most popular type of evaluation is the summative evaluation with 60%, followed by the confirmative evaluation with 43%, and formative evaluation with 29%. In combination, 40% of the proposals consider a summative-confirmative evaluation and 26% consider a summative-formative combination. The most popular tool to evaluate training courses is the questionnaire with 57%, followed by interviews with 31%. Additionally, it was found that there are very few integrative training evaluation methodological proposals.*

**Keywords:** *Training evaluation; integrative evaluation model; training courses; evaluation model; evaluation tools; evaluation types; knowledge transfer; summative evaluation; confirmative evaluation; formative evaluation.*

### **1. INTRODUCTION**

One of the main pillars in the search to innovate and create new knowledge is the development of the human resource through training courses. In the past, training courses have been classified as one of the most popular knowledge transfer methods (Brennenraedts et al., 2006; Bekkers and Bodas Freitas 2008; and Arnold et al., 2012). Even though knowledge transfer is a very popular topic and has been studied, there are some gaps to attain a full comprehension. And yet, there is no full understanding of knowledge transfer and how the influencing factors get to affect its results (Zhao and Anand, 2009). Specifically, in the field of training courses, the transfer of knowledge has become a current activity in the planning and operations of all organizations, in which organizations have also invested plenty of money (ATD Research, 2016). Organizations have reached a consensus on the fact that human resource plays a vital role. Organizations invest huge

amounts of money in training subjects in the search for improving their operational indicators (Raji, 2016).

Training courses are very expensive for organizations in terms of time and money. However, most of them just calculate the impact and return of their investment by evaluating learning, without considering performance, even if the intention of a training program is the improvement of organizational performance and not the individual acquisition of knowledge (Griffin, 2012). This is largely because organizations want cost cutting associated with training evaluation, lack of experience, a blind confidence on the training process or the lack of methods and tools for an appropriate training evaluation program (Kumar et al., 2012).

Literature refers to the Four-Level Evaluation Model (Kirkpatrick, 1996) as one of the most commonly used models in training evaluation. However, various studies (Galagan, 2011; Lee-Kelley and Blackman, 2012; and Prasad et al., 2016) show that most of the organizations do not fulfil the four levels that the model refers to. Training evaluation often focuses on the satisfaction of trainees, as a final evaluation tool, which has been strongly criticized in the past by several researchers (Ritzmann et al., 2014; and Prasad et al., 2016). Overall, the authors agree that it is still very complicated to effectively measure the impact of training courses in organizations (Aguinis and Kraiger, 2009; and Hayes et al., 2016). Previous efforts have been made to group different methods of training evaluation trying to improve their process and get to evaluate the achievement of different objectives, often presented as integrated training evaluation methods (Dessinger and Moseley, 2009; Pineda-Herrero et al., 2010; and Griffin, 2012). However, Ritzmann et al. (2014) argued that it is necessary that researchers offer trainers and evaluators some practical, systematical and plausible evaluation methods that can be flexible and do not need to apply all the tools or levels in the methodology, and instead, only select and apply each level or tool that the trainer or evaluator feels necessary based on their organizational objectives. Nevertheless, we have not yet identified any review or article that lists all or most of the training evaluation methodologies that allows to observe, analyze and identify all attributes of each methodology to be able to select and integrate them into new integrated training evaluation methods.

The main objective of this study is to analyze the involved variables in training evaluation through an extensive analysis of the different methodologies used in training evaluation and the characterization of all the involved elements during training; also, to identify all the types of evaluations and tools used to evaluate and quantify learning. This review of the literature aims to contribute to the integration of knowledge in training evaluation and provide an approach to the solution of evaluation problems through the integration of tools and create custom-made models for each organizational need.

This paper is organized as follows: first is presented the related terminology used, which describes concepts related to knowledge transfer, training courses and training evaluation. Subsequently, the importance of evaluation within the transfer of knowledge and the factors or variables that have been previously identified, common tools and different types of evaluation. As the core part of this study, all the methodologies for training evaluation are described and classified in their corresponding evaluation type, their purpose, the appropriate timing for use and tool proposed by author. Finally, an analysis and a discussion are presented, where the authors search to generate strategies to identify the organizational information requirements to integrate the appropriate tools and models to find specific solutions to training evaluation environments relevant to results as impact,

importance, utility, value, acceptancy factor, return of investment and any other variable associated to training evaluation.

## **2. LITERATURE REVIEW**

Below, the related terminology and general concepts utilized in the current research are presented.

### **2.1 Training: A Knowledge Transfer Activity**

Without a doubt, one must talk about training in any highly qualified human resource discussion, mainly because training has the potential to allow trainees to improve their knowledge, skills and abilities (Blume et al., 2010). Some authors use the terms 'knowledge sharing', 'knowledge exchange' and 'knowledge transfer' as synonyms (Agoston et al., 2011), however, for this study, we will understand knowledge transfer as any action by which an individual intends to share or disclose their knowledge (Winkler, 2014). Training is defined as an action to increase the knowledge of an individual to perform better and improve performance (Khanna, 2014). Although training has been previously conceptualized in many ways, all definitions agree that training is a technique used to develop the skills and knowledge of trainees in a particular discipline, which leads to a change of attitude and behavior of participants to a particular direction (Al-ajlouni et al., 2010).

Human resource training and development allow organizations to adapt, innovate, improve and make safer processes and operations (Salas et al., 2012), for example, it has been already proved in fields like medicine in surgery rooms (Rothenberger et al., 2015), aviation (Taylor, 2000) and militia (Pasquier et al., 2016).

A poorly trained workforce can lead to mistakes, injuries or even legal involvement problems, which at the end would turn up to be more costly than training itself (Grossman and Salas, 2011). It is estimated that in the US about \$183 bn is spent every year on causes associated with poor training practices (Grossman and Salas, 2011), meanwhile organizations only spend \$135 bn in training (Salas et al., 2012).

Training is a learning experience seeking to permanently change an individual on his/ her ability to perform an action or job. It involves changing their knowledge, skills and attitude; generally speaking, it seeks to transfer knowledge and skills to a trainee (Purohit, 2015). In short, training can be seen as a tool for knowledge transfer (Winkler, 2014).

### **2.2 Importance of Transferring Knowledge in Training Courses**

A Knowledge transfer has become a current activity in the planning and operations of all organizations, investing large sums of money. In 2015, according to ATD Research (2016), organizations spent in the US an average of \$1,252 per employee in 2015 on training. On the other hand, The Training Magazine in its 2015 edition reports a global expenditure that exceed \$70 bn in training expenditures (Blume et al., 2010; and Raji, 2016), averaging between \$350,000 and almost \$13 mn between the small and the big enterprise. Organizations agree that human resource plays a vital role in every organization, which leads them to invest large sums in order to improve all of their operational indicators (Raji, 2016).

Noe (2010) states that education and training can raise an organization's profit, exceeding by far the costs associated with training. However, Sutarto et al. (2016) argue that training must be designed properly to meet expectations and have good evaluation methods that allow validation of the results. In order to validate training success, it must be ensured that

the knowledge transfer takes place from an educational to an organizational environment, and most importantly, it has to improve performance and productivity (Shenge, 2014). Effectiveness of thorough training has to do with achieving the expected results (Sitzmann and Weinhardt, 2015).

### **2.3 Training evaluation**

Training evaluation has been used in many ways, from the measurement of the direct results of a training course to the usage of acquired knowledge and skills in worksite as a result of training (also called training effectiveness), also it has been used as the assessing of impact generated by training (Blume et al., 2010). Training evaluation seeks to analyze the value of a program for all the stakeholders (Prasad et al., 2016). Training evaluation represents a data-collecting process where effectiveness and benefits are analyzed as their contribution for the improvement of employees and/or organizations (Rahimiæ and Vuk, 2005).

Several authors agree that training evaluation is still complicated (Al-ajlouni et al., 2010; and Masood and Usmani, 2015); the evaluation of any program that aims to improve intellectual capital should tell if the program was appropriate to achieve the organizational objectives and goals that were supposed to be accomplished through training (Al-ajlouni et al., 2010).

There are several motivations to apply a training evaluation method, the main motivations found in the literature are shown in Table 1.

Training evaluation should answer questions related to training such as: How much time does training consume? Could it be shorter? Could training be replaced with work aid? How much does training cost? Was training worth? Who says so? What is the proof of it? More questions can be included in the evaluation process to make it more and more complex (Kirkpatrick and Kirkpatrick, 2009; and Shenge, 2014).

One of the most used models in training evaluation is the Kirkpatrick's (1996) four-level evaluation model. However, it is as yet very difficult for organizations to measure the impact of training effectively (Aguinis and Kraiger, 2009; and Hayes et al., 2016). Galagan (2011) mentioned that in a survey conducted in the US, 91.6% of organizations agreed to use Kirkpatrick's (1996) model for training evaluation, that same survey reveals that only 36.9% concluded all the four levels. Other studies such as the one presented by Prasad et al. (2016) reveal similar results, where satisfaction and learning (most often assessed only by a brief written test) are used as their only evaluation method.

Many organizations only utilize the first level of evaluation model of Kirkpatrick (1967), using a written questionnaire that measures satisfaction (Lee-Kelley and Blackman, 2012). These evaluations have been previously criticized as insufficient and inefficient to evaluate a training course (Holton, 1996; Holton et al., 2000; and Holton and Naquin, 2005). While participants may be very satisfied with training, this does not imply that training was positive for the development of knowledge, skills and competencies and that the previously stated has an organizational impact (Blume et al., 2010). So, it can be intuited that organizations, in most cases, do not even realize that training has been appropriate.

In order to answer all questions raised before, or fulfil the motivations reviewed in the previous paragraphs, there are several types of evaluation, each one oriented to certain aspects. They are briefly described in the next section.

Author	Kirkpatrick and Kirkpatrick (2009)	Griffin (2012)	Kumar et al. (2012)	Prasad et al. (2016)
Motivations to apply a training evaluation method	<ul style="list-style-type: none"> <li>➤ Determine if a program should continue.</li> <li>➤ Determine improvement needs of the program.</li> <li>➤ Ensure learning.</li> <li>➤ Maximize training effects.</li> <li>➤ Align training to organizational goals.</li> <li>➤ Demonstrate the value of knowledge.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Justify the allocation of resources (time, money, personnel, etc.)</li> <li>➤ Identify ways of improving.</li> <li>➤ Assessing how training improves trainee's knowledge and skills.</li> <li>➤ Determine whether training was an appropriate response to organization's needs.</li> <li>➤ Compare cost-benefit between programs.</li> <li>➤ Establish a profile or prior set of knowledge needed to succeed in the program.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Determine whether a program helped on the organizational objectives achievement.</li> <li>➤ Identify program's strengths and weaknesses.</li> <li>➤ Determine cost-benefit ratio.</li> <li>➤ Identify if trainees took advantage of training.</li> <li>➤ Reinforce the main points with trainees.</li> <li>➤ Determine utility of training.</li> <li>➤ Help future marketing of the training program.</li> <li>➤ Establish a background for making decisions.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Identify ways to improve the training program, training process and training contents.</li> <li>➤ Determine if training is aligned with organizational objectives.</li> <li>➤ Know the real value of training.</li> </ul>

Table 1. Main motivations for training evaluation.

### 3. GENERALITIES AND TOOLS OF TRAINING EVALUATION PROGRAMS

Training evaluation can be classified in several ways, however, for this study, they were classified by type of evaluation, timing of application and tools proposed. They are described below.

#### 3.1 Types of evaluation

Zinovieff (2008) describes seven types of evaluation according to their information output. Each of them is described briefly in Table 2.

Type of evaluation	Description	Evaluations included
Formative evaluation	Oriented to obtain information about training itself, its possible results and the validity and acceptance of the forms and methods used in training.	Determine who needs to improve, evaluability of the course, allows the structured conceptualization of the possible results and the evaluation of the implementation and the process.
Summative evaluation	Mainly focused to search for impact and direct effects related to knowledge transfer.	Training results, learning, training impact, cost-benefit ratio, effectiveness of spent resource.
Confirmative evaluation	Seeks to confirm the acquisition of knowledge, skills or competence by trainee and the implementation of them.	Gather, analyze and interpret information about the change of behavior, goals achievement or proof of skills and knowledge acquisition.
Meta-evaluative	It could be defined as the formative evaluation of the evaluation itself. Search for answers about the methods, validity and acceptability of the evaluation.	Assessment of the evaluation process, validation of the evaluation process, outputs and results.
Goal-based evaluation	Evaluates the program's capability to meet established goals.	Fulfillment of program goals, program effectiveness, progress generated by training in goal accomplishment.
Process-based evaluation	Evaluates the training process and allows to understand the operation of the training process, especially if it has changed over time.	Training needs for process compliance, customer needs of the process, ability to perform.
Outcomes-based evaluation	Evaluates the results of training. This evaluation is especially used when sponsors require to make the decision whether to continue or not with the training program.	Effectiveness and efficiency of invested resources.

Table 2. Types of evaluation in training evaluation programs. Adapted from Zinovieff (2008).

### 3.2 Evaluation timing to be applied

Each of the evaluation types usually has certain characteristics about the time or exact timing that the evaluation should be applied. The most common timing moments are described in Table 3.

### 3.3 Tools used in training evaluation

According to several authors (Zinovieff, 2008; and Kumar et al., 2012), several tools have been used and proposed in training evaluation, however, they agree that among the most frequently used and have good acceptance are the questionnaires, interviews, examinations, on-site demonstrations and to a lesser extent: comparison of indicators (before vs. after) or the use of mathematical formulas such as return on investment, training effectiveness and others. Each of them is briefly described in Table 4.

Timing to be applied	Description	Evaluations included
Before training course.	Timing for the “before” state of trainee for future comparison. Commonly applied as a diagnostic, could be either virtually or in-person applied prior the training course or in the first session of the course.	Previous knowledge diagnosis, characterization of participants, definition of expectations, among others.
During the training course.	This timing is used in course development, usually to know if trainees are understanding and learning, and if the expected objectives are being met.	Immediate learning, academic achievement, opportunities for improvement, trainees understanding.
Immediately after the training course.	This timing is often used to apply evaluations that measure immediate impact of training in terms of learning (knowledge, skills and competences), reaction and satisfaction.	Immediate learning, perceived utility, perception of the program, satisfaction, replication of movements, among others.
Between 30 and 90 days after training.	This timing is used when evaluators search for evidence that confirm or ratify trainee’s learning experience.	Comparison of indicators, transfer of knowledge to the work area, impact of knowledge and others.
More than 90 days after training.	In this timing, as in the previous one, the aim is to search for evidence or proof that ratifies or confirms the learning experience, however, in this group evaluators often look for very convincing evidence, based on historical data and reports comparison.	Comparison of indicators, return of investment, knowledge transfer to the workplace, impact of knowledge within organizations return on expectations and others.

Table 3. Training evaluation timing for training programs. Adapted from (Thompson et al., 2006; Zinovieff 2008; Rajeev et al., 2009; Kumar et al., 2012; Lazowski and Hulleman, 2016).

Tool	Description
Questionnaire	Used to obtain information from trainees, the information obtained is based on self-beliefs, perspectives and opinions. It is probably the most popular tool in training evaluation.
Interview	It is used to obtain information in a more personal way.
Exams	Used to evaluate the acquisition of theoretical knowledge.
In-site demonstrations	Consist on the observation of trainees, usually accompanied by a checklist or guide to evaluate specific points.
Comparison of indicators	Consist on selecting and comparing relevant indicators that can be used as a proof or evidence of training impact.
Return of investment	Introduced by Phillips (1996), it focuses on collecting information and calculate the benefits of the course based on profits and their a posteriori comparison with expenditures.

Table 4. Mainly used tools for training evaluation. Adapted from Kumar et al., (2012).

#### 4. IDENTIFICATION AND ANALYSIS OF TRAINING EVALUATION METHODOLOGIES AND MODELS

Based on an extensive review of training evaluation methodologies and models, a summary is presented in Table 5. A wide number of models and methodologies found (new ones) and integrated models and methodologies (combination of one or more previously presented evaluation method, model or methodology) for training evaluation were considered. All of them were classified under three aspects: evaluation type (Zinovieff, 2008), timing for application (Thompson et al., 2006; Zinovieff 2008; Rajeev et al., 2009; Kumar et al., 2012; and Lazowski and Hulleman, 2016) and tools proposed (Phillips, 1996; Zinovieff 2008; and Kumar et al., 2012). Below, each of the column of the Table 5 are briefly described.

- Methodology or Model: This column shows the name which the author refers to their model or methodology.
- Information Obtained: This column refers to the information that the evaluator would get to apply this model or methodology. This column tries to guide the reader to identify the use of each phase of a model or methodology. This should be paired with the information requirement to select the most appropriate one for each situation.
- Evaluation Type: This refers to the type of evaluation that each phase of the model or methodology belongs to.
- Timing for Application: This refers to the timing in which each of the phases is proposed to be applied by the author.
- Tool Proposed: This section describes the tools (if any) that the author proposes to carry out at each phase of model or methodology.

Methodology or model	Information obtained	Evaluation type						Timing for application			Tool proposed									
		Results-based	Process-based	Goal-oriented	Meta	Confirmative	Summative	Formative	Before training	During training	Immediately after training	Between 30 and 90 days after training	More than 90 days after training	Questionnaire	Exams	Interviews	In-site demonstrations	Comparison of indicators	Return of Investment (ROI)	Others
<i>The Four-level evaluation model</i> (Kirkpatrick 1967)	Level 1: Perception of trainees toward training course.						X			X			X	X						
	Level 2: Trainees immediate learning.					X				X			X	X						
	Level 3: Trainee's performance improvement.					X					X				X					
	Level 4: Organizational performance improvement.					X						X			X					
<i>CIRO Model</i> (Warr et al., 1970)	Content/context.						X			X			X							
	Inputs.						X			X			X							
	Reactions.						X			X			X							





	report.																			
<i>Kaufman and Keller Evaluation Model</i> (Kaufman et al., 1995)	Reactions to training.						X			X			X							
	Learning.					X				X			X		X					
	Behavior.					X				X			X					X		
	Organizational results.	X										X	X					X	X	X
	Training social contributions.			X								X	X							X
<i>ROI: The fifth level of evaluation</i> (Phillips 1996)	ROI Calculation					X				X										X
<i>Augmented Four Levels Taxonomy</i> (Alliger et al., 1997)	Trainees reaction (willingness to learn)					X				X			X							
	Judgement on value (usefulness)					X				X			X							
	Immediate knowledge acquired.					X				X			X							
	Retention of knowledge.					X				X			X							
	Demonstration of knowledge (ability to perform).					X				X							X			
	Trainees ability to adopt knowledge.					X						X							X	
	Accounting/ measurable transfer results.					X						X							X	
<i>Stakeholder-based Evaluation</i> (Michalski and Cousins 2000; Michalski and Cousins 2001)	Trainees and stakeholder's perception of training results.	X								X										X
	Training evaluation (importance of training).							X		X			X							
<i>Learning Transfer System Inventory</i> (Holton et al., 2000)	Trainees prior preparation to learn.					X	X			X			X							
	Trainees motivation (willingness).					X	X			X			X							
	Positive and negative thoughts of trainees					X	X			X			X							
	Sources that benefit knowledge transfer (trainee's exposition)						X	X			X			X						
	Sources that benefit the use and application of new knowledge.						X	X			X			X						
	Expectations about training.					X					X			X						
	Identified problems in knowledge transfer analysis.					X					X			X						
<i>Multi-level analysis</i> (O'Connor 2002)	Level 1: Perception.					X				X			X		X					
	Level 2: Immediate learning.					X				X			X		X					
	Level 3: Trainees performance improvement.					X						X			X					



<i>The Kirkpatrick Business Partnership Model</i> (Kirkpatrick and Kirkpatrick 2009)	Level 1: Trainees perception.					X			X			X	X				
	Level 2: Trainees immediate learning.					X			X			X	X				
	Level 3: Improvements in trainee's performance.					X					X		X				
	Level 4: Improvements in organizational performance.					X					X		X				
	Level 5: Return on expectation.	X									X					X	X
<i>Full-Scope Evaluation Model</i> (Dessinger and Moseley 2009)	Formative evaluation.							X		X		X					
	Summative evaluation.							X		X		X					
	Confirmative evaluation.					X				X		X	X	X	X	X	X
	Meta-evaluation.					X						X					
<i>12-Step Outcomes-Based Program Evaluation Model</i> (McNeil 2011)	Expectations (purpose, objectives and goals of the program).							X	X								X
	Evaluation of knowledge, skills and attitude based on Bloom's domains.							X		X		X	X		X		X
	Course feedback.							X		X					X		X
<i>ROI Training Evaluation on Public Sectors</i> (Jayani 2012)	Level 1: Perception.							X		X		X	X				
	Level 2: Immediate learning.							X		X		X	X				
	Level 3: Trainees performance improvement.							X				X		X			
	Level 4: Improvements in organizational performance.							X				X		X			
	Level 5: Return of Investment.							X				X					X
<i>Integration of Biggs' 3P Model and Kirkpatrick's Four Levels Methodology</i> (Draper 2012)	Learning outcomes situational analysis.					X			X			X	X	X			
	Immediate reaction.							X		X		X	X	X			
	Individual learning (short and long term).							X		X	X	X	X	X			
	Changes in behavior.							X			X	X	X	X			
	Return on expectations.	X	X								X	X	X	X		X	X
<i>SOAP-M Model for training and coaching evaluation</i> (Passmore 2012)	Level 1: Individual (learning).							X	X	X		X					
	Level 2: Others (external factors).							X	X	X		X					
	Level 3: Achievements (change in behavior).							X	X	X		X					
	Level 4: Potential (skills projection).	X							X	X		X					
	Level 5: Meta-analysis (analysis of results).							X		X	X		X				
<i>A practitioner friendly and</i>	Pre-learning situation.							X	X			X					
	Learning.	X				X				X		X					



	Behavior					X			X	X							X			
	Team training abstract					X			X								X			
	Trainees relationship					X			X				X							
	Critical moments feedback					X			X				X							
<i>Pre- and post-training evaluation of dental efficacy and activation measures in caretakers of adults with disabilities in South Australia (Pradhan et al., 2016)</i>	Caretakers Activation Measure (CAM) Knowledge					X		X				X		X						
	CAM Skills					X		X				X		X						
	CAM Confidence					X		X				X		X						
	CAM Efficacy (Self-efficacy)					X		X				X		X						
Impact-Based Training Evaluation Model (Sutarto et al., 2016)	Reactions							X						X						
	Learning							X						X	X					
	Behavior					X										X	X			
	Business results					X													X	
	Return of investment					X														X
	Long-term contribution					X										X		X		X

Table 5. Identification of methodologies and models for training evaluation.

The ‘X’ marks in Table 5 show if the model or methodology in row has the respective characteristic shown in the column.

As shown in Table 5, 35 training evaluation models/methodologies were identified in the literature. Slightly, over 30% of them were presented prior to the 21st century, almost 30% were presented during the first decade of the 21st century and about 40% of them were presented in the second decade of the present century, i.e., between 2010 and 2016; which shows that now-a-days training evaluation has become a trend and remains a current topic for organizations and researchers.

Within the methodologies found in the literature, the most popular type of evaluation is the summative evaluation, considered in 60% of the models/methodologies, followed by the confirmatory evaluation considered in 43% of them, and 29% of them consider formative evaluation for their proposals. In combination, 40% of the proposals consider a summative-confirmative evaluation and 26% consider a summative-formative combination. Proposals with a combination of evaluation types have been observed in more recent proposals, which indicate a tendency to integrate robust evaluation programs based on evaluator’s needs.

On the other hand, there are at least nine suggested tools for training evaluation. However, the most used tool among them is the questionnaire with 57%, followed by interviews, which are included in 31% of the models/methodologies.

It is very important to highlight the growing appearance of the ‘integral’ or ‘integrated’ term in recent proposals. Researchers have slowly accepted the necessity of gathering two or more models/methodologies, or even to select one or more of their components to integrate them into a new model to solve specific application problems. Hayes et al. (2016) highlight the value of combining different evaluation methods to achieve a panoramic image of training that allows to make decisions and supports organization’s planning process, also to validate from different perspectives the training process and discourage

putting full faith in a single evaluation method. The summary of models/methodologies found in the literature of the last 50 years shown in Table 5 has been developed in order to serve researchers as a guide and be able to choose which models, components or tools that are considered appropriate by each organization to obtain expected information output which has been previously identified as a need for researchers by Ritzmann et al. (2014).

## 5. DISCUSSION

To date, there is no consensus on an integrative evaluation model for training courses, despite being highlighted as a core part in the search for improving and developing the existing knowledge of society (Park et al., 2016). Griffin (2012) presents a proposal of what an integrated evaluation model should include: Pre-training (characteristics of trainees and organizations), Learning (acquisition of knowledge and skills, program design, content and transfer), Transfer (barriers and facilitators), Impact (direct, indirect, intentional, unintentional) and Costs. Pineda-Herrero et al. (2010) refer to the integration of eight factors for a comprehensive assessment of knowledge transfer in Spain: satisfaction with training, acquired learning, motivation for transfer, perceived self-efficacy, participant responsibility, scope of application, organizational support for transfer and design of transfer. Dessinger and Moseley (2009) on the other hand, talk about a Full-Scope evaluation model that consider at least one formative, summative, confirmative and meta-evaluation.

That is why one of the grouping criteria in Table 5 was the type of evaluation (obtained from Table 2) and tools (obtained from Table 4) that the methodology or model could apply. So that the reader is able to integrate his/her own proposal according to the identified needs in the development of his/her training evaluation program in agreement with the steps proposed by Zinovieff (2008).

According to the analysis, it is considered that an integral methodology proposal should consider at least one formative, one summative, two confirmative and one meta-evaluation tools. Formative evaluation is very important for training improvement and to evaluate all factors involved during training. Summative evaluation allows evaluators to clarify direct results generated by training in terms of learning and change of behavior. The two confirmatory evaluation tools will allow to measure knowledge transfer to workstations. It is advisable to use two different confirmatory evaluation tools, so that if one of them gets complicated to evaluate, either because of lack of time, lack of information, resources or availability, the second tool can provide information of knowledge transfer. Finally, it is recommended to integrate a metaevaluation phase to generate trends, profile and forecast possible training results, in this way, organizations can make smart decisions about who (more suitable trainees), how (face-to-face or virtual, oriented to practice or theory), when (willingness to acquire knowledge, ready to take advantage of knowledge) and where (ideal conditions to deliver training). Making training more efficient for organizations in the search for continuous improvement of human resource.

Regarding Table 5 applicability, using Zinovieff's (2008) 10-step to design a training evaluation program methodology, the program should be observed and determine the reasons why one evaluates. Then one must determine what needs to be known and formulate research questions. It is from this step that Table 5 can be used during the design of the training evaluation program, trying to look for the desired information output in the column identified as 'outputs'.

A practical example of how to use Table 5 as a support to design an integrative training evaluation methodology would be the following: An organization that pretends to know

which employees are the most suitable to take the new training course that will be part of the organizational training program. In addition, the company would want to know what will be the impact of training for workers in the short-term through the acquisition of knowledge and skills, change of behavior in the medium and achievement of organizational goals in the long-term. Finally, the organization is very interested in knowing if the resources invested in this course are being used appropriately and if it should be part of the organizational training program or if it should be improved before its integration into the organizational training program.

For the above, we can identify that the organization needs to: (a) Know the participant's willingness to learn (Noe and Schmitt, 1986; and Alliger et al., 1997) and their judgement on value (Alliger et al., 1997); (b) Knowledge and skill acquisition (Kirkpatrick, 1976); (c) Change of behavior (Wang and Wilcox, 2006); (d) How training impacts goal achievement (Kraiger et al., 2004; and Attia et al., 2005); (e) Know if trainees give value and utility to training (Alliger et al., 1997); and (f) Return on Investment (Phillips, 1996; and Wang et al., 2002). This evaluation program will help the organization formulate appropriate conclusions and use the results to modify or continue with the training course based on tangible evidence.

## 6. CONCLUSION

35 methodologies for training evaluation have been identified, each one of them with their own purposes and set of tools, which are referred to in this study to fulfill the need of giving researchers the possibility to know and select the most appropriate method for each specific situation. As emphasized, it is very important to define at the first instance, what is the main reason to evaluate and what answers one is searching for, since diverse types of evaluation are used in each case. For example, different methodologies and tools are suggested if evaluators want to know who the best candidates for training are, if they want to make the choice to discontinue or not a training program, and if evaluators are looking for evidence that determines whether the knowledge needs for the new production process are covered by the training course. Therefore, it is very important to have clear and precise evaluation objectives.

Likewise, there are very few integrative training evaluation methodological proposals. However, these serve as a practical example to the reader for the tools and methods integration. It is important to keep in mind that the diversification of evaluation methods should avoid repeating the tools. Also, it is important to highlight the fact that an integrative training evaluation methodology will hardly solve 100% of the evaluation needs mainly because of the variation of information requirements or questions made from one environment to another.

As part of future work, we intend to develop a comprehensive training evaluation methodology which will characterize the profile of the ideal participant, evaluate learning and skills, impact, knowledge transfer, achievement of goals associated with training results, return on expectations and meta-evaluation to improve design, methods and content.

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