International Journal of Training and Development 6:4
ISSN 1360-3736

# The relationship between learner utility reactions and predicted learning transfer among trainees

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*Although learner reaction measures are increasingly shown to be insufficient indicators of training effectiveness and impact, they are still highly over-used in practice. New research on transfer of learning is contributing to a better understanding of how reaction measures may relate to important HRD outcomes. This study explored the relationship between learner utility reactions and predictors of learning transfer as operationalised in the Learning Transfer System Inventory. A limited correlation between participant reaction measures and predictors of learning transfer was found. However, the results of this study continue to raise questions about the role and value of reaction measures.*

## Introduction

During the past ten years, human resources professions have enjoyed the fruits of organisations' messages that 'People are our most important asset.' The extent to which actual resources have been invested, however, still warrants many questions. And, with the economy experiencing its current downturn, it is already clear that organisations are shaving every expense that does not promise a return. The challenge has been and continues to be that Human Resource Development (HRD) professionals must better demonstrate strategic (Huselid *et al.*, 2001; Swanson and Holton, 1999) and bottom-line impact (Fitz-Enz, 2000; Phillips, 1997; Swanson, 2000).

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Without such evidence, HRD is guaranteed a lacklustre future with diminishing impact.

In spite of this mounting pressure, reaction measures, or measures of trainee satisfaction, remain one of the most over-used methods of evaluation in the field of HRD today. A recent benchmarking survey completed by the American Society for Training and Development (ASTD) found that 77 per cent of the organisations surveyed collected learner reaction information and 38 per cent measured learning, while only 14 per cent evaluated behaviour change and even fewer (7 per cent) measured results from training (VanBuren, 2001). It seems that many organisations persist in believing that learner reactions are valid and reliable indicators to assess the effectiveness of training and to demonstrate its impact in organisations.

These statistics are alarming because for over 15 years researchers have consistently questioned this very assumption and offered evidence to the contrary. Research has informed us that there is little correlation between reaction and learning, and even less between reaction and performance (Alliger *et al.*, 1997; Alliger and Janak, 1989; Dixon, 1990; Noe and Schmitt, 1986; Warr and Bunce, 1995).

In addition, Kirkpatrick's (1994) evaluation model which advocates evaluating interventions at four levels – reaction, learning, behaviour change, and results – has been increasingly questioned and/or criticised (Holton, 1996; Kaufman and Keller, 1994; Phillips and Phillips, 2002; Swanson and Holton, 1999) as a primary typology for operationalising evaluation. The consensus among many in HRD and Performance Improvement (PI) (Holton, 1996; Preskill and Russ-Eft, 2000; Robertson, 2002; Russ-Eft and Preskill, 2001) is that 'evaluation as currently conceptualized, practiced, and researched, is not sufficient for answering many of the questions trainers and others have about the effectiveness of organizations' training and development efforts' (Preskill, 1997: 53).

One glaring shortcoming of the current conceptualisation of evaluation is that it neglects important aspects that influence outcomes of learning, performance and organisational results (Holton, 1996). Without this kind of pertinent information, HRD professionals will continue to narrowly understand training evaluation and continue to make costly decisions based on only reaction-level information. Our aim with this research was to expand notions of training criteria and evaluation by exploring the relation between learner utility reactions and predictors of learning transfer.

## Summary of the literature

Two areas of literature are particularly relevant to this research. These are (a) reaction measures in the context of training evaluation; and (b) transfer of learning. Both are briefly reviewed below.

### Reaction measures

Discussion about the insufficiency of reaction measures has been prevalent in the literature since the late 1980s. Noe and Schmitt (1986) determined that trainee satisfaction was not related to learning, and learning was not related to behaviour change. Dixon (1990) found no significant relationship between trainee perceptions of job relevance, amount learned, enjoyment, or instructor skill and subjects' post-test scores. Warr and Bunce (1995) determined that there was no association between reported enjoyment and learning scores. Strong corroboration of these findings is provided in a meta-analytic study conducted by Alliger *et al.* (1997) in which an analysis of 34 studies containing 115 correlation coefficients yielded only a weak association between reactions of any type and immediate learning. Alliger *et al.* concluded that 'reaction measures cannot be used as surrogates of other measures' (ibid.: 353).

Even the most recent literature continues to expose the insufficiency of reaction

measures as they are currently designed. The tenor of recent discussion has turned to the critique of reaction measures themselves. Morgan and Casper (2000) assert that many of the reaction measures used in past studies were poorly designed and unreliable, and call for a multi-dimensional approach to evaluation measures. Two notable studies seem to support Morgan and Casper's assertion by beginning to experiment with more advanced and distinctive evaluation measures. Alliger *et al.* (1997) showed a modest relationship between reactions, learning and transfer of learning when they differentiated between affective reactions (enjoying training) and utility reactions (training's perceived usefulness). Warr *et al.* (1999) also used a multi-dimensional reaction measure that differentiated between enjoyment of training, perceptions of usefulness and perceived difficulty. When they made these kinds of differentiators, they found evidence that reactions could be correlated to learning and good learning outcomes. However, and most importantly, even in this study they confirmed once again that there was no significant relationship between reactions and behaviour change.

It is an exciting time in the field as we continue to tackle reaction measures. It is clear that reaction measures cannot be viewed as surrogate measures for other valued outcomes such as learning and results (Swanson and Holton, 1999). However, the work of Morgan and Casper (2000) is an important step towards refining reaction measures and discovering whether they have any relation to other outcomes that we should care more about. While we seek to better understand reaction measures, we must also help to put (and keep) them in their place.

## Transfer of learning

Although there are multiple definitions of transfer of learning, it is generally agreed that transfer involves the application, generalisability, and maintenance of new knowledge and skills (Ford and Weissbein, 1997). It also increasingly understood that transfer involves a system of influences. Baldwin and Ford (1988) were one of the first researchers to introduce a model which proposed three sets of factors related to transfer of learning: (a) trainee characteristics, including ability, personality and motivation; (b) training design, including a strong transfer design and appropriate content; and (c) the work environment, including support and opportunity to use.

Since Baldwin and Ford's (1998) review of the literature, considerable progress has been made in identifying specific factors that affect transfer, especially as related to understanding work environment factors (Awoniyi *et al.*, 2002; Cromwell and Kolb, 2002; Gumuseli and Ergin, 2002; Kontoghiorghes, 2001; Lim and Johnson, 2002; Roullier and Goldstein, 1993; Tracey *et al.*, 1995). Much of the recent attention on issues of transfer of learning has focused on how work environment factors affect the transfer of learning through a transfer climate, which is seen as a mediating variable in the relationship between the organisational context and an individual's job attitudes and work behaviour. Thus, even when learning occurs in training, it is increasingly clear that the transfer climate may either support or inhibit application of learning on the job (Holton *et al.*, 2001; Mathieu *et al.*, 1992). Several studies have established that the transfer climate can significantly affect an individual's ability and motivation to transfer learning to job performance (Huczynski and Lewis, 1980; Roullier and Goldstein, 1993; Tracey *et al.*, 1995; Xiao, 1996).

Many authors support the importance of transfer climate, some stating that it may even be as important as training itself (Roullier and Goldstein, 1993). However, there is still no clear consensus on the nomological network of factors affecting transfer of learning in the workplace. Transfer climate is but one set of factors that influences transfer, though the term is sometimes incorrectly used to refer to the entire set of influences. Other influences on transfer include training design, personal characteristics, opportunity to use training, and motivational influences. We prefer the term *transfer system*, which we define as all relevant factors in the person, the training programme, and the organisation that influence transfer of learning to actual job performance. Thus, the transfer system is a broader construct than transfer climate

 

but includes all factors traditionally referred to as the transfer climate. For example, the validity of the training content is part of the transfer system but is not a climate construct. Transfer can only be completely understood and predicted by examining the entire system of influences.

The Learning Transfer System Inventory (LTSI) has been developed to operationalise the learning transfer system and to develop a valid and generalisable set of transfer system scales (Holton *et al.*, 1997; Holton *et al.*, 2000). The instrument's theoretical framework (see Figure 1) is derived from Holton's (1996) HRD Research and Evaluation Model. It follows Noe and Schmitt's (1986) macrostructure that hypothesises that HRD outcomes are a function of ability, motivation, and environmental influences at three outcome levels: learning, individual performance, and organisational performance. Holton's framework also includes important constructs that influence each of these factors. Figure 1 shows how the complete set of transfer system factors fit in the model. Note that this figure is a subset of the larger model and only includes elements affecting transfer of learning to individual performance. The full model includes constructs for learning outcomes and organisational performance outcomes as well. This conceptual framework of factors affecting transfer of learning provides a unique way to further understand participant reactions and how they relate to outcomes of learning, individual performance, and organisational performance.

## Research questions

The aim of this study was to explore the relationship between learner utility reactions and the predicted learning transfer among trainees. Specifically, there were two research questions:

1. How are learner utility reactions associated with ratings of predicted learning transfer?

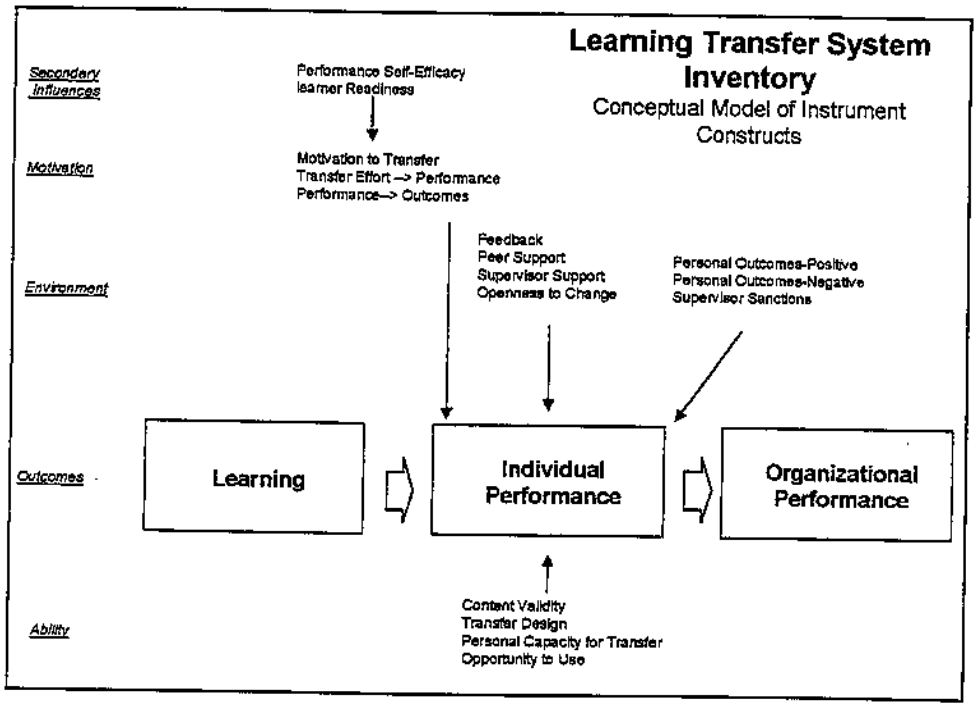


*Figure 1: Learning Transfer System Inventory: conceptual model*

 

2. What percentage of the variance in motivation to transfer learning is explained by the utility reaction ratings of trainees?

## Method

The following section introduces the instrumentation and sample used for this study. In addition, the methods used for data collection and analysis are also explained.

### Instrumentation

Participants were asked to complete the LTSI at the end of training programmes they attended. This construct-validated instrument (Holton *et al.*, 2000), consists of a pool of 69 items designed to measure 16 factors affecting transfer of learning. Eleven of the constructs represent factors affecting a specific training programme, while five are classified as general factors because they are expected to affect all training programmes. Scales developed to measure these 16 constructs yielded exceptionally clean loadings and interpretable factors. Reliabilities were acceptable on all 16 scales, with only three scales having reliabilities below .70. A convergent and divergent validity study showed that most of the constructs had only low correlations with other related variables (Bookter, 1999) and it has recently been validated in a research study in Thailand (Yamnill and McLean, 2002). It is one of the most robust transfer system assessment instruments developed.

At the same time, participants were also asked to complete a five-item reaction scale designed to measure learners' reactions to the training programme. The items on this scale addressed primarily utility reactions. Utility reaction measures are an 'attempt to ascertain the perceived utility value, or usefulness, of training for subsequent job performance' while affective reactions consist of items that explore participant satisfaction or liking of the course (Alliger *et al.*, 1997: 344). Alliger *et al.*'s research suggests that learner utility reactions are more closely associated with transfer of learning than affective reactions. Five reaction items from a pool of items commonly applied to evaluate organisational training programmes were selected. These items were:

- My time was well spent.
- The session objectives were met.
- I would recommend this programme to others in my organisation.
- I learned something I can apply immediately to my work.
- The course provided me with new ways of thinking about my job.

These items were chosen because previous research has shown them to be highly reliable, internally consistent, and effective predictors of other reaction measures (Wilson Learning Corporation, 1995).

Data from the utility reaction items, combined with data measuring participants' perceptions of the transfer system, is meant to provide additional evidence about the role of participant reaction information in ascertaining the potential effectiveness of training interventions.

### Sample

The LTSI was administered to 1,616 people in a wide variety of organisations and training programmes (see Table 1). Questionnaires were administered to respondents at the conclusion of a training programme. Completion of the survey was voluntary. Because responses were anonymous, it was not possible to track and compare relevant characteristics of non-respondents with individuals who completed the questionnaire.

The sample was deliberately chosen to be as heterogeneous as possible. It included respondents from a variety of industries including shipping, power utilities,

 

*Table 1: Selected demographics*

| Organisation type | *n* | % | Training type | *n* | % |
|---|---|---|---|---|---|
| Government | 676 | 41.8 | Technical Skills | 544 | 33.7 |
| State (175) | | | Sales/Cust Serv | 434 | 26.9 |
| Local (501) | | | Volunteer Mgt. | 192 | 11.9 |
| For Profit Organisation | 432 | 26.7 | Leadership/Mgt. | 175 | 10.8 |
| Non-Profit Organisation | 192 | 11.9 | Professional Skills | 80 | 5.0 |
| Public Training Classes (mostly for-profit) | 316 | 19.6 | Supervisory Skills | 67 | 4.1 |
| | | | Clerical | 62 | 3.8 |
| | | | Communication | 44 | 2.7 |
| | | | Computer | 18 | 1.1 |
| TOTAL | 1616 | | TOTAL | 1616 | |

computer/precision manufacturing, insurance, chemical companies, industrial tool/construction, non-profit organisations, and municipal and state governments. The municipal and state government classes were offered by a central training organisation so the classes included representatives from a wide variety of agencies and functions.

A wide range of employees attended the various training programmes. These included secretaries, manufacturing operators, technicians, engineers, managers, professionals, sales people, and law enforcement personnel. The training programmes covered a wide variety of topics including sales, safety, volunteer management, project management, computer and technical skills, quality science, emergency medicine education, and various classes related to leadership, mid-management, and supervision.

### Analysis

Pearson product-moment correlations were used to examine the association between participant utility reactions and predictors of learning transfer (research question 1). This allowed for an exploration of the linear association between the utility reaction scale and each of the 16 constructs measured by the LTSI.

For research question 2, we examined participant utility reactions within the context of other transfer of learning factors by determining if participant utility reactions added any predictive power after other transfer of learning factors was taken into consideration in predicting Motivation to Transfer. This is an appropriate test in that participant utility reactions are the most general, and therefore, the least useful in diagnosing barriers to transfer. The test was conducted by using a forced entry method. The LTSI factors were all entered into the regression equation prior to the entry of participant utility reactions. This allowed us to determine if the participants' utility reactions can add to the multiple-R after other, more specific transfer of learning factors were already accounted for.

## Results

The results for each of the research questions are reported individually in the following section. A discussion of the results follows.

*Table 2: Correlations between participant utility reactions and transfer of learning factors*

| | Participant utility reactions | Sig. |
|---|---|---|
| Transfer Design | .619 | ** |
| Motivation to Transfer | .554 | ** |
| Transfer Effort | .480 | ** |
| Perceived Content Validity | .456 | ** |
| Performance Self-Efficacy | .358 | ** |
| Opportunity to Use Learning | .349 | ** |
| Outcomes Expectations | .303 | ** |
| Peer Support | .277 | ** |
| Feedback | .260 | ** |
| Personal Capacity for Transfer | .211 | ** |
| Supervisor Manager Support | .211 | ** |
| Learner Readiness | .167 | ** |
| Personal Outcomes – Positive | .121 | ** |
| Personal Outcomes – Negative | −.091 | ** |
| Resistance/Openness to Change | −.115 | ** |
| Manager Sanctions | −.156 | ** |

Note ** = $p < .001$

**Research question 1: How are learners' utility reactions associated with ratings of predicted learning transfer?**

Table 2 shows the Pearson product-moment correlations between the participant utility reactions and the 16 LTSI factors. All correlations were significantly different from zero ($p < .001$ for all correlations) and ranged from a high of $r = .619$ (Transfer Design) to a low of $r = -.156$ (Manager Sanctions).

The strongest correlations appeared to be with the Motivational and Ability factors of the transfer system (see Figure 1). All the Environmental factors were in the lower half of the correlation set. Among the Ability factors, the strongest correlations were with Transfer Design ($r = .619$), and Content Validity ($r = .456$). Among the Motivational factors, the strongest correlations included Motivation to Transfer ($r = .554$), Transfer Effort-Performance Expectations ($r = .480$), and Performance Self-Efficacy ($r = .358$).

**Research question 2: What percentage of the variance in motivation to transfer learning is explained by the utility reaction ratings of trainees?**

A forced entry multiple regression procedure was used to test the second research question. Participant utility reactions were forced to enter the predictive equation last, after all of the variability associated with the transfer of learning constructs was accounted for. The results of this analysis are presented in Table 3. Results indicate

*Table 3: Multiple-regression results of transfer climate factors predicting participant utility reactions*

| | R | Adjusted $R^2$ | F |
|---|---|---|---|
| Transfer of Learning Factors | .641 | .405 | 76.98* |
| Participant Utility Reactions | .679 | .460 | 87.88* |

Note * = $p < .001$.

 

that participant utility reactions had a small, but significant impact on the ability to predict Motivation to Transfer. Entry of participant utility reactions raised the multiple-R from R = .641 (without participant utility reactions) to R = .679 ($F = 87.88$, $p < .001$).

Addition of participant utility reactions to the regression equation increased the amount of variability accounted for by .038. Table 4 shows the beta-weights for each factor. Step 1 results show the standardised beta coefficients of the LTSI factors before entry of participant utility reactions. Step 2 results show the beta coefficients after the entry of participant utility reactions.

Despite being the final factor entered, participant utility reactions had the strongest beta of all factors entered into the equation (beta = .306, $t = 11.92$, $p < .01$). In addition, the entry of participant utility reactions resulted in Transfer Design being eliminated as a significant contributor to the regression analysis. The standardised beta for Transfer Design was reduced from .148 ($t = 5.65$, $p < .01$) to .023 ($t = .853$, ns). This is not surprising given the strong correlation between Transfer Design and participant utility reactions shown in Table 2 and suggests a great deal of shared variance between participant utility reactions and Transfer Design.

## Discussion

Entering the utility reactions last into the regression equation provided an opportunity to assess their ability to explain any unique variance in motivation to transfer above and beyond that explained by the other variables examined in the study.

*Table 4: Factor betas from multiple-regression of transfer climate factors predicting motivation to transfer*

| | Step 1 Results Standardised beta | t | Step 2 Results Standardised beta | t |
|---|---|---|---|---|
| Learner Readiness | .010 | 0.47 | .013 | 0.64 |
| Personal Outcomes – Positive | .224 | 9.49* | .202 | 8.91** |
| Personal Outcomes – Negative | .105 | 4.82** | .062 | 2.91** |
| Peer Support | .099 | 3.92** | .096 | 3.97** |
| Supervisor Manager Support | .046 | 2.02* | .045 | 2.09* |
| Manager Sanctions | .005 | 0.219 | .001 | 0.03 |
| Perceived Content Validity | .025 | 4.19** | .069 | 2.66** |
| Transfer Design | .148 | 5.65** | .023 | 0.85 |
| Opportunity to Use Learning | .008 | 0.346 | .004 | 0.17 |
| Transfer Effort | .254 | 10.01** | .209 | 8.48** |
| Outcomes Expectations | .113 | 4.10** | .085 | 3.21** |
| Resistance/Openness to Change | .112 | 4.61** | .082 | 3.50** |
| Performance Self-Efficacy | .082 | 3.51** | .057 | 2.55* |
| Feedback | .007 | 0.29 | .009 | 0.36 |
| Participant/Utility Reactions | NA | NA | .306 | 11.92** |

*Notes:* ** = $p < .01$, * = $p < .05$
Factors excluded from equation: personal capacity for transfer

 

Despite this, participant utility reactions still contributed to predicting Motivation to Transfer. While the increase in the multiple-R was relatively small, it was an increase in the predictive power of the model. It should be noted that the large sample size made for a rather robust analysis with sufficient statistical power to detect even small effects. Perhaps if this study were replicated on a smaller sample, participant utility reactions might not contribute significantly to the regression equation.

Despite the limitations, these results raise two critical issues. First, what could participant utility reactions contribute that is not accounted for in the other transfer of learning constructs? The results, while not providing direct evidence, hint at a possible answer. Although this study has no way of causally connecting positive reactions to increased motivation to transfer, the correlational analysis does indicate that participant reactions are more closely associated with Ability and Motivational constructs (including secondary influences) than with the Environmental constructs. Ability and Motivation are largely antecedent constructs, representing what the participant and the programme bring to the learning process.

In contrast, perceptions of the Environment constructs, while formed earlier, are largely directly experienced *after* a specific training experience. It may be that the only real value of learner utility reactions is their association with antecedent constructs associated with transfer of learning (i.e., Ability and Motivation). Reaction measures may simply tell us more about the learner and what he/she brings to the process than about the actual capacity to transfer new learning into behaviour change. This is consistent with a recent study that found correlations between reactions and learning (which is very individual-focused), but not with behaviour change which is impacted more by other, post-training factors related to the transfer climate/system (Warr *et al.*, 1999). Further research might help clarify this and ultimately strengthen HRD's understanding of evaluation and transfer.

However, it should also be noted that the correlation analysis does suggest that there is a great deal of shared variance between participant utility reactions and all the LTSI factors. It may be that participant utility reactions operate as a kind of summary judgement, particularly for the Ability factors. Thus, while somewhat predictive of transfer factors, as a summary judgement, utility reactions would have limited value in diagnosing problems with learning transfer (Holton *et al.*, 2000).

The second issue raised by this analysis is the value of participant utility reactions given their small contribution to the prediction of motivation to transfer. Participant utility reactions tend to be broad, vague, and therefore, not very useful measures in identifying and diagnosing the causes of transfer (or lack thereof) (Morgan and Casper, 2000). Their relatively small contribution to the overall predictive power of transfer motivation suggests that utility reaction measures serve little purpose in the analysis of learning outcomes. While participant utility reactions may appear to be a simple substitute for the general characteristics of Ability and Motivational constructs, their usefulness is limited in predicting whether or not learning will actually transfer to the workplace or in determining facilitators and barriers to transfer.

Finally, this analysis showed the degree to which participant utility reactions contributed to predicting motivation to transfer learning, not actual performance outcomes. Given previous research cited above, we would expect participant utility reactions to have even less of an impact on actual performance. While we cannot assess the impact of utility reactions on learning in this analysis, these results clearly suggest that they are unlikely to have much, if any, impact on actual transfer of learning to on-the-job application.

## Implications

This research contributes additional evidence that speaks to the usefulness of utility reactions, given knowledge of other predictors of learning transfer and HRD outcomes. This study supports the position that reaction measures have limited use in evaluating the outcomes of training and development, perhaps serving only as some indication of participants' antecedent ability and motivation. Despite their wide-

 

spread use, participant reactions do not seem to contribute greatly to predicting transfer of learning nor do they seem to predict actual performance improvement. This study also demonstrates that, if reaction measures are to be used at all, utility reactions may be of greater value in evaluating outcomes than traditional affective reactions. Certainly much more research is needed to confirm this.

The evidence provided here also helps us to better understand what is involved in the transfer of learning process, thus, helping HRD professionals channel resources towards those things that can actually ameliorate the effectiveness of an organisation's performance improvement efforts. In addition, the significant contribution of utility reaction measures to predicting motivation to transfer, even after all other measures of transfer climate have been accounted for, suggests that some, untapped aspect of the transfer system exists. Future research should focus on continuing to account for the transfer system by exploring these variables.

It is also hoped that this research will further inform HRD professionals in their use of various frameworks for categorising training criteria as well as provide added theoretical undergirding for the growing movement (Bae and Jacobs, 2001; Preskill and Russ-Eft, 2000; Robertson, 2002) towards new approaches to training evaluation.

## References


Alliger, G. M. and Janak, E. A. (1989), 'Kirkpatrick's Levels of Training Criteria: Thirty Years Later', *Personnel Psychology*, 42, 331–40.

Alliger, G. M., Tannenbaum, S.I., Bennett, W., Traver, H. and Shotland, A. (1997), 'A Meta-Analysis of the Relations among Training Criteria', *Personnel Psychology*, 50, 341–58.

Awoniyi E. A., Griego, O. V. and Morgan, G. A. (2002), 'Person-environment Fit and Transfer of Training', *International Journal of Training and Development*, 6, 25–35.

Bae, E. and Jacobs, R. L. (2001), 'Three Perspectives of Training Evaluation Based on Organizational Needs', in O. Aliaga (ed.), *Proceedings of the 2001 Academy of Human Resource Development Annual Conference* (Baton Rouge, LA: Academy of Human Resource Development).

Baldwin, T. T. and Ford, J. K. (1988), 'Transfer of Training: A Review and Directions for Future Research', *Personnel Psychology*, 41, 63–105.

Bookter, A. (1999), 'Convergent and Divergent Validity Study of the Learning Transfer Questionnaire', unpublished dissertation, Louisiana State University.

Cromwell, S. E. and Kolb, J. A. (2002), 'The Effect of Organizational Support, Management Support, and Peer Support on Transfer of Training', in T. Egan and S. A. Lynham (eds), *Proceedings of the 2002 Academy of Human Resource Development Annual Conference* (Bowling Green, OH: Academy of Human Resource Development).

Dixon, N. M. (1990), 'The Relationship Between Trainee Responses on Participation Reaction Forms and Posttest Scores', *Human Resource Development Quarterly*, 1, 129–37.

Fitz-Enz, J. (2000), *The ROI of Human Capital: Measuring the Economic Value of Employee Performance* (New York: AMACOM).

Ford, J. K. and Weissbein, D. A. (1997), 'Transfer of Training: An Update Review and Analysis', *Performance Improvement Quarterly*, 10, 22–41.

Gumuseli A. I. and Ergin, B. (2002), 'The Manager's Role in Enhancing the Transfer of Training: A Turkish Case Study', *International Journal of Training and Development*, 6, 80–97.

Holton, E. F. (1996), 'The Flawed Four-Level Evaluation Model', *Human Resource Development Quarterly*, 7, 5–21.

Holton, E., F., Bates, R. A. and Ruona, W. E. A. (2000), 'Development of a Generalized Learning Transfer System Inventory', *Human Resource Development Quarterly*, 11, 333–60.

Holton, E. F., Bates, R. A., Seyler, D. and Carvalho, M. (1997), 'Toward Construct Validation of a Transfer Climate Instrument', *Human Resource Development Quarterly*, 8, 95–113.

Holton, E. F., Chen, H. and Naquin, S. S. (2001), 'An Examination of Learning Transfer System Characteristics across Organisational Settings', in O. Aliaga (ed.), *Proceedings of the 2001 Academy of Human Resource Development Annual Conference* (Baton Rouge, LA: Academy of Human Resource Development).

Huczynski, A. A. and Lewis, J. W. (1980), 'An Empirical Study into the Learning Transfer Process in Management Training', *The Journal of Management Studies*, 17, 227–40.

Huselid, M. A., Becker, B. and Ulrich, D. (2001), *The HR Scorecard: Linking People, Strategy, and Performance* (Boston, MA: Harvard Business School Publishing).

Kaufman, R. and Keller. J. M. (1994), 'Levels of Evaluation: Beyond Kirkpatrick', *Human Resource Development Quarterly*, 5, 371–80.


 

Kirkpatrick, D. L. (1994), *Evaluating Training Programs: The Four Levels* (San Francisco: Berrett-Koehler).
Kontoghiorghes, C. (2001), 'Factors Affecting Training Effectiveness in the Context of the Introduction of New Technology: A US Case Study', *International Journal of Training and Development*, 5, 248–60.
Kupritz, V. W. and Reddy, T. F. (2002), 'The Impact of Workplace Design on Training Transfer', in T. Egan and S. A. Lynham (eds), *Proceedings of the 2002 Academy of Human Resource Development Annual Conference* (Bowling Green, OH: Academy of Human Resource Development).
Lim, D. H. and Johnson, S. D. (2002), 'Trainee Perceptions of Factors that Influence Learning Transfer', *International Journal of Training and Development*, 6, 36–48.
Mathieu, J E., Tannenbaum, S. I. and Salas, E. (1992), 'Influences of Individual and Situational Characteristics on Measures of Training Effectiveness', *Academy of Management Journal*, 35, 882–47.
Morgan, R. B. and Casper, W. J. (2000), 'Examining the Factor Structure of Participant Reactions to Training: A Multidimensional Approach', *Human Resource Development Quarterly*, 11, 301–17.
Noe, R. A. and Schmitt, N. (1986), 'The Influence of Trainee Attitudes on Training Effectiveness: Test of a Model', *Personnel Psychology*, 39, 497–523.
Phillips, J. J. (1995), *Handbook of Training Evaluation and Measurement Methods* 2nd edn (Houston, TX: Gulf).
Phillips, J. J. (1997), *Return on Investment in Training and Performance Improvement Programs: A Step-By-Step Manual for Calculating the Financial Return on Investment* (Woburn, MA: Butterworth-Heinemann).
Phillips, P. P. and Phillips, J. J. (2002), 'Symposium on the Evaluation of Training: Editorial', *International Journal of Training and Development*, 5, 240–7.
Preskill, H. (1997), 'HRD Evaluation as the Catalyst for Organizational Learning', in E. F. Holton, III (ed.), *Proceedings of the Academy of Human Resource Development* (Baton Rouge, LA: AHRD).
Preskill, H. and Russ-Eft, D. (2000), 'A Systems Model for Evaluating Learning and Performance', in K. P. Kuchinke (ed.), *Proceedings of the 2000 Academy of Human Resource Development Annual Conference* (Baton Rouge, LA: Academy of Human Resource Development).
Robertson, K. (2002), 'Theory-driven Evaluation', in T. Egan and S. A. Lynham (eds), *Proceedings of the 2002 Academy of Human Resource Development Annual Conference* (Bowling Green, OH: Academy of Human Resource Development).
Roullier, J. Z. and Goldstein, I. L. (1993), 'The Relationship between Organizational Transfer Climate and Positive Transfer of Training', *Human Resource Development Quarterly*, 4, 377–90.
Russ-Eft, D. and Preskill, H. (2001), *Evaluation in Organizations: A Systematic Approach to Enhancing Learning, Performance, and Change* (Cambridge, MA: Perseus).
Swanson, R. A. (2000), 'Economic Analysis of Human Resource Development: Update on the Theory and Practice', in K. P. Kuchinke (ed.), *Proceedings of the 2000 Academy of Human Resource Development Annual Conference* (Baton Rouge, LA: Academy of Human Resource Development).
Swanson, R. A. and Holton, E. F. (1999), *Results: How to Assess Performance, Learning, and Perceptions in Organizations* (San Francisco: Berrett-Koehler).
Tannenbaum, S. I. and Yukl, G. (1992), 'Training and Development in Work Organizations', *Annual Review of Psychology*, 43, 399–441.
Tracey, J. B., Tannenbaum, S. I. and Kavanaugh, M. J. (1995), 'Applying Trained Skills on the Job: The Importance of the Work Environment', *Journal of Applied Psychology*, 80, 239–52.
VanBuren, M.E. (2001), *The 2001 ASTD State of the Industry Report* (Alexandria, VA: ASTD).
Warr, P., Allan, C. and Birdi, K. (1999), 'Predicting Three Levels of Training Outcome', *Journal of Occupational and Organizational Psychology*, 72, 351–75.
Warr, P. and Bunce, D. (1995), 'Trainee Characteristics and Outcomes of Open Learning', *Personnel Psychology*, 48, 347–75.
Wilson Learning Corporation. (1995), *Program Evaluation System Statistical Analysis* (Minneapolis: Author).
Xiao, J. (1996), 'The Relationship Between Organizational Factors and the Transfer of Training in the Electronics Industry in Shenzhen, China', *Human Resource Development Quarterly*, 7, 55–86.
Yamnill, S. and McLean, G. (2002), 'Factors Affecting Transfer in Thailand,' in T. Egan and S. A. Lynham (eds), *Proceedings of the 2002 Academy of Human Resource Development Annual Conference* (Bowling Green, OH: Academy of Human Resource Development).

 