

PRESENTING VALID AND RELIABLE TOOLS TO MEASURE THE EFFECTIVENESS OF A FRONT LINE MANAGEMENT TRAINING PROGRAMME

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Abstract

In order to demonstrate the effectiveness of planned learning from a training intervention, in terms of organizational performance, the systematic evaluation of the transfer of training is critical. The study followed a retrospective, longitudinal trend design with two groups of respondents and utilized the training evaluation measurement tools that the researchers developed. The key results of the study indicated the research's value to the human resource development paradigm as research-based measurement tools, with known psychometric properties, were developed. These measurement tools could be used by training and development practitioners to effectively evaluate the impact made by a front line management training programme on the effectiveness of the organization.

Keywords: Transfer of Training, Measurement Tools, Training Evaluation

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In 1985 Porter identified human resource management as a key element in an organization's value chain that will play a pivotal role in assisting an organization to gain competitive advantage. Khandekar and Sharma (2005) found that human resource capabilities are positively correlated to organizational performance and is a significant predictor of sustainable competitive advantage (Gourlay, 2001; Salas & Cannon-Bowers, 2001). Training has been identified as one of the methods to develop human resources to leverage business performance towards organizational effectiveness (Gilley & Maycunich, 2000; Gilley, Egglund & Gilley, 2002; Noe, 2007) as it has the potential to increase sales and productivity (Birdi, 2005; Brooks & Nafukho, 2006; Desimone, Werner & Harris, 2002; Rowold, 2008) enhance quality and market share (Verdonschot, 2006; Yadapadithaya & Stewart, 2003) and reduce turnover, absence and conflict (Daft, 2008; Lepine, Piccolo, Jackson, Mathieu & Saul, 2008; Salas & Cannon-Bowers, 2000). However, training has been criticized as being a fad or too expensive (Salas & Cannon-Bowers, 2000; Kraiger, McLinden & Casper, 2004), and there is growing skepticism about the practice and theoretical framework of linking training to organizational performance (Nguyen, Truong & Buyens, 2010; Wright & Geroy, 2001). Hence, as organizations find themselves under

increasing pressure to perform, human resource development practitioners are faced with the challenge of making the linkages between learning and organizational performance explicit in the minds of the organization's members by showing which human resource development interventions provide real value for the strategic direction of the organization (Yorks, 2005) as research indicates that not all human resource development programmes are strategically planned and aligned with organizational goals and objectives (Abdullah, 2009; Rothwell & Sullivan, 2005).

Kirkpatrick, cited in Yamnill and McLean (2005), noted that the fundamental criterion for evaluating training effectiveness is the transfer of training. Transfer of training, according to Holton, Bates, Seyler and Cavalho, cited in Kim (2004), is the extent to which trainees apply the knowledge, skills, behaviours and attitudes they gained in training to their jobs.

Thus, in order to demonstrate the effectiveness of planned learning from a training intervention, in terms of organizational performance, the systematic evaluation of transfer of training (that is, proving with data that training is adding value) is critical (Jamrog & Overholt, 2004; Wang & Wang, 2005). Furthermore, Swanson and Holton, cited in Kim (2004), postulated that the transfer of training is a

corporate process in which various stakeholders involved in training programmes, ranging from senior management to the trainees' peers, participate. Additionally, whilst it has been documented that training evaluation in general is difficult (McLean, 2005) and that management training is more difficult to assess (Galvin, 1983), training evaluation continues to be vital in demonstrating the value of human resource development interventions in ensuring organizational effectiveness (Wang & Wang, 2005). The success of such an evaluation process hinges on the level of sophistication of the data collection instruments as well as the psychometric properties of these tools.

The current research, thus, focuses on the development of training evaluation tools to effectively (by developing an inclusive 360 degree stakeholder-based research design) evaluate the extent to which front line managers utilise the enhanced self-awareness and knowledge of managerial competencies learned, in the training phase of a management development intervention, in their current supervisory or front line management jobs.

Evaluation

According to Scriven (1967), cited in Yorks (2005, p. 194), evaluation is "the process of determining the merit, worth or value of something...the valuation process normally involves some identification of relevant standards....[and]...some investigation of the performance.....on these standards." Additionally, literature on training and evaluation has identified Kirkpatrick's (1959) four-level evaluation model (reaction, learning, behaviour, results) as the most pervasive training evaluation model (Richmond, 2008; Kirkpatrick, 2007; Bates & Coyne, 2005). Kirkpatrick's (1959) model follows an outcomes based evaluation approach (Newstrom, cited in Bates and Coyne, 2005) and provides a comprehensive framework to determine multiple measures of training effectiveness by conducting evaluation at the reaction, learning, behaviour and results level in the organization. However, it is by Kirkpatrick's (1994) own admission that the true mark of training effectiveness is determined by the degree of behaviour change on the job (transfer of training) and by Phillips (1991) assertion that goal-based and systems-based approaches are predominantly used in the evaluation of training effectiveness, that this study benchmarked the determination of training effectiveness at the third level of his (1959) model by using a stakeholder based design approach.

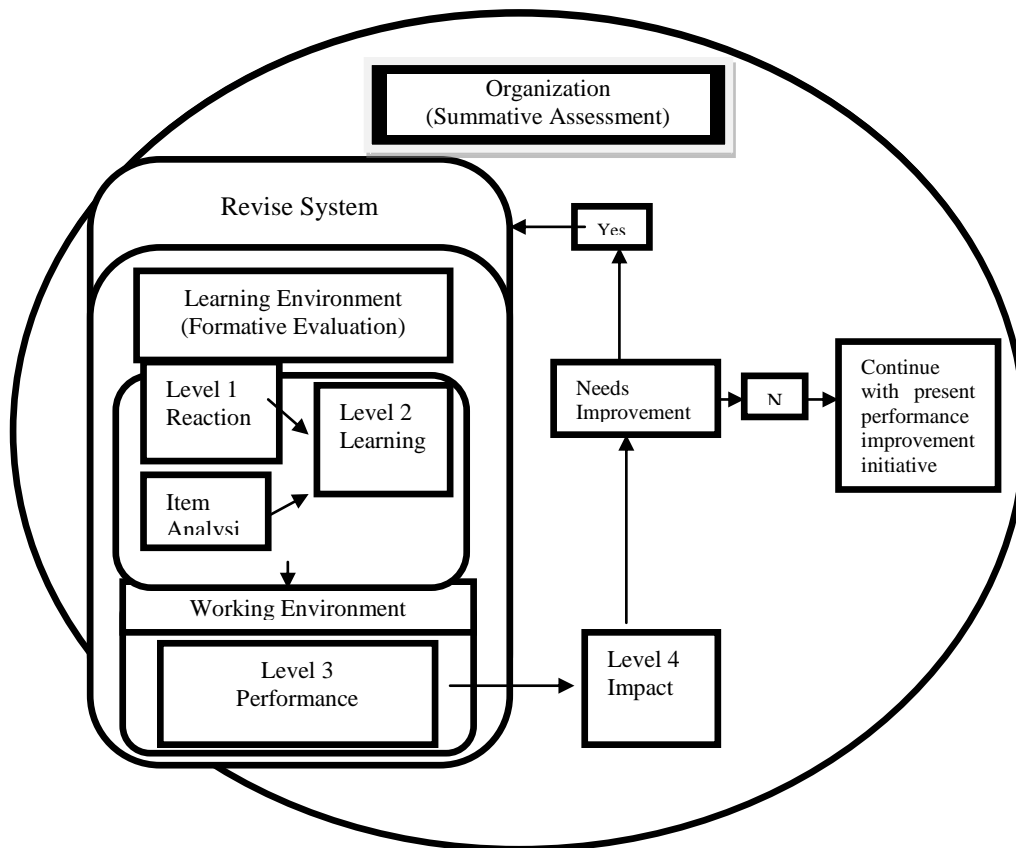
Not-with-standing the model or paradigm it subscribes to, a successful evaluation process also hinges on the level of sophistication of the data collection tools used in the evaluation process as well as its psychometric properties.

Psychometrics: measurement, instrument construction and validation

Psychometrics is the discipline of measurement, instrument construction and validation. Moss, Pullin, Gee and Haertel (2005, p. 68) noted the goal of psychometrics to be that of developing "interpretations that are generalizable across individuals and contexts and to understand the limits of those generalizations".

Measurement theory, as a branch of applied statistics, thus attempts to describe, categorise and evaluate the quality of measurements, improve the usefulness, accuracy and meaningfulness of measurements and proposes methods for developing new and better measurement tools (Chadha, 1996). *Instrument construction* or *measurement tool development* requires a systematic protocol to be followed and De Vellis, cited in Internet 1 (2006), advocates an eight-step methodology for the development and validation of measurement tools, which the researchers in this study subscribed to:

- Step 1 – determine clearly what is being measured.
- Step 2 – generate a range of items from the statement of what the tool intends to measure for inclusion in the measurement tool.
- Step 3 – determine scale format (rating technique or response categories) to be used in the measurement tool.
- Step 4 – have the initial item pool reviewed by subject matter experts.
- Step 5 – consider the inclusion of validation items (if these exist) to serve as a baseline standard measure of the attributes under study.
- Step 6 – administer the tool to a pilot sample of respondents representative of the target population to eradicate issues that could not have been predicted in the design phase.
- Step 7 – evaluate the items and the overall tool using various statistical techniques to assess their psychometric properties.
- Step 8 – optimise the scale length by deleting redundant and poorly performing items using the results from the psychometric testing process.

Figure 1. Kirkpatrick's four levels of training evaluation

*Electronic format: <http://www.nwlink.com/~donclark/hrd/ahold/evaluateconcept.jpg>

In terms of validation, the measurement characteristics of a measurement tool were assessed in terms of the two psychometric properties that attest to the trustworthiness of the tool, namely, validity and reliability. The validity of any measuring instrument depends on the accuracy with which it measures what it intends to measure. Three conceptually different aspects of validity can be distinguished (content, criterion-related and construct validity) corresponding to the three basic objectives of validity measurement (Internet 2, 2008).

Reliability measures indicate whether, with all things being equal, repeated measurements for a test or a measure, give the same result consistently (Internet 1, 2006). The higher the reliability of the measurement tool, the greater the extent to which it is free of measurement error (Internet 2, 2008). As such, the estimation of error variance in a measurement tool refers to two equivalent definitions of reliability (Chadha, 1996, p. 92): firstly, "reliability is the proportion of the 'true' variance to the total obtained variance of the data yielded by the measuring instrument" and secondly, "It is the proportion of error variance to the total obtained variance of the data yielded by the measuring instrument subtracted from 1.00. The index of 1.00

indicates perfect reliability." Cooper and Schindler (2001, p. 215) note that "reliable instruments are robust; they work well at different times under different conditions. This distinction of time and condition is the basis for frequently used perspectives on reliability." Test-retest coefficient, parallel forms coefficient and split half reliability are methods that can be utilised to measure the reliability of a measurement tool (Internet 2, 2008):

Hence, the goals of this research are:

- to derive training evaluation tools which purport to effectively validate and evaluate front line management training, and
- to assess the effectiveness of the new training evaluation tools.

RESEARCH DESIGN

Research approach

Data for the study was collected using a two-pronged approach:

- Literature review: A literature review was undertaken to understand the concepts of strategic human resource development and how to evaluate its contribution to organizational

effectiveness. This review provided insight into models and instruments that can be used to evaluate the effectiveness and transfer of training and, informed the modification of the measurement tool utilised in this study, and

- Empirical analysis: An empirical analysis was undertaken on the data collected, using a retrospective, longitudinal trend design using two groups of respondents, by utilising the evaluation measurement tool that the researchers developed.

Participants

A sample of 55 (N = 88) front line management programme graduates and their respective stakeholders from Group 1 and sample of 40 (N = 77) front line management programme graduates and their respective stakeholders from Group 2 were drawn using a consensus sampling technique. For the purpose of Factor Analysis, the Kaizer-Meyer-Olkin Measure was used to determine the adequacy of the sample in each Group (0.949, $p = 0.000$ and 0.958, $p = 0.000$) respectively and showed suitability and adequacy. The results indicate that the normality and homoscedasticity preconditions are satisfied.

Measuring Instruments

The research instrument derived for use in the study was a self administered questionnaire which was couched in the third level of the four levels of the evaluation framework of choice, the Kirkpatrick Four-level Evaluation Model. The research instruments used in the study were an amended version of the Jack Phillip's 'Leadership Development Program Impact Questionnaire' which, from this point forward, will be labeled as the Level 3 Student Form and a self-developed stakeholder form which, from this point forward will be labeled, as the Level 3 Stakeholders' Form.

- Level 3 Student Form

The Level 3 Student Form comprised of 10 questions in total, with some questions having sub-questions. The questions in the Level 3 Student Form were framed to provide feedback on the dimensions (namely, progress with objectives, personal change, programme relevance, knowledge and skills enhancement, barriers to implementation, programme skills use, enablers, investment perception, management support and appropriateness of intervention) towards determining the level of transfer of knowledge, skills and attitudes gained by programme graduates from the front line management development training programme back to the workplace within the client organization.

- Level 3 Stakeholders' Form

The Level 3 Stakeholders' Form comprised of three sections. The questions in the Level 3 Stakeholder Form were framed to provide feedback on the dimensions (biographical data, result areas and

open-ended questions for completion by the graduate's promoter) towards validating by triangulation, the claim by programme graduates of the level of transfer of knowledge, skills and attitudes from the front line management development training programme back to the workplace within the client organization:

These two questionnaires were constructed to be a summative evaluation of the front line management development intervention by efficiently collecting data to determine the extent to which the programme had achieved its objectives and the extent to which these objectives were attributable to the programme. This was imperative as research indicates the importance of integrating summative evaluation into the learning process (Ridde, Fournier, Banza, Tourigny & Ouédraogo, 2009). Subjects (students and their respective stakeholders) were required to indicate their responses to dichotomous scale items, open-ended questions as well as a 5 point Likert scale (where the greater the score, the greater the extent to which subjects reflected the effectiveness or on-the-job utility of the front line management development training programme).

Procedure

Both the Level 3 Student Form and the Level 3 Stakeholder Form were subject to a pre-test to identify issues of coding and cognitive problems of comprehension and response generation. For both Groups, due to the geographical dispersion of respondents on the national grid, the questionnaires were self-administered via e-mail. Return of the completed questionnaires was also via e-mail and this served to facilitate the tracking of responses and hence, the follow up of non-responses. Non-respondents (students and/or stakeholders) were subsequently contacted to ensure a suitable response rate.

Statistical Analysis

Statistical analyses pertained to the psychometric soundness (validity and reliability) of the measuring instruments. The validity of the questionnaires were determined using factor analysis. Principal component extraction method for factor analysis was performed using the SPSS statistical packaged with a Varimax with Kaiser normalization rotation method for each Group respectively. When analysing the factor matrix, only items with loadings >0.5 were regarded as being significant and when items were significantly loaded on more than one factor, only the factor with the highest loading was acknowledged. The factors were labeled in terms of the loadings of the items.

Cronbach's Coefficient of Alpha was computed for the questionnaires to determine the degree to which each measurement tool is reliable and provides

consistent results. The choice of Alpha as a reliability coefficient is based on its utility for multi-item scales at the interval level of measurement (Cooper & Schindler, 2001).

RESULTS

Construction of the training evaluation measurement tools

The impetus for the output of the current study (that is, the training evaluation measurement tools) was in response to Chen, Holton and Bates (2005) call for (in light of the paucity of research-based transfer of training instruments) the development of research-based tools which could be used to effectively evaluate transfer of (management) training and this was achieved against Swanson and Holton’s (2001) view that management development involves purposive activities designed to transform managerial functions in the following way:

A key-word search on training evaluations turned up amongst the various models of training evaluation, Kirkpatrick’s four levels of training evaluation which revealed that at the third level, behavioural change is key to determining the effectiveness of training. However, this search revealed the Learning Transfer System Inventory as the only research-based instrument for assessing transfer of training (Holton, Bates & Ruona, 2000). The search however, also revealed the Jack Phillips ‘Impact Questionnaire for Leadership Development Program’, which however, carried a caution that the questions included were but only a ‘sampling’ and that it did not ‘represent a document that is ready for implementation’. Using Phillip’s Impact Questionnaire for Leadership Development Program as a benchmark tool, identifying the main roles for a front line manager to be that of leading and controlling and through close reading of texts on training evaluation, the self-constructed Student Form and concomitant Stakeholders’ Form evolved.

Table 1. Extracts from the student level 3 form

In the following results areas please indicate the degree to which your knowledge of or skills with the following items have improved during the last few months as influenced by your participation in the front line management development programme. Tick the appropriate response beside each item. If ticking 1 or 2, please indicate why, i.e. the barriers you encountered that prevented you from using the knowledge or skills gained from the training programme. (Please note that the numbering utilised in the "Barriers to Implementation" section is not a rating scale, but for codification purpose)

Result Area	Degree of Improvement					Barriers to Implementation				
	No Improvement 1	Some Improvement 2	Moderate Improvement 3	Definite Improvement 4	Significant Improvement 5	the opportunity to use the skills.	does not support these skills.	not support this type of course.	not apply to my job.	Other (please specify)
Leading										
4. Lead by example.										
5. Apply techniques that influence better teamwork.										
Controlling										
1. Clarify roles/responsibilities of all team members.										
2. Implement performance measures for team members.										
3. Monitor a business project team.										
Personal Outcomes										
1. Takes responsibility for own behaviour.										
6. Inspire trust in others.										

Table 2. Extracts from the stakeholder level 3 form**Section B**

In the following result areas, please indicate the degree to which the learner has demonstrated a change in knowledge of, or skills with each of the following items as influenced by his/her participation in the management development programme (which was scheduled between August 2006 and June 2007)

Result Area	Degree of Improvement				
	No Improvement 1	Some Improvement 2	Moderate Improvement 3	Definite Improvement 4	Significant Improvement 5
Leading					
2. Encourages calculated risk taking.					
4. Lead by example.					
5. Apply techniques that influence better teamwork.					
9. Applies problem-solving processes to solve conflict situations.					
Controlling					
1. Clarify roles/responsibilities of all team members.					
2. Implement performance measures for team members.					
3. Monitor a business project team.					
Personal Outcomes					
1. Takes responsibility for own behaviour.					
6. Inspire trust in others.					

Psychometric Analyses of the Questionnaires

Psychometric analyses of the Level 3 Stakeholder and Student Forms included testing its validity and reliability. This was achieved by conducting factor analysis and computing the Cronbach Coefficient Alpha statistic, for each stakeholder form in Group 1 and Group 2 respectively.

Validity

In this study, content validity (logical and face validity) and construct validity (via Factor Analysis) were determined.

The logical validity (Cooper & Schindler, 2001) of the measurement tools were ensured by the researcher who intuitively, yet carefully, defined the topic, the items to be scaled and the scales used in the

study to ensure that the items in the self-constructed measurement tools portrayed face validity (Kaplan & Saccuzzo, 1993) by purporting to measure the effectiveness of the training intervention. The questionnaires' validity with respect to face validity were upheld in the in-house pretesting face validity review that was conducted by subject matter experts in the field as well as the pilot testing.

Construct validity of the self-constructed questionnaires was derived using Factor Analysis. The factors measured in each Group were compared using two methods (namely, Coefficient of Congruence and comparison of Eigenvalues and percentage variances between the Groups), with the results of this comparative process as depicted in Table 3 and Table 4 respectively.

Table 3. Coefficient of congruence comparison of factor analysis for corresponding stakeholder groups from group 1 and group 2

Compared Factors		Coefficient of Congruence	
PROMOTER			
Group 1	Group 2	Value (rc)	p
Factor 1	Factor 1	0.978	< 0.001
Factor 2	Factor 2	0.928	< 0.001
Factor 3	Factor 3	0.970	< 0.001
PEER			
Group 1	Group 2	Value (rc)	p
Factor 1	Factor 1	0.965	< 0.001
Factor 2	Factor 2	0.911	< 0.001
Factor 2	Factor 3	0.905	< 0.001
SUBORDINATE			
Group 1	Group 2	Value (rc)	p
Factor 1	Factor 1	0.936	< 0.001
Factor 2	Factor 2	0.881	< 0.001
Factor 2	Factor 3	0.886	< 0.001
INTERNAL CUSTOMER			
Group 1	Group 2	Value (rc)	p
Factor 1	Factor 1	0.989	< 0.001
Factor 2	Factor 3	0.994	< 0.001
Factor 3	Factor 2	0.962	< 0.001
STUDENT			
Group 1	Group 2	Value (rc)	p
Factor 1	Factor 2	0.974	< 0.001
Factor 2	Factor 1	0.976	< 0.001
Factor 3	Factor 3	0.966	< 0.001

Table 4. Between group differences in eigenvalues and percentages of variance accounted for by the 3 factors for all corresponding stakeholder groups in both group 1 and group 2 respectively

Stakeholder Group	Between Group Difference in Eigenvalues	Between Group Difference in % Variance
Promoter	0.05	0.22
Peer	0.08	0.35
Subordinate	0.03	0.13
Internal Customer	0.13	0.57
Student	0.36	1.57

Factor analysis as a statistical tool was used to reveal the patterns via which items combine as a factor towards summarising the original set of items under study, in both Group 1 and Group 2, for each stakeholder category respectively. Factor loadings thus, become an important output that is used to determine differences in factor loadings between two samples. However, due to the ambiguities in identifying the factors, it is not always easy in deciding which pairs of factors to compare, as an eyeball test of the Factor Analysis data reported in this study shows that Factor 1 in Group 1 looks more like Factor 2 in Group 2 (by way of example see the Student Form Factor Analysis statistic, reflected in Table 3, where Factor 1 from Group 1 looks more like Factor 2 from Group 2). This premise is supported by Darlington (Internet 3, 2007, p. 14) in his exposition on "Comparing Factor Analyses in Two Groups"

when he noted that "it is never completely meaningful to say one particular factor in one factor analysis 'corresponds' to one factor in another factor analysis" and moreover, Wuensch (2007, p. 10) noted that "it is not always easy to decide which pairs of factors to compare." To this end, Brauchle & Azam (2004) suggested using preliminary matching of factors by using marker variables (with marker variables being those variables that had the highest loadings [greater than 0.5] in the pairs of factors being compared). This method was utilised in the present study and thereby, "reduced the chance of obtaining spuriously significant results that capitalized on chance relationships" (Brauchle et al., 2004, p. 3). Pattern magnitude similarities of the factor loadings were then compared using the coefficient of congruence (Brauchle et al., 2004). The use of the coefficient of congruence test is quite common in literature

(Cordano Scherer & Owen; Ommundsen, Hak, Morch, Larsen & Veer and Carroll, Houghton & Baglioni, cited in Brauchle et al., 2004). Coefficient of congruence ranges from -1.00 (for perfect negative similarity) through zero (for complete dissimilarity) to 1.00 (for perfect positive similarity) and Broadbooks and Elmore, cited in Brauchle et al., (2004, p. 7), claimed that “an obtained sample congruence coefficient greater than 0.50 will usually be an underestimate of the actual population value. Therefore, the actual population coefficients of congruence may be even higher than the values obtained here”. The computations, in line with the coefficient of congruence measure for comparing factor analyses in the two groups, for each corresponding stakeholder category from Group 1 and Group 2 are reflected in Table 3. These findings from the coefficient of congruence comparison between the groups for each stakeholder category (the promoter, peer, subordinate, internal customer and student stakeholder categories, respectively) suggests a very strong match between the factors. However, Cattell, cited in Brauchle et al. (2004), advised the use of at least two methods of factor comparison when matching factors. For this reason, in addition to the coefficient of congruence measures, comparisons were also made using the mean eigenvalues and percentage variances method, as advocated in research conducted by Juan-Espinosa, Cuevas, Escorial and García (2006) and the outcome of this set of comparisons is reflected in Table 4 for the promoter, peer, subordinate, internal customer and student stakeholder categories, respectively.

In reviewing both methods of factor comparisons, the coefficient of congruence comparison across the possible pairs showed substantial similarity across both Groups. This additional similarity of eigenvalues and percent variance attributable to each factor across both groups indicates that the magnitudes of the factor loadings are also quite similar. According to Brauchle et al. (2004), this does not imply that the factors of the two Groups are identical. However, Allen & Thorndike, cited in Kush, Watkins, Ward, Ward, Canivez & Worrel (2001, p. 73) noted that, regardless of whether factors arising out of the factor analytical process being true representations of the tools’ underlying dimensions, “the psychometric utility of the instruments is derived directly from their ability to measure the composition of these factors” across groups. However, in this study, the findings were for similar factors thereby adding to the robustness of the tools.

The second criterion against which the psychometric soundness of the self-constructed measurement tools were assessed, was reliability.

Reliability

The results for the Alpha calculations for the subscales and full scale of the results areas (leading, controlling, personal outcomes) on the questionnaires, for both Group 1 and Group 2, are depicted in Table 5.

Table 5. Summary of Cronbach’s coefficient alpha for the sub-scales and full scales of the result areas per stakeholder grouping

Stakeholder Group	Result Areas Subscales						Result Areas Full Scale	
	Leading		Controlling		Personal Outcomes		Group 1	Group 2
	Group 1	Group 2	Group 1	Group 2	Group 1	Group 2		
Promoter	0.994	0.995	0.977	0.959	0.990	0.993	0.995	0.995
Peer	0.995	0.994	0.974	0.988	0.994	0.995	0.989	0.997
Subordinate	0.997	0.996	0.988	0.983	0.996	0.996	0.992	0.998
Internal Customer	0.997	0.995	0.933	0.992	0.995	0.991	0.998	0.996
Student	0.974	0.987	0.907	0.939	0.979	0.979	0.984	0.987

Cronbach's Coefficient Alpha as a test of reliability indicates that the closer the value of the Coefficient Alpha to 1, the greater the reliability of the questionnaires. From Table 5 it is concluded that Cronbach Alpha figures from the result areas of the self-constructed tools were only marginally different between the two administrations of the questionnaires. It is thus, contended that this part of the measuring tool measures consistently from one time to another and thereby verifies that the tool withstands the vicissitudes of situational and personal factors that could have impinged on the results.

Cronbach's Coefficient Alpha for the other Likert (which assessed the attainment of programme objectives and relevance of programme elements to the job) and dichotomous items (namely, personal change, knowledge and skills enhancement, investment perception and appropriateness of intervention) in the student form was computed as 0.864 for Group 1 and 0.978 for Group 2. Both these scores represent strong reliability. The item-total statistics for each of the 15 items, for both Group 1 and Group 2, is shown in Table 6.

From Table 6 it is noted that if question 2 ("Do you feel that you are better able to do your job after attending the training programme?") was deleted from the Student Form for Group 1, Cronbach's Coefficient

Alpha will increase from 0.864 to 0.963. This is a rather curious finding in that this question, by tapping the ability to do the job better after the training intervention, is high in face validity and supports the aim of the questionnaire. However, this result can be explained by the descriptive statistics for the result areas where Group 1 respondents were their own worst critics in terms of their self-report on the level of development that they achieved in each of the result areas. With respect to Group 2, Cronbach's Coefficient Alpha would have been marginally increased from 0.978 to 0.980 on the Student Form if question 8 ("Do you think the management development programme represented a good investment for the company?") was removed. Deletion of this item would not have resulted in a significant change in Alpha and it is for this reason that the item was retained in the questionnaire.

Furthermore, corrected item scale correlations were computed to assess the relationship between each item and its sub-scale score and the item and its full scale score towards providing information for further instrument refinement and the results of this computational process is reflected in Table 7 and Table 8 for Group 1 and Table 9 and Table 10 for Group 2.

Table 6. Item-total statistics for the other likert and dichotomous items on the student form

Item	Group 1		Group 2	
	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Achievement of objective: 1.1	0.818	0.846	0.934	0.975
Achievement of objective: 1.2	0.841	0.845	0.939	0.975
Achievement of objective: 1.3	0.784	0.847	0.876	0.976
Achievement of objective: 1.4	0.794	0.846	0.858	0.976
Achievement of objective: 1.5	0.794	0.846	0.940	0.975
2. Do you feel better able to do your job after attending the programme?	0.175	0.963	0.938	0.976
Relevance of programme element: 3.1	0.793	0.846	0.902	0.975
Relevance of programme element: 3.2	0.767	0.846	0.913	0.975
Relevance of programme element: 3.3	0.735	0.847	0.928	0.975
Relevance of programme element: 3.4	0.666	0.849	0.842	0.976
Relevance of programme element: 3.5	0.798	0.845	0.895	0.975
Relevance of programme element: 3.6	0.766	0.845	0.862	0.976
4. Have you used the written materials since you participated in the programme?	0.791	0.856	0.772	0.978
8. Do you think the ASDP represented a good investment for your organization?	0.755	0.857	0.584	0.980
10. Looking at the business need that you had, was this an appropriate programme? If no what other alternative could have been effective.	0.720	0.857	0.903	0.977

Table 7. Item-total statistics for the sub-scales per stakeholder category for group 1

	Corrected Item-Total Correlation					Alpha if Item Deleted				
	Promoter	Peer	Subordinate	Internal Customer	Student	Promoter	Peer	Subordinate	Internal Customer	Student
Leading	0.981	0.978	0.981	0.984	0.825	0.993	0.995	0.996	0.997	0.972
	0.958	0.947	0.953	0.978	0.786	0.994	0.995	0.997	0.997	0.973
	0.954	0.988	0.980	0.993	0.906	0.994	0.995	0.996	0.997	0.970
	0.959	0.983	0.976	0.988	0.882	0.994	0.995	0.996	0.997	0.971
	0.968	0.947	0.985	0.990	0.919	0.994	0.995	0.996	0.997	0.970
	0.970	0.979	0.977	0.987	0.909	0.994	0.995	0.996	0.997	0.970
	0.961	0.970	0.981	0.982	0.846	0.994	0.995	0.996	0.997	0.972
	0.964	0.984	0.988	0.983	0.842	0.994	0.995	0.996	0.997	0.972
	0.967	0.971	0.971	0.988	0.917	0.994	0.995	0.996	0.997	0.970
	0.968	0.983	0.987	0.991	0.806	0.994	0.995	0.996	0.997	0.973
	0.965	0.950	0.980	0.988	0.822	0.994	0.995	0.996	0.997	0.972
	0.958	0.982	0.984	0.941	0.828	0.994	0.995	0.996	0.998	0.972
Controlling	0.939	0.949	0.976	0.984	0.852	0.971	0.963	0.984	0.991	0.868
	0.961	0.954	0.982	0.983	0.846	0.968	0.963	0.983	0.991	0.868
	0.934	0.935	0.975	0.983	0.663	0.972	0.966	0.984	0.991	0.907
	0.930	0.900	0.954	0.972	0.760	0.973	0.971	0.987	0.993	0.888
	0.905	0.883	0.940	0.976	0.718	0.976	0.974	0.989	0.992	0.897
Personal Outcomes	0.968	0.940	0.986	0.962	0.934	0.988	0.995	0.996	0.995	0.974
	0.966	0.983	0.987	0.978	0.946	0.989	0.992	0.996	0.994	0.973
	0.955	0.992	0.990	0.986	0.938	0.990	0.991	0.996	0.993	0.974
	0.962	0.984	0.989	0.987	0.934	0.989	0.992	0.996	0.993	0.974
	0.972	0.990	0.989	0.988	0.948	0.988	0.991	0.996	0.993	0.973
	0.981	0.978	0.988	0.988	0.876	0.987	0.992	0.996	0.993	0.980

Table 8. Item-total statistics for the full-scale per stakeholder category for group 1

	Corrected Item-Total Correlation					Alpha if Item Deleted				
	Promoter	Peer	Subordinate	Internal Customer	Student	Promoter	Peer	Subordinate	Internal Customer	Student
Leading	0.974	0.955	0.960	0.983	0.844	0.994	0.989	0.991	0.997	0.983
	0.952	0.921	0.936	0.982	0.759	0.995	0.989	0.991	0.997	0.984
	0.952	0.966	0.955	0.991	0.904	0.995	0.989	0.991	0.997	0.983
	0.952	0.951	0.964	0.983	0.891	0.995	0.989	0.991	0.997	0.983
	0.964	0.944	0.962	0.987	0.931	0.995	0.989	0.991	0.997	0.982
	0.965	0.951	0.946	0.983	0.886	0.995	0.989	0.991	0.997	0.983
	0.957	0.944	0.959	0.984	0.835	0.995	0.989	0.991	0.997	0.983
	0.960	0.948	0.961	0.986	0.858	0.995	0.989	0.991	0.997	0.983
	0.960	0.953	0.947	0.979	0.890	0.995	0.989	0.991	0.997	0.983
	0.962	0.951	0.974	0.983	0.788	0.995	0.989	0.991	0.997	0.983
	0.961	0.930	0.963	0.985	0.811	0.995	0.989	0.991	0.997	0.983
	0.960	0.963	0.961	0.932	0.859	0.995	0.989	0.991	0.998	0.983
Controlling	0.921	0.881	0.968	0.963	0.865	0.995	0.989	0.991	0.998	0.983
	0.915	0.892	0.963	0.961	0.808	0.995	0.989	0.991	0.998	0.983
	0.887	0.881	0.963	0.964	0.640	0.995	0.989	0.991	0.998	0.984
	0.966	0.910	0.930	0.987	0.863	0.995	0.989	0.991	0.997	0.983
	0.921	0.842	0.929	0.979	0.683	0.995	0.989	0.991	0.997	0.984
Personal Outcomes	0.941	0.809	0.789	0.960	0.892	0.995	0.989	0.992	0.998	0.983
	0.951	0.790	0.791	0.960	0.911	0.995	0.990	0.992	0.998	0.983
	0.936	0.794	0.790	0.958	0.885	0.995	0.990	0.992	0.998	0.983
	0.937	0.784	0.785	0.962	0.865	0.995	0.990	0.992	0.998	0.983
	0.952	0.794	0.789	0.962	0.896	0.995	0.990	0.992	0.998	0.983
	0.959	0.796	0.789	0.961	0.902	0.995	0.990	0.992	0.998	0.983

Table 9. Item-total statistics for the sub-scales per stakeholder category for group 2

	Corrected Item-Total Correlation					Alpha if Item Deleted				
	Promoter	Peer	Subordinate	Internal Customer	Student	Promoter	Peer	Subordinate	Internal Customer	Student
Leading	0.983	0.978	0.971	0.942	0.933	0.994	0.994	0.995	0.995	0.986
	0.964	0.968	0.935	0.966	0.929	0.994	0.994	0.996	0.994	0.986
	0.970	0.946	0.981	0.980	0.966	0.994	0.994	0.995	0.994	0.985
	0.974	0.976	0.986	0.977	0.969	0.994	0.994	0.995	0.994	0.985
	0.969	0.979	0.980	0.957	0.944	0.994	0.994	0.995	0.994	0.985
	0.973	0.974	0.975	0.974	0.959	0.994	0.994	0.995	0.994	0.985
	0.967	0.941	0.971	0.977	0.916	0.994	0.994	0.995	0.994	0.986
	0.950	0.976	0.981	0.982	0.919	0.995	0.994	0.995	0.994	0.986
	0.971	0.948	0.946	0.979	0.827	0.994	0.994	0.996	0.994	0.988
	0.977	0.974	0.980	0.937	0.904	0.994	0.994	0.995	0.995	0.986
	0.950	0.966	0.986	0.977	0.957	0.995	0.994	0.995	0.994	0.985
0.960	0.956	0.974	0.958	0.872	0.994	0.994	0.995	0.994	0.987	
Controlling	0.924	0.972	0.982	0.982	0.860	0.943	0.983	0.975	0.990	0.921
	0.944	0.975	0.942	0.982	0.910	0.940	0.983	0.980	0.990	0.912
	0.833	0.939	0.932	0.983	0.808	0.958	0.988	0.982	0.989	0.930
	0.914	0.971	0.968	0.959	0.839	0.944	0.983	0.977	0.993	0.925
	0.813	0.959	0.929	0.978	0.768	0.961	0.985	0.982	0.990	0.938
Personal Outcomes	0.957	0.964	0.982	0.963	0.917	0.993	0.995	0.996	0.990	0.976
	0.984	0.988	0.989	0.969	0.947	0.991	0.993	0.995	0.989	0.973
	0.980	0.984	0.989	0.979	0.935	0.991	0.993	0.995	0.988	0.974
	0.979	0.983	0.992	0.986	0.950	0.992	0.993	0.995	0.988	0.973
	0.986	0.982	0.986	0.933	0.942	0.991	0.993	0.995	0.993	0.973
	0.969	0.985	0.978	0.987	0.884	0.992	0.993	0.996	0.988	0.979

Table 10. Item-total statistics for the full-scale per stakeholder category for group 2

	Corrected Item-Total Correlation					Alpha if Item Deleted				
	Promoter	Peer	Subordinate	Internal Customer	Student	Promoter	Peer	Subordinate	Internal Customer	Student
Leading	0.981	0.978	0.972	0.935	0.909	0.995	0.997	0.997	0.996	0.986
	0.953	0.964	0.941	0.948	0.920	0.995	0.998	0.997	0.996	0.986
	0.973	0.950	0.983	0.972	0.935	0.995	0.997	0.997	0.996	0.986
	0.976	0.978	0.989	0.966	0.950	0.995	0.997	0.997	0.996	0.986
	0.969	0.978	0.980	0.955	0.916	0.995	0.997	0.997	0.996	0.986
	0.974	0.974	0.972	0.965	0.924	0.995	0.997	0.997	0.996	0.986
	0.969	0.942	0.975	0.968	0.875	0.995	0.997	0.997	0.996	0.987
	0.947	0.977	0.979	0.977	0.892	0.995	0.997	0.997	0.996	0.986
	0.971	0.951	0.945	0.980	0.833	0.995	0.998	0.997	0.996	0.987
	0.975	0.974	0.980	0.927	0.873	0.995	0.997	0.997	0.996	0.987
	0.949	0.970	0.986	0.976	0.937	0.995	0.997	0.997	0.996	0.986
	0.957	0.957	0.976	0.974	0.876	0.995	0.997	0.997	0.996	0.986
	Controlling	0.969	0.978	0.977	0.975	0.832	0.995	0.997	0.997	0.996
0.913		0.974	0.949	0.974	0.797	0.995	0.997	0.998	0.996	0.987
0.815		0.945	0.928	0.962	0.710	0.995	0.997	0.998	0.996	0.987
0.980		0.971	0.984	0.956	0.840	0.995	0.997	0.997	0.996	0.987
0.799		0.973	0.952	0.958	0.705	0.995	0.997	0.998	0.996	0.987
Personal Outcomes	0.953	0.967	0.979	0.954	0.876	0.995	0.997	0.997	0.996	0.986
	0.984	0.983	0.988	0.971	0.882	0.995	0.997	0.997	0.996	0.986
	0.975	0.977	0.985	0.963	0.915	0.995	0.997	0.997	0.996	0.986
	0.971	0.980	0.986	0.966	0.912	0.995	0.997	0.997	0.996	0.986
	0.978	0.984	0.980	0.905	0.893	0.995	0.997	0.997	0.997	0.986
	0.966	0.985	0.979	0.954	0.838	0.995	0.997	0.997	0.996	0.987

The high item scale correlation suggests that each item forms a cohesive construct with other items in the sub-scale. This is evidenced in Group 1 by the fact that if any one item is deleted, this will result in an overall lower Cronbach's Coefficient Alpha statistic for the full scale than if all items were maintained on the scale. In Group 2, the scenario is much the same for all the forms except for the peer

form where if two items ("Encourage calculated risk taking" and "Applies problem-solving processes to solve conflict situations) are removed, Cronbach's Coefficient Alpha will increase marginally from 0.997 to 0.998; the increase is so negligible that it is not advisable to eliminate these two items as it influences only one stakeholder (Peer) form and not the others

and its exclusion would offset other principles of questionnaire design that were adhered to.

Notwithstanding these findings in each of Group 1 and Group 2 respectively, Cronbach's Coefficient Alpha figures were high in both Group 1 and Group 2 per stakeholder grouping for the different forms. Furthermore, Kaplan and Saccuzzo (1993) noted that Cronbach's Coefficient Alpha represents a general reliability estimate and provides the lowest estimate of reliability that can be expected and if Cronbach's Coefficient Alpha is high, it can be assumed that the reliability of the tool is acceptable. The high Cronbach's Coefficient Alpha figures reported for the study therefore, in line with Kaplan and Saccuzzo's (1993) argument, substantiates that the measurement tools have acceptable reliability by attesting firstly, to the robustness (Cooper & Schindler, 2001) of the self-constructed measurement tools and secondly, to the degree to which the self-constructed measurement tools, are free of measurement error (Chadha, 1996).

DISCUSSION

Interpretation

In order to demonstrate that targeted learning resulted in critical on-the-job behaviours which subsequently enhanced organizational performance and hence organizational effectiveness, deliberate and purposeful evaluation of the transfer of training is crucial.

The need for researchers to make available psychometrically sound, research-based, theoretically derived assessment tools is also exemplified. It is for this reason that an inductive approach to understand how to evaluate learning as an outcome by triangulating data from organizational stakeholders resulted in the two transfer of training evaluation tools. Each of these tools was subject to psychometric analyses including face validity, content validity, construct validity and reliability. The results as presented provide support for these tools to provide valid and reliable evaluation of transfer of training.

Implications for practitioners

For human resource development practitioners, this research is valuable because it demonstrates how learning transfer can be evaluated using a retrospective training evaluation tool.

Limitations

- In this study data were gathered from a single source, making the results not readily generalisable.
- The study lacks an international perspective in that the sample was drawn from the client organization's national footprint only.

- A stakeholder approach to evaluating training was adopted in this study. However, not all stakeholder categories were used in the study, for example, the external customer stakeholder category was omitted from the research design.

Suggestions for further research

The measurement tools were validated in one institution only and in order to verify the external validity of the measurement tools, it is recommended that these tools be tested by applying them to multiple sample sources from different industries. Additionally, the study should be replicated using the measurement tools, with stakeholder categories that were omitted (for example, the external customer stakeholder category).

Conclusion

This exploratory study provided an initial attempt to develop measurement tools towards effectively (by means of a 360 degree stakeholder research design) evaluating a front line management training intervention and furthermore, by following a trend longitudinal design, also attempted to validate the psychometric integrity of the tools. This study has added to the fund of knowledge; in that psychometrically sound training effectiveness measurement tools can assist the human resource discipline defend its place as a strategic contributor to organizational effectiveness by providing definitive answers to questions pertaining to training effectiveness (or the transfer of training).

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