

Managerial Learning From The Perspectives Of Individual And Organization Level Learning

Vikineswaran Maniam, Jegak Uli and Rahim Sail*

The purpose of this research paper is to investigate managerial learning from the perspective of individual and organization level learning by managers in the organizations they work for.

Keyword(s): Managerial learning, Individual level learning, Organization level learning

1.0 Introduction

It was extremely difficult to find a consensus on the definition or the “conception about learning organizations” (Moilanen, 2001c). According to Easterby-Smith (1997) literature in the field of learning in organization was focused on “organizational learning and not on learning organizations” per se. Viewing learning organizations in holistic manner involve the inclusion of “various elements covering the whole”, thereby capturing the “strategic and human aspects of learning organizations” (Moilanen, 2001c). Based on the works of Pedler *et al.* (1988, 1989), Senge (1990a) and Argyris & Schon (1978, 1996), as in Moilanen (1999a), Moilanen suggested that the five key elements of learning organizations consisting of “managing and leading”, “finding purpose”, “questioning”, “empowerment”, and “evaluating” need to be measured in order to assess the learning of the organization as a whole or as a holistic learning entity. Based on these elements, Moilanen (1999a, 1999b, 2001a, 2001b) constructed a tool (questionnaire instrument), that was further developed and tested on how organizations measure up as holistic learning entities. The same tool was also used to measure the learning organization in this research.

* Vikineswaran Maniam, Jegak Uli and Rahim Sail

Faculty of Business and Accountancy, INTI University College, vikines@intimal.edu.my,

Tel: +606 798 2119, Fax: +606 799 7531

Department of Professional Development and Continuing Education, Faculty of Educational Studies, Universiti Putra Malaysia, jegak@ace.upm.edu.my, rms@ace.upm.edu.my Tel: +603 8946 8234 (DID), Fax: +603 8945 0455

The key member in any organization who drive such interactions was the manager. The role of the manager in “building and sustaining a learning organization” was well articulated by Teare & Dealtry (1998). According to Teare & Dealtry (1998), “the first step in diagnosing the interactions that occur in the ‘learning environment’ was to examine the active roles of managers and the related behaviours”. In this research the active role of managers was explored by doing an in depth study of managers’ perception on their learning at workplace from the viewpoint of their individual learning and organization level learning. Furthermore, as change agents, managers carry the role of change “catalyst”, “solution giver”, “process helper” and “resource linker” (Havelock, 1973) that involve massive amount of learning at managerial level as well as at subordinate level to bring about organization development by way of building, sustaining and developing the organization they work for as a learning organization, that ultimately leads to increased growth, stability, productivity, innovativeness and profitability for the organization. As almost all the researchers in the field of learning organizations argued that the responsibility to conceptualize and operationalize in mobilizing an organization as a learning organization was anchored upon managers, the interest to know on managerial learning grows much deeper. Research by Van der Sluis (2000) has highlighted, to a very large extent, on factors contributing to learning at managerial level, that can be connected to building and sustaining the learning organization.

2. Research Objectives

Three specific objectives of this research are: (i) to identify the managers’ perception on the OOLL in the organization they work for, (ii) to determine the significance of differences in mean scores among the factors within the OOLL and (iii) to determine the structure of learning amongst managers.

3. Literature Review

3.1 Definitions of Learning Organizations

Defining the term or concept of the learning organization has been an arduous task in the past. Even the world acclaimed guru of learning organizations, Peter Senge, was said to have not been able to provide a “short and precise definition of a learning organization in his works. ...” (Moilanen, 2001c). Many scholars have forwarded their definitions on what constitutes a learning organization. It was necessary to present here the definitions by various authors on learning organizations or a learning organization before the researcher arrives at a definition of a learning organization that can be operationalized for this research. For the purpose of this research, a learning organization was defined as a “holistic concept” that was used to address an organization as a “learning environment or as an infrastructure” (Moilanen, 2001c). The definition includes viewing the organization as an entity that has expertise at creating, acquiring, and transferring knowledge, and at modifying its behaviour, as well as that of its managers and subordinates, to reflect new knowledge and insights as a result of

learning process and outcomes, deliberately developed, monitored and modified on a continuous basis. Hence, a learning organization is a learning infrastructure or learning environment where managers, as change agents, play the key role in managing and leading ‘the learning of the organization as a whole’. This is facilitated holistically and continuously by managers as they build and sustain the organization as a learning organization.

3.2 Forming and Measuring the Learning Organization.

The roots of the study by Moilanen (2001a) to diagnose learning in organizations are based on the two holistic views presented earlier (e.g. Pedler *et al.*, 1991; 1997; Senge, 1990a), although certain aspects have their origin based on the work of Argyris & Schon (1978; 1996). The instrument, named as The Learning Organization Diamond (TLOD), consists of five major elements, and each has two-sided concept – first the more holistic aspects of a learning organization and secondly the more individual-based views. Hence, in total, there are ten elements to diagnose or measure the learning organization learning holistically based on the five key elements. The five key elements identified by Moilanen (2001a) are presented in the following paragraphs.

I. **Driving forces.** The element of driving forces refers to how managers will almost always manage and lead in the organization they work for in developing it as a learning environment. The organizational side was named by Moilanen (2001c; 1999b) as “managing the whole ... best defined by stating that a manager is taking care of, or at least being conscious of, all organization-wide systems, processes and structures which could enable or hinder learning.” It can be deduced that another safe way to refer a learning organization in an interchangeable manner was ‘the learning of the organization as a whole’. As for the managerial level of driving forces, “managers lead learners and their learning [by] taking care of individuals and groups for as long as they need assistance in becoming better learners or masters of the learning processes” (Moilanen, 2001c). Hence, the union of all other key elements of a learning organization rests much, to a large extent, with the managers’ driving forces focused at building, maintaining, supporting and developing a holistic learning infrastructure in the organization they work for (Moilanen, 1999b).

II. **Finding purpose** refers to the need to identify the intended direction that an organization wants to take based on or guided by the vision and strategy built by a learning organization, as Moilanen (1999a) puts it: “Strategy and vision direct companies in their operations, and should also direct learning.” As vision and strategy direct the learning organization at organizational level, it was the “motivation” and willingness to learn new things and processes that guides the managers’ learning at personal level, which ultimately links to learning for organization-wide purpose, “concentrating on the most crucial needs of the company [organization]” (Moilanen, 1999a).

III. **Questioning** was the reflective element in the manager that involves “inquiring, doubting and asking for the value of the present state [of learning in the organization]”

(Moilanen, 2001a). The need for "... questioning organization-wide routines" constitutes the learning taking place at organizational level and at the managers' personal level, it was his/her own routines, "mental models and patterns" that were questioned on a continuous basis reflectively (Moilanen, 2001c; Senge, 1990a).

IV. **Empowering** was a concept used by Moilanen (1999a; 2001c) to describe the combinations of various "organization-wide arrangements and support systems" that can help in effecting "learning climate and providing self-development opportunities for all (Pedlar *et al.* 1997)". According to Moilanen (1999a) organizations can exercise learning via direction of empowerment to make changes to the whole organization infrastructure. Managers also can exercise the power of empowerment at personal level by organizing, for example, "social learning, training, listening, reading, ... and job rotation" that can enhance or develop learning in organization (Moilanen, 1999a).

V. **Evaluating** was a necessary element in that it helps the management of the learning organization to gain accurate information on the progress of the organization in relation to organization-wide learning taking place. At the organizational level, evaluation was meant to assess the results achieved "in the field of learning and development" of the whole organization (Moilanen, 2001c). At the managerial level, "this might best be characterized by self-assessment and group-based evaluating systems" (Moilanen, 2001a).

The TLOD questionnaire consists of 40 statements; 20 statements focused on the organization level learning (OLL) and the remaining 20 on the individual level learning (ILL). The statements are presented in two sections for answering, but during the analysis phase they are combined according to the overall model of the Learning Organization Diamond (driving forces, finding purpose, questioning, empowering and evaluating) which was referred to as Overall Organization Learning (OOLL) in this research. The statements were formed to operationalize the above mentioned two levels and elements with the aim to formulate the statements in such a clear and simple way that filling the questionnaire could be possible for everyone in different kinds of organizations and at different levels (Moilanen, 2001c). The core of the tool was in creating a holistic picture of an organization and seeing the present state of learning among managers in the organization they work for.

4. Research Design

This study was a one-shot study design incorporating a cross-sectional survey using quantitative techniques. The descriptive research approach was used to explore the current status of the subjects' perceptions on quantitative variables in this study without manipulating or influencing any variables viz. individual level learning and organization level learning. For this research the selection of study population was based on top two industries in manufacturing and services sectors each in Kuala Lumpur and Selangor, as per reports by Malaysia Productivity Corporation, Malaysia industrial Development Authority and Bank Negara Malaysia. A target sample of 600 managers, involving a total of 120 organizations selected to seek these respondents. From the stratified

random selection of 120 out of 403 organizations, with a sample size of 600 people, and 95% confidence in the results, the margin of error would be $\pm 1.96\%$

5. Instrument Validity and Reliability

The validity of the instrument with the 40 statements was ascertained by five specialists in the field of human resource development prior to testing for reliability. The results of reliability tests shown in Table 1 below indicate a Cronbach $\alpha = .9106$ (quite similar to previous research), exceeding 0.7, which is the convention for reliability of instruments acceptable for behavioural science research, recommended by Nunnally & Bernstein (1994). The statements in the instrument used ten-point Likert scale on a continuum of 1=strongly disagree to 10=strongly agree.

Table 1: Results of Reliability Test

Instrument component	Cronbach's Alpha Value	
	Previous research (Moilanen, 2001)	Current Research
Overall Organization Level Learning (OOLL)	.9500	.9106
Individual Level Learning (ILL)	.9566	.7661
Organization Level Learning (OLL)	.8672	.9210

6. Findings and Discussions

6.1 Research Objective 1: Findings for Managers' Perception on OOLL

Analysis for the first research objective involved descriptive statistics on data collected (see Table 2), to identify the level of managers' perception towards OOLL. The median OOLL rating value was 7.16 with a standard deviation of 1.40. The mean OOLL rating was 7.26 implying that overall the level of OOLL is good. The combination of scores between 25th to 100 percentile of the OOLL shows that 99% of the respondents (306 managers) have a OOLL rating of 6.5 or above. In accordance with the ratings of below 4.5 is ranked low, 4.6-6.4 was moderate, 6.5-7.9 is high and above 8 is very high as the indication of satisfaction, the management staff appeared to have been rather satisfied or felt positively with their level of OOLL.

Table 2: Descriptive Statistics for Overall Organization Level Learning

Descriptive	Overall Organization Level	No of respondents
Mean	7.26	
Median	7.16	
Standard	1.04	
Minimum	3.78	
Maximum	10.0	
Interquartile	1.40	
Skewness	.042	
25 th Percentile	6.50	72 (high)
50 th Percentile	7.16	
75 th Percentile	7.90	166 (high)
90 th Percentile	8.56	68 (very high)

6.1.1 Discussions for Managers' Perception on OOLL

In Moilanen's (2001a) study, based on the mean score of 2.68 for 686 managers, the percentage of actual score against possible maximum score is 67% (measured on a five point Likert scale) for OOLL. In other words the mean score of 2.68 shows that the OOLL level was high in previous research. In this research the percentage of actual score against possible score for OOLL is 72.6%., which also shows high level of OOLL among 309 managers.

6.2 Research Objective 2: The Significance of Differences in Mean Scores of Factors within the OOLL

A paired samples *t*-test was conducted to evaluate the impact of learning levels (ILL and OLL) on the OOLL. The results of the tests are given in Table 3 and Table 4. There was a statistically significant difference in ILL scores (M=7.95, SD=1.11) to OLL scores (M=6.81, SD=1.27), $t(308) = -15.42, p = .0001$. Although it was found that a statistically significant difference exists between the two sets of scores, there is a need to assess the effect size of this result by calculating for the Eta-squared value. The value obtained in this study is .44. Using the commonly used guidelines proposed by Cohen (1988), whereby .01 =small, .06=moderate, .14=large effect, this result suggests a very large effect size, indicating a substantial difference in the ILL and OLL scores obtained for the same group of respondents.

Table 3: Paired Samples Statistics for ILL and OLL

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	OLL	6.8055	309	1.27044	.07227
	ILL	7.9502	309	1.10970	.06313

Table 4: Paired Samples Test for ILL and OLL

Pair		Paired Differences					T	df	p valu e
		Mean	Std. Dev	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
1	OLL - ILL	- 1.144 7	1.305 42	.07426	-1.2909	-.9986	- 15.41 5	30 8	.000 1

6.2.1 Discussions on the Significance of Differences in Mean Scores of Factors within the OOLL

Results of Moilanen's (2001b) research showed that the mean score for OLL was 2.43 and ILL was 2.93 based on responses to the 40 items using a five-point Likert scale. In other words, managers perceive that learning at individual level is better than that occurring at organizational level. However, in previous research, the finding was not tested as to whether the difference was significant or otherwise. In this research the findings are similar to previous research in that it showed differences in mean scores for OLL (M=6.81) and ILL (M=7.95), indicating that managers perceive that learning at individual level is higher or better than organization level. Further tests showed that the difference identified in this research had a very large effect size, indicating a substantial difference in the ILL and OLL scores obtained from the managers.

6.3 Research Objective 3: Findings on the Structure of OOLL

The second research objective was to determine the underlying structure for OOLL. The OOLL consists of individual level learning (ILL) and organization level learning (OLL). Each variable consists of constructs or factors that are measured by specific items or statements, obtained from questionnaires used in previous researches in European organizations (and reused in this research). Hence, the need to explore and determine the factor structure for each major variable through principal component analysis (PCA), as part of factor analysis. The response to 40 items by 309 managers were subjected to principal components analysis (PCA) using SPSS. Prior to performing PCA the suitability of data for factor analysis was assessed. Inspection of the correlation matrix revealed the presence of many coefficients of .3 and above. The Kaiser-Meyer-Olkin value was .94, exceeding the recommended minimum value of .6 (Kaiser, 1970, 1974) and the Barlett's Test of Sphericity (Bartlett, 1954) reached statistical significance, supporting the factorability of the correlation matrix (see Table 5).

Table 5: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.			.936
Bartlett's Test of Sphericity	Approx. Chi-Square	7964.04	1
	Df	780	
	Sig.	.000	

Principal components analysis (partially shown as in Table 6) revealed the presence of six components with eigenvalues exceeding 1, explaining 39.39 per cent, 14.03 per cent, 4.46 per cent, 3.11 per cent, 2.85 per cent, and 2.56 per cent of the variance respectively; in total these six components can explain 66.4 percent of the variance. Using Catell's (1966) scree test, it was decided to retain two components for further investigation. Therefore a two factor analysis is required to determine item loadings on components.

Table 6: Principal Component Analysis

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
		1	15.97		39.939	39.939		15.97	39.9
2	5.611	14.027	53.966	5.611	14.0	53.96	9.678	24.19	53.96
3	1.785	4.463	58.429						
4	1.242	3.106	61.535						
5	1.141	2.852	64.388						
6	1.024	2.559	66.947						
7	.984	2.461	69.408						
8	.841	2.104	71.512						
9	.815	2.037	73.549						

To aid in the interpretation of these two components, Varimax rotation was performed. The rotated solution (presented in Table 7) revealed the presence of simpler structure (Thurstone, 1947), with two components showing a number of strong loadings, and all variables loading substantially on only two component. Only loadings higher or equal to 0.50 in absolute value would be considered statistically significant (Stevens, 1996) and as such a higher loading of 0.6 was used. It was found that the OLL items load strongly on Component 1 and ILL items load strongly on Component 2, giving a clear picture of the existence of two variables, i.e. ILL and OLL, explaining OOL. The two factor solution explained a total of 54.0 per cent of the variance, with Component 1 (OLL) contributing 29.8 per cent and Component 2 (ILL) contributing 24.2 per cent.

Table 7: Varimax Rotation of Two Factor Solution for OOLL Items

Items for Comp1 (Organization Level Learning)	Load	Items for Comp 2 (Individual Level Learning)	Load
D_12: learning & development are valued in the firm	.84	D4: learn from own and others' mistakes	.84
D_8: discuss changes & impacts in good time	.82	D2: keen on learning new things	.84
D_10: good learning & development outcomes praised	.81	D20: support/encourage others in their learning	.83
D_11: excellent LOP offered to employees	.80	D5: learning and development awareness	.81
D_7: OL is directed by shared picture of development	.80	D15: feel satisfied when learning new things	.79
D_5: development targets are monitored	.80	D18: can solve problems several different ways	.78
D_20: individual & teams assess their own development	.77	D19: can teach and coach others	.75
D_19: new technique mastering well coached	.77	D7: want to be involved in development	.73
D_15: successful development ventures rewarded	.76	D9: take part in courses & educate myself actively	.71
D_16: always identify obstacles to learning	.76	D14: apply what I learn to develop my work	.70
D_1: learning facilities developed systematically	.75	D3: not scared of big changes	.69
D_3: learning obstacles in the firm eliminated	.71	D12: purposive in my learning	.69
D_6: invest a lot in building a LO	.70	D10 : as group member I can assess work results	.67
D_14: critical thinking, varied work ways support	.68	D13: continuous development is more vital than routine work	.62
D_17: learning is vital part of competitiveness	.67		
D16: feel bosses appreciate my learning	.64	D_9, D_18 (loadings below 0.60)	
D_2: Lrg guided by what's vital for bus success	.62		
D_4, D_13, D11, D1, D 17, D6, D8 (loadings below 0.60)			
No of items loading on Comp 1	17	No of items loading on Comp 2	14
	items		items
% of variance explained	29.8	% of variance explained	24.2
	%		%

%

Note: Only loadings above .60 are displayed.

6.3.1 Discussions on the Structure of OOLL

In previous research, Moilanen (2001c) did not carry out any factor analysis. However based on Moilanen's report on mean scores, the findings in this research support Moilanen's mean score results in that the use of ILL items and OLL items as separate scales in measuring OOLL via The Learning Organization Diamond instrument is appropriate. In Moilanen's (2001b) research, it was reported that the mean score for OLL was 2.43 and ILL was 2.93 based on responses to the 40 items using a five-point Likert scale, with no indication of any element being distinct from the other. In other words, Moilanen found no reason to remove any items, and the instrument is retained as it is. However in this research, upon PCA, items with loadings below .60 are removed. In this way the instrument measuring ILL and OLL is refined, thereby retaining those items that make-up the underlying structure of the variables being measured. With items removed and clear pattern shown with most items loading on to respective variable from which they originally belong to, it can be said that generally the instrument is acceptable (with items removed) to measure ILL and OLL, for further correlational studies. In other words the interpretation of the two components (ILL and OLL) was consistent with previous research on the OOL scale, with ILL and OLL measurable on separate scales, moreover Therefore, the results of this analysis, at best, support the use of the items identified in separate scales.

6.3.2 Further Structure Breakdown Analysis

Based on the items loaded given in Table 7 a further analysis is necessary to view the structure of OOLL in detail. The items are regrouped into the five elements for each component of OOLL i.e. OLL and ILL, as shown in Table 8 below.

Table 8: Items Loaded According to Elements of Learning

Organization Level Learning		Individual Level Learning	
Elements	Items	Elements	Items
1. Managing	D_1, D_6, D_11, D16, D_16	1. Leading	No loading
2. Finding Purpose	D_2, D_7, D_12, D_17	2. Finding Purpose	D2, D7, D12
3. Questioning	D_3, D_8	3. Questioning	D3, D13, D18
4. Empowerment	D_14, D_19	4. Empowerment	D4, D9, D14, D19
5. Evaluating	D_5, D_10, D_15, D_20	5. Evaluating	D5, D10, D15, D20

Subsequently, mean score analysis was done to identify the main variables that constitute each of the OOLL components (see Table 7). For OLL, similar to previous research findings, managers in this research feel that finding purpose depicted by focus on vision and strategy essentially direct leaning and development in their organization as a whole. This is followed by evaluating, empowering, managing and questioning in descending order of learning at OLL level. Managing the organization in the perspective of learning organization involving handling of organization-wide systems and processes is one of the least enabler of learning. As for ILL, managers as individuals find that evaluating depicted by self-assessment and team-based evaluating systems as posing the learning motivations at the individual level. The other variables in descending order of learning motivations experienced by managers are finding purpose, empowering, questioning and leading. Leading, in this research did not receive any loading, hence scored a zero. Findings in previous research on learning at ILL showed similar pattern, except that evaluating is the second highest contributor and finding purpose the first. However, the mean scores for variables in respective components are quite close and as such all tools are important for managerial learning.

6.3.3 Discussions on Further Structure Breakdown

From the mean scores given in Table 9, ILL components have a higher score giving the notion that they learn better at individual level than organization level. Self evaluation seems to be the key learning tool for managers at the individual level learning which Hendry (1996) describes, from the viewpoint of cognitive theory, that individuals have preference to learn by assessing learning outcomes. Also, Pedler *et al.* (1997) have mentioned that self managed learning and action learning, both incorporating self evaluation, are popular methods of measuring one's learning at work. At the organization level, managers feel that their organization's focus on vision and strategy are the best enablers of learning. Senge (1990a) alluded vision as one of the main disciplines for development and learning. Pedler *et al.* (1997) presented that strategy is a learning and participative process of learning in organizations. Previous research by Moilanen (2001a; 2001b) also had similar finding in that finding purpose is the main managerial learning approach at organization level.

Table 9: Descriptive Statistics for OOLL Structure

	N	Min	Max	Std. Dev	Mean	Ranking by Current Research	Ranking by Mean Previous research (Moilanen, 2001)
<i>Organization Level Learning (OLL)</i>							
Managing	30	1.60	10.	1.570	6.69	4	4
Finding Purpose	30	1.75	10.	1.568	6.87	1	1
Questioning	30	1.00	10.	1.808	6.25	5	3
Empowering	30	1.00	10.	1.646	6.76	3	2
Evaluating	30	1.00	10.	1.707	6.79	2	5
<i>Individual Learning Level (ILL)</i>							
Leading	30	-	-	-	-	5	5
Finding Purpose	30	4.00	10.	1.171	8.05	2	1
Questioning	30	4.33	10.	1.176	7.93	4	4
Empowering	30	4.50	10.	1.162	7.98	3	3
Evaluating	30	4.25	10.	1.152	8.07	1	2
Valid N (listwise)	30						

7. Recommendations for Practice

The level of OOL among respondent managers is of good standing, with managerial learning at individual level contributing more than at organizational level. Since managers feel that it is their individual learning that is contributing to overall organization level learning and not learning at organization level, it can be concluded that team learning or knowledge sharing is weak. Lack of team learning affects OOLL as one of the disciplines of organizational learning in forming learning organizations means that there must be a sharing of mental models among people working in the organization (Senge, 1990a), more so among managers, in order to facilitate a holistic learning organization (Moilanen, 2001c). To encourage team learning, more opportunities, workshops or activities must be organized on a regular basis by the management for the sharing of tacit and explicit knowledge. Proper monitoring systems must be developed and implemented to ensure effectiveness of team sharing in contributing to the career success of managers as well as for organizational learning.

8. Conclusions

Initial analysis on the structure of the learning organization showed that managers have good impression on the overall learning taking place in their organization. Factor reduction resulted in retaining the items that have strong loadings on the components of OLL and ILL. The removal of items for leading due to weak loading indicated that managers do little to lead learners and their leaning, similar to previous research. Managers are more concerned on their own learning outcomes, as further breakdown of structure revealed that self-evaluation is the key tool used in ILL. At OLL level,

managers feel that vision and strategy of the organization make the main driving force to enable learning. Managing as a tool for effecting the learning organization is not the main tool as per previous research, rendering the notion that managers work with lower conscious attention towards the learning organization. Nevertheless, scores on other elements also show that other elements at both levels are still useful to develop the learning organization.

References

- [1] Argyris, C. and Schon, D.A. (1978). *Organizational Learning: A Theory of Action Perspective*. Reading: Addison-Wesley Publishing Company.
- [2] Argyris, C. and Schon, D.A. (1996). *Organizational Learning II; Theory, Method and Practice.*, Reading, MA: Addison-Wesley.
- [3] Bartlett, M.S. (1954). A note on the multiplying factors for various chi square approximations. *Journal of the Royal Statistical Society*, 16 (Series B), 296-298.
- [4] Catell, R.B. (1966). The scree test for number of factors. *Multivariate Behavioral Research*. 1:245-276.
- [5] Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences*. 2nd Edition, Hillsdale, NJ: Erlbaum.
- [6] Easterby-Smith, M. (1997). *Disciplines of organizational learning: contributions and critiques*. *Human Relations*. 50(9):1085-113.
- [7] Havelock, R.G. (1973). *The Change Agent's Guide to Innovation in Education*. pages 3-20. Englewood Cliffs, NJ: Educational Technology Publications. Retrieved on 3 December 2007 from <http://www.fsu.edu/~adult-ed/jenny/program.html#Havelock>.
- [8] Hendry, C. (1996). Understanding and creating whole organizational change through learning theory. *Human Relations*. 49(5):621-637.
- [9] Huber, G.P. (1991a). Organizational learning: The contributing process and the literatures. Reprint from *Organizational Science* Vol.2, No. Feb. 1991. In *Organizational Learning*, ed. By M. Cohen and L. Sproull. London: Sage Publications. 1996, 124-62.
- [10] Kaiser, H. (1970). *A Second Generation Little Jiffy*. *Psychometrika*. 35:401-415.
- [11] Kaiser, H. (1974). *An Index of Factorial Simplicity*. *Psychometrika*. 39:31-36.
- [12] Moilanen, R. (1999a). Finnish learning organizations: structure and styles. *The Entrepreneurial Executive*. No.4, pp.1-40.
- [13] Moilanen, R. (1999b). Management and leadership in a strategically and motivationally focused learning organization. In S. Lahteenmaki, L. Holden and I Roberts (Eds.) *HRM and the Learning Organisation*. Publications of the Turku School of Economics and Business Administration A-2, 51-76.

- [14] Moilanen, R. (2001a). Diagnostic tools for learning organizations. *The Learning Organization*. 8(1): 6-20. [15] Moilanen, R. (2001b). *Diagnosing learning organizations*. Working papers from the School of Business and Economics of the University of Jyväskylä 232/2001.
- [16] Moilanen, R. (2001c). *A learning organization: Machine or human?* Doctoral dissertation. University of Jyväskylä, Finland.
- [17] Nunnally, J.C. and Bernstein, I.H. (1994). *Psychometric Theory.*, New York, NY: McGraw-Hill.
- [18] Pedler, M.J., Boydell, T. and Burgoyne, J.G. (1988). *The Learning Company Project: A Report, Training Agency*. Sheffield.
- [19] Pedler, M.J., Boydell, T. and Burgoyne, J.G. (1989). Towards the learning company. *Management Education and Development*. 20(1): 1-8.
- [20] Pedler, M., Burgoyne, J. and Boydell, T. (1991). *The Learning Company: A Strategy for Sustainable Development*. London: McGraw-Hill.
- [21] Pedler, M., Burgoyne, J. & Boydell, T. (1997). *The Learning Company, a Strategy for Sustainable Development*, 2nd ed, McGraw-Hill, London.
- [22] Senge, P. (1990a). *The Fifth Discipline: The Art and Practice of the Learning Organization*. New York, NY: Doubleday Currency.
- [23] Teare, R. and Dealtry, R. (1998). Building and sustaining a learning organization. *The Learning Organization*. 5(1): 47-60.
- [24] Thurstone, L.L. (1947). *Multiple Factor Analysis*. Chicago: University of Chicago Press.
- [25] Van der Sluis, L.E.C. (2000). *Management learning and development: The role of learning opportunities and learning behavior in management development and career success*. Erasmus University Rotterdam, Dissertation: Thela Thesis/Tinbergen Institute.