IMPACT OF LEARNING ORGANIZATION ATTRIBUTES ON ORGANIZATION PERFORMANCE: A STUDY OF AN INDIAN PSU

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Abstract

The purpose of this paper is to study the impact of learning organization dimensions on

organizational performance in one of India's leading PSUs using the 'Dimensions of Learning

Organization Questionnaire (DLOQ)'developed by Marsick and Watkins. DLOQ has nine

dimensions out of which seven dimensions address learning activities at four levels namely;

Individual, Group, Organizational, and Global. Organizationa performance is captured through

financial and knowledge performance. Literature on learning organizations was reviewed along

with the various measures available in learning organization area. The impact of level specific

learning activities on the sample organization's performance is observed, Sixty eight responses

were obtained from the sample organisation which is Asia's largest integrated aluminium complex.

Data were analysed quantitatively, findings presented, conclusions drawn and suggestions made

for future research.

Key words: Learning Organization, DLOQ, Knowledge Performance, Financial Performance

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Introduction

In order to cope with unexpected and drastic changes, organizations need to embrace and devise

cutting edge strategies. For survival and growth, they are constantly changing their existing

strategies by unlearning, relearning and learning new ways of behaving. This emerging

organization is termed 'the learning organization'. Senge (1990) defined a learning organization

as one "where people continuously expand their capacity to create the results they truly desire,

where new and expansive patterns of thinking are nurtured, where collective aspiration is set

free, and where people are continually learning how to learn together". This capacity for creation

distinguishes learning organizations from others.

From 1990's, a number of papers both research and conceptual were published on this topic. The

underlying concept of learning organization is 'how to design organizations that can withstand

the environmental turbulence'. To foster better agility to adapt to a changing order, there is a

need to design organizations that can learn (McGill, Slocum & Lei, 1993).

This paper attempts to look into the basic assumptions regarding learning organizations and uses

the Dimensions of Learning Organization Questionnaire developed by Watkins and Marsick,

(1996) to measure the extent of learning organization score in the Indian context and measure the

impact of learning organization practices/process on organizational performance. The results are

analyzed, followed by conclusions and recommendations for future research.

Literature Review

This part of the paper reviews literature pertaining to learning organization and studies

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conducted using dimensions of learning organization questionnaire (DLOQ).

The concept of Learning Organization

The concept of learning organization has been in existence for quite some time but it gained

larger currency after the work of Peter Senge in 1990 with his book The Fifth Discipline: The Art

and Practice of the Learning Organization. Senge described learning organization in terms of

five building blocks, i.e. personal mastery, mental models, shared vision, systems thinking, and

tea learning.

The major themes identified from the literature on learning organizations are: building

blocks(Senge,1990), characteristics/components/attributes(Pedler, 1991; Garvin,1993; Slater and

Narver, 1995; Goh, 2001, Watkins and Marsick, 1998; Greigo et al 2000, Thomson and Hoest,

2001), creation, acquisition, and transfer of knowledge(Garvin, 1993; Marquardt, 1996 Lewis,

2002, Jensen, 2005), individual, team and organizational learning (Senge, 1990; Moilanen,

2005). Other themes identified are; learning organization creates a culture of adaptation to

change (Senge, 1990; Watkins and Marsick, 1993, 1996; Jamali and Sidani, 2008). Some studies

report the linkage between learning organization and outcomes including financial performance,

innovation, employee job satisfaction, motivation to transfer learning, organizational

commitment, and minimal turnover (Egan et al., 2004; Ellinger et al., 2002; Sta. Maria and

Watkins, 2003).

Jamali et al, (2009) observed there is a lack of consensus among researchers and practitioners

with regard to a common definition of learning organization and there is ambiguity relating to

what a learning organization is or should be. Hence, research on learning organization is still characterized by vagueness and abstraction (Ortenblad, 2004). In addition to this, Jamali and Sidani, (2008), stated that "However, such conceptual abstraction, if not addressed, risks undermining the utility that can potentially accrue from a promising change paradigm". This finding has support from a study by (Awasty and Gupta, 2011; and Sharifirad,2011). Hence, there is a need for measuring the implementation of dimensions of learning organizations in different organizations(Weldy and Gillis, 2010).Of late, there are a large number of empirical studies in developed countries but the same is not true in developing countries (Jamali and Sidani, 2008). This was further reiterated by Walczak (2007) and more specifically in Asian countries (Lien et al, 2006). The present study is designed to address some of the above mentioned issues.

Theoretical framework

This study adopts the Watkins and Marsick's(1996) learning organization model as its theoretical base. In order to define the construct of learning organization(LO) i.e., DLOQ, Watkins and Marsick proposed an integrated model. The model and the instrument, DLOQ are discussed in the next section.

There are a number of factors that prompted the use of DLOQ like its comprehensiveness, depth, and validity. The instrument covers learning at the level of individual, team, organizational, and global. Besides the depth, the instrument has a wide coverage as it integrates important attributes of learning organizations like continuous learning opportunities, learning and dialogue, team learning, empowerment, systems, and leading learning. Apart from these

dimensions, two more dimensions have been added to evaluate performance improvement in

both financial and knowledge areas. Further, the DLOQ has also been scientifically validated and

revised in different cultural contexts (Jamali et al, 2009).

The DLOQ

Watkins and Marsick (1996, p. 4) proposed an integrated model for a learning organization and

defined a learning organization as "one that learns continuously and transforms itself . . .

Learning is a continuous, strategically used process – integrated with and running parallel to

work". They proposed seven action imperatives or dimensions and two dimensions relating to

performance outcomes that characterize organizations in their journey towards learning

organizations. These are presented in Table 1.

Table No.1 about here

Further they propose that learning activities should occur at four organizational levels, i.e.,

individual, team and/or group, organizational, and global. The seven dimensions in this model

address learning activities at the above mentioned four levels in an organization. The level

specific dimensions are discussed in the next section.

Individual Learning (IL)

Learning at the individual level is "the ways in which people make meaning of situations they

encounter, and the way in which they acquire and apply the knowledge, attitudes, and skills they

need to act in new ways" (Watkins and Marsick, 1999, p. 81). Individual learning is fostered by

creating continuous learning opportunities and promoting inquiry and dialogue (Watkins and

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Marsick, 2003)

Group Learning(GRL)

Through teams, people learn how to work collaboratively, which is valued by the culture and

rewarded (Watkins and Marsick, 2003).

Organizational Learning(OL)

According to Watkins and Marsick (2003), there are two action imperatives that pertain to this

level of organizational learning, namely: (1) create systems to capture and share learning; (2)

empower people toward a collective vision.

Global Learning(GL)

When the organization is connected to its environment, interdependencies between the

organization and its internal and external environment are acknowledged and worked through,

which promotes learning. Finally, learning in an organization is difficult to create without

supportive and appropriate leadership in the organization. Leaders provide strategic direction for

using learning to leverage change and to move the organization in new directions (Watkins

& Marsick, 2003).

Figure 1 about here

The learning at different levels is shown in the model illustrated in Figure 1. This model stresses

the importance of the systems level continuous learning and the management of knowledge

outcomes which might lead to performance improvement in terms of financial and nonfinancial

intellectual capital (Marsick and Watkins, 1999).

Review of literature

The review of literature is centered around studies or concepts relating to application of learning

organization concept using DLOQ and its relationship to organizational performance. Most of

the studies have tested the psychometric properties of DLOQ in different cultural contexts to test

the applicability of learning organization concept. This includes studies by (Yang; 2003, Lien et

al; 2006, Hernadez and Watkins; 2003, Song and Chermack; 2008, Sharifirad; 2011, Jamali et

al; 2009, Zhang et al.; 2004, Somerville and McConnell-Imbriotis; 2004, Yang et al; 2004,

Dahanayake and Gamlath; 2013, Dirani; 2013). These studies have examined the applicability of

the DLOQ in different cultures, providing internal consistency of each item reliability and

reliable factor structure of the dimensions of the learning organization(Song and

Chermack, 2008).

Different studies (Hernandez; 2000, Ellinger et al; 2002, Dymock; 2003, Yang; 2003, Egan et

al.;2004, Kumar & Idris; 2006, Davis and Daley; 2008, Noubar et al; 2011, Awasthy and Gupta;

2011, Kim & Marsick; 2013, Sahaya; 2012) have attempted to link learning organization

dimensions and organizational performance outcomes using DLOQ. These are presented in

Table No. 2

Table No.2 about here

A closer look at these studies reveals the following points:

1) Number of items in DLOQ and the inclusion of performance variables: Only three

studies have adopted the 43 items or the 55 items scale (Dymock, Yang, and Davis & Daley)

- 2) Most of the research is into validation of DLOQ in different cultural contexts.
- 3) The literature Pertaining to the impact of level specific (IL, TL, OL, and GL) learning on both financial and knowledge performance is somewhat non-existent.

So it may be inferred that there are hardly any studies which adopted DLOQ to find the relationship between learning vis-à-vis performance outcomes at different organizational levels (Individual, Group, Organizational and Global). Though Jamali et al have looked at level specific learning, but the financial measures were not a part of the study. Thus, the current research is a humble attempt to fill this gap in the literature. The following section deals with formation of research questions and hypothesis development.

Hypotheses Development

This study tries to minimize the existing literature gap by focusing on the applicability of the concept of the learning organization based on the theoretical framework proposed by Watkins and Marwick (1996, 1998) in an Indian Public Sector organization. The current research specifically addresses the following research questions:

- 1. To what extent do the employees of an Indian organization perceive the impact of dimensions of learning organization on organizational performance?
- 2. To what extent can the perceived measures of organizational performance be

explained by learning dimensions at different levels i.e. global, organizational, team, and individual)?

In order to address the research questions the following hypotheses were developed:

H1: Higher the presence of learning organization dimensions better will be the organizations' Performance (Financial and knowledge).

H2: Individual learning, team learning, organizational learning and global learning dimensions will emerge as significant predictors of organizational financial performance.

H3: Individual learning, team learning, organizational learning, global learning dimensions will emerge as significant predictors of knowledge performance of the organization.

Research Methodology

As mentioned earlier, this research has taken the learning organization model proposed by Watkins and Marsick(1996) as its theoretical base. This study uses the DLOQ to measure the progress of an Indian Public Sector Organization in becoming a learning organization. This PSU was incorporated in 1981 by Government of India. It is Asia's largest integrated aluminum complex.

We have adopted the DLOQ developed by Watkins and Marsick (1996), while omitting the last section pertaining to information relating to 'you and your organization'. As shown in Table 3, the questionnaire consisted of 55 items, which are clubbed under 9dimensions i.e. seven dimensions of learning organization plus two dimensions relating to performance. The seven dimensions are continuous learning, inquiry and dialogue, collaboration and team learning,

systems that capture and share learning, people empowerment, connecting the organization to its environment, and strategic leadership for learning, and two dimensions relating to results/outcomes (financial performance and knowledge performance). The seven dimensions of learning organization are categorized into four levels:

- (1) Individual (continuous learning, inquiry and dialogue);
- (2) team (team learning);
- (3) organization (empowerment, systems that capture and share learning); and
- (4) global (strategic leadership and connection to environment).

Table No.3 about here

Sample and data collection

Responses were obtained on a six-point likert scale that ranged from "almost never true" to "almost always true". Convenient sampling technique was used for select the sample organization. After approaching many organisations, permission was obtained from this organization. The questionnaire was initially administered to 300 employees. After a couple of visits to the sample organization and follow-up telephone calls, 68 usable responses were obtained. All the respondents were in managerial positions. The average age of respondent was 45.16 years (SD of 6.76years) and average experience was 20.49 years (SD of 6.66 years). Out of 68 responses obtained, 63 were males and 5 females. The respondents were asked not to

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mention their names and were assured confidentiality of the data.

Data Analysis

First, the collected data were subjected to descriptive analyses. Subsequently, reliability and

validity of the instruments was established. For the main analysis, the relationships among the

constructs were tested based on the hypotheses generated.

Reliability and validity of the instrument

The proposed nine dimensions of the learning organization have been considered valid measures

to assess the learning organization through numerous studies in both Western (Ellinger et al.,

2002; Watkins and Marsick, 2003; Yanget al., 2004) and Non-Western cultures (Lien et al.,

2006; Song and Chermack, 2008; Zhang et al., 2004, Weldy and Gillis, 2010; Song et al.,

2009, Sharifirad, 2011; Awasthy and Gupta, 2011). The reliability of the instrument was assessed

by computing Cronbach's coefficient alpha. For the main analysis, Pearson's product moment

correlation and multiple regression analysis techniques were used. Table 4 below shows

coefficient of alpha of all the dimensions of DLOQ.

Table No.4 about here

Results and discussion

In order to examine the hypotheses, the following analyses were performed. The results are as

follows:

Hypothesis 1

We stated in H1 that the higher the presence of learning organization dimensions in the

organization, the better will be its performance. Table 5 shows the result.

Table No.5 about here

Table 5 shows that the study variables are significantly related. This implies the presence of

relationship between learning organization dimensions and performance. These findings help us

to infer that the employees in this organization perceived that the existence of effective and

suitable learning organization characteristics in the organization will result in better

organizational performance. This result is also supported by the existing literature (Davis and

Daley, 2008; Marsick and Watkins, 2003; Goh et al, 2012; Awasthy and Gupta, 2011; Ellinger et

al, 2002; Yang, 2003).

Hypothesis 2 & 3

Multiple regression analysis was conducted to test hypothesis 2 and 3.

Hypothesis 2:The level specific learning dimensions were entered in the model as independent

variables, while financial performance was the dependent variable. The results are presented in

Table 6.

Table No.6 about here

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Table 6 presents the result of regression analysis. Independent variables explained 49.9% of the

variance in financial performance. The result indicates only global level learning is positively

associated with financial performance. It can therefore be inferred that out of the four, only

Global Level learning is directly linked to financial performance in this organization. Thus

hypothesis 2 is partially supported.

The above findings are little surprising and initiate an interesting debate on the interdependency

among various dimensions of DLOQ. To some extent, similar results were reported by Jamali et

al, (2009) and Awasthy and Gupta(2011). In the current study, Global level learning consisting of

(providing strategic leadership and connecting the organization to its environment) impact

financial performance.

This can be explained from the nature of organization and contextual realities. The sample

organization where the Government of India (GOI) holds majority stake and is subjected to lot of

bureaucracy from the ministry.CFO connect, 2012 has reported India's 220-odd central public

sector enterprises (CPSEs), suffer from major problems like; fall in share prices, low

profitability, etc. 'Over-governance' is one of the factors that gives rise to this pathetic scenario.

Most of these organizations are governed by rigid hierarchy, strict rules, and standard procedures

which curtail employee participation in decision making. Decision making and policy

formulation are restricted to top management, whereas implementation is carried out by lower

level employees. This may hinder the other level specific learning.

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In another article, Lalnunmawia (2010) has written that though Indian public sector has

contributed enormously to Indian economy, these public enterprises suffer from several

problems. The management is ineffective and inefficient with uninspiring leadership, with too

much of centralization, frequent transfers of officials and lack of personal stake. Civil servants

who are often deputed to manage these enterprises who lack proper training in enterprise

management. Political interference in day-to-day affairs, rigid bureaucratic control and

ineffective delegation of authority hampers initiative, flexibility and quick decision making. The

net result is lack of shared learning. Instead of organization wide learning, fragmented learning

takes place (Stata, 1989).

Hypothesis 3: In order to predict the impact of level specific learning on knowledge

performance, stepwise regression analysis was carried out. The results are reported in Table 7.

Table 7 shows the independent variables explained 35.1% of the variance in knowledge

performance. The result indicates that out of four dimensions, only one i.e. global learning

emerged as significant predictor of knowledge performance. Thus Hypothesis 3 gets partial

support from the result.

Table No.7 about here

As we have already mentioned in Indian cultural context, subordinates tend to feel comfortable

in being guided and directed by their superiors. Sinha's (1973) research has shown Indian

personality is dependence proneness. Such people were found to be very receptive to the

expectation of others, particularly those who served as their role models. Another reason may be,

in high power distance society (India's score is 77) subordinates bestow high dependence on

their leaders for directions and guidance thereby impacting performance. According to CFO

connect, 2012, positive changes are happening in the Indian PSU space. These central PSUs have

started thinking strategically compared to earlier times, giving more importance to talent

management, and are strengthening their governance structures. The current sample organization

is no different from to this.

A comparison of the above two findings shows a similar trend. It is only global level learning

which holds key to knowledge and financial performance of the sample organization. This

organization is in the journey toward becoming a 'learning organization'. Whatever macro level

learning taking place is on account of strategic planning and environmental scanning. These

changes which are happening at the macro level may be having an impact on the macro level

learning (global level learning) and not on the micro level (individual, organizational and team

level learning). The time period which was chosen for this current piece of research falls in this

phase, which may explain the findings.

Conclusion

This paper tries to build upon the idea of Senge's (1990) 'systems thinking' by taking Watkins

and Marsick's (1996) learning organization framework. Watkins and Marsick have identified

seven distinct but interrelated dimensions of the learning organization at individual, team,

organizational, and global level and two outcome variables. These dimensions were analysed as a whole for the purpose of this study across one Indian public sector organization. The impact of various levels of DLOQ on performance was explored thereby reflecting the applicability of systems theory. According to Jamali et al.(2006), 'systems theory explains learning organizations as comprising of inter-dependent building blocks at the individual, group, organizational and global levels. The idea is that the dimensions and propensities detected at various levels necessarily combine, interact and co-evolve to shape the disciplines of an advanced learning organization' (p.117)

The findings of the study suggest that significant relationship exists between the seven action imperatives and performance variables. Further the study extended the work of Jamali et al(2009), by incorporating financial outcomes, tried to explore the predictive efficiency of learning characteristics (at different levels i.e. global, organizational, team, and individual) on performance variables (financial and knowledge). In terms of strength of learning levels our research indicates only global level learning has bearing on financial and knowledge performance.

As described by Goh et al. (2012), organizational or cultural context plays an important role in organizational learning research. They studied the relationship between organizational learning capability and performance and questioned "can the strengths of this relationship be partially explained by context?" They further added "is it possible that organizations that are smaller or are in the service industry can benefit more from developing a learning capability than, for

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example, public sector organizations where performance is often more difficult to measure and

define and is not as crucial to survival?"The present study has strengthened this notion to some

extent.

This study has examined the existing theoretical base in Indian organizational context, thereby

extending the existing learning organization literature in developing countries. Conducting

research in a country like India, with such diverse socio-cultural characteristics' create an

interesting arena for testing western management theories. The current study is a humble attempt

in this regard.

Management can use some of the findings of this research to diagnose current strengths and

weaknesses of organizations and develop strategic action plans in making an organization a

learning organization. Further, results from this study can help firms establish a business case for

learning orientation initiatives at different levels as well as help assess the impact these

initiatives have on business performance.

Limitations and Suggestions for Future research

Although the research findings were quite interesting, it is noteworthy that any sweeping

generalization of the results needs to be done with caution because of the limitations of our

research arising from one organization surveyed. So, there is a need to replicate the study with

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larger sample of organizations and in different industrial settings and in other developing countries. Another shortcoming in this research is the nature of financial data obtained. 'Knowledge performance' and 'financial performance' are self-reported measures subject to the biases of the individual responding to the survey. So, future research can take in its purview and collect data from on learning organizations dimensions and financial and knowledge performance data from different respondents to eliminate common source bias.

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Table 1: Definitions of Constructs for the Dimensions of the Learning Organization

Dimension	Definition
Create continuous learning	Learning is designed into work so that people
Opportunities	can learn on the job; opportunities are provided for ongoing education and growth.
Promote inquiry and	People gain productive reasoning skills to
Dialogue	express their views and the capacity to listen and inquire into the views of others; the culture is changed to support questioning, feedback, and experimentation.

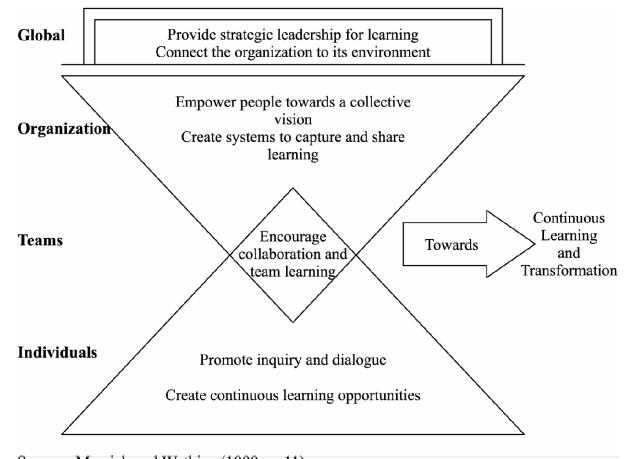
Encourage collaboration	Work is designed to use groups to access
and team learning	different modes of thinking; groups are expected to learn together and work together; collaboration is valued by the culture and rewarded.
Create systems to capture	Both high- and low-technology systems to
and share learning	share learning are created and integrated with work; access is provided; systems are maintained.
Empower people toward a	People are involved in setting, owning, and
collective vision	implementing a joint vision; responsibility is distributed close to decision making so that people are motivated to learn toward what they are held accountable to do.
Connect the organization	People are helped to see the effect of their
to its environment	work on the entire enterprise; people scan the environment and use information to adjust work practices; the organization is linked to its communities.
Provide strategic leadership for learning	Leaders model, champion, and support

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	learning; leadership uses learning strategically

Key results/Performance outcome	State of financial health and resources
Financial performance	available for growth
Knowledge performance	Enhancement of products and services because of learning and knowledge capacity (lead indicators of intellectual capital)

Source: Adopted from Marsick and Watkins (2003)

Figure 1: Learning organization action imperatives



Source: Marsick and Watkins (1999, p. 11)

Table 2: Research Studies on Learning organization dimensions and organizational performance using DLOQ. Numbers in Parenthesis shows DLOQ item numbers

Year	Author	Concept studied using DLOQ (number of items of DLOQ in parenthesis)
2001	Selden and Watkins,	Evaluated the relationships
		between the seven
		learning organisation
		dimensions, company
		characteristics and
		knowledge and financial
2003	Dymock	Case study based on
		qualitative data in an
		Australian organization using
		DLOQ. This research focuses
		on how this organization has
		developed a learning culture
		in a changing industrial
2003	Ellinger et al	Relationship between the
		learning organization
		concept and firms' financial
		performance using DLOQ
		and objective measures of
		performance (21 items). The
		target sample is logistics
		managara

2003	McHargue	His	study	/	was
		conducted to)		
		understar	nd	the	LO
		dimensions	and	nonj	orofit
		porformanco	and	how	thic

		relationship impacts
		nonprofit organizations' ability to become nonprofit learning organizations. (55 items)
2003	Hernandez and Watkins	Studied the ways in which
		learning organisation dimensions impact the process of tacit knowledge transfer, knowledge performance and financial performance within private manufacturing organisations in Colombia. A positive structural relationship between the seven learning organisation dimensions and the transfer of tacit knowledge process is found. The transfer of tacit knowledge process consecutively showed a positive influence on knowledge performance. (49 items)

2003	Yang	Concept of a learning culture
		can be adequately measured and validated by relating it to organizational performance. Relation to financial
		performance is analysed by
		canonical correlation. (43 items).
2004	Power and Waddell	Examined the relationships
2006	Kumar &Idris	between self-managed work teams and the learning organisation dimensions using four measures of performance: knowledge performance, financial performance, customer satisfaction and turnover as a medium. Explore the relationships
		between learning organisation dimensions, institutional characteristics and knowledge performance in Malaysian context(49 item)
2008	Davis & Daley	Managerial responses to the Dimensions of the Learning Organization Questionnaire together with both perceptual and objective measures of firms' financial performance were analyzed (55 items)

2011	Awasthy& Gupta	Assess employees'
		perceptions of their organizations' orientation
0011		towards learning in manufacturing and service firms. This study tries to find out the impact of level specific (structural and people) dimensions on outcome variables, i.e. Knowledge and performance (21 items).
2011	Noubar et al	Relationships between learning organization dimensions, and change in financial and knowledge performance among Malaysian companies (21 items).
2012	Sahaya	Studied the role of Learning organization as a mediator between leadership style and financial measure (ROA) using DLOQ and came to the conclusion that promote inquiry, provide strategic leadership, and empower people dimensions of learning organization mediate the relationship between leaderships style and performance. (43 items)
2013	Kim &Marsick	Used DLOQ to design and implement a learning organization initiative

Table 3 DLOQ dimensions and their items in our study

Section	Dimension	Items
Individual level	Continuous learning	7
	Inquiry and dialogue	6
Team or group level	Collaboration and team	6
Organizational level	Systems that capture and share	6
	learning	6
Global level	Connecting the	6
	organization to	6
	its environment	
	Strategic leadership	
	for loorning	_
Financial Performance		6
Knowledge Performance		6

Table 4Cronbach's coefficient alpha for DLOQ measures

Dimensions	Alpha Value (α)
Continuous learning	.85
Inquiry and dialogue	.82
Collaborative and team	.87
Empower people	.88
Create systems	.82
Connect the organization	.84
Strategic leadership	.89
Knowledge performance	.93
Financial performance	.83

N=68

Table 5: Correlation between dimensions of DLOQ and outcome variables (financial performance and knowledge performance)

Dimensions	Financial Performance	Knowledge Performance
Continuous learning	0.47**	0.53**
Promote inquiry & dialogue	0.45**	0.53**
Collaboration & team	0.51**	0.56**
Systems to capture & share	0.49**	0.53**
Empower people towards a	0.58**	0.62**
Connect organization to	0.61**	0.57**
Strategic leadership for	0.72**	0.53**

^{**}Correlation is significant at 0.01 level N=68

Table 6: Regression results: Level specific learning dimensions as a predictor of financial performance

	Criterion	Predictors	Standardi	Significan
			zed	ce
	Financial	Globa	.706	.000
	Performanc	1		
e		level(GL)		

Note $R^2 = .499$; p < .001

Table 7: Regression results: Level specific learning as a predictor of Knowledge performance

Criterio	n	Predictors	Standardi	Significan
			zed	ce
Knowled	lge	Global	.425	.001
Performa	ınc	level(GL)		
e		learning		

Note $R^2 = .382$; p<.001