A STUDY FOR DEVELOPING A MEASURING INSTRUMENT OF “ORGANIZATIONAL LEARNING”

Dr. Partha Sarkar

Associate Professor, Department of Business Administration (Human Resource)
The University of Burdwan, Golapbag, Burdwan, West Bengal, India

Debangsu Sarma Chaudhuri

Research Scholar, Department of Business Administration
The University of Burdwan, Golapbag, Burdwan, West Bengal, India

ABSTRACT

Organizational Learning started to develop as an area of interest and as a subject of study since sixties. The concept is concerned with a type of knowledge which the organisational members gather by their day to day interaction with external and internal environment of the organisation, and using the knowledge for permanent change and development of the strategy, process, culture etc. which are continued in the organisation as a semi-permanent process. When such permanent changes occur, it is assumed that the organization “learns”. A lot of research works were undertaken on this subject since its inception but most of them are conceptual or prescriptive in nature. The reason for shortage of empirical studies may be the absence of a suitable instrument for measuring the construct. In this article following a literature survey of the existing literature, including the existing quantitative instruments for measuring OL, a new quantitative instrument for measuring OL is developed. Initially following the survey, a 37-item questionnaire was developed which was modified to a 34 item instrument on the basis of based on feedback from expert’s opinion and pilot study. Ultimately, item-wise responses were obtained on a Likert scale from 134 managers of Port and Shipping Organizations in India and that was analyzed by exploratory factor analysis. Eventually, the study developed a 27-item questionnaire with 4 dimensions named as “Internal capability”, “Organizational Memory”, “Spontaneous learning” and “External Knowledge”

Keyword: Organizational Learning (OL), Organizational Memory, Knowledge Generation, Knowledge dissemination, Learning Organization.

Cite this Article: Dr. Partha Sarkar and Debangsu Sarma Chaudhuri, A Study for Developing a Measuring Instrument of “Organizational Learning”, *Journal of Management*, 6(1), 2019, pp. 152-161.

<http://www.iaeme.com/jom/issues.asp?JType=JOM&VType=6&IType=1>

1. INTRODUCTION

One of the major objectives in research in the area of social science in subjects like Management, Sociology, Political Science etc., is to develop an appropriate instrument for measuring the qualitative constructs. For example, there is no direct way to measure abstract constructs like ‘Motivation’; ‘Leadership’ etc., by using a quantitatively measurable instrument. In the light of this, the present paper makes an attempt to develop an opposite construct for organizational learning in the light of a questionnaire survey carried out among the executives in the port and shipping organisations in India. The present research work has been carried out in the port and shipping sector in view of the apparent dearth of research works on the managerial aspects in the sector coupled with the fact that this sector is undergoing dynamic changes in the external environment. Furthermore, from a generic perspective, it would be academically rewarding to develop a construct on organizational learning since the topic is coming into sharper focus due to the increasing trend in the application of technology in learning and the changing dynamics of how comprehensive and organized learning is taking place within an organisation.

2. CONCEPTUALISING ORGANISATIONAL LEARNING: INSIGHTS FROM LITERATURE

“Organizational Learning” was first used by Cyert & March in academic literature in 1963, followed by the research work of ‘Cangelsi and Dill’ in the year 1965. However, the subject got the desired popularity from the publication of the book “Organizational Learning: A theory of action Perspective” in by Argyris and Schon in 1978. Argyris & Schon (1978: Page 58(1)) defined organizational learning as “a process in which members of an organization detect error or anomaly and correct it by restructuring organizational theory of action, embedding the results of their enquiry in organizational maps and images”. They identified two types of learning – single and double loop, with a view to illustrate the difference between short term/emergent changes and long term/strategic changes. March (1991) observed that there are two modes of knowledge creation namely, exploration and exploitation. The basic objective of exploration is to broaden the domain knowledge by analysing the external environment whereas exploitation is the knowledge gained by effective, efficient and innovative use of the existing resources of the organization. Argote (2013) observed that there are three overlapping contexts under which any organization functions. The most outer context, i.e. external environment comprises competitors, clients and other regulatory frameworks. The intermediate context comprises the structure, culture, technology, process etc. of the organisation. The innermost ‘active context’ is comprised of members, tools and tasks where the organizational learning takes place. Members gather knowledge through the tasks by using the tools which in turn affects all these three identified contexts. Kim (1993) observed that the employees gather conceptual knowledge through the Observe-Assess-Design-Implement (OADI) cycle which also influences to change the mental models of the employees. However, the OADI cycle is influenced by organizational structures or routines and also by the environmental response. Kim (1993) also observed that the individuals through dialogue and discussion develop the shared mental model. In other words, group learning occurs when the groups and organizational actions (structure/routines/processes) are permanently changed by these groups. According to Kim (1993), when such permanent change occurs, it is assumed that the organisation learns. Nanoka (1991) examined the knowledge creation process in an organisation and observed that knowledge gathered by individuals are primarily of two types –tacit and explicit, i.e. hidden and documented. He further observed that the knowledgebase of the actors of the organisation are generated and stored through a spiral cycle of Combination (tacit to tacit, level-individual), Socialization (tacit to explicit, level- group), Externalization (explicit to explicit, level-

Organization) and Internalization (explicit to tacit, level-individual of same or other organization). Huber (1991) first identified the process dimensions of organizational learning. He found that there are four sub processes that are associated with OL. These are “knowledge acquisition, information distribution, information interpretation and organizational memory”. Dixon (1999) found that organizational learning occurs through ‘Widespread generation of information’ followed by ‘Integrating novel and local information into the context’, ‘Collective interpretation of information’ and ‘Authority to take responsible action based on the interpreted meaning’. Following a similar approach, Schwandt & Marquardt (1999) observed that there are four sub processes of OL-as “Goal reference knowledge”, “Action/Reflection”, “Dissemination/Diffusion” and “Meaning and Memory”. Organizational members gather information from their ‘Interface’ with other entities. In this process, the information is transferred to ‘Goal Reference Knowledge’ through ‘Action/Reflection’ subsystem. The ‘Dissemination & Diffusion’ subsystem transmits and synthesizes the knowledge and develops a shared mental model (Senge, 1990) which ultimately forms ‘Meaning and Memory’ subsystem for the purpose of embedding the gathered knowledge in organizational tasks. Pawlowsky (1999) based on his meta-analysis of OL literature, observed that OL in an organization has four dimensions – (a) entity level (individual, group, organizational and intra organizational), (b) learning types (single loop, double loop, deuteron learning), (c) learning modes (cognitive, behavioral, cultural or action learning) and (d) system-process perspective (Identification, diffusion, integration and action).

Thus, from above discussion, it can be said that conceptually, organizational learning hinges on effective application of the knowledgebase of the employees for the benefit of the organisation. The employees of the organization learn different things while doing their day to day activities, rather formal or informal way. Further they are exposed to the external environment through interaction with members of other organisations or groups/individual from whom they gather knowledge. They can also gather knowledge by observing the systems of other organisations. The experience they gather through these interactions and dialogues are further modified while discussing and deliberating these issues with their peers, superiors and subordinates. Subsequently, these are synthesized and shaped through the internal culture, systems, behavior and processes of the organisation. The gathered created knowledgebase may be used for changing the strategy, structure, processes etc. of the organisation. The entire process of OL may involve all kinds of groups of employees and may occur at any level of the organisation. It may form temporary or permanent change and also effects different cognitive levels of employees. OL, to some extent occurs in all organization, but when there is a deliberate attempt to develop it, the organization is called “Learning Organization”.

3. ORGANISATIONAL LEARNING AS A CONSTRUCT: INSIGHTS FROM EXISTING RESEARCH WORKS

It has already been mentioned that abstract constructs are normally measured in an indirect way, analyzing the observations of experts who have the domain knowledge and deal with the different aspects of the construct. The same procedure is followed in this article to develop one such measurable instrument for “Organizational Learning”. For this, a two-phase approach has been pursued—first following literature survey and then analyzing the existing measuring instruments of OL (used primarily in foreign research). Accordingly, a set of 37 items has been developed which have subsequently been refined and reduced to a questionnaire of 34 items following the feedback on the pilot survey/expert opinion. Next, the instrument was administered to a group of participants to validate the measuring capability of the instrument. For developing the instrument, we primarily followed the procedure used by Templeton et.al (2002).

Though there are many research articles on the subject “Organizational Learning”, the number of empirical research works on this construct is limited (Kontoghiorghes et.al, 2005). One of the reasons of it may be the absence of any specific instrument for measuring the construct. Furthermore, as the construct is multi-level as well as multi-dimensional in nature, developing an appropriate instrument may be difficult. From literature survey it is observed that only few such instruments have been developed by the researchers. A brief overview of these instruments is presented below which in other way have enabled the researchers to develop the construct that has been presented in this paper.

Bontis et al (2000) developed an organizational learning measurement questionnaire based on 4I model of Crossan et.al (1999). He identified that OL occurs at 3 levels- Individual, Group and Organizational and there are feed-forward and feedback mechanism among these three levels. Based on these 5 building blocks, he developed a 24 items questionnaire. Chiva et.al (2006) identified five essential aspects comprising organizational learning. These are (i) ‘experimentation’ signifying the attention to new ideas and the probability of accepting and testing these ideas, (ii) ‘risk-taking’ implying organizational tolerance of ambiguity, uncertainty and errors, (iii) interaction with the forces outside the organisation, (iv) ‘dialogue’ connoting frequent and deliberate discussion on processes, assumptions, culture etc. and (v) participative decision making extent of influence of employees in organizational decisions. They developed a 14-item questionnaire and validated it by confirmatory factor analysis. Templeton et al (2002), developed a questionnaire of 46 items following the four dimensions of OL developed by Huber (1991). On the basis of a questionnaire survey and analysis by factor analysis, eight dimensions OL were identified. They have been named as “Awareness, Communication, Performance Assessment, Intellectual Cultivation, Environmental Adaptability, Social Learning, Intellectual Capital Management and Organizational Grafting”. In the Indian context, only one relevant research work could be identified, wherein a 73-item questionnaire was developed with the view to determine the relationship between different dimensions of OL using structural equation modeling (Jyothibabu, *et. al.* 2010).

In the light of the above backdrop, it can be inferred that the number of instruments that have hitherto been developed for measuring OL is scanty and hence provides scope for further study. Moreover, only one of them was carried out in the light of the Indian perspective. Thus, it appears pertinent and academically rewarding to develop and test another measuring instrument on OL in the Indian context. Further, as Port and Shipping Sector is not a well-researched sector in management research, we have chosen the Port and Shipping Sector executives for collecting data and validating the instrument.

4. ORGANISATIONAL LEARNING AS A CONSTRUCT: RESEARCH METHODOLOGY

In the light of the framework of Templeton (2002), an effort has been taken to develop a questionnaire on OL. We have considered the different questionnaires developed for OL measurement and initially developed a 37-item questionnaire. For pre-testing, the questionnaire was sent to select experts on the port and shipping sector for pilot study by taking feedback from 35 senior officers of Kolkata Port Trust as well as from some consultants/academicians engaged in this sector. The numbers of items were subsequently reduced to 34 based on the responses of experts. The statements of the questionnaire developed for the purpose of the present research work signify the different aspects of OL and responses have been sought on a 5-point Likert scale. A list of 250 senior and middle level officers of port and shipping organizations in India has been prepared and the questionnaire was sent through e-mails and personal visits. The list of officers has been primarily collected from the websites of the concerned organisations. Snowball sampling method was also used to find out the appropriate

respondents. The respondents are primarily the managers working in the port and shipping organizations having experience of 5 to 40 years. Reliability of the questionnaire has been studied using Cronbach's alpha since it is considered to be a popular measure of reliability. Factor analysis has been carried out using Varimax rotation and considering Eigen values greater than 1 (Malhotra & Dash, 2011).

5. ANALYSIS AND INTERPRETATION OF RESULTS

As previously discussed, a sample size of 250 has been determined for the present study. Response to the questionnaire has been received from 134 respondents signifying a response rate of 53.6%. On the basis of these responses received, the overall reliability of research instrument was computed using Cronbach's Alpha and was found to be 0.956, which is more than the threshold value of 0.7 (Tavakol & Denick, 2011). Hence, the questionnaire i.e. the research instrument is found to be reliable in terms of the inherent consistency signifying the fact that the items of the questionnaire are closely associated with one another. Furthermore, as previously discussed, the construct/face validity of the questionnaire was assessed by the pilot survey. The responses received from the 134 participants were analyzed using exploratory factor Analysis by using SPSS Version 23. The results of KMO measure of sampling adequacy was found 0.926 and Bartlett's Test of Sphericity result was statistically significant and found to be 2515.55 with 351 degrees of freedom(df), both of which are significant, and hence the sample size adequacy of the data was ensured (Taherdoost *et.al.*)(2). We have preferred to use Varimax rotation for identifying the factors which are independent with one another. In order to eliminate the less important factors and to find out groups of variables which are independent to each other, three steps were adopted. As the first step, it was decided not to consider the factors whose anti image correlation matrix diagonal values are less than 0.5, but as actually as all such values were found greater than 0.8, no factor was eliminated. Secondly, we considered only the variables, whose eigen values were greater than 1. Further, the variables whose all factor scores are less than 0.5 were discarded. Ultimately only 27 significant variables were found with 4 factors. It explained 64.802% of variance. The brief result of the factor analysis is provided below in tabular forms:

Table 1 KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.92
Bartlett's Test of Sphericity	Approx. Chi-Square	2515.55
	df	351
	Sig.	0.00

Table 2 Total Variance Explained (Considered Eigen values greater than 1 only)

Total Variance Explained									
Component	Initial Eigen values			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	12.807	47.432	47.432	12.807	47.432	47.432	7.193	26.641	26.641
2	1.876	6.947	54.379	1.876	6.947	54.379	4.786	17.724	44.365
3	1.542	5.712	60.091	1.542	5.712	60.091	3.415	12.647	57.012
4	1.272	4.711	64.802	1.272	4.711	64.802	2.103	7.790	64.802

Table 3 Factor Scores

Rotated Component Matrix ^a					Rotated Component Matrix ^a				
	Component					Component			
	1	2	3	4		1	2	3	4
OL12	0.783	0.232	0.138	0.22	OL32	0.353	0.819	0.069	0.061
OL11	0.746	0.16	0.058	0.365	OL30	0.366	0.765	0.046	0.086
OL10	0.745	0.075	0.243	0.263	OL31	0.36	0.719	0.267	0.067
OL25	0.703	0.275	0.31	0.138	OL33	0.255	0.65	0.346	0.198
OL14	0.693	0.127	0.306	0.061	OL7	0.039	0.627	0.005	0.245
OL9	0.686	0.205	0.371	0.162	OL20	0.011	0.578	0.427	0.057
OL23	0.663	0.251	0.207	0.303	OL28	0.512	0.528	0.18	0.307
OL13	0.658	0.245	0.375	-0.098	OL19	0.197	0.173	0.812	-0.156
OL21	0.638	0.37	0.347	0.142	OL5	0.276	0.225	0.691	0.202
OL22	0.636	0.341	-0.047	-0.204	OL6	0.425	0.095	0.682	0.197
OL4	0.589	0.383	0.176	0.405	OL2	0.206	0.112	0.561	0.421
OL27	0.572	0.449	0.173	0.198	OL1	0.175	0.272	-0.001	0.746
OL17	0.504	0.498	0.201	-0.058	OL3	0.268	0.106	0.451	0.593
OL8	0.503	0.451	0.257	0.179					

Table 4 Organizational Learning Questionnaire: Factor Wise Sorted

Variable Name	Item Description	Factor No
OL4	Management of my organization emphasizes on proactive identification and solving possible future problems.	1
OL8	My organization regularly monitors the organizational performance for collecting relevant information.	1
OL9	The employees of my organization acquire many innovative ideas while undertaking day to day activities.	1
OL10	Management of my organization considers new ideas for implementation.	1
OL11	Top management of my organization provides due cognizance to the views of all executives during meetings/group discussions etc.	1
OL12	In my organisation, gathered knowledge/information of the organisational members are interpreted, aggregated and shared at all organizational levels through the interactions of members in the organizations.	1
OL13	The employees of my organization are aware of the channels for getting the required relevant information.	1
OL14	The employees of my organization voluntarily share important organization-related information with other employees	1
OL17	In my organization employees extensively use information systems for transmission and collection of relevant information.	1
OL21	The culture of encouraging employees to communicate clearly/without hesitation exists in my organization.	1
OL22	My organization is fast enough for learning and adopting technological changes.	1
OL23	My organization welcomes/appreciates new ways of doing work/job/activities from the employees.	1
OL25	My organization encourages different points of view in group/team work.	1
OL27	Group/team recommendations are adopted by the management of my organisation while framing policies/strategy etc.	1
OL7	My organization collaborates with outside consultants/experts on various matters in case when the in house executives are unable to solve the problems.	2

Variable Name	Item Description	Factor No
OL20	In my organization employees have access to a large variety of communication tools (telephone, mobile, e-mail, internet etc.).	2
OL28	My organization develops/trains employees to make them experts in their respective domain of work.	2
OL30	My organization extensively uses information and communication technology (ICT)/other electronic means for storing of organizational information.	2
OL31	My organization stores detailed information for guiding operations.	2
OL32	Formal data management functions including collection, storage and retrieval through electronic means exist in my organization.	2
OL33	My organization members use past data for decision making.	2
OL2	The employees of my organization gather knowledge while performing day to day activities of the organization.	3
OL5	The employees of my organization learn new things about the nature/process of work of the company by direct observation of different incidents.	3
OL6	The employees of my organization gather knowledge and learn about the recent developments of my organization through formal as well as informal means.	3
OL19	In my organization, employees learn new things from the unexpected outcomes/failures.	3
OL1.	My Organization recruits specialized and knowledgeable human resources.	4
OL3	The top executives of my organization learn from their interaction with different stakeholders including-Competitors, Suppliers and Consumers.	4
OL15	In my organization employees are aware where their knowledge can serve/benefit the company.	X*
OL16	The top management of my organization gathers and assimilates information from different areas of activities.	X*
OL18	In my organization, one important objective for transfer of employees between departments/ divisions/sections is cross training.	X*
OL24	My organization encourages the use of artefacts like models, charts etc. for decision making.	X*
OL26	In my organisation executives/employee groups are having necessary mental preparation to rethink past decisions when presented with new information.	X*
OL29	My organization maintains certain mix of skills among its pool of employees.	X*
OL34	The knowledge gathered through the repeated rounds of experiences by the employees and the management (related with the work processes/activities, practices, rules, regulations etc.), is considered for developing the works/processes/activities of my organization.	X*

**irrelevant factors*

Table 5 Factor Wise Reliability Statistics

Factor Number	Name	Cronbach's Alpha Value signifying a sub-construct	Comments
1	Internal capability	0.94	Highly Acceptable
2	Organizational Memory	0.89	Highly Acceptable
3	Spontaneous Learning	0.80	Highly Acceptable
4	External Knowledge	0.60	Acceptable

From the result of the exploratory factor analysis it is revealed that the first factor explains 26.641% of variance. It consists of 14 items viz. proactive identification of problems, considering innovative ideas and their implementation, new ways for doing the jobs, positive

organizational culture and acceptance of recommendation of group’s teams etc., interpretation and sharing of information, learning and adapting technological change, use of information system by organizational members for transmitting the information. Thus, all these aspects are related with generation, interpretation and sharing of information with necessary management assistance in the light of the internal environment of the organization. The knowledge is generated by the interaction amongst the employees, which is shared and transmitted to the top management by using IT. Positive organizational culture and due cognizance of the top management facilitate and propel the process. Conceptually, these are characteristics of a learning organization where the management creates an environment which itself facilitates learning. This is broadly analogous with the exploitation dimension of March (1991) and knowledge gathering (as an internal process), sharing and dissemination dimension of Huber (1991). Thus, we are inclined to name this factor as “Internal capability”

Factor 2 explains 17.724% of variance and it comprises 7 items namely accessing a large variety of communication tools, using information and communication technology (ICT), storing detailed information, using past data for decision-making, collection, storage and retrieval of both quantitative and qualitative data through electronic means, development and training of employees for making them expert. All these factors are related with storage and retrieval of past data as per requirement primarily through electronic means. This is largely synonymous with “Organizational Memory” concept of Huber (1991). It shows that the use of long-standing data is valuable in generating and instilling new ideas among the employees and hence it is relevant from the human capital perspective. Further, easy retrieval of old data in electronic format facilitates organizational learning as these are easily accessible. Moreover, if data are kept in electronic format, there is almost no chance of loss of data. Thus, considering these aspects in mind, we also name it as “Organizational Memory”.

The third factor has 4 items and it explains 12.647 % of variance. It consists of four items as gathering knowledge while performing day to day work, learning new things by direct observation, gathering knowledge through unexpected events and knowledge about the recent developments of the organization. These are characteristics of social learning and hence we preferred to name it as “Spontaneous Learning”. It is almost equivalent to the characteristics of factor 1, but here the stress is more on spontaneous learning which is a natural process rather than deliberate learning.

The fourth factor consists only 2 items as “recruitment of knowledgeable manpower” and “knowledge gathers from the interaction with different stakeholders”. Both these are sources of getting external knowledge into the organization and hence we named it as “External Knowledge”. Huber (1991) named this type of knowledge gathering as “Congenital Learning”. This factor explains 7.79% of variance.

In addition to this, for further checking the factor wise reliability scores signifying the sub-construct reliability, the value of Cronbach’s Alpha for the variables of each factor was calculated (Details in Table-5 above). It was found that for the first three factors, the values are 0.94, 0.89 and 0.80 all are above the threshold limit of 0.7. For the fourth factor the value was found 0.60, which though slightly (14%) less than the threshold limit, we can accept the fourth factor as reliable enough because it is based on the values of only two variables. Hence it can be said that the entire questionnaire is reliable. The considerably excellent values of the sub-construct reliability signify the strength of the sub-constructs of the different identified factors associated with organizational learning.

Thus, the four factors identified signify 4 different dimensions of OL. The first 2 factors cumulatively explain 43 % of the variance. Thus, we can conclude that it may be possible that extensive use of IT with supporting attitude of management is the most effective and strategically important factor for facilitating OL. However, these are also supported by the

factor 3 and 4, i.e. gathering information from outsiders and spontaneous learning in day to day activities of the employees. In our opinion, these 4 factors are complementary to each other and with simultaneous execution of all the processes embedded in these factors can enhance organizational learning. We therefore conclude that although the four identified factors are discrete in nature they need to be considered as in unison in an integrative manner.

6. CONCLUSION

The basic contribution of the article is to develop a new set of measuring instrument of “Organizational Learning”. In this perspective it supplements the existing measuring instruments of the construct. Further, the said instrument is based on the perception of Indian Managers, whereas, except one, all the other instruments developed earlier were developed in overseas environment. Moreover, we have deliberately chosen the managers from port and shipping organisations in India, as the number of research carried out in this sector is quite low throughout the world, not only in India. Furthermore, the sector is undergoing several changes and facing a dynamically changing environment. It is therefore imperative to examine organisational learning can be conceptualized in this sector.

However, just like any other research it has also certain shortcomings. It is based on the observations of only 134 participants. Though it satisfies KMO’s sampling adequacy test, the number of valid responses/participants should be more for getting a more reliable and robust output. Further, we have taken the views of the managers as there is no direct method for measuring OL quantitatively. This shortcoming can be reduced if the research is accompanied with case studies on relevant organizations, highlighting the situational aspects.

REFERENCE

- [1] Cyert, R., & March, J. A Behavioral Theory of the Firm. New Jersey: Englewood Cliffs, 1963
- [2] Congelsi, V., & Dill, W. R. Organizational Learning: Observations towards a Theory. Administrative Science quarterly, 1965, pp. 175-203.
- [3] Argyris, C., & Schon, D. A. A Theory of Action Perspective. Addison Wesley Longman Publication, 1978.
- [4] March. J.G., Exploration and Exploitation in Organizational Learning, Organization Science 2(1), 1991, pp. 71-87
- [5] Argote, L. Organizational Learning: Creating, Retaining and Transferring Knowledge. Springer Publication, 2013.
- [6] Kim, D. H., The Link Between Individual and Organizational Learning. Sloan Management Review, 1993, fall, pp.37-50.
- [7] Nanoka, I., The Knowledge Creating Company. Harvard Business Review, 1991, Nov-Dec, pp. 96-104.
- [8] Huber, G. P., Organizational Learning: The contributing Processes and the Literature. Organization Science, 1991, 2(1), pp. 88-115.
- [9] Dixon, N.M., Organizational Learning Cycle: How Can We Learn Collectively. Gower Publishing Limited, 1999
- [10] Schwandt, D. R., & Marquardt, M. J., Organizational Learning: From World Class Theories to Global Best Practices. St Lucie Press, 1991.
- [11] Senge, Peter M., The Fifth Discipline -The Art and Practice of the Learning Organizations, Random House, London, 1990

- [12] Pawlowsky, Peter, the Treatment of Organizational Learning in Management Science, Handbook of Organizational Learning and Knowledge Management: Oxford University Press, 2001,
- [13] Templeton, G. F., Lewis, B. R., & Snyder, C. A., Development of a Measure for Organizational Learning Construct. Journal of Management Information System, 2002, (Fall), pp.175-218.
- [14] Kontoghiorghes. C, Awbrey. S.M, Feurig. P.L , Examining the Relationship Between Learning Organization Characteristics and Change Adaptation, Innovation and Organizational Performance, Human Resource Development quarterly ,2005, 16 (2) , pp.185-211
- [15] Bontis, Nick, Crossan, M & Hulland, J, “Managing an Organizational Learning System by Aligning Stock and Flows”, Journal of Management Studies, 2002, 39(4) pp 437-469
- [16] Crossan.M.M, Lane. H. W & White. R. E, An Organizational Learning Framework: From Intuition to Institution, Academy of Management Review, 1999, 24(3), pp 522-534.
- [17] Chiva. R, Algere. & J, Laperdra. R., Development and Validating an instrument to Measure Organizational Learning Capability, OKLC 2006 Conference at the University of Warwick, March, 2006, pp 20-22
- [18] Jyothibabu. C, Farooq. A & Pradhan. B., An Integrated Scale for Measuring an organizational Learning system, The Learning Organisation, 2010, 17(4), pp. 303-327
- [19] Malhotra, N, K; Dash, S., Marketing Research: An Applied Orientation; Pearson, New Delhi, 2011
- [20] Tavakol, M & Dennick, R, Making Sense of Chronbach’s Alpha, International Journal of Medical Education, 2001, pp.53-55
- [21] Taherdoost, H; Shahibuddin, S & Jalaliyoon, N. Exploratory Factor Analysis; Concepts and Theory, Advances in Applied and Pure Mathematics, (Year Not Mentioned), pp.375-382,