Impact of TQM on innovation performance with the mediating role of organizational learning of Ilam industrial town

Farajolah Vahidnia, Belqes Bavarsad, Mohammad Senoubari

M.A business management student in researches sciences of Khuzestan university
Advisor of Chamran university
Counselor of Shushtar Azad university

ABSTRACT

Many scholars have suggested that both total quality management (TQM) and organizational learning can individually and effectively promote innovation. However, the question remains as to whether a relationship exists between TQM and organizational learning. This study has three main goals: (1) to determine the relationships between TQM, organizational learning, and innovation performance; (2) to determine if organizational learning fosters innovation performance and plays a mediating role between TQM and innovation performance; and (3) to test a proposed model explaining the relationships among TQM, organizational learning, and innovation performance through empirical examination. In this study three hypothesis and proposed model are tested. The purpose of this study is to evaluate the effect of total quality management on innovation performance with the mediating role of organizational learning. The instrument of gathering of information has been questionnaire that its validity & reliability proved. The statistical sample was 95 people of top, middle and operational managers of Ilam industrial town and the analysis of data was done by using of T-test single society and the model of structural equation. The finding of the study showed that TQM has the positive & meaningful effect on organizational learning. Also TQM & organizational learning has positive & meaningful effect on innovation performance.

Key words: total quality management, organizational learning, innovation performance

Introduction

Different aspects regarding TQM concept are introduced which produced various definitions. For instance Persico defined TQM as a method to modify culture to increase the involvement of the employee with different parts of business, and correct the quality consistently to reach the special organizational goals. Evans and Lind say [9] referred to TQM as a management perspective which concentrates on quality and leads to the organization modification and flexibility. Ston and Jarrell believe that TQM of high quality productions decreases the costs and increases the customers and employees satisfaction, then it modifies the financial function. TQM success requires an organizational culture which is organized based on trust, certainty and common use of knowledge.

Innovation and invention are usually due to the knowledge attraction in research and development (RXD) and other units of company. Learning capacity of employees can increase the internal information attraction [6] and it also correct the organizational capacity of learning. According to Baker and Sinkula those companies which have the learning condition identification tool are able to prepare the external environment for new technology diagrams which is the result of innovation and invention. Invention itself changed to an instrument to a process of problem solving. Arggris and Schon [2] represent that problem solving is a learning process which completes various types of knowledge and provides a constant condition for knowledge. New knowledge acquiring is the source of invention.

TQM is considered as a primary and powerful factor in forming of learning culture formation. Those mechanisms related to organizational learning provide a special condition to apply cooperation relationship. In this regard, some sources can be obtained too, which can be used for development process and cooperation research by the use of organization and its capacities. [17]. The companies which have applied TQM successfully, can promote knowledge and its common functions which can be used for group knowledge transformation. According to Martifer- Kasta & Janes- Jesin [10], TQM companies are into learning more than other companies.
Innovation can occur in the area of productions, products and processing. It also can be an idea or thought, product or process, system or tool which is new for a person, a group of people or companies and industrial units [14]. According to Damanpour, organization innovation is a complex of growth, progress and idea execution for production system and novel technologies.

2) Literature Review:

1.2) Total Quality Management:

Total quality management (TQM) is a management philosophy which tries to apply optimum uses of the existing opportunities of accessible sources, to increase the quality of products and customers satisfaction. The quality enhancement is not the single emphasis of this kind of management philosophy, rather, there are some other factors which are as follow: on time delivery, quality of goods or services, cost decrease, beneficiary increase and market development. Moreover, cultural goals can be considered in the frame of total quality management just like development of the motto of rights of customers in an institution and elimination of the limitations and hinders of institution units. Total quality management is a perspective based on which, the organization management provides a continual improvement regarding customers' satisfaction by the cooperation and satisfaction of all employees.

Total quality management model provides a different method of the management theory and develops a co-operation culture in which each of the staff makes decisions in their professional field which can be organized by quality cycles and spreads a positive attitude related to quality and organization among employees, by this way they can provide an attractive and suitable environment (Ibid).

Although there are different definitions of total management, but there is no unit definition based on total quality management [4].

2.2) Organizational Learning:

Organizational learning is one of the important factors of learning organization in which the attitudes and behaviors of people are changed and the learn a new way of thinking and behaving [3].

Learning is a process higher than education. Organizational learning is more complicated than individual learning. A major part of organizational learning is learnt during the relationship with the employees, external or internal personnel, involvement in the activities of different groups, the study of internal documents, accomplishment of personal tasks and investigation of different activities in a slow process. Organizational learning can be described precisely as "tasks and duty, skills, values, beliefs and attitudes applied in the improvement of maintenance, growth and organizational development".

The definition of organizational learning which is of vital role is stated in various ways. "Petter senge" believes that the main high level competitive source is the ability of organization for learning and a fast reaction toward the fluid market compared to other competitors. In his idea there are two types of companies: Failed companies which disappeared fast or gradually and acquiring organizations.

3.2) Innovative Function:

Innovative function as the last weapon in business which helps companies to decrease the costs, increase the quality and introduce new services to market. Obviously, acquiring new innovative advantages, is a complex process which is full of technical complications, intrafield relationships, indefiniteness and complex uniformity. It should be noted in future just those companies are successful which can manage innovation and its applications and control it in away which can have economical beneficiary beside the existence of fast changes of technology, increasing risks, indefiniteness, costs, demanding for more flexibility of market and lower hinders and limitations.

4.2) Total quality management and organizational learning:

The concepts of learning organization, acquiring and learner organization were introduced in literature review. In this part we are going to clarify the relationship among these three factors. In this regard it is emphasized that the process of learning is a necessity instead of being an extra task, without which no organization can live, and also, total quality management (TQM) can be internalized only by acquiring organizations.

So, an acquiring organization should eliminate all the hinders and limitations and apply facilitator factors of learning process.

Infact, learning is on of the most important factors of quality management philosophy which is not paid attention to a lot. Even those people with small experience of learning, understand the importance of this philosophy. A company can be a responsive agent toward its customers, when it is a learner organization. In other word, verification of total quality management depends on verification of learning principles.

5.2) Organizational Learning and Innovative Function:

Creativity, innovation and entrepreneurship in different organizations become an unavoidable necessity. Since the competitive environment among
organization, reinforces the process of innovation and creativity. Each organization should look for innovation and entrepreneurship and by identification of environment and conditioned changes and revolutions, introduces novel and innovative responses. These types of company encounter new competitive capacities which make them successful. So, to carry out this process, knowledge, expert knowledge guarantee of employees are of high importance in the process of innovation.

Innovation is the application of ideas, process and new products. Organizational learning process referred as education, publication and application of this knowledge which is related to organizational innovation process. The process of organizational knowledge invention and organizational learning are in a parallel way which is one of the basis of innovation. In this process new knowledge innovation is not important by itself, rather it strengthens innovation. Organizational learning depends on data base of the company which is strengthened by organizational learning. Those companies which are constructed based on learning process, get a strong capacity for weak and strength points of competitors and the position of its role in innovation invention can predict and understand customers' needs and new technologies, finally these companies don't miss customers' demands. Organizational learning supports creativity and suggests new ideas and knowledge [7] and increases the ability of understanding of these vital factors [7].

5.3) Total Quality Management and Innovative Function:

Nowadays, the novel process and innovative condition of the organization should be continued and developed to prevent its failure and stagnation. By providing such a condition, the situation become constant and progressive. Uninnovative organizations are thrown out of the systems or they should correct their system. Infact, environmental changes and their effects on productive and service units lead to alternation of products and services quality, technology, construction, market share, workers' relationship or other parts of the organization [15].

Total quality management is a system with the aim of quality increasing. This system has 8 principles: The observing of the third principle - employees' involvement toward the organization, innovation and invention verification of the organization goals. (Technical Committee 176 ISO 2008).

3) Theoretical Framework:

According to literature review, the following frame work is introduced in which total quality management has a direct and indirect effect on innovative function via organizational learning:

![Conceptual Model of Total Quality Management Organizational Learning and Innovative Function](image)

**Research Hypotheses:**

H1) There is a positive and meaningful relationship between total quality management and innovative function.

H2) These is a positive and meaningful relationship between total quality management and organizational learning.

H3) There is a positive and meaningful relationship between organizational learning and innovative function.

H4) Total quality management has a positive and meaningful effect on innovative function via organizational learning.

2.3) Methodology:

The present research has a functional purpose and the data collection is descriptive and scientific with the goal of an investigation into the effects of management and organizational learning on innovative function. The research is depends on structural equations. Total quality management (TQM) is considered as independent variable and innovative functions is considered as intermediary variable. A pretest was carried out on the prototype to do final evaluation of the questionnaire including 40 questionnaire of likert 5 alternative, then the amount of final coefficient was calculated by Cronbach $\alpha$ which is as follow: Total quality management task 80%, organizational learning 81% and innovative function 73%.

To evaluate the reliability of questions, a factor validity was used. Factor validity is a kind of structure validity which is calculated by factor
interpretation. This type of interpretation is so common in statistics and is of various functions. In human science, in fact it is an essential tool in those research with test and questionnaire (Klin, 1380). Initially, 40 questions and 3 general factors of total quality management, organizational learning and innovative function are designed. The interpretative results of exploratory factor which uses the interpretation of main component and Warimax rotation method by normalization are shown in Table 2.

The statistical society of the research are top middle and operational managers. Since this society is limit, so, to calculate the required sample volume the following equation is used:

\[ n = \frac{N \times \frac{Z^2 \alpha}{2} \times P(1-p)}{\varepsilon^2 (N - 1) + \frac{Z^2 \alpha}{2} \times P(1-p)} \]  

4.1) Results and discussion:

According to liserl output, the model is of a suitable condition regarding proportion index like chi ratio divided by degree of freedom and RMSEA amount. Since chi ratio divided by degree of freedom is below 3, which show the small amount of chi-2.

RMSEA amount is less than 0.08 and GFI and AGFI amount is more than 0.9. The results of exploratory and confirmatory factor of the evaluation model shows the convergent validity and reliability.

4.2) Average Test of statistical society and correlation:

Initially on average test of a statistical society and correlation was carried out according to the average amount of dependent and independent variables, the results of which are shown in Table 3.

4.3) The Results of Structural Equations Model by the Use of Lizerl:

The direction interpretative model of the investigation of structural model by the use of lizerl is shown in figure 2. According to lizerl output this model has a suitable condition regarding proportion index like chi ratio divided by degree of freedom and RMSEA, since chi ratio divided by degree of freedom is below 3 which is a small amount. RMSEA amount is less than 0.05. The results of direction interpretative model of the main hypotheses are shown in Table 4. As it can be seen, all the parameters like regression coefficients and factor load coefficient become meaningful, since the meaningful numbers of all parameters of that figure are more than 1.96.

According to the results, it can be understood total quality management has a positive impact on organizational learning (0.80 and 0.56) and on innovative function (6.60 and 4.10) respectively. Thus, the first, second and third hypotheses are proved by the meaningful level of 0.05. Because the impact of organizational learning on innovative function is 0.41 and its meaningful level is 2.41. The fourth hypothesis is also proved according to standard coefficient and meaningful level.

According to the results it can be said, total quality management has a positive and meaningful impact on innovative function via intermediary variable.

<table>
<thead>
<tr>
<th>Field</th>
<th>Obtained factors</th>
<th>Variance percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Quality Management (TQM)</td>
<td>Top management (tm), employees involvement (ei), continual improvement (ci) customers' focus (cf)</td>
<td>%71</td>
</tr>
<tr>
<td>Organizational Learning (OL)</td>
<td>Learning Culture (LC) Learning Strategy (LS)</td>
<td>%73</td>
</tr>
<tr>
<td>Innovative Function (in)</td>
<td>Production and service (ps) Products innovation (pi) Organizational learning (pi)</td>
<td>%70</td>
</tr>
</tbody>
</table>

Table 2: The results of confirmatory factor interpretation of second grade

<table>
<thead>
<tr>
<th>variable</th>
<th>Chi-square(df)</th>
<th>Z^2/df</th>
<th>GFI</th>
<th>AGFI</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>TQM</td>
<td>275.44(1717)</td>
<td>1.611</td>
<td>0.943</td>
<td>0.903</td>
<td>0.07</td>
</tr>
<tr>
<td>OL</td>
<td>256.01(164)</td>
<td>2.171</td>
<td>0.961</td>
<td>0.912</td>
<td>0.05</td>
</tr>
<tr>
<td>IN</td>
<td>401.31(174)</td>
<td>2.306</td>
<td>0.988</td>
<td>0.954</td>
<td>0.06</td>
</tr>
</tbody>
</table>

Table 3: The correlation of dependent and independent variables

<table>
<thead>
<tr>
<th>variable</th>
<th>Mean</th>
<th>S.D.</th>
<th>Cronbach sa</th>
<th>TQM</th>
<th>OL</th>
<th>IN</th>
</tr>
</thead>
<tbody>
<tr>
<td>TQM</td>
<td>3.525</td>
<td>.79530</td>
<td>.753</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OL</td>
<td>3.71</td>
<td>.6788</td>
<td>.766</td>
<td>0.500</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>IN</td>
<td>3.745</td>
<td>.8137</td>
<td>.750</td>
<td>0.148</td>
<td>0.612</td>
<td>1</td>
</tr>
</tbody>
</table>
Fig. 2: Way Interpretation Model

Table 4: The Results of Way Interpretation Model**

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Total Impact</th>
<th>Direct Impact</th>
<th>Indirect Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>TQM → IN</td>
<td>(0/56),4.10</td>
<td>(0/56),4.10</td>
<td></td>
</tr>
<tr>
<td>TQM → OL</td>
<td>(0/80),6.60</td>
<td>(0/80),6.60</td>
<td></td>
</tr>
<tr>
<td>OL → IN</td>
<td>(0/41),2.41</td>
<td>(0/41),2.41</td>
<td></td>
</tr>
<tr>
<td>TQM → IN</td>
<td>(0/98),9.10</td>
<td>(0/56),4.10</td>
<td>(0/42),5.03</td>
</tr>
</tbody>
</table>

GFI=0.973 , AGFI=0.922 , RMSEA=0.0487, P-Value=0.0045

4.4) The Results of Simple and Multiple Regression Test:

Multiple regression - a regression including a dependent variable and some independent variables is used for subordinate hypothesis testing. The results of this regression are shown in Table 6. ANOVA meaningful number of regression model is 0.00, which is less than meaningful level 105 for all 4 models. This condition shown that regression model can explain dependent variables' changes.

5) Conclusion and Suggestions:

The results of this study shown that organizational learning acts as an intermediary variable between total quality management and innovative function. According to the literature review of the relationship between total quality management and innovative function, the results of this study show that there is no meaningful relationship between total quality management and innovative function. Thus, total quality management can affect innovative function meaningfully and positively via organizational learning. Therefore, the managers of the studied companies can carry out their approach and get high levels of innovative function by investing on these 2 factors. The results of way interpretation model prove the meaningful and positive impacts of total quality management on learning. The results of multiple regression of way interpretation model shows that top managers (0/88) day a vital role in TQM. Learning strategy (0/91) is also an importance which impacts organizational learning. So, the top managers can reach a permanent competition and they can change their organization into a knowledge organization too, compared to their competitors.

References


