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A model to learn from mistakes (using TOPSIS)

Fariba Azizzadeh[1] - *Department of Management, Isfahan (Khorasgan) Branch, Islamic Azad University, Isfahan, Iran*
Hamidreza Bahrami- *Department of Management, Isfahan (Khorasgan) Branch, Islamic Azad University, Isfahan, Iran*
Alireza Shirvani- *Department of Management, Isfahan (Khorasgan) Branch, Islamic Azad University, Isfahan, Iran*
Mehdi Nafar - *Department of Management, Isfahan (Khorasgan) Branch, Islamic Azad University, Isfahan, Iran*

Abstract
Learning is a new paradigm that is introduced in today's organizations. The purpose of this study is to determine learning contingency model from the mistakes using TOPSIS. Variables were identified using the Delphi technique. The samples of this study were consisted 30 public administrators in Iran. The results show which factors have the greatest impact and which causes the least impact on learning from mistakes in public sector of Iran.

Keywords: *learning from mistakes, public administrators, stages of learning*

1. Corresponding Author, Tel: 09131987658 , Email Address: azizzade.fariba@yahoo.com

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Introduction

Public offices have seen a lot of changes and developments in Iran since the first model of the administrative system of European governments in the early years of the 14th century (Kian, 1964). If you take a look at the researches in the field of learning from the mistakes of public offices in Iran, a small number of studies can be realized. So this research has been conducted to fill this gap in the administration system. The question arises here is that what factors are affecting the learning of mistakes in organizations. This research tries to identify factors that influence learning from mistakes. Also factors affecting individual learning from the mistakes will be ranking that the importance of learning from the administrators opinion will be received. This study tries to identify the factors affecting learning from mistakes in public offices. Learn from mistakes is involved: mistake identification, mistake analysis and experience from the mistakes. All mistakes are not the same (i.e., some are good and some are bad mistakes). Three criteria for the study were considered. These three criteria are avoidable mistakes in the predictable operations, unavoidable mistakes in complex systems and smart mistakes in getting started.

Research literature

Organizations need to engage in learning for survival in complex environment (Visser, 2008; Raman et al., 2010). Learning is permanent change in behavior that comes from experience (Hergnhahn, 1982). Most of human behaviors are on the basis of their learning (Abtahi, 2007, 71). Learning means a new understanding of past mistakes (Torgersen, 2009) and requires fundamental change in mind (Senge, 2011, 22). Hiding some errors is such as hiding burning coal on the barn full of dry wood, which eventually burns everywhere (Mirzaaghyi, 2004). Learning from work feedback helps the staffs gain the skills required to correct mistakes (Goodman & et al., 2004; Goodman & Wood, 2004). When external feedback is negative, negative feelings may increase, because employees doubt motivation and truth of those who give feedback or the accuracy of the performance appraisal system (Norman, 1981; Zapf & Reason, 1994; Reason, 1990).

Feedback and learning structures are not in their place and are inflexible. (Esain & Williams, 2012). Feedback received through learning can facilitate or prevented the creation of new knowledge (Arling & Chun, 2011). The biggest challenge in organizations is that how learning can be used for their purpose (Dasgupta, 2012). Learning in the workplace is vital to the survival of organizations (Rahimnia et al., 2011). This learning involves conscious learning activities, to reflect real experiences in the workplace (Raelin, 2000). Learning in the workplace improves the perceptions of work activities (Elkjaer & Wahlgren, 2006), because learning is associated with performance improvement and adoption of environmental changes (Gherardi, 2006). Learning in the workplace is essential to solve the problems of individuals and organizations (Ellstrom, 2001). Learning improves the integration process of the interaction between the individual and his environment (Doornbos et al., 2004). Work place is considered as a social field (Gherardi & Nicolini, 2001) and a place for learning (Ashton, 2004).

Learning needs both the motivation and the cognitive resources (Rybowaik, et al., 1999; Kanfer & Ackerman, 1989), the motivation for learning is a direct introduction of learning (Weick & Ashford, 2001; Noe, 1986). In fact, motivation is a mediation mechanism which is essential to promote learning (Colquitt, et al., 2000; Colquitt & Simmering, 1998). When you obtain vision about cause of mistakes, you can provide changes to prevent or reduce negative outcomes in the future (Frese, et al., 1991; Reason, 1990; Reason, 1997). The ability of the labor force to learn faster is a competitive advantage over organizations that are not (De Gues, 1998). Understand learning in the

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workplace means recognizing its complexity, social, individual and organizational processes that affect it (Boud & Garrik, 1999). Researches about learning have studied various affect factors e.g., conducive learning culture (Park, 2011).

Learning in the workplace requires a rethinking of experiences and plans for future (Streecher et al., 1986). This type of learning in the workplace involves reasonable process to achieve individual and organizational expected outcomes (Matthews, 1999). A key feature of this type of learning is linked with employee participation (Clarke, 2005). A work should be a form of learning and learning should be as a form of work (Barnett, 2002).

Human errors are common in most organizations (Ramanujam & Goodman, 2003). Mistakes can be often results economic costs, bad reputation, stress and dissatisfaction (Helmreich, 1997). Errors creates negative gap between what is expected and what occurs in reality (Zhao, & Olivera, 2006).

Errors are unbearable for most people because human society has a blaming culture to mistakes. (Pearn, et al., 1998). People have negative feelings about their errors that affect their learning's (Edmondson, 1996; Paget, 1988; Snell, 1988). When employees feel they cannot talk about small failures, organizations will face greater failures (Edmondson, 2008).

Many researchers have mentioned to the importance of learning from mistakes (Argyris, 1993; Edmondson, 1999). Learn from the errors is an important activity for individuals, groups and organizations (Weik & Ashford, 2001; Edmondson, 1996). The value of the mistakes is that you can learn from them (Sitkin, 1992). Learning from the mistakes includes discovering and testing ways to understand the relationship between actions and outcomes (Goodman, 1998; Heimbeck et al., 2003). Learning is based on experience (Senge, 2011, 429).

Learning from mistakes is a process in which people reflect the mistakes they have been made determine the causes (Duncan & Weiss, 1979). Negative emotions are associated with mistakes in learning from mistakes, (Norman, 1981; Zapf & Reason, 1994; Reason, 1990). In organizations that enhancing the performance is based on the culture of blaming any of the errors, the staffs know their working environment where management intolerance is low toward mistakes (Zhao, 2011). McCall (1994) noted that the Board Chairman, seek clear signs to learn from errors. In any organization, managers and employees may have some mistakes in their work tasks (Esfahani et al., 2013).

It can be said that the environment (Mirzaaghayi, 2004) is one of the factors affecting learning from mistakes. The reasons for mistakes can be mentioned to distraction, inattention, lack of ability, inefficient processes, activity challenges, uncertainty, hypothesis testing and exploratory testing (Edmondson, 2011). Also fear paralyzes learning process (Edmondson, 2008). Organizational culture can facilitate the learning for its members. Centralized or decentralized organizational structures are the factors that affect the learning model (Visser, 2008). In order to promote learning within the enterprise, it needs to develop a certain degree of confidence (Niu & Miles, 2012). However fear irritates learning from mistakes. Fear does it by warning the employees who need to learn in order to avoid repeating the same mistakes (Lazarus, 1991; Baumeister et al., 2007).

One of the important issues is learning environment (Visser, 2008). The behavior of the leader or manager is effective on learning (Ellinger, 2005). Sense of psychological security team will show that employee on what level of involvement in the process of learning from mistakes (Edmondson, 1999).

A study examines the predictability of employees learning through a learning culture, through empowerment and management effectiveness. The results showed that participative management and employee involvement

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is a powerful mediator to predict the impact of a learning culture on employee teaching (Rahimnia et al., 2011). According to a research, crime is significantly associated with motivation to learn (Lewis, 2000; Tangney et al., 1996). Researches also demonstrate that women show stronger emotional reactions to success and failure (Beyer, 1998). Unpleasant feelings caused by mistakes are very common (Pearn, et al., 1998). Research suggests that negative emotions temper learning motivation with reduced hope and excitement (Seo et al., 2004). Also a significant negative relationship was found between fear and learning from the errors (Zhao, 2011).

Also Rybowiak et al (1999) have developed scale to assess the ability of individual to deal with errors. Snell (1988) was used the job interview for data collection through qualitative method. According to him, learning from the mistakes is the second form of education report. According to the study results, organizational changes including double-loop learning have been more preserved (Hovlid et al., 2012).

A study by Raadgever and colleagues (2012) used five indicators to assess cognitive learning (assessment of changes in attitudes, learning from the results of research and development results, learning from other people's perspectives and learning from the results of research).

Contingency management is a useful paradigm of behavioral strategies (Roll, 2007). Experimental studies in the framework of contingency recognize the importance of contingency theory (Gerdin & Greve, 2004). The underlying assumption in the Contingency model is that the international system would not be equally appropriate in all organizations (Otley, 1980). The main area of Contingency view is that no unique system exists for all organizations in all environmental conditions (Sirinuch & Michaeles, 2010). Contingency in organizational life can take many forms (Jean-Philipe & Rodolphe, 2010; Vergne & Durand, 2010). Factors that influence the Contingency include: new economic organizations, globalization and increased competitiveness of international markets, changes in the integration of labor, new technologies, especially information technology (IT) (Thompson & Jones, 2008; Wiengarten et al., 2013; Chenhall, 2003). The Contingency model emphasizes on the external and internal environment (Mirsepassi, 2009, 29).

Contingency is an unpredictable phenomenon (Garud et al., 2010). Contingency view is the fitness between organizational features and contingency factors (Nimtrakoon & Tayles, 2010). Organizational context are Contingency factors in the organization (Pizzo, 2011).

A large number of contingency factors have been studied (Sirinuch & Michaeles, 2010). The nature of the relationship with the supplier and degree of proximity (geographic proximity, structural and institutional proximity) are other contingency factors (Jarraya & Leclere, 2013). Another researcher focused on Contingency model in static and dynamic environment (Gruber, 2007). The contingency variables have been identified with a focus on the customer and include: a group structure, company size, unity, culture, system design quality, results, type of business, etc. (Jayaram et al., 2010).

Research method

This research is applied one and it uses the descriptive method. Research approach is survey and it is in non-experimental research group. The study populations consist of 30 of administrators and are experts in the public offices. Delphi technique was used to collect information, interviews, and questionnaires. To run the Delphi technique, 15 of those were selected with PHD in human resource management in government offices.

In Delphi technique the number of participants is usually less than 50, and often 15 to 20 (Powell, 2003; Okoli & Pawlowski, 2004; Crisp et al., 1997). The Delphi method is not used for statistical purposes of sampling methods.

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The validity of a Delphi study depends on a combination of experts (Pashaiizade, 2007). The average is used as the criteria for weight. The averages are obtained involve the below:
Criterion 1. Environments with avoidable mistakes in the predictable operations: The result shows that the weight of this criterion is 0.33.
Criterion 2. Environments with unavoidable mistakes in complex systems: The weight of this criterion is 0.31.
Criterion 3. Environments with Smart mistakes in getting started: The weight of this criterion is measure as 0.36.
Due to the obtained weight for each criterion, it can be said that they are not much different from each other.

Data Analysis

Factors affecting learning from mistakes have been identified in three phases that they are: identifying the mistake, mistake analysis and experience from mistakes. To rank the factors affecting learning from the mistakes of TOPSIS technique is used. In the TOPSIS technique the variables are related to each other so it was chosen to analysis data. In evaluating alternative based on any qualitative criteria, 9-grade Likert scale has commonly used in this technique and it has been used in this research.

Mistake identification step

The most effective factors on learning from mistakes at the mistake identification stage are Involvement request, because its closeness coefficient is more than any other factor (0.872958).

Error analysis step

The most effective factor on learning from mistakes at the error analysis stage is detailed team discussion and analysis with closeness coefficient of 0.941185.

Experience from the mistakes step

The highest closeness coefficient relates to organizational rules (0.983564).

Conclusion

By analyzing the tables separately it can be calculated which factors have the greatest impact on learning from mistakes in public sector organizations in Iran. Also you can see which

Results	factors	series
0.872958	Involvement request	1
0.872958	Welcoming to questions	2
0.703045	Encouraging smart experiments	3
0.689938	Knowledge development	4
0.673396	Asking intelligent questions	5
0.668892	Reporting without blaming	6
0.636046	Talking about personal experiences	7
0.626973	Encouraging free discussions	8
0.573091	Creating mistake expression culture	9
0.561075	Reducing the stigma of failure	10
0.503528	Acknowledging the limitations	11
0.491281	Expressing humility and curiosity	12
0.473118	Creating procedures and mistake expression system	13
0.452775	Determining a scope for errors	14
0.187633	Organizational tolerance to errors	15
0.087188	Encouraging the mistakes	16

Table1. Ranking factors Mistake identification step

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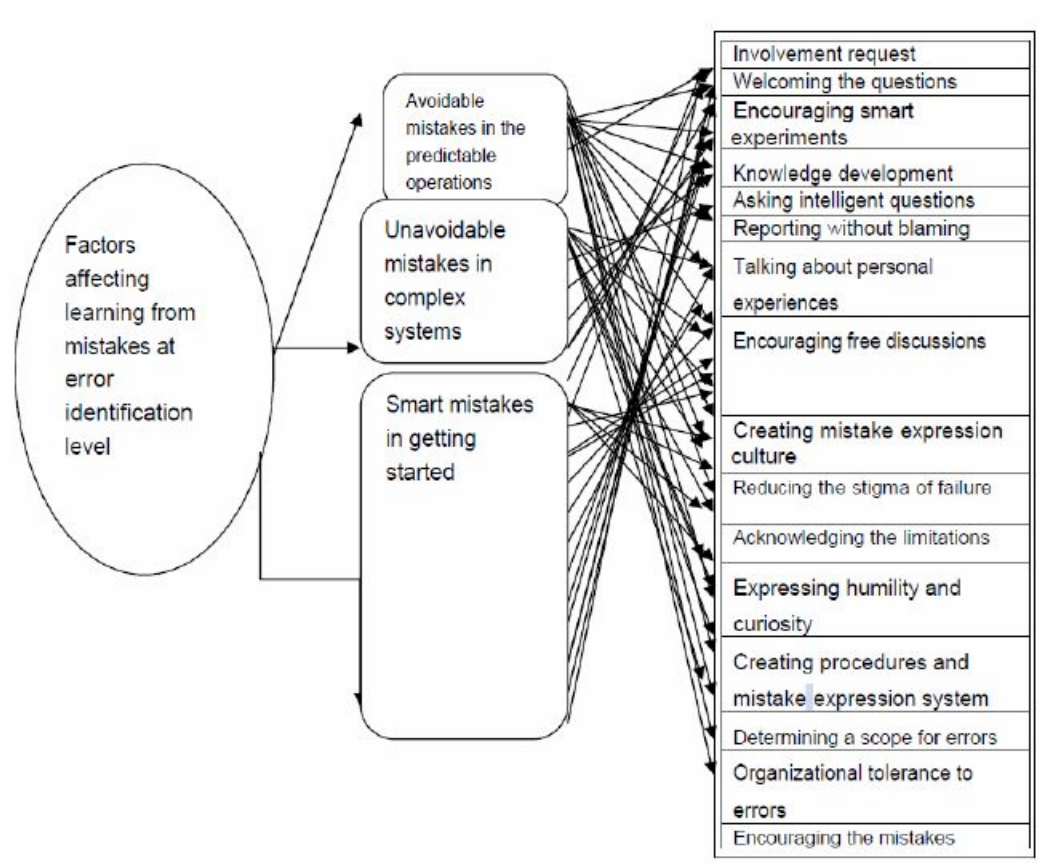


Fig 1. Final model for learning from mistakes at error identification stage by managers' point of view

Results	Factors	Series
0.941185	Detailed team discussion and analysis	1
0.892281	Data exchange for better results	2
0.748451	The principled analysis to learn from the errors	3
0.702712	Going beyond apparent arguments	4
0.625842	Analysis of deviations from the rules	5
0.568044	Flexible organizational culture	6
0.562197	Strengthening passion to use advanced analysis	7
0.510142	Openness and patience in facing serious uncertainties	8
0.428017	The right culture for managers' minds, not efficiency and decisive performance	9
0	Extraversion of people	10

Table2. Ranking factors in Error analysis step

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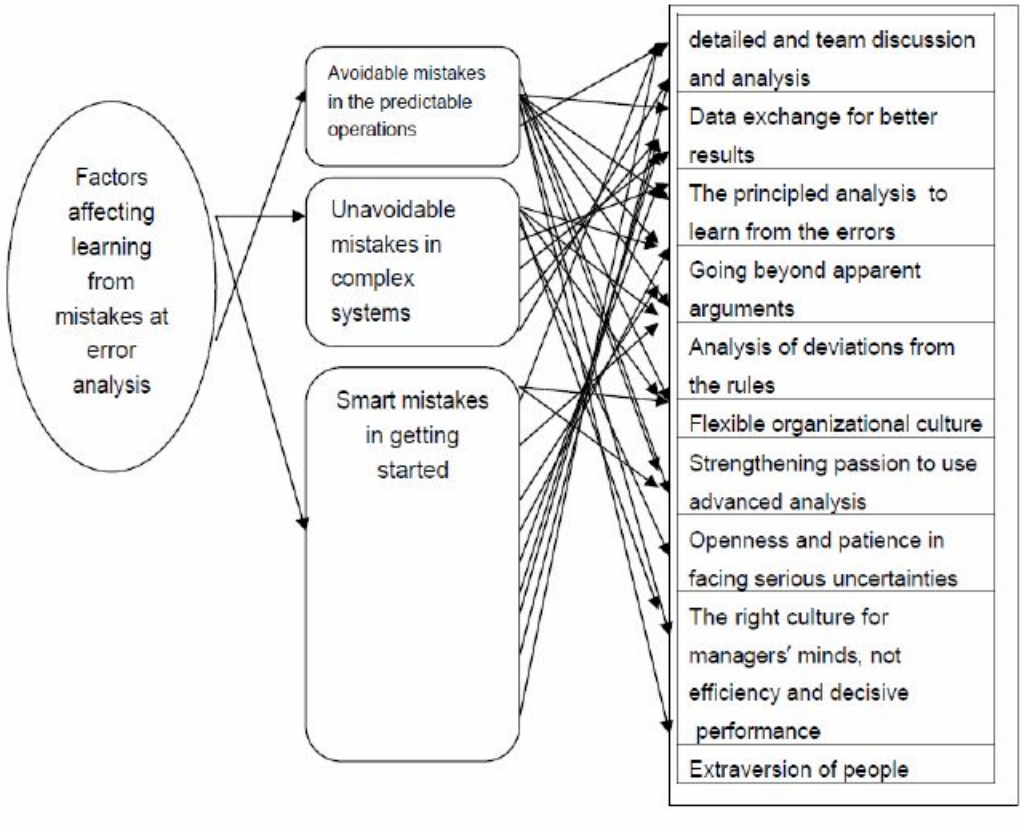


Fig2. Final model for learning from mistakes at error analysis step by managers' point of view

Results	Factors	Series
0.983564	organizational rules	1
0.856985	Evaluation of performance	2
0.837406	feedback	3
0.68432	Creating a culture of experimentation	4
0.585093	Considering actual conditions, not optimal	5
0.573877	Encouraging experiments	6
0.50342	Considering the complexity and unpredictability	7
0.456286	Amplification mistake volubility culture to get information	8
0.446816	Bonus to rapid production of smart errors	9
0.357813	Narrow operating of new techniques and simulation	10
0.174203	Strategically production of errors	11
0.103461	Spending small budget for experiences and experiments	12

Table3. Ranking factors in Experience from the mistakes step

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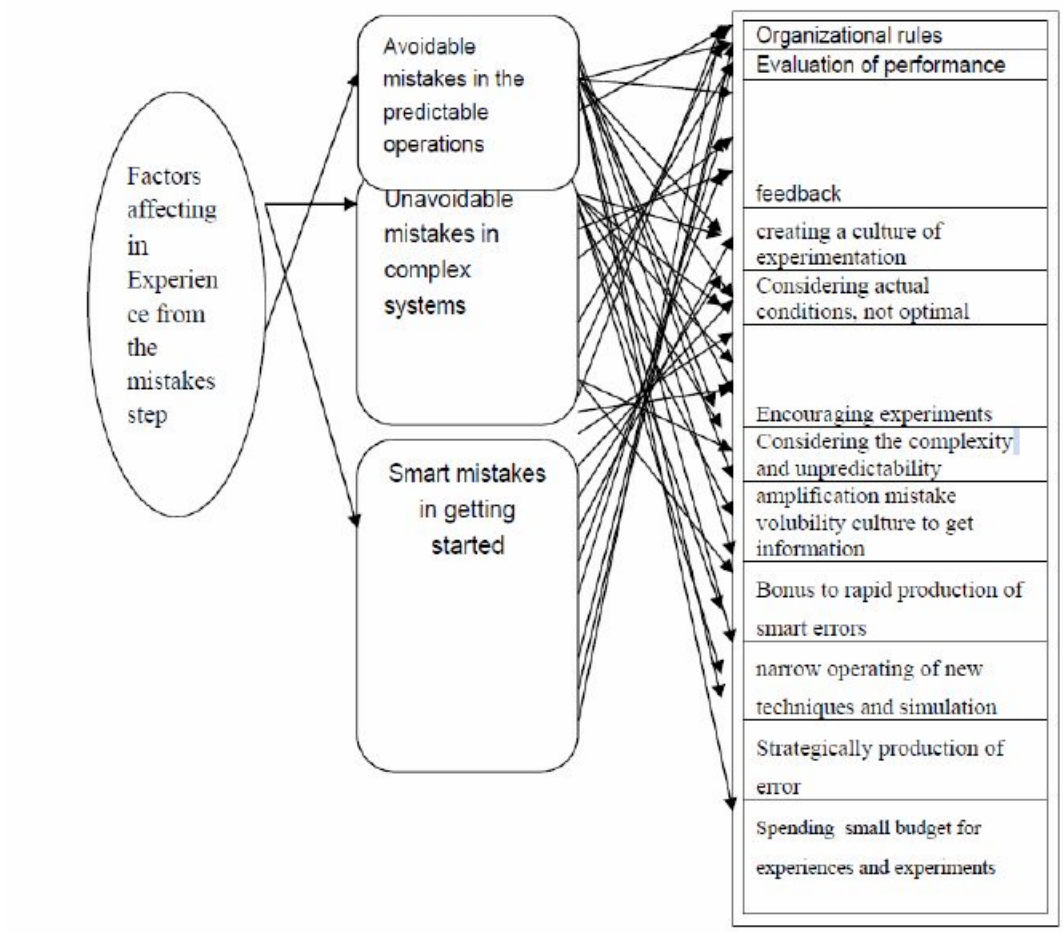


Figure 3. Final model for learning from mistakes in experience of errors by managers' point of view

causes the least impact on learning from mistakes in public sector organizations. The factors affecting learning from mistakes are visible separately in various stages of learning from mistakes. They are mistake identification step, analyzing mistakes step and the experience of errors step. According to the data obtained, it can be said that contingency model of learning from mistakes at the mistake identification level is according to three criteria for avoidable mistakes in the unpredictable process, unavoidable errors in complex systems and smart mistakes in the beginning. In this study, only the factors which obtained through Delphi technique (from teachers' experts) and content analysis have been studied. Considering the wide range of indicators and factors that affect learning from mistakes, there may be many other factors that professors from other countries are mentioned according to their situations and can be used to identify contingency model presented in accordance with them. The factors affecting learning from the mistakes examined in this study are limited to three steps (mistaken identification, error analysis and experience from own mistakes). The researchers can examine a variety of categories for learning from the mistakes in other organizations to provide acquisition contingency model. Also, given that many theories about learning from mistakes is not provided by different scholars. So the basis of this study can be used by other researchers to examine the contingency model.

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