Chapter 215
Learning from Errors and Learning from Failures: A Study on the Model of Organizational Learning from Errors

Yangqun Xie, Jianian Zhang and Xiangzhi Zhuo

Abstract Errors is ubiquitous and unavoidable in the process of organizational production, serving and management. Once the exterior trigger conditions are met, they could lead to organizational failure. Up to now, though there are a few studies about learning from failures, there are few studies of learning from errors in the area of organizational learning. Firstly, this paper clarifies the relations among learning from errors, learning from failures and organization learning, with emphasis on learning from errors a very important resource of organization learning. Secondly, this paper also puts forward the learning models and processes of learning from errors in organization. Its aim arises more attention to be paid to them.

Keywords Learning from errors · Learning from failure · Organizational learning

215.1 Introduction

Organization consists of pluralistic individuals with diversity of cultural background, knowledge base, mental state, and communication skills, etc. Everyone can make errors because of lacking of relevant knowledge, shortcoming of training, working pressure, and so on. As a Chinese proverb says: nobody is perfect, and everybody may make mistake. There is the same meaning of "to err is human" in the Latin language. These words illuminate that errors is ubiquitous. Therefore, errors is unavoidable in the process of production, management and services, furthermore, it is impossible to be fully eradicated in organization.

Y. Xie (✉) · X. Zhuo
Management School of Huaibei Normal University, No. 100, Dongshan St, Huaibei 235000, China
e-mail: xieyangqun1980@163.com

J. Zhang
Educational School of Huaibei Normal University, Huaibei 235000, Anhui, China

The results of errors can be much different from one another. Some errors' emergence do not lead to any ill consequences. For example, a builder without a safety helmet entered construction site and worked a day. Though there was not emergence of injuring his or her safety, the error behavior was taken place. Some errors give birth to slips. For example, a nurse gave a more tablet to patient who took them and did not unfold serious consequence. Though some errors have the tendency of grievous aftermaths, they are detected timely and adopted recovery measures i.e., near-miss. For example, when nurse gave medicines to patient, she found the dosage of a kind of medication increased 1,000 times than usual. After communicated with physician and pharmaceutists of pharmacy, they confirmed that pharmaceutists misread the dosage and a possible critical incident was avoided. Some errors can result in disasters which called failures. For example, The Space Shuttle Challenger disaster occurred on January 28, 1986. Disintegration of the entire vehicle began after an O-ring seal in its right solid rocket booster (SRB) failed at lift-off. The Rogers Commission found NASA's organizational culture and decision-making processes had been key contributing factors to the accident (Wikipedia). The Chernobyl disaster was a catastrophic nuclear accident that occurred on 26 April 1986 at the Chernobyl Nuclear Power Plant in Ukraine, which was under the direct jurisdiction of the central authorities of the Soviet Union. There were two official explanations of the accident: the first, later acknowledged to be erroneous, the catastrophic accident was caused by gross violations of operating rules and regulations. The second is operating instructions and design deficiencies found (Wikipedia).

Failures are the serious results of a few erroneous behaviours which caused of less cognitive effort. In studies of organizational learning, there are many studies focusing on learning from failures [1–3]. These studies showed that the organization should learn from failures of themselves or others and draw lessons in order to avert the similar failures occurrence. By comparison, studies of learning from errors are infrequent. Although errors resulted in failures should be attached to more attention, there are massive errors that are concealed or not uncovered just as the iceberg below sea level. This chapter tries to integrate learning from failures and learning from errors into organizational learning from organizational learning, and construct the model of learning from errors in organization for advancing the performance levels of production, management and services.

215.2 Relations Among Learning from Errors, Learning from Failures and Organizational

215.2.1 Learning from Errors

From the perspective of problem-solving, Zhao [4] proposed advanced learning from errors as the process through which individuals (a) reflect on errors that they have made, (b) locate the root causes of the errors, (c) develop knowledge about

action–outcome relationships and the effects of these relationships on the work environment, and (d) use this knowledge to modify or improve their behavior or decision making. From this perspective, learning from errors is an effortful activity—it involves purposeful reflection on, and analysis of, errors and application of new knowledge into decisions or actions [4], p. 436).[1] The content of learning from errors includes contextual information of errors emergence, status information of the operator, information of operative environment, detecting information, reporting information, corrected information of errors, and so on.

   Through information accessing, arranging, analyzing and attributing, the deficiency of knowledge could be found in organization system. For example, is instruction of production perfect? Is the organizational structure adaptive to new technology application? Is there unreasonable part in organizational management? Are there any problems in the training system of employees' knowledge and skills in organization? Just as Deming pointed out that the managers should bear the 85 % responsibility of the quality problem, and the operator should only bear the 15 % responsibility [5]. From this point of view, once errors are found in organization, organization should bear more responsibilities, and prompt organizational learning and transformation in knowledge management, organizational structure, organizational system, organizational production mode, etc.
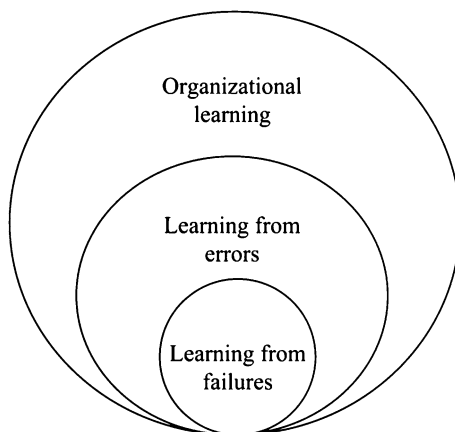
215.2.2 Organizational Learning

The definition of learning is accessing knowledge by self-regulation learning and self experiences, an art of pertaining and applying knowledge, skills, abilities, attitudes and standpoint, a transformation of experience-based behavior [6]. The true learning arises in the obvious behavior, and expresses through behavior changing. Learning also embodies in reflecting on individual experience and drawing lessons from the results.

   What is organizational learning? [7] suggested organizational learning "as any modification of an organization's knowledge occurring as a result of its experience" (p. 453). Goal of organizational learning is to facilitate organization accommodating the change of internal and external environment, and constantly renew and improve its performance level and abilities, thereby realizing the organizational goal. According to Marquardt's viewpoint: adaptive learning will happen, when individual and organization learn from the experience and reflection [8]. The content of organizational learning is mainly from their experience [9], Organizations constantly seek new ways to improve their processes and outcomes. Their success depends largely on their capacity to learn from their experiences [10, 11]. The experiences include successes, failures and errors.

---

[1] B. Zhao [5]. Learning from errors: The role of context, emotion, and personality. Journal of Organizational Behavior. 32, 436.

Fig. 215.1 Relations of learning from failures, learning from errors and organizational learning

215.2.3 Learning from Failure

Learning from failure is the process that organization analyses, summarizes and finds out the failure during their production, service and management, thus putting forward the countermeasure to avoid the same failure in the future. For example, the organization can do things like increasing efforts of knowledge learning and training, modifying the operational rules of organization to fit new technology and equipment, reforming system of organizational structure and strengthening the enterprise culture construction. Recent work has explored organizational learning from prior failure experience, disaggregated from total prior experience [12, 13].

However, the researches are not richer than those of learning from success. Baumard and Starbuck [2] bemoaned the scarcity of empirical studies in this domain, stating that "there have been so few studies of learning from failures" (p. 282).[2]

215.2.4 Relations of Learning from Failures, Learning from Errors and Organizational Learning

In order to clarify the relations of three areas, this paper depicts a figure (see Fig. 215.1). It contains different relations among them, hereinto. Learning from failures is a subset of learning from errors. Learning from errors is also a subset of organizational learning. Organizational learning are serious results of part of errors. Errors are those behaviors that deviate the standards, goals or rules in

---

[2] Baumard, P., & Starbuck, W. H. [2]. Learning from failures: Why it may not happen. Long Range Planning, 38, 282.

organization and some of them maybe lead to failures. The range of organizational learning is widest. In order to boost performance level and development of organization, there are two ways. On the one hand, it should constantly introduce new knowledge system, including new technology, fangles, new operational rules, new management system, etc. The aim is to update the dated knowledge On the other hand, reformation offers the opportunity for organizations to find problems and support innovation from errors and failures of themselves or others. Consequently, organization realizes disruptive innovation [14].

215.3 Model Constructing of Organizational Learning from Errors

215.3.1 Information Flow and Knowledge Flow of Organizational Learning

Before constructing the model of organizational learning from errors, we should defecate and understand the model of information flow and knowledge flow in organizational learning. Organizational learning, learning from errors and learning from failures are based on the interaction, sharing and utilizing of information. Without information flow, there is no learning. The results of organizational learning, learning from errors and learning from failures thus facilitate renewal and evolution of knowledge. Then organizational learning, learning from errors and learning from failures are also the kind of knowledge flowing, interacting in organization, transforming and sharing. Therefore, their final goals are to advance the levels of performance and abilities of organization (see Fig. 215.2).

215.3.2 Constructing the Model of Learning from Errors in Organization

From the analysis above, failures are results of error behaviors. Learning from failures thus is a subset of learning from errors. This paper only involves how to integrate learning from errors into organizational learning (see Fig. 215.3).

The nature of learning from errors is a process of problem-solving. It can be divided into four parts: detecting and identifying errors, analyzing and attributing errors, developing and implementing program, evaluating and giving feedback. According [15], organizational learning includes five parts: learning preparation, learning and communication, knowledge acquisition and practice, knowledge integration and transformation, evaluation and giving feedback. In order to correspond to the process of learning from errors, this chapter combines phases of the knowledge acquisition and integration and transformation.
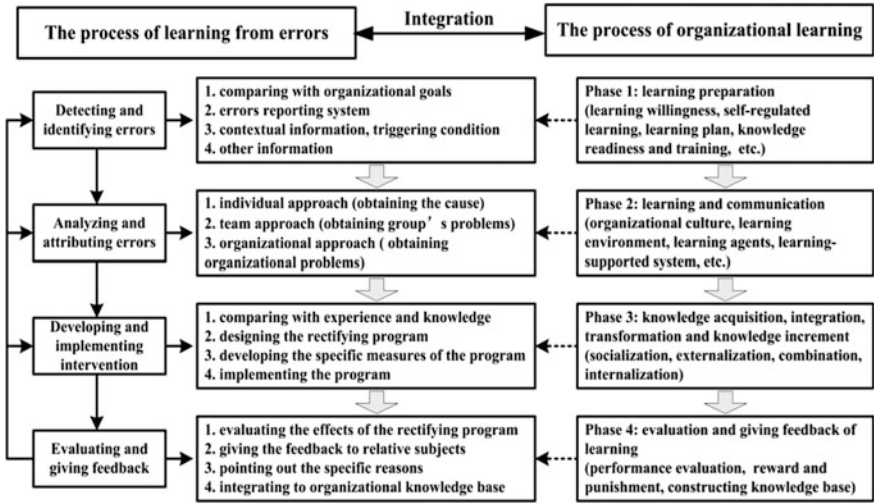
Fig. 215.2 Information flow and knowledge flow among the three learning
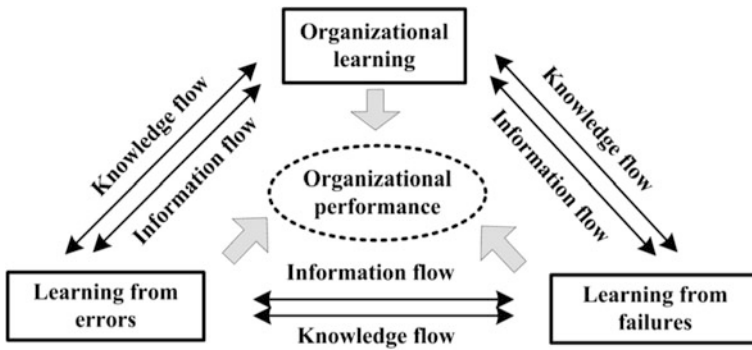

Fig. 215.3 Process of integrating learning from errors to organizational learning

- **Phase 1 detecting and identifying errors:** In this phase, there are several measures to adopt. For example, through comparing current states with normal states, it can be identified if current states deviate from organizational goals. Through error reporting system, subjects of organization can hold the contextual information, trigger conditions and other information of errors' occurring. Correspondingly, phase 1 is the process of learning preparation during organizational learning. Subjects must have the thirst for learning, acquiring knowledge, planning learning, error training, etc. Its aim is to advance their skills and knowledge of detecting and identifying errors through learning from experience (including errors and failures).

- **Phase 2 analyzing and attributing errors:** The measures of this phase include three types. Firstly, through individual approach organization can analyze the cause of errors' emergence, such as which knowledge and skills he or she is lack of? Secondly, through team approach can locate the group's problems, such as which barriers and problems exist in cooperating, communicating and understanding among team members? Finally, through organizational approach can obtain the organizational problems. It is a macroscopical and systemic approach. Organization can find the problems of organizational system, structure, operational flow and knowledge system. Correspondently, organizational learning emphasizes information change and communication. During this phase, organizational culture exerts a major influence on information or knowledge communicating and sharing. Especially, organization should promote no blame culture for active reporting of errors and handling timely. Otherwise, there are some factors including knowledge and skills of learning agents, training methods and guidance, and learning supportive system.
- **Phase 3 developing and implementing intervenes:** In the light of the context of errors and comparing with existing experience and knowledge, subjects design the correcting program and develop countermeasures and implement it in order to avoid adverse effect. In organizational learning process, subjects acquire, integrate, transform and increment knowledge through correcting errors. On the one hand, through explicit knowledge internalized, they integrate the prior knowledge and skills into their operational procedures. On the other hand, through tacit knowledge transformed into explicit knowledge and the experience of correcting errors sublimed, they communicate with others in order to sharing the experience and the experience is socialized.
- **Phase 4 evaluation and giving feedback:** According to evaluating the effects of measures to rectify errors, organization should give feedback to the subjects. If it is not achieve previous goals, the errors give birth to failure. Then, organization should help the subject to analyze and find specific causes. Organization also can collect and classify and pack up the information of errors in order to become an example of organizational knowledge base. In the process of organizational learning, it is the similar to learning from errors.

215.4 Conclusion

Overall, theoretical framework and results of this study display an intriguing picture of integrating learning from errors into organizational learning in organization. From this angle, we regard errors as learning resources, that is a type of knowledge in organization and very important to avoid adverse effects and find opportunity of innovation to improve organizational performance.

References

1. Muehlfeld K, Rao SP, Van WA (2012) A contextual theory of organizational learning from failures and successes: a study of acquisition completion in the global newspaper industry. Strateg Manag J 1981–2008 33(8):938–964

2. Baumard P, Starbuck WH (2005) Learning from failures: why it may not happen. Long Range Plan 38(3):281–298

3. Edmondson AC (2004) Learning from mistakes is easier said than done: group and organizational influences on the detection and correction of human error. J Appl Behav Sci 40(1):66–90

4. Zhao B (2011) Learning from errors: the role of context, emotion, and personality. J Organ Behav 32:435–463

5. Zhao S (2012) Cultivating the manager with responsibility. http://news.china.com.cn/rollnews/2012-03/13/content_13241383.htm. Accessed 20 Oct 2012

6. Gilley JW, Eggland SA (1989). Principles of human resource development. Perseus Books, MA, pp 120–121

7. Madsen PM, Desai Vinit (2010) Failing to learn? the effects of failure and success on organizational learning in the global orbital launch vehicle industry. Acad Manag J 53(3):451–476

8. Marquardt M (1996) Building the learning organization. McGraw-Hill, New York, p 38

9. Darr E, Argote L, Epple D (1995) The acquisition, transfer, and depreciation of knowledge in service organizations: productivity in franchises. Manage Sci 31:1750–1762

10. McGrath RG (2001) Exploratory learning, innovative capacity, and managerial oversight. Acad Manag J 44:118–131

11. Reagans R, Argote L, Brooks D (2005) Individual experience and experience working together: predicting learning rates from knowing who knows what and knowing how to work together. Manage Sci 51:869–881

12. Baum JA, Ingram P (1998) Survival-enhancing learning in the manhattan hotel industry. Manage Sci 44:996–1016, 1898–1980

13. Haunschild PR, Sullivan BN (2002) Learning from complexity: effects of prior accidents and incidents on airlines' learning. Adm Sci Q 47:609–643

14. Cannon MD, Edmondson AC (2005) Failing to learn and learning to fail (intelligently): how great organizations put failure to work to innovate and improve. Long Range Plan 38:299–319

15. Gilley JW, Maycunich A (2000) Organizational learning, performance, and change: an introduction to strategic HRD. Perseus, MA

16. Wikipedia. Chernobyl disaster. http://en.wikipedia.org/wiki/Chernobyl_disaster. Accessed 8 Jan 2013

17. Wikipedia. Space Shuttle Challenger disaster. http://en.wikipedia.org/wiki/Space_Shuttle_Challenger_disaster. Accessed 8 Jan 2013