

# Organizational Learning in Utah Commercial Construction during Economic Recession

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Organizational learning, the process through which organizations gain and utilize knowledge, has been shown to directly affect an organization's performance improvement efforts. Existing research on organizational learning suggests that double-loop learning has a greater impact on an organization's performance improvement than does single-loop learning. This existing research also indicates that organizations as a whole, and construction companies in particular, rarely employ double-loop learning. It is suggested that drastic changes in an organization's environment, such as economic recession, may necessitate, and therefore facilitate, double-loop learning. This research studied the organizational learning of five Utah based commercial construction companies during the 2008-2009 U.S. recession through semi-structured interviews. It was found that the two companies that exhibited double-loop learning were the only two companies in the study that exhibited growth during the recession. The contribution of these findings is to increase the understanding of organizational learning in the construction industry and identify the potential role of double-loop learning in performance enhancement.

**Keywords:** Organizational learning, Single-loop learning, Double-loop learning, Construction, Recession

## Introduction

Valuable experience is gained by individuals who weather economic downturns with their companies. If this experience is not absorbed into the company's organizational structure in a meaningful way, it may be inaccessible for use during future market downturns. As with most industries, construction is cyclical. As general economic conditions worsen, demand for construction services decreases, leading to insolvency, job loss, and economic drain. Without adequate preparation, the subsequent recovery can be equally detrimental. As companies with reduced operational capacity and capital attempt to meet the increasing demands for their services, the lack of liquidity and qualified personnel can lead to negative cash flow, poor performance, or similar complications. Current practices in the construction industry do not appear to have improved the industry's outlook during hard times. Organizational learning can incorporate the individual knowledge, skills, and experience gained during such difficult times into the organizational structure of the company. Companies need to retain these lessons-learned and employ them prudently to better withstand future economic upheaval. Though many construction companies are able to learn from past experience, this learning is generally applied toward incremental changes in behavior rather than drastic paradigm shifts in the underlying principles that guide behavior. This lack of innovation has trapped the majority of the construction industry in an effort to perform better within economic cycles rather than to escape these cycles. This study analyzed the organizational learning of five Utah based commercial construction companies. Levels of learning and their effect on the company were identified. Such information highlights the need for, and lack of, high level learning within the construction industry.

## Background

At its most basic definition, organizational learning describes the process by which organizations acquire and utilize knowledge. The most practicably applicable explanation of organizational learning is provided by Lipshitz in his suggestion “that learning by organizations occurs when individual learning... occurs within the context of Organizational Learning Mechanisms that ensure that people get the information they need and that the products of their reflections are stored and disseminated throughout an organization” (Chan, Cooper, & Tzortzopoulos, 2005, p. 749). Organizational Learning Mechanisms are described by Lipshitz, Popper, and Oz (1996) as “institutionalized structural and procedural arrangements that allow organizations to systematically collect, analyze, store, disseminate, and use information that is relevant to the effectiveness of the organization” (p. 293). Organizational learning differs from individual learning, but cannot occur without it. An organization, of itself, cannot learn. Learning takes place within the minds of individuals (Lipshitz et al., 1996). As demonstrated in Figure 1, organizational learning takes place when the culture, values, and processes of the organization encourage individual learning, then collect and disseminate their newly acquired knowledge throughout the company. This transformation from specific individual knowledge to general company knowledge creates a learning organization rather than a collection of learning individuals (Love, Li, Irani, & Faniran, 2000).

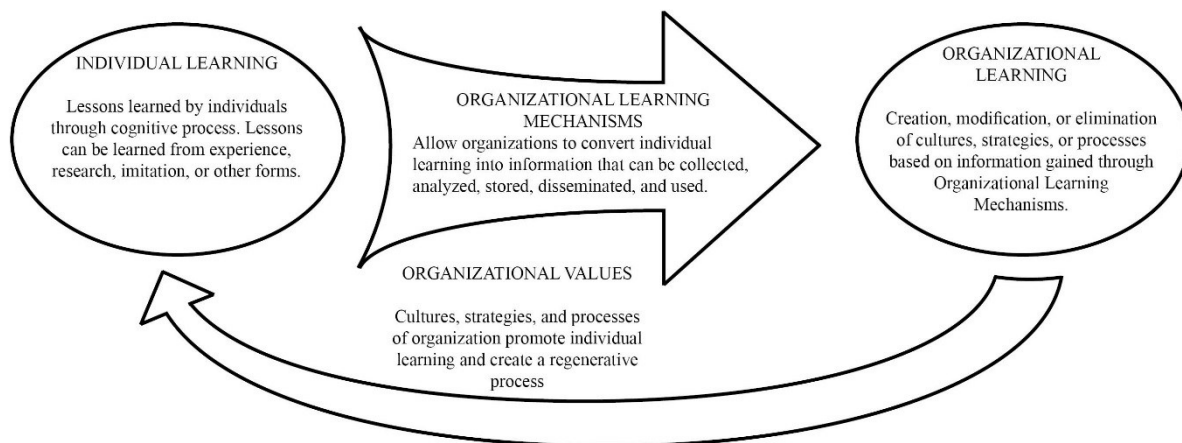


Figure 1: Organizational Learning Process

### *Levels of Organizational Learning*

Organizational learning is often categorized into single-loop and double-loop learning. Single-loop learning, as demonstrated in Figure 2, detects and corrects errors without questioning the organizational structures and norms that may have initiated them. It may be considered as a lower level of organizational learning. Single-loop learning is often characterized by working under a set of clearly identified project goals and interpreting feedback on the success of achieving those goals based on past experience (Wong, Cheung, Yiu, & Hardie, 2012). This approach is the most commonly used in business at-large and even more so in the construction industry. It is advantageous in that it fits conveniently into the current corporate structure, and its execution is straightforward – fix problems as they occur. Single-loop learning is able to improve the organization’s performance and knowledge base without requiring drastic changes to the culture of the organization. There are, however, three significant weaknesses to single-loop learning:

- The errors corrected may only be symptoms of greater underlying problems with the existing organizational norms, but these are not questioned (Love et al., 2000).
- The process of acquiring knowledge in this manner does not allow the organization's knowledge to change rapidly with its environment. The culture, strategy, and process created, or knowledge attained, may no longer be in line with the requirements of the environment since the environment has continued to evolve while the knowledge is processed. It is at this point that unlearning may need to occur in order to achieve double-loop learning (Wong et al., 2012).
- Single-loop learning is not a self-sustaining process. There is no built-in system of continuous learning or improvement. Single-loop learning is initiated when a problem occurs and ends when that problem is perceived to be fixed (Love et al., 2000).

Double-loop learning, on the other hand, scrutinizes and modifies the underlying norms or structures within an organization. Argyris and Schone stated that “changing beliefs and routines are preconditions for organizations to improve by developing new strategies. Double-loop learning refers to a change of performance improvement actions taken after reviewing the need to change the underlying assumptions that have caused errors or deficiencies” (Wong et al., 2012, p. 100). “Double-loop learning activities are manifested in the form of paradigm shifts of organizational protocols, technology, operation, and culture as a precursor for effective and efficient construction business processes” (Kululanga, Price, & McCaffer, 2002, p. 386). As demonstrated in Figure 2, double-loop learning identifies the root of a problem before taking improvement action; it seeks and adopts new management and working approaches through the evaluation of current practices (Wong et al., 2012). It is self-sustaining in that “[t]he processes are designed for continuous responsiveness, ongoing learning, and the use of feedback loops to fuel future decisions” (Love et al., 2000, p. 328).

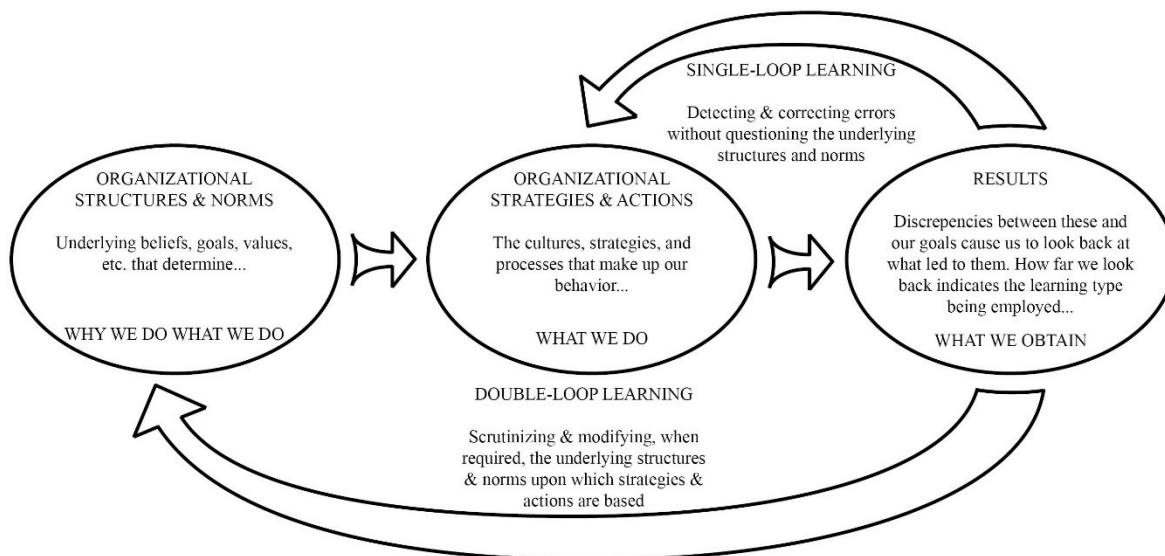


Figure 2: Single & Double-Loop Learning - Adapted from ICL Resources (2012)

Double-loop learning generally differs from single-loop learning by asking, “Why?” Single-loop learning involves changing and improving an organization's behavior, while double-loop learning asks why that behavior is occurring. This can be related to construction in the transition of many organizations from the design-bid-build delivery model to design-build, design-assist, or even integrated project delivery. At some point, stakeholders asked, “Why are the future builders of a project uninvolved in its design?” Such questions create an environment in which outdated or incorrect assumptions can be replaced by new, more accurate paradigms, ultimately resulting in a greater improvement in performance. “The key to powerful breakthroughs is not simply to change your behavior –it's not

enough to change your attitude; it's necessary to change how you see the world, your paradigm, the assumptions you make... [I]f you want to make small, incremental changes, work on behavior or attitude. However, if you want to make quantum changes or improvements, work on paradigms" (Marcum, Smith, & Khalsa, 2002, p. viii).

Practicing double-loop learning has been shown to have a greater impact on performance than single-loop learning, yet most organizational learning exhibited in construction is single-loop learning (Wong et al., 2012). This is thought to occur because "not many organizations are capable of learning in an introspective manner... [They] rarely accept an operational change that does not fit their core values" (Wong et al., 2012, p. 95). Double-loop learning requires that old knowledge, beliefs, cultures, or routines be removed or changed as they become obsolete, a process called unlearning. The routines of a company have been developed over a long period of time, and discarding or changing them may be difficult. As such, most construction entities do not achieve double-loop learning (Wong et al., 2012). The effects of this shortcoming are pronounced. A review of the construction industry's labor productivity since 1964, as shown in Figure 3, paints a startling picture. The productivity of the construction industry has actually fallen in comparison to all other non-farm industries.

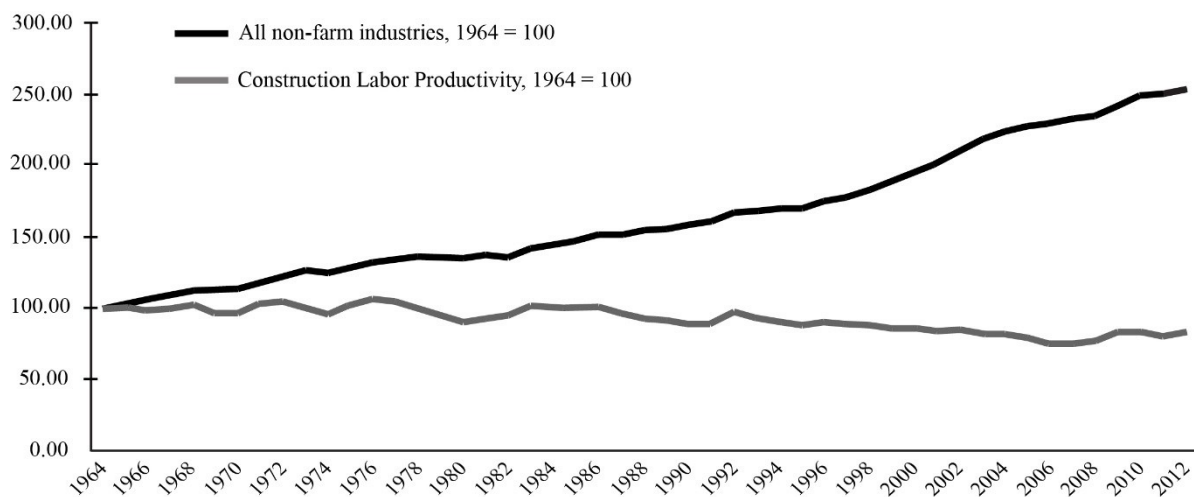


Figure 3: Construction Labor Productivity – Adapted from Teicholz (2013)

### *Economic Recession as a Catalyst for Organizational Learning*

"The rate and type of technological change in an industry are the result of environmental dynamics acting on that industry. A host of environmental factors put pressure on firms to generate and implement innovations" (Arditi, Kale, & Tangkar, 1997, p. 373). As the environment changes, successful companies will follow. Proactive companies may even change in anticipation of environmental change. Buckler states that an organization must have a capacity to learn that exceeds the rate of change imposed by the external environment in order to be successful (Love et al., 2000). Therefore, in a static environment, incremental single-loop learning may be sufficient for the continuous improvement and success of an organization. However, a rapidly changing environment may force or facilitate radical change, potentially enabling double-loop learning.

Lipshitz, Popper, and Oz (1996) identified four preconditions that may support or encourage organizational learning. "First organizations that operate in unstable and competitive environments need to improve continuously to survive. Hence these organizations... invest considerable resources in learning mechanisms that allow them to stay ahead in their fields... Second, organizations in which the cost and salience of errors are high are motivated to learn to avoid

such errors” (p. 300-301). These preconditions are copiously satisfied by the nature of the construction industry and the environment created by recessions. Given these two conditions one could assume that a great deal of organizational learning occurs in the construction industry. However, the third and fourth conditions may either support or undermine that assumption. They are “third, organizations with a leadership committed to learning invest considerable resources in developing OLMs [Organizational Learning Mechanisms]” (Lipshitz et al., 1996, p. 301), and fourth, the professionalism of the organizational members. Though professionalism involves numerous attitudes and attributes, “an important criterion by which professionals are evaluated (particularly among peers) is the extent to which they keep abreast of the state of the art in their fields” (Popper & Lipshitz, 1998, p. 176). It is these latter two preconditions, leadership and professionalism, that often separate a learning from a stagnant organization.

Though environmental factors play a large part in recession era management for construction companies, leadership which has planned for such an event can find opportunities in such turmoil. In a recent study on recession era management, Pearce and Michael noted that “perhaps the most important implication of our findings for theory is that recession-induced declines in the market value of resources not only create new threats, they provide important new opportunities. Recessions generate both an operating effect and a strategic effect. The operating effect is that the decline in resources affects our firm; the strategic effect is that the decline affects all firms. By being better able to conserve, maintain, and attract resources relative to competitors during recession, and to deploy those resources to capture customers, competitive advantage can be built” (Pearce & Michael, 2006, p. 209). Studies conducted by both McKinsey & Company and Boston Consulting Group further confirm this. Though “around a third of the companies in the first quartile of their industries tumbled from their perches during the 2000 slowdown... 15% of today’s market leaders vaulted to the top during that recession” (Williamson & Zeng, 2009, p. 66).

## Methodology

The purpose of this research was to identify whether double-loop learning occurred in Utah commercial construction companies during the most recent recession, and how it affected the overall well-being of each company. Due to the exploratory nature of the research, a combined Qualitative/Quantitative approach was employed using Grounded Theory Methodology. In Grounded Theory, the researcher begins data collection with no preconceived theories and conducts multiple rounds of data collection from which theories are generated. As subsequent rounds of data collection are completed, theories are initially generated, elaborated upon, or modified as the new data suggests. In this way, the concluding theories are derived from, rather than tested against, the data collected. This paper covers the first round of sampling and therefore conclusions are preliminary.

In order to achieve comparable information across multiple companies while still achieving variation within the sample, Stratified Purposeful Sampling was used. Stratification divides members of a sample population into homogeneous groups for sampling. This research stratified respondents according to positions within their company so as to maintain the aforementioned comparability. Purposeful, rather than random, sampling allowed for the pre-selection of variables such as company type, company size, geographic location, and position of respondent within the company. This initial round of data collection sought maximum comparability within a small sample size. As such, respondents were selected to meet the following criteria: Company Managers of a commercial construction company with annual revenue over \$50 million, based in Utah, holding membership in a professional contractor’s association. Respondents within the companies were required to hold a position of vice-president or higher. Respondents included one Chairman of the Board, two Presidents/CEOs, one Executive Vice-President, and one Vice-President. The data was collected through a series of semi-structured interviews which included specific questions to be answered, but allowed for follow-up questions and clarification. Interviews consisted of both open-ended and Likert scale questions. Open-ended questions allowed for a wide variation in experiences, while the Likert scale questions provided a quantitative basis for comparing performances of the companies (Jick, 1979). Below are the interview questions asked.

- 1 What business lessons were learned in attempting to improve your company’s outlook during the 2008-2009 U.S. recession?
- 2 Why was this approach successful?

- 3 What strategies did you try that were not successful (if any)?
- 4 How have these changes affected your company during the recovery?
- 5 What systems, programs, or culture (if any) does your company use to get feedback from employees?
- 6 On a scale of 1 to 10, 1 being significantly worse and 10 being significantly better, how are your profit margins now as compared to before the recession?
- 7 On a scale of 1 to 10, 1 being significantly worse and 10 being significantly better, how do you feel that your company is positioned for future recessions because of these changes?
- 8 Do you have any other lessons or advice that you feel would be pertinent to research on lessons learned from the recession?

Interviews were recorded and transcribed for accuracy. All lessons and strategies mentioned in the interviews were compiled into a master database. Similar lessons or strategies were combined and the number of respondents to mention them were counted. Each item on the resulting list was analyzed to determine whether it constituted single or double-loop learning. Items were determined to be single-loop learning if they involved a modification of behavior or attitude. Items were determined to be double-loop learning if they involved a paradigm shift in how the company viewed some aspect of its organization or environment.

## Results

A review of organizational learning literature concluded that double-loop learning is rarely utilized by organizations in general, and becomes even more infrequent in the construction industry. Given this information, the research expected to find few, if any, instances of organizational learning.

The learning experienced by the respondents was expressed both in terms of actual knowledge gained and of strategies employed. The strategies mentioned are grouped with lessons-learned because they were the end result of an internal learning process and so must be accounted for as the external manifestation of that process. Similar responses were combined and twenty-six unique lessons and strategies were identified during the interviews. The responses are compiled in Table 1. Responses that dealt with a change in behavior or superficial attitude were categorized as single-loop learning. Responses that indicated a shift in the company's underlying paradigm were categorized as double-loop learning. It is important to note that a change in behavior may be prompted by a paradigm change, making that behavioral change a part of double-loop learning. For example, the strategy of investing in new staff and markets at lower cost during the recession was initiated due to the same company's paradigm shift of perceiving the recession as an opportunity rather than a threat. Due to the uncertain nature of attempting to match behavior modifications with paradigm shifts, the decision was made to include only the initial paradigm shift as double-loop learning and categorize any subsequent behavior change as single-loop learning. This provides a clarity and practicality to the measurement of double-loop learning that eludes academic research on the subject, but becomes necessary for a practical application of its precepts.

Table 1

### *Interviewee Responses*

<b>Responses out of 5</b>	<b>Lesson or Strategy</b>	<b>Single-Loop Learning</b>	<b>Double-Loop Learning</b>	<b>Justification</b>
4	Invest in employee morale & loyalty	X		
3	Diversify before recession	X		
3	Reduce overhead expenses	X		
3	Remain disciplined during recovery	X		
3	Improve subcontractor relations	X		

3	Prequalify and insure subcontractors to protect against default	X		
2	Do not bid no-profit work	X		
2	Bid no-profit work to maintain capacity	X		
2	Invest in estimating	X		
2	Increase field training to improve efficiency	X		
2	Reduce staff through attrition rather than layoffs	X		
2	Implement accountability programs and reports to improve efficiency	X		
2	Increase backlog of work to above capacity at first indication of recession	X		
1	Focus on core business	X		
1	Invest in identifying potential projects early	X		
1	Identify the recession early	X		
1	Educate clients on benefits of delivery systems other than low-bid	X		
1	Alter perception of recession from threat to opportunity		X	Paradigm shift from traditional philosophy about recession
1	Increase efficiency of self-performed work	X		
1	Invest in new staff and markets at lower cost during recession	X		
1	Invest in learning about the recession	X		
1	Cut salaries rather than employees	X		
1	Reduce manpower rather than across-the-board wage reduction	X		
1	Facilitate new projects through reduced/free preconstruction services and banking relation assistance		X	Paradigm shift from traditional philosophy of the role of project creator
1	Reduce debt	X		
1	Do not postpone hard decisions	X		

The information shown in Table 2 compares the companies studied based on information they provided during the interviews. The second and third columns in the table, "Preparation for Future Recessions" and "Profit Margin Comparison" correlate to the answers given by the companies to questions six and seven of the interview, with Likert scale rankings from one (indicating significantly worse preparation or margins) to ten (indicating significantly better preparation or margins). The presence of double-loop learning was determined from an analysis of the information provided by the interviewee. The companies that demonstrated double-loop learning performed comparatively well in both profit margin and preparation for future recessions, but the aspect of growth is the most compelling. Both companies that exhibited double-loop learning mentioned significant company growth during the recession. Because of the small sample size and the purposeful, rather than random, sampling, this information is considered informationally, rather than statistically, significant (Sandelowski 2000). Regardless, the information presented provides significant evidence in support of existing research on the performance enhancing benefits of double-loop learning.

Table 2

***Company Response Comparison***

<b>Company</b>	<b>Preparation for Future Recessions</b>	<b>Profit Margin Comparison</b>	<b>Double-Loop Learning Present</b>	<b>Growth Mentioned</b>
Company 1	7	4	No	No
Company 2	8	4	No	No
Company 3	8	4	Yes	Yes
Company 4	9	5	Yes	Yes
Company 5	5	2.5	No	No

**Conclusion**

The purpose of this pilot study was to identify whether double-loop learning was utilized to enhance the performance of commercial construction companies during the 2008-2009 recession and gauge its effectiveness in this endeavor. The study identified twenty-six individual items that were learned and/or implemented during the recession. The majority of these items were categorized as single-loop learning. This finding is in agreement with existing research that indicates that single-loop learning is the predominant form of learning within the construction industry (Wong et al., 2012). Single-loop learning, though not associated with innovative changes, provided meaningful performance improvement for the interviewed companies. Notable among the single-loop learning items were the importance of maintaining employee morale, the benefits of diversifying industries and geographic locations prior to the recession, and the necessity of improving subcontractor relations. Of great interest were companies' positions on no-profit work and wage versus manpower reduction. The companies that mentioned these items were in disagreement on whether or not engaging in these practices proved beneficial. The reason behind this discrepancy may be linked to organizational structure, business plan, or employee morale. This phenomenon of perceiving similar results from directly conflicting strategies is a potential area for future study. Perhaps having a clearly defined strategy, regardless of its merits, provides some measure of performance improvement.

Of the lessons learned and strategies implemented, only two were identified as double-loop learning. Within the five companies studied, the two companies that demonstrated double-loop learning also exhibited growth during the recession. This is consistent with current organizational learning research that indicates double-loop has a greater impact on performance than single-loop learning (Wong et al., 2012). Though these results are preliminary, relying only upon a small sample size, they support the premise that the rapid and innovative changes inherent in double-loop learning better allow organizations to cope with, and succeed in a rapidly changing economic environment. They provide the groundwork and justification for further research and provide an important introduction to the topic of organizational learning, which is relatively unknown in the industry. Further study is planned with increased sample sizes to better understand and corroborate this phenomenon. Subsequent rounds of sampling will generate greater variation, richer results, and continued analysis.

**References**

Arditi, D., Kale, S., & Tangkar, M. (1997). Innovation in Construction Equipment and Its Flow into the Construction Industry. *Journal of Construction Engineering and Management*, 123(4), 371-378.



- Chan, P., Cooper, R., & Tzortzopoulos, P. (2005). Organizational learning: conceptual challenges from a project perspective. *Construction Management and Economics*, 23, 747-756.
- ICL Resources. (2012). [Graph illustration of learning model]. Single-Loop and Double-Loop Learning Model. Retrieved from <http://www.afs.org/blog/icl/?p=2653>.
- Jick, T. D. (1979). Mixing Qualitative and Quantitative Methods: Triangulation in Action. *Administrative Science Quarterly*, 24(4), 602-611.
- Kululanga, G. K., Price, A. D. F., & McCaffer, R. (2002). Empirical Investigation of Construction Contractors' Organizational Learning. *Journal of Construction Engineering and Management*, 128(5), 385-391.
- Lipshitz, R., Popper, M., & Oz, S. (1996). Building Learning Organizations: The Design and Implementation of Organizational Learning Mechanisms. *The Journal of Applied Behavioral Science*, 32(3), 292-305.
- Love, P. E. D., Li, H., Irani, Z., & Faniran, O. (2000). Total quality management and the learning organization; a dialogue for change in construction. *Construction Management and Economics*, 18, 321-331.
- Marcum, D., Smith, S., & Khalsa, M. (2002). Foreward. *Business Think: Rules for getting it right – now, and no matter what*. New York, NY: John Wiley & Sons, Inc.
- Pearce, J. A. II, & Michael, S. C. (2006). Strategies to prevent economic recessions from causing business failure. *Business Horizons*, 49(3), 201-209.
- Popper, M., & Lipshitz, R. (1998). Organizational Learning Mechanisms: A Structural and Cultural Approach to Organizational Learning. *The Journal of Applied Behavioral Science*, 34(2), 161-179.
- Sandelowski, M. (2000). Focus on Research Methods: Combining Qualitative and Quantitative Sampling, Data Collection, and Analysis Techniques in Mixed-Method Studies. *Research in Nursing and Health*, 23(3), 246-255.
- Teicholz, P. (2013). Labor-Productivity Declines in the Construction Industry: Causes and Remedies (Another Look). *AECbytes*, 67.
- Williamson, P. J., & Zeng, M. (2009). Value-for-Money Strategies for Recessionary Times. *Harvard Business Review*, 87(3), 66-74.
- Wong, P. S. P., Cheung, S. O., Yiu, R. L. Y., & Hardie, M. (2012). The Unlearning Dimension of Organizational Learning in Construction Projects. *International Journal of Project Management*, 30, 94-104.