



This item was submitted to Loughborough's Institutional Repository (<https://dspace.lboro.ac.uk/>) by the author and is made available under the following Creative Commons Licence conditions.



CC creative commons
COMMONS DEED

Attribution-NonCommercial-NoDerivs 2.5

You are free:

- to copy, distribute, display, and perform the work

Under the following conditions:

BY: **Attribution.** You must attribute the work in the manner specified by the author or licensor.

Noncommercial. You may not use this work for commercial purposes.

No Derivative Works. You may not alter, transform, or build upon this work.

- For any reuse or distribution, you must make clear to others the license terms of this work.
- Any of these conditions can be waived if you get permission from the copyright holder.

Your fair use and other rights are in no way affected by the above.

This is a human-readable summary of the [Legal Code \(the full license\)](#).

[Disclaimer](#) 

For the full text of this licence, please go to:
<http://creativecommons.org/licenses/by-nc-nd/2.5/>

THE KNOWLEDGE MANAGEMENT TO LEARNING ORGANIZATION CONNECTION

Paul Chinowsky¹ and Patricia Carrillo²

ABSTRACT

The changes in the engineering-construction (E-C) industry of the 21st century require organizations to take a more active role in developing knowledge management and learning organization initiatives. The need to both retain knowledge within the organization and focus on continuous human resource development throughout all levels of the organization is becoming a primary challenge throughout the industry. This paper addresses this challenge by focusing on the question of the link between knowledge management and learning organizations and how to transform an organization from a focus on knowledge management to a focus on developing a learning culture. Based on a series of studies by the PIs into the characteristics of both knowledge management and learning organizations, this paper outlines models of each of these concepts and introduces a bridge that details the level of knowledge management implementation that must be in place prior to an organization having the capacity to move to a learning focus. Additionally, the case studies conducted during the current study provide a basis for presenting potentially unsuccessful paths that may be selected by organizations during the implementation of a knowledge management to learning organization transition.

KEYWORDS

Construction, management, knowledge management, learning organizations

INTRODUCTION

The engineering-procurement-construction (EPC) industry of the 21st century is undergoing significant changes as it addresses issues such as the introduction of advanced field and office technologies, the aging of the workforce, globalization, economic integration, and international partnering. These changes are initiating a challenge for the EPC industry in regards to how to educate personnel to appropriately respond to the rapid introduction of change within the industry. The foundation of this challenge focuses on how to both retain knowledge within the organization and establish continuous human resource development throughout all levels of the organization. At the present, the response to this challenge is focusing on the development of knowledge management programs where organizations emphasize the collection and managed distribution of knowledge within the organization. However, the scope of the changes within the construction industry requires EPC organizations to evolve one step further beyond knowledge management programs into learning organizations. In this evolution, organizations continuously develop, capture, and pursue knowledge with the additional explicit purpose of continuously reviewing existing processes for opportunities to improve operations.

¹ Associate Professor, Department of Civil, Env, and Arch. Engineering, University of Colorado, Boulder, CO 80309-0428, (ph) 303-735-1063, paul.chinowsky@colorado.edu

² Professor, Department of Civil and Building Engineering, Loughborough University, Leics. LE11 3TU, England, (ph) 44 1509 222634, p.m.carrillo@lboro.ac.uk

This move to a learning organization is a comprehensive transformation by an organization. However, the drivers for this move are well documented by researchers both within and outside the business domain (Goh 1998; McGill et.al. 1992; Stata 1989). Primary among these drivers is the emergence of the knowledge worker as the new model for an organization employee (Drucker 1993). The 1950s through the 1970s witnessed the strength of the manufacturing era where the production of goods dominated the economy. Within this economy, the production worker had primary importance. These individuals had the primary responsibility to assemble components into the finished assemblies that drove the production era. In contrast, today's economy with an emphasis on issues such as globalization and automation is moving toward the knowledge era where the manipulation and application of knowledge takes primacy over the production of components. In parallel with this transformation has been the emergence of the knowledge worker who is expected to understand how to apply knowledge in unique scenarios and with greater imagination and efficiency. Creativity has overtaken process as the foundation for successful solutions.

This emphasis on creativity and the application of organization knowledge places a spotlight on a critical divide between knowledge management and learning organizations that currently exists in the EPC industry. Specifically, the question of how to transform the organization from a focus on knowledge management to a focus on learning is the question addressed in this paper. Based on a series of studies by the authors into the characteristics of both knowledge management and learning organizations (Chinowsky and Molenaar 2005; Carrillo, et.al. 2004), this paper outlines models of each of these concepts and introduces a bridge that details the level of knowledge management implementation that must be in place prior to an organization having the capacity to move to a learning focus.

BRIDGING THE MODELS

As outlined in the Introduction, the focus of the current research effort is to identify a bridge between knowledge management and learning organizations. To facilitate this research, two models were selected as evaluation tools for these topics. The STEPS model was selected for evaluating knowledge management progress. The STEPS model helps organizations to structure and implement knowledge management and to benchmark their implementation efforts. The model was developed as part of a three-year UK-government funded project that investigated the relationship between knowledge management and business performance (Carrillo et al., 2004). The Learning Organization Maturity Model was selected for learning organization evaluation. The LO model is based on work conducted by the Construction Industry Institute on Learning Organizations in construction (Chinowsky and Molenaar 2005). The model was developed to provide construction organizations with a framework that identifies a path forward for establishing a learning organization culture.

The current research effort looked specifically at what stage of the STEPS model can an organization bridge over to the LO model and successfully pursue a learning organization culture. To facilitate this identification process, the authors undertook a series of four case studies with organizations that were previously identified by the authors as having active efforts in knowledge management and learning. The focus of these case studies was to identify three items: 1) an evaluation of the organization on the STEPS model, 2) an evaluation of the organization on the LO model, and 3) the identification of the barriers and strategies that existed for the organization to advance its current level of learning implementation. Based on this

identification, the focus of the research shifted to the main emphasis of identifying the bridge between the two models.

Case Studies

The case study process focused on conducting in-depth interviews with individuals in organizations that were actively pursuing knowledge management initiatives and were at least in the early stages of pursuing a learning organization culture. Four engineering-construction organizations were involved, based on their documented development of knowledge management and learning initiatives. The companies selected were each based in the UK but each had significant international operations in different parts of the world. This component was an important factor in selecting the organizations due to the greater need for sharing and disseminating knowledge across geographically distributed offices. This section highlights the methodology used in the case study process and the results obtained during the interviews. After completing the interviews, the team was able to analyze the results to propose the knowledge management – learning organization bridge.

Methodology

The first step in the case study process was to select the organizations that would be included in the process. Two key requirements were put in place for the selection process; 1) the organization must have a documented focus on pursuing knowledge management initiatives and have previously stated a desire to pursue a learning organization culture, and 2) the organization must have a record of pursuing knowledge management initiatives over a period of time that was sufficient to obtain insights into the barriers and opportunities available to this pursuit. As a secondary consideration, the team consciously decided to select organizations that were actively involved in international operations which required the organization to address geographic, cultural, and divisional differences. Based on this criterion and the contacts that were available to team members, four UK-based organizations were included in the final interview population as follows:

1. Company A is an international consulting firm focusing on the key areas of infrastructure and transportation. The company has a specific individual in charge of coordinating knowledge management activities.
2. Company B is an international firm that has a dual focus on construction of major facilities as well as a property development division. The company has a Knowledge manager in charge of knowledge management initiatives internationally.
3. Company C is an international consulting firm focusing on public infrastructure projects and management of infrastructure in conjunction with public officials. Company C has a director of learning to focus specifically with public highway agency owners.
4. Company D is an international engineering-construction firm that constructs major facilities of all types in all regions of the globe. Company D has a team of individuals responsible for knowledge management learning initiatives.

Once the final organizations were selected, interviews were arranged with the one or two individuals who had the responsibility of overseeing the knowledge management process for the entire organization. In some cases this oversight was direct with each of the operating units and in some cases this focused on managing individuals who were in charge of the knowledge

management process at respective units. The methodology employed for the case study process was a semi-structured interview process. In this process, the authors interviewed the learning organization team at the office of the interviewee. The following sections provide highlights of the responses to the questions during the interview process.

- **Knowledge Sharing** - A fundamental component of both knowledge management and learning is the concept of knowledge sharing. In this context, knowledge sharing encourages the collection and dissemination of knowledge throughout the organization. Each of the four companies selected for the follow-up studies has an established history of knowledge management activities that emphasized knowledge sharing. At this point in time, only one of the companies believes it is successfully achieving knowledge sharing at an acceptable level. Within this organization, the combination of engineering collaboration and demand from the client is a driving influence in supporting knowledge sharing activities. The common issues stated with the other organizations focused on barriers from divisions, geographic distribution, or having the “will, but not the implementation”. In these organizations, the common thread is a focus on project delivery over organizational collaboration. Although this is believed to be a reaction to client demands, this short-term perspective is having noticeable ramifications on long-term knowledge sharing initiatives. Specifically, the absence of focus on long-term initiatives is resulting in a reduction in resources focused on knowledge sharing.
- **Communities of Practice** - Within any large organization, individuals can begin to feel isolated and lose a sense of “team” due to the feeling that they are not making a significant contribution to the organization or to a project. Communities of Practice (COPs) are one tool used to counter this feeling by providing individuals with a community of individuals, each of whom have similar technical or managerial responsibilities. In terms of knowledge management and learning, these communities serve a critical purpose in terms of promoting and supporting knowledge development, sharing, and use both within the individuals that belong to the community and to the greater organization. In the organizations that were interviewed for this study, the design-focused organizations, Companies A and C, each had formal COPs that provided strong support for their knowledge management activities. However, in the construction-focused organizations, these COPs were less evident due to a stronger focus on project teams rather than technical responsibilities. Similar to the knowledge sharing topic, the focus on delivering the project in these latter organizations was overshadowing the focus on organization collaboration. The result of this lack of focus on communities was a much lower emphasis on groups of individuals assessing and promoting new ideas within the organization.
- **Leadership Support** - The third area of focus in the study was leadership support. This issue is critical to developing a learning culture since learning and knowledge management are organization-wide issues that require support beyond an individual project or group. The four organizations interviewed in this process each have leadership teams that are aware of the importance of these activities based on past commitments to knowledge management initiatives. However, the continuation of this commitment is mixed at best. Company A is witnessing the strongest continued support with top management providing active support, establishing a formal policy on knowledge sharing, encouraging employee participation

through rewards, and committing substantial resources to the learning effort. Although not as focused as Company A, Company C also is receiving strong support for developing new ideas, although this is influenced by individual clients and projects. Where new ideas are client encouraged, the company is committing resources and has established a formal policy encouraging knowledge sharing. In contrast to these efforts, Companies B and D are witnessing a decrease in leadership support for knowledge initiatives. Specifically, these organizations are experiencing inconsistency in support as management determines the value of these initiatives to the overall organization. The result being that the individuals given the responsibility to oversee these efforts are less inclined to undertake ambitious efforts and instead focus on smaller initiatives.

In summary, the case studies presented in this section served a primary purpose of providing foundational evidence for the knowledge-learning link described in the next section. As outlined in the focus areas above, the relationship between initiatives, barriers and strategies is highly focused on the ability of the organization to demonstrate benefits from implementing learning activities. The next section builds on this requirement by outlining the link between knowledge management efforts and the transition to a learning organization culture.

THE KM-LEARNING LINK

The authors have previously established the potential benefits of pursuing a knowledge management or learning culture strategy. However, as stated at the beginning of this paper, the question of how an organization moves from a knowledge management initiative to a proactive learning initiative is a gap in current engineering and construction research. In an effort to bridge this gap, the authors studied the responses from the case studies described above to develop a proposed bridge between the two knowledge concepts. Specifically, the responses from established knowledge-focused organizations provided the foundational insight required to determine when and how an organization can successfully make the transition from a reactive approach to knowledge to a proactive approach.

The proposed bridge between knowledge management and learning initiatives is illustrated in Figure 1. As illustrated in this figure, the connection between the two concepts is based on the knowledge management STEPS and learning organization maturity models. The left side of the figure illustrates the STEPS model with each of the five levels from start-up through sustainability. In addition to these five steps, a preparation step has been added for those organizations just beginning to approach knowledge management and a continuation step has been added for organizations who are continuing to refine knowledge management practices beyond the maturity stage. Similarly, the learning maturity model is illustrated on the right side of the diagram. In this illustration, the five stages of maturity are illustrated vertically from establishing to maturing. Once again, the preparation and continuation stages have been added at the beginning and end of the process.

The beginning of the link between these two models resides in the STEPS knowledge management model. Since learning cannot occur without an active pursuit and management of knowledge, the establishment of a knowledge management initiative is essential to the eventual movement to a learning culture. As illustrated in Figure 1, since knowledge management must come first in the process, the beginning of the STEPS model is pictured with a lower first step than the learning maturity model. In the process of establishing a knowledge management focus,

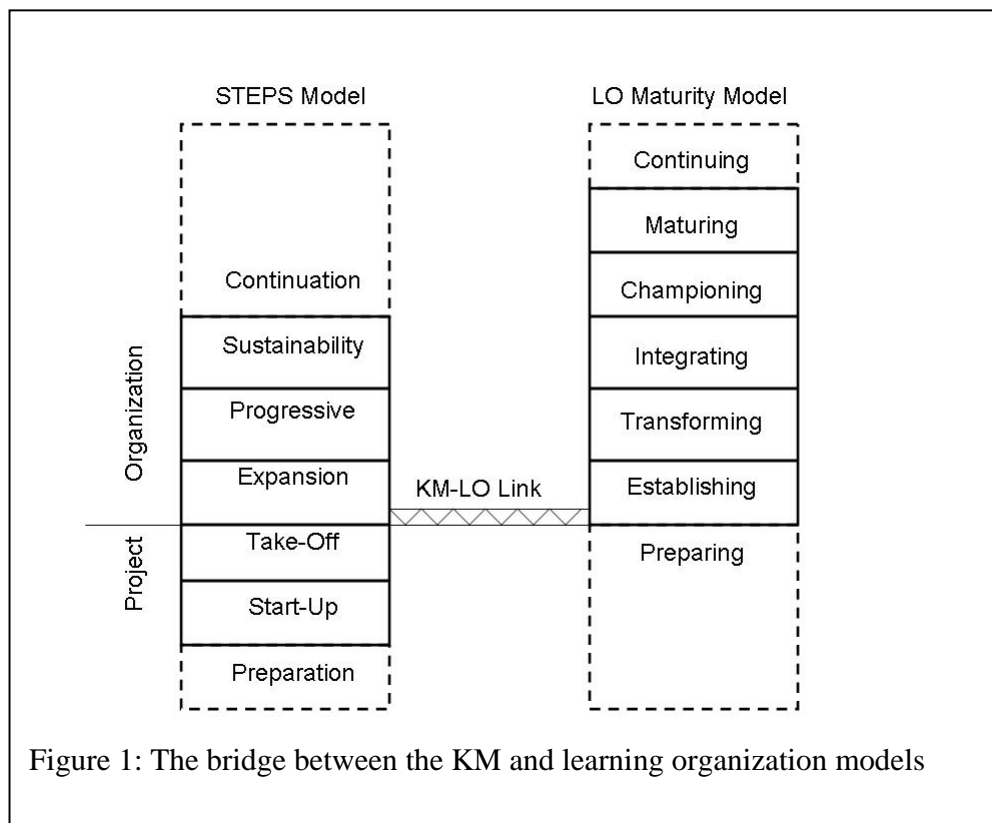


Figure 1: The bridge between the KM and learning organization models

an organization will move through the first and second steps with a focus on an individual project or group. Since learning is an organization activity that requires sharing among all segments of the organization, these first stages in the knowledge management process are not conducive to a sustained learning initiative. Therefore, the first two stages of the knowledge management are considered preparatory for learning rather than the launching points for a learning initiative.

In contrast to the first two stages of knowledge management, the third stage of the STEPS model, Expansion, focuses on the organization transitioning from a project-focused knowledge management initiative to an organization-based initiative. Specifically, this stage witnesses the organization expanding knowledge management beyond a single project to multiple projects or multiple groups within the organization. This Expansion stage is critical to the eventual transition to a learning culture since it is at this stage that knowledge sharing among individuals outside of a constant working group begins to appear.

Once the Expansion stage has been achieved in the knowledge management model, the organization is ready to expand the knowledge initiative in two directions, mature knowledge management and establishment of learning. In terms of the former, the organization should continue to refine and expand its knowledge management efforts to achieve a mature knowledge management implementation. However, at this stage, the organization is ready to initiate a transition to a learning culture. Specifically, the existence of a knowledge management infrastructure and an awareness of the need to share knowledge are the essential precursors to initiating a learning initiative. Thus, as illustrated in Figure 4, the bridge between knowledge

management and learning is established between the Expansion stage in STEPS and the establishing stage in the learning maturity model.

Although the existence of a knowledge management initiative in the Expansion stage does not ensure a successful transition to a learning initiative, it is proposed that this is an essential requirement for a successful transition. Given that this requirement is in place, an organization can transition to a learning initiative by establishing a focus on leadership and communications within the learning context. Since the organization is already emphasizing a knowledge focus, this transition should be a natural evolution. The primary difference being that the organization must now begin to emphasize proactive knowledge acquisition and an examination of existing practices to determine the potential for enhancements and changes in standard practices. Once this change in focus occurs, the organization can begin an active move toward establishing a learning culture by progressing through the learning maturity model.

Unsuccessful Model Relationships

The proposed link between knowledge management and learning presents a potential roadmap for organizations moving toward a learning culture. However, as documented by the authors during this study and previous case studies, organizations do not always follow a preferred path in a roadmap. Specifically, the existence of the knowledge management and learning models in a single roadmap provide opportunities for organizations to embark on alternative paths between and through the models. Some of these alternatives may result in similar endpoints, but others can result in serious limitations and long-term delays for organizations pursuing a learning culture. A few of these negative alternatives are discussed here as follows.

- **Perpetual Management** – The first unsuccessful venture an organization can undertake is attempting to adopt a fully sustainable knowledge management process prior to embarking on a learning initiative. In this scenario, the organization perpetually strives to refine its knowledge management system with the belief that the perfect knowledge storage and retrieval system is the foundation for learning. In reality, this approach results in an organization finding it difficult to ever reach the first level of the maturity learning model since it is reluctant to champion a change in its knowledge management course.
- **Insufficient Preparation** – The second unsuccessful venture an organization can take into learning is to attempt to move from the take-off stage of knowledge management directly into the learning process. The difficulty with this combination is the lack of organization focus put in place prior to moving from knowledge management to learning. Rather than moving from a project focus to an organization focus and then to a learning focus, these organizations attempt to move from a project focus to a learning focus with no intermediate organization emphasis. As detailed earlier, the cornerstone of learning is a focus on organization knowledge sharing. Organizations that attempt this direct transition fail to put in place this step and find themselves compounding the difficulty of establishing an organization-based rather than a project-focused learning initiative.
- **Loss of Focus** – The final unsuccessful combination outlined here is the loss of focus that can occur between knowledge management and learning initiatives. Specifically, the authors found a common thread within organizations where a successful knowledge management initiative approaching the progressive stage was unable to match that success in the transition to a learning initiative. The common thread in these

organizations was a reduction in resources directed toward the learning initiative. In these organizations, management would believe that the success in knowledge management translated to a reduction in resource requirements to continue success. The move to maturity in these efforts was interpreted as a move toward self-sufficiency. In reality, these efforts were only entering a resource dependent phase as they now required resources to communicate the need for learning and initiate new learning initiatives.

Although these are only a few of the potential relationships that can result in negative transitions between knowledge management and learning, they represent common difficulties encountered by study participants. This commonality reinforces the need for organizations to follow the proposed roadmap to minimize the potential for delays in the transition between the two models.

CONCLUSION

The topics of knowledge management and learning organizations have each received considerable attention in recent years, both in the academic and professional communities. However, the link between these two subjects in terms of progressing from a knowledge management strategy to a learning organization initiative is less apparent. This paper has attempted to fill this gap by providing a link between the two topics based on a combination of the STEPS and Learning Maturity models previously developed by the authors. As outlined in the paper, the progression from knowledge management to a learning culture is dependent on the successful initiation of a knowledge management strategy. Once this strategy is in place, the expansion of knowledge management beyond a single project or group is the preparatory step to a learning initiative. At this stage, an organization can cross the bridge to the learning model and commence a focus on establishing the leadership required to initiate a learning culture.

In summary, the path from a successful knowledge management initiative to a successful learning organization initiative has many options for success. This paper provides one path based on essential requirements for making the link between the two concepts. The next step for an organization is to evaluate where it currently stands in the process and focus on putting in place the support and the plan for successfully moving to a dynamic learning culture.

REFERENCES

- Carrillo, P.M., Robinson, H.S., Al-Ghassani, A.M. and Anumba, C.J., (2004). "Knowledge Management in UK Construction: Strategies, Resources and Barriers." *Project Management Journal*, 35(1), 46-56.
- Chinowsky, Paul S. and Molenaar, Keith R. (2005). "Learning Organizations in Construction," *Proceedings of the 2005 Construction Research Congress, San Diego, CA, ASCE*.
- Drucker, Peter F. *Post-Capitalist Society*. Harper Business, 1993.
- Goh, Swee C. (1998). "Toward a Learning Organization: The Strategic Building Blocks." *Advanced Management Journal*, 63(2).
- McGill, Michael E., Slocum, John W. Jr., and Lei, David (1992). "Management Practices in Learning Organizations." *Organizational Dynamics*, 21(1), 4-17.
- Stata, R. (1989). "Organizational learning – The key to management innovation," *Sloan Management Review*, 30(3), 63-74.