

PROMOTING ORGANIZATIONAL LEARNING AND PROJECT SUSTAINABILITY IN THE CONSTRUCTION INDUSTRY

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The concept of organizational learning is receiving an increasing amount of attention in construction management research and practice. The importance of organizational learning is its potential impact on the improvement of organizational performance. The construction industry is of high economic significance and its projects have strong environmental and social impacts. There is need for sustainable change in the construction industry and the ability of construction organizations to cope with such change requires organization learning. However existing organizational learning methods in the industry such as post project review and post occupancy evaluation do not assess the completed project against the triple bottom line, as they focus on technical issues. The general area of investigation in this on-going PhD research is organizational learning and project sustainability in the construction industry. It explores the issues of organizational learning and maturity levels at which construction organizations can deliver sustainable projects. It reviews relevant literature and presents the results from an exploratory pilot study that interviewed experts in the industry to explore the state of the art in practice. The findings suggest a new strand of investigation for this on-going PhD; which is to examine the impact of leadership on organization's ability to deliver sustainable construction projects irrespective of their level of maturity. The research shows that, there is a need in construction management research to further explore the link between organizational learning and sustainability; little research has been done linking organizational learning and sustainability in the construction industry. The research therefore identifies the need to develop a framework for implementing organizational learning for sustainable project delivery. The paper concludes by setting out a design for further work in this area.

Keywords: organizational learning, post project review, post occupancy evaluation, sustainability.

INTRODUCTION

There has been an increased interest in organizational learning within the construction industry since the Latham (1994) "constructing the team" and Egan (1998) "rethinking construction" reports. In this current climate of economic volatility and uncertainty, many construction organizations are striving to survive and remain competitive. The construction industry is very important to the UK national economy; however, it is believed to have low productivity and poor performance. The key to company survival and prosperity is organizational learning (Chan *et al.* 2004);

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however, the construction industry is perceived to be slow to implement new management and technological approaches as compared to other industries.

Barlow and Jashapara (1998) believe that, people involved in construction projects are not given the opportunity to feed the experience they have gained back into future projects. These experiences get lost due to the fragmented nature of the organizational structure of the construction industry. Organizational learning improves organizational performance (Lopez *et al.* 2005; Kululanga *et al.* 2001) however construction as a project based industry is facing the problems in embracing organizational learning (Chan *et al.* 2004).

The relation between sustainable development and the construction industry has become clear, since construction is of high economic significance and has strong environmental and social impacts (Sev 2009). Implementing sustainability in an organization necessitates organizational learning. It is the key element of any effort to effectively implement sustainable development in organization (Siebenhuner and Anold 2007) In order to address the triple-bottom line of sustainability, construction organizations have to learn to adapt to environmental changes and economic opportunities, with organizational level learning is the primary vehicle for the achievement of the Brundtland (1987) sustainable development agenda in terms of meeting the needs of current and future generations (Porter 2008).

This paper explores the link between organizational learning and project sustainability in the construction industry. The first part of the paper reviews literature on organizational learning, organizational maturity, organizational learning methods in construction and sustainability. The second part of the paper presents the research questions, the aim and objectives, and the research design and methodology for the on-going PhD study. The final part of the paper concludes with the findings from interviews conducted with experts in the field of sustainability and construction management to explore the state of the art in practice.

LITERATURE REVIEW

Organizational learning

Organizational learning was defined as “the detection and correction of error” (Argyris and Schon, 1978) cited in (Fuller *et al.* 2007); however organizational learning needs to go beyond detecting and correcting errors. Organizational learning can be described as a dynamic process of creation, acquisition and integration of knowledge aimed at the development of resources and capabilities that contribute to organizational performance (Lopez *et al.* 2005). The significance of organizational learning is that it can improve organizational performance. Organizational learning is widely acknowledged as holding the key to companies’ survival and prosperity.

Pemberton *et al.* (2001) pointed out that, organizations develop new knowledge and core competencies in order to gain competitive advantage through organizational learning. Organizational learning is very important for creating and sustaining competitive advantage. Organizational learning is the effective way of making use of past experience and adapting to environmental changes (Berends *et al.* 2003). It is argued that most successful organizations develop effective learning processes at all levels of their organization. Due to poorly developed or inappropriate knowledge acquisition systems in the construction industry, knowledge and experiences gained by many firms are at the individual level and not at the organizational level (Barlow and Jashapara 1998) Organizational learning should be a restoration process of

changing behaviours to enable an organization to achieve change as well as growth (Murray and Chapman 2003) Organizational change in the world today is so fast and prevalent that, if organizations fail to keep pace through learning, they will not survive (Chan *et al.* 2004) Organizations now consider learning as a more critical variable than it used to be, due to the changing nature of work today (Thomas 2006) Organizations can change beliefs and adjust their regular pattern of behaviour through feedback (Hong 1999) Learning is described as the process of adjusting behaviour in response to experience (Law and Chuah 2004). The ability of organizations to effectively process information and influence various organizational actions is fundamental to the process of organization learning. The construction industry is at the forefront of the sustainable change agenda and the ability of construction organizations to cope with such change requires organizational learning. To succeed in the sustainable development concept, organizations have to engage in learning (Muller and Siebenhuner 2007).

Organizational maturity

The ability of an organization to engage in learning is influenced by its level of maturity. Organizational maturity level determines how organizations change and improve over time and incorporate lessons learned (CMU 1994). A maturity model provides an organization with the support and guidance necessary to evaluate their performance today and identify the next steps forward in realizing their capabilities. It shows the extent to which project-based organizations clearly and constantly set out processes that are documented, managed, controlled and continually improved. A mature process passes through an unstable stage to a stable stage, to enjoy improved capability (Cooke-Davies 2004) Organizations differ in their ability to perform organizational learning processes (Muller and Siebenhuner 2007). As an organization increases in maturity, it shows more improved results (Cooke-Davies 2004). A qualitative research carried out by Zedtwitz (2002), based on 27 in-depth interviews with R&D managers to review the role of post project review as a tool for improving organizational learning; proposed a five-level organizational maturity model for evaluating the effectiveness of an organization's processes. Analogous to Carnegie-Mellon University's maturity model, the five-levels are namely; Initial, Repeatable, Defined, Managed and Optimizing.

Organizational Learning tools in construction

The construction industry engages in organizational learning through post project reviews (PRR) and post occupancy evaluation (POE). Post project review is one of the most commonly used approaches for passing on previous experience to enhance future project and organizational practice (Zedtwitz 2002; Cushman and Conford 2003) Organizational learning involves an organization's ability to reflect on its past experience to modify its future thinking (Chan *et al.* 2004) The engagement in project reviews and the application of lessons learned provides a mechanism for organizational learning (Kululanga and Kuotcha 2008).

Lessons learned should be documented and fed back into the organization. Project review is an important organizational learning process. It facilitates continuous learning on all levels within an organization. It is recommended that, a solid post project review practice should be part of a construction organization's learning processes (Zedtwitz 2002).

Post occupancy evaluation (POE) helps in obtaining feedback on recently completed construction projects from people involved in the construction process, occupants and

other end users. However, POE which is very significant in the sustainable process is severely underutilized as sustainability continuous to grow as a priority in the construction industry (Mendler 2007). Lessons learned from POE can be used to improve the process and the design of future construction projects. The most important function of POE is to feed forward the learning of lessons obtained from the review of completed projects into future projects (Carthey 2006).

POE has the potential for supporting “double-looping learning” (Argyris and Schon 1978); that is to reflect on whether goals need to be reconsidered as well as evaluating how to achieve existing goals better. The use of POE contributes to the reduction of environmental impacts, increased economic viability and high client satisfaction in the construction industry (Kaatz *et al.* 2006).

Organizational learning methods in the construction industry such as post-project review (PPR) and post-occupancy evaluation (POE) focus on technical issues (OGC 2007; Zedtwitz 2002) and do not review completed projects against the triple-bottom line of sustainability; environmental, social and economical impacts.

Sustainability and organizational learning

Sustainable development is rapidly being accepted across the world as the effective way of addressing the social, economic and environmental concerns. Sustainable development balances environmental resource protection, social progress and economic growth and stability now and for the future. Sustainable development has been defined in many ways but the most widely accepted definition is.

“Development that meets the needs of the present without compromising the ability of future generations to meet their own needs”- From ‘Our common future’ (The Brundtland Report, 1987).

The construction industry has a significant social responsibility to minimize the damage its projects do to the social environment. Sustainability at the organizational level refers to meeting social and environmental needs in addition to the firm’s profitability (Porter 2008).

Sustainable construction is the application of sustainable development principles in the construction industry. Sustainable construction aims at reducing the environmental impact of a building over its entire lifespan, providing safety and comfort to its occupants and at the same time enhancing its economic viability. The construction industry recognizes sustainability as a key factor in the success of a project and that performance through the supply chain is, key to this achievement. Sustainability in construction has become a core issue and it is considered as one of the key vehicles for the successful completion of construction projects (Schultman and Sunke 2007) It is believed that the implementation of sustainability in any organization necessitates organizational learning (Siebenhuner and Anold 2007) Organizations that ignore and do not turn sustainability issues into competitive advantage are likely to become less effective. Learning and development processes are believed to be an important path towards the sustainable development agenda (Muller and Siebenhuner 2007).

Construction organizations are required to integrate the concept of social and environmental concerns in the operations; however this can only be achieved through the acquisition of knowledge on the sustainability concept to develop relevant solutions and standards through learning (Muller and Siebenhuner 2007) Progress towards more sustainable construction requires both government and individual organizations to take action (Holton *et al.* 2008).

Construction organizations are being urged to learn and engage in new ways of working in order to compete in the current business environment where sustainability is at the heart of the industry (Siriwardena and Kagioglou 2005). With the increasing demand for sustainable product and services, construction firms should position themselves in order to demonstrate the ability to deliver and tender for works (Cushman *et al.*, 2002).

RESEARCH QUESTIONS

The research therefore addresses the following key questions.

- What is organizational learning in construction.
- Does the maturity level of an organization influence its learning capacity.
- How can organizational learning promote sustainability in construction.

AIM AND OBJECTIVES

The aim of this research is to develop a framework for managing organizational learning for sustainable project delivery by construction organizations at different levels of maturity. The research contributes towards the understanding of organizational learning and sustainable project delivery in construction.

To achieve this research aim, the following specific objectives need to be addressed.

- review the current knowledge on organizational learning in construction.
- critically examine the key features of organizational learning methods in construction.
- explore the key features of sustainable construction project.
- identify and discuss organizational maturity levels for sustainable project delivery in construction.
- develop a framework for managing organizational learning in the delivery of sustainable construction.

RESEARCH DESIGN AND METHODOLOGY

This research will adopt a pragmatic philosophical stance. Pragmatism is an epistemological position where one believes that the meaning of an idea or a proposition lies in its observable practical consequences. The pragmatic approach to research involves mixing data collection methods and data analysis procedures. (Creswell 2003) The research therefore employs both quantitative and qualitative methods that match the specific research questions. Hence the pragmatic paradigm includes tools from both positivist and interpretivist tradition.

Hunt (1991) argues against the use of both qualitative and quantitative methods in the same research, because it is asserted that the two paradigms differ epistemologically and ontologically, However many researchers believe that combining qualitative and quantitative methods (Triangulation) can increase the in-depth understanding of the phenomenon under investigation as well as increase in the credibility of scientific knowledge (Bryman 2004; Creswell 2003; Tashakkori and Teddlie 2003) Triangulation is the combination of two or more methodological approaches, theoretical perspectives, data source and data analysis methods to the study of the same phenomenon. It is a robust and rigorous means of ensuring the use of a mixed method approach.

The first phase of the research is to extensively examine existing literature on organizational learning and sustainability in construction. It will be supported by empirical data drawn from a variety of sources including questionnaires, pilot study, interviews and case study, which will seek respondents from the construction industry in the UK. Questionnaire and interview techniques will be adopted for primary data collection. The motive to use a questionnaire is the ability to reach a large target group in a practical and efficient way. A pilot study will be used to test the quality, clarity, time scale and bias of the questionnaire (Naoum 2002) Interviews are useful to obtain detailed information about personal feelings, perceptions and opinions.

The presence of data is an essential part of every empirical research. Data were collected for this paper through an exploratory pilot study; this approach is best used when the research problem to be investigated is at the preliminary stage. A pilot study was conducted by interviewing practitioners in the field to explore the current state of practice in relation to organizational learning, organizational maturity level and sustainable practices in project delivery processes.

DATA COLLECTION AND DISCUSSION

This exploratory pilot study sets out to explore the state of the art in practice for organizational learning and sustainable project delivery in the construction industry. In this paper, the term pilot study is used to mean a feasibility study or trial run carried out in preparation for the main study. It is a means of gathering primary data to support the suspected research gap in literature.

In addition, a pilot study is undertaken at the early stages of a research study as means of convincing funding bodies, stakeholders and academia that, the proposed research is worth supporting (Teijlingen Van and Hundley 2001).

This study seeks to engage experts in the field of sustainability and construction management processes to explore the state of the art in practice for organizational learning and sustainable project delivery.

This exploratory pilot study was conducted by interviewing eight (8) practitioners in the field including sustainability managers, visiting professors, sustainability consultants, construction managers etc. drawn from industry and practice with background in contracting, social housing, regeneration, academia and consultancy organizations. The interviews were conducted in a loose structure lasting 15-20 minutes.

The qualitative data collection established the relevance of post project review and post occupancy evaluation in achieving organizational learning in the construction industry. It was also conducted to explore if sustainability is currently a key criterion in the above learning methods.

The first interview question asked the usefulness of post project review and post occupancy evaluation in achieving organizational learning in the construction industry. It was found that all the interviewees were in agreement that post project review and post project evaluation are very useful for the achievement of organizational learning in construction. As one interviewee put it.

“Very useful, there is a substantial lack of feedback from completed projects to the teams developing the preliminary phases of new projects”.

When respondents were asked if sustainability should be considered a key criteria in post project review and post occupancy evaluation, it was found that the interviewees

supported the view that, sustainability should be a key criteria in the above construction industry organizational learning methods. However this interviewee commented that.

“Yes, sustainable development is now at the top of the agenda in the industry of the built environment, because this industry uses 40% of the energy used by man and generates 40% of the waste generated by man. It is the key industry to address and engage the improvement of the sustainable presence of man on the planet”.

Contrary to the above, some respondents were of the view that, sustainability should be an issue that is only considered at the beginning of the construction process. When probed further, the interviewee responded by saying.

"Sustainability comes at the beginning of the construction process and re-evaluated at the end of completed project".

There were mixed responses when interviewees were asked about the importance of an organization's experience or level of maturity in achieving organizational learning to deliver sustainable construction projects. Some of the respondents believed strongly that there was a link between organizational maturity or organizational experience and achieving organizational learning to deliver sustainable construction project. One respondent argued that, organizational maturity or experience was important because such organizations will understand better what works and what doesn't. Other interviewees agreed but indicated uncertainty on how important organizational maturity or experience was in isolation. Some respondents argued that, less mature or less experienced organizations could collaborate with more matured organizations to deliver sustainable construction projects. For instance an interviewee responded as below.

“I'm not certain there is a connection here, there might be. Sustainable project delivery requires improved collaborative work methods and a by-product of working this way is likely to potentially improved organizational learning”.

To add to the above, another interviewee simply put it by saying.

"Not very important but some level of organizational maturity or experience is required to fully engage in a meaning learning that will help deliver sustainable construction project".

One significant finding of the study was the impact of leadership on organization's ability to learn and deliver sustainable construction projects. Although leadership was not considered in the initial review of literature and this pilot study, one interviewee said that.

"The role of leadership in sustainability is very essential; organizations need leaders who can champion the sustainable agenda".

Another interviewee added that.

"Organizational maturity level may not work on a linear manner when it comes to learning sustainability; irrespective of the level of maturity, construction organizations need committed leadership to pursue learning that deliver sustainable projects".

Findings from the above data collection and discussion support the need to explore this area of research further, as little has been written on the link between organizational learning and sustainability in the construction industry. These findings are relevant to the study and justify the need to move from exploring the current situation and collect more evidence to actually ascertain the current state of the art.

CONCLUSIONS

Organizational learning has been identified in the literature reviewed as the key to organizational survival and prosperity. Sustainability is currently at the core of the construction industry's practices because of its high economic significance and strong environmental and social impacts. Sustainability is now a criteria for all UK public sector procurement and a project criteria for all publicly funded housing projects. Construction organizations are required to demonstrate the ability to deliver and tender for works as demand for sustainable services increases.

Organizational learning methods in the construction industry such as post-project review and post-occupancy evaluation focus on technical issues and do not review completed projects against the triple-bottom line of sustainability namely; environmental, social and economical impact. It is argued therefore that, it is essential that construction organizations engage in organizational learning methods to embrace sustainability.

Data from interviews conducted with experts from the field of built environment, support the need to incorporate sustainability into organizational learning methods in the construction industry in order to survive in this current business climate.

Most importantly, the findings have also changed the direction of this research with leadership as a new strand of investigation. It will now examine the impact of leadership on organization's ability to deliver sustainable construction projects irrespective of their level of maturity. This review therefore provides a strong basis for carrying out the proposed on-going PhD research which will attempt to explore the link between organizational learning, leadership and sustainability. The research is now aimed at developing a framework to help construction organizations promote sustainability through organizational learning and leadership.

REFERENCES

- Argyris, C and Schon, D (1978) *Organizational Learning: A theory of Action Perspective*. Reading MA: Addison Wesley.
- Barlow, J and Jashapara, A (1998) Organizational learning and inter-firm partnering in the UK construction industry. *The Learning Organization*, **5** (2) 86-98.
- Berends, H, Boersma, K and Weggeman, M (2003) The Structuration of Organizational Learning. *Human Relations*, **56** (9), 1035-1056.
- Brundtland, G H (1987) *Our Common Future: Report of the world Commission in Environment and Development*. Oxford: Oxford University Press.
- Bryman, A (2004) *Social Research Methods*, 2nd edition, Oxford: Oxford University Press.
- Carnegie Mellon University (CMU), Software Engineering Institute (1994) *The capability maturity model*, Upper Saddle River, NJ: Addison Wesley.
- Carthey, J (2006) Post Occupancy Evaluation: Development of a standardized methodology for Australian Health Projects. *The International Journal of construction Management*, 57-74.

- Chan, P, Cooper, R, Carmichael, S, Tzortzopoulos, P, McDermott, P and Khalfam, M. M A (2004) Does Organizational Learning creates a Learning Organization? Conceptual Challenges from a project perspective. In: Khosrowshahi, F (Ed.) *20th Annual ARCOM conference*, 1-3 September 2004, Herriot Watt University. Association of Researchers in Construction Management, Vol.2, 759-766.
- Cooke-Davies, T J (2004) Measurement of Organizational Maturity. *Innovations and Project Management Research*.
- Creswell, J W (2003) *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. 2nd edition, London: Sage.
- Cushman, M, Venter, W, Cornford, T and Mitev, N (2002) Understanding Sustainability as Knowledge Practice, presented to the *British Academy of Management conference: Fast-Tracking Performance through partnership*, London, 9-11 September, 2002.
- Cushman, M and Cornford, T (2003) Infrastructures for Construction Collaboration: The Cross Organizational learning Approach. *International Journal of IT in Architecture, Engineering and Construction*, **1** (1), 67-78.
- Egan, J (1998) *Re-thinking Construction: Report of the construction Industry Task Force*. London: DETR.
- Feagin, J, Orum, A and Sjoberg, G (Eds.) (1991) *A case for case study*. Chapel Hill, NC: University of North Carolina Press.
- Fuller, P A, Dainty, A R J, Thorpe, T and Slater, I (2007) Learning Organizations: Can they be shown to exist through the realization of quantifiable benefits? In: Boyd, D (Ed.), *23rd Annual ARCOM conference*, 3-5 September 2007, Belfast, UK, pp 713-722.
- Hunt, S D (1991) *Modern Marketing Theory: Critical Issues in the Philosophy of marketing Science*, Cincinnati, OH: South-Western.
- Holton, I, Glass, J and Price, A (2008) Developing a Successful Sector Sustainability Strategy: Six Lessons from the UK Construction Product Industry. *Corporate Social Responsibility and Environmental Management*, **15**, 29-42.
- Hong, J (1999) Structuring for organizational learning. *The Learning Organization*, **6**(4), 173-185.
- Kaatz, E, Root, D S, Bowen, P A and Hill, R C (2006) Advancing key outcomes of sustainability building Assessment. *Building Research and Information* **34**(4), 308-320.
- Kululanga, G K and Kuotcha, W S (2008) Measuring Organizational learning through project Reviews. *Engineering, Construction and Architectural Management* **15**(6), 580-595.
- Kululanga, G K, Edum-Fotwe, F T and McCaffer, R (2001) Measuring construction contractors' organizational learning. *Building Research and Information* **29** (1), 21-29.
- Latham, S M (1994) *Constructing the Team: Report of the government/industry review of procurement and contractual arrangements in the UK construction Industry*. London: HMSO.
- Law, K M Y and Chuah, K B (2004) Project-based action learning as Learning approach in Learning Organization: the theory and framework. *Team performance Management*, **10**(7/8), 178-186.
- Lopez, S P, Peon, J M and Ordas, C J V (2005) Organizational learning as a determining factor in business performance. *The Learning Organization*, **12** (3), 227-245.

- Mendler, S (2007) Thinking inside the Box: The case for post-occupancy Evaluation, Building Design and Construction [Online Journal] Available at, <http://www.bdcnetwork.com>, [Accessed on 17/12/2009].
- Muller, M and Siebenhuner, B (2007) Policy Instruments for sustainability oriented Organization Learning. *Business Strategy and the Environment*, **16**, 232-245.
- Murray, P and Chapman, R (2003) From Continuous Improvement to Organizational Learning: development theory. *The Learning Organization*, **10**(5), 272-282.
- Naoum, S G (2002) *Dissertation Research and Writing for construction students*, Oxford: Butterworth Heinemann.
- OGC (2007) *Improving performance: project Evaluation and Benchmarking*, London: OGC.
- Porter, T B (2008) Managerial applications of corporate social Responsibility and systems-Thinking for achieving sustainability outcomes. *Systems Research and Behavioural Science*, **25**, 397- 411.
- Pemberton J D, Stonehouse, G. H and Yarrow D J (2001) Benchmarking and the Role of Organizational Learning in Developing Competitive Advantage. *Knowledge and Process Management*, **8**(2), 123-135.
- Sev, A (2009) How can the construction industry contribute to sustainable Development? A conceptual framework. *Sustainable Development*, **17**, 161-173.
- Schultman, F and Sunke, N (2007) Sustainable management of construction projects. *CIB world building congress*, construction for development, 14-17 May, 2007, Cape Town, South Africa.
- Siriwardena, M L and Kagioglou, M (2005) An Integrative Review of Organizational Learning Research in Construction, In: Sidwell, A C (Ed.) *COBRA 2005 conference*, 4-8 July 2005, Brisbane, Australia.
- Siebenhuner, B and Anold, M (2007) Organizational learning to manage sustainable Development. *Business strategy and the Environment* **16**, 339-353.
- Tashakkori, A and Teddlie, C (2003) *Handbook of mixed-methods Research in the social and behavioural sciences*, London: Sage.
- Teijlingen Van, E R and Hundley V (2001) The importance of pilot studies. *Social Research Update*, Issue 35, UniS (University of surrey).
- Thomas, K (2006) The learning organization: a meta-analysis of themes in literature. *The Learning Organization*, **13**(2), 123-139.
- Zedtwitz, M V (2002) Organizational Learning through post-project reviews in R&D. *R&D management*, **32**, (3), 255-268.