

LEARNING FROM EXPERIENCE: ALIGNING CONTINUING PROFESSIONAL DEVELOPMENT WITH KNOWLEDGE MANAGEMENT

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The need for the development and testing of models for knowledge management (KM) in construction organisations is now well recognised. As part of a doctoral study seeking to develop a model of KM through grounded theory, an in-depth case study of a leading Irish construction organisation was conducted. Based on theoretical sampling from the first phase of the research, the case study sought to identify and evaluate current and potential approaches to managing knowledge at individual, project and organisational levels. This consisted of a combination of interviews and surveys with a broad spectrum of management and professional staff, including a director, project managers, quantity surveyors, foremen and engineers. It was found that the company are committed to the provision of life-long learning opportunities for all staff through comprehensive continuing professional development (CPD) activities, such as mentoring, training and education. They have also implemented a lessons learned database as part of a KM initiative, which has not been as successful as initially anticipated. The dissemination of lessons learned through the database has been augmented by the use of in-house CPD seminars given by the organisation's staff. The use of both technology and face-to-face interaction has improved the lessons learned process, particularly in aligning individual learning with that of the organisation. The paper concludes by considering the potential for aligning CPD activities with KM, making recommendations for the next phase of research and more specifically for construction organisations attempting to learn from experience. Such an approach could lead to improving the professional skills of individual staff, whilst contributing to improvements in organisational performance.

Keywords: case study, continuing professional development, grounded theory, knowledge management, lessons learned.

INTRODUCTION

Increased profitability, improved project delivery and client satisfaction can be achieved by construction organisations that employ highly skilled staff. Knowledge management (KM) has been promoted as a means of harnessing and utilising the intellectual resources of an organisation's employees to this effect. Jashapara (2004: 12) defines KM as: "the effective learning processes associated with exploration, exploitation and sharing of human knowledge (tacit and explicit) that use appropriate technology and cultural environments to enhance an organisation's intellectual capital and performance." However time and cost constraints leave little room for reflection and learning in an intensely competitive industry, where there is a need for further exploration of knowledge and KM-related issues (Robinson *et al.* 2005). In managing

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knowledge within an organisation, the dissemination of knowledge at three ontological levels; individual, project (group) and organisational requires consideration (Jashapara, 2004). This can be supported by numerous knowledge sharing practices, such as knowledge exchange seminars, departmental meetings, coaching and mentoring, site visit programmes, rotation of staff, intranet and databases, recruitment and training, communities of practice and post-project reviews (Dainty *et al.*, 2005; Kamara *et al.*, 2002). Barriers to KM include lack of management support, employee resistance to sharing knowledge, poor ICT infrastructure, lack of dedicated resources, poor organisational culture, poorly articulated strategy, and difficulty in evaluating benefits (Robinson *et al.*, 2005; Dainty *et al.*, 2005). The purpose of this paper is to present the second phase of an ongoing doctoral study, the aim of which is to develop a model of KM for the leading Irish construction organisations through grounded theory. This comprises consideration of the grounded theory methodology and the first phase of the research, before moving onto the second phase which focuses upon the role of Continuing Professional Development (CPD) in KM. Through the emergent nature of grounded theory, the paper concludes by considering the potential alignment of CPD and KM activities for increased profitability, improved project delivery and client satisfaction.

GROUNDED THEORY

The aim of the grounded theory methodology is to produce formal, substantive theory about the behavioural patterns that shape social processes as people interact in groups (McCallin, 2003). The grounded theory approach is now proving popular within the construction management research domain, with a number of recent research projects being undertaken in the area of KM (Hunter *et al.*, 2005). There are however various versions of how researchers can go about implementing grounded theory. Jones and Noble (2007) recommend that the researcher should clearly state the version they intend to use and adhere to its procedures. Given the need for integrity, the present study adopts the version of grounded theory developed by Strauss and Corbin (1998), a key feature of which are the detailed open, axial and selective coding procedures. As concepts emerge from the initial field research, further sites are selected based upon developing categories and emerging theories (Goulding 2002). In concluding the theory development, theoretical saturation should occur whereby additional analysis no longer contributes to discovering anything new about a category and is vital if a theory of substance is to be developed (Denscombe 2003).

FIRST PHASE OF THE RESEARCH

The first phase of this research involved conducting an initial review of KM literature to identify initial ideas and concepts (Denscombe 2003). Arising from this review, an interview schedule was compiled with questions relating to the three ontological levels of KM within construction organisations, the use of ICT, current approaches to managing knowledge and the potential for a more formal approach to KM. In the early stages of grounded theory, Goulding (2005) suggests initially talking to informants who are most likely to provide information which may lead to provisional concepts and “direct the researcher to further ‘theoretically’ identified samples, locations, and forms of data.” Senior managers from ten of the leading Irish construction organisations were interviewed in order to get an overview of current approaches to managing knowledge from both strategic and operational perspectives. In order to build a dense and tightly structured theory, Strauss and Corbin (1998: 281) suggest that ten good interviews during the early phases of research should “provide

the skeleton of a theoretical structure,” which can be “filled in, extended, and validated through more data gathering and analysis, although coding can be more selective.” Microanalysis of these ten interviews was undertaken to identify initial categories, their properties and dimensions and potential relationships between them. This involved line-by-line analysis of each interview transcript, asking questions of, and constantly comparing data, using a combination of open and axial coding (Strauss and Corbin, 1998). Adopting this rigorous approach, eight categories emerged as part of the initial analytical process: knowledge; managing knowledge; CPD; supportive learning environment; the role of Human Resource Management (HRM); ICT; other organisational initiatives; and the reality of the business. Through the analytical process and the resultant memos, a record of ideas, questions and sites for further data collection were collated, with a number of areas identified for further research (Strauss and Corbin, 1998). These included construction professionals, HRM and CPD specialists, ICT Managers, professional bodies, other industries where KM is utilised and further in-depth literature review to enhance the development of categories.

SECOND PHASE OF THE RESEARCH

The second phase focuses upon the categories managing knowledge, CPD and supportive learning environment from the perspective of construction professionals. Following a review of literature relating to CPD and KM, the case study methodology is considered and findings presented and discussed.

Continuing Professional Development

The development of technical knowledge in their specialist subject area; personal transferable skills and attributes such as team working and problem solving; and general managerial skills are identified as the main areas of learning for professionals (Roscoe, 2002). In order to develop these skills, CPD is important and is defined as: “the planned acquisition of knowledge, experience and skills and the development of personal qualities necessary for the execution of professional and technical duties throughout a construction professional’s life (Wall and Ahmed 2005: 1290).” Three of the main stakeholders in CPD are the individual member, the professional body to which they belong and employers of professional staff who are concerned with maintaining the competence of their staff (Roscoe, 2002). While much informal learning occurs through on-the-job experience, there are a number of activities which can account for formal CPD, such as completion of training courses and post-graduate academic studies. Other activities which can contribute to formal CPD and are recognised by professional bodies include conferences and lectures, private study and reading, tutoring and mentoring, tours and site visits, open distance learning, workshops and seminars, teaching and examining, working groups, and research publications (CIOB, 2007; Engineers Ireland, 2007; SCS, 1996).

Continuing Professional Development & Knowledge Management

It is worth comparing CPD with KM, particularly as both are concerned with knowledge and learning. In terms of knowledge production, Gibbons *et al.* (1994) identified two types, mode 1 and mode 2. Mode 1 is concerned with the production of discipline-specific, scientific knowledge, while mode 2 knowledge is socially generated and is anchored in practical, context-specific here-and-now problems. Burns and Chisholm (2003: 181) state that mode 2 knowledge is “transdisciplinary, involving teams and largely concerned with developing tacit knowledge skills.” This

is particularly relevant in construction organisations where multi-disciplinary teams work together to manage construction projects and solve problems. While the primary focus of CPD is on the individual professional and KM is concerned with the organisation as a whole, there is considerable overlap in terms of the activities, as evidenced in Table 1. Participation in such activities can allow employees the opportunity to “reflect upon their work, trade stories and ideas with co-workers, or catch up on professional theory and practice (Grisham and Walker, 2005: 554).” It is important that employers afford their employees the opportunity to reflect on their practice, learn from mistakes and seek guidance in a supportive organisational environment (McDougall and Beattie, 1998).

Table 1: A Comparison of CPD and KM

	CPD (Individual)	KM (Organisation)
Definition	Planned acquisition of experience, knowledge and skills	Learning processes associated with exploration, exploitation and sharing of human knowledge
Activities	Conferences and lectures Private study and reading Tutoring and mentoring Tours and site visits Open distance learning Workshops and seminars Teaching and examining Working groups Research publications	Knowledge exchange seminars Departmental meetings Coaching and mentoring Site visit programmes Rotation of staff Intranet and databases Recruitment and training Communities of practice Post-project reviews

Roscoe (2002) contends that individuals undertake CPD, not only to satisfy their professional body's requirements, but to ensure credibility with colleagues and employers, improve current job performance, widen and deepen the capacity to perform in the current role and develop future capacity to enable promotion and progression. The relationship between individual and organisational learning is discussed by McDougall and Beattie (1998) who view individuals at the core of learning within organisations. CPD has a role to play in facilitating the integration of mode 2 knowledge production that is relevant to employees, their role and the company's objectives according to Burns and Chisholm (2003), who recommend that a work-based knowledge transfer strategy for CPD is established. The link between knowledge and learning is discussed by Gourlay (2001) who cites the need for the involvement of HRM specialists in KM projects if they are to be successful, particularly as the design and delivery of formal training is complimentary with the dissemination of explicit knowledge within organisations. McDougall and Beattie (1998) suggest that there is a role for training and development professionals in increasing awareness of informal learning strategies within organisations, which can lead to effective knowledge transfer and organisational learning.

Methodology

For the second phase of the research, a case study of PJ Hegarty & Sons (PJH), a leading Irish construction organisation was conducted. A case study approach was chosen as it seeks a range of different kinds of evidence in a case setting, which when abstracted and collated has the potential to provide the best possible range of answers (Robson, 1993). In 2004 PJH became the first construction company in Ireland to gain accreditation from Engineers Ireland for their CPD practices. The company's primary activity is undertaking large and complex construction projects in the commercial, industrial and civil engineering sectors. The main aim of this case study

was to further develop the emerging categories from the first phase of the research, with the case study comprising the following:

- Interview with Director: in order to get a good overview of various KM-related issues, a semi-structured interview was conducted with one of the company's directors as part of the first phase of research. This individual was selected as he has an in-depth knowledge of the organisation and is responsible for CPD.
- Staff Questionnaire: the purpose of the questionnaire was to explore the effectiveness of identified KM initiatives within the organisation. The questionnaire was e-mailed to 180 professional and management staff, achieving a 36% response rate.
- Project Team Interviews: with the questionnaire completed, it was decided to undertake in-depth semi-structured interviews with a full project team based on a €70 million commercial development project. The interviewees comprised thirteen professional and management staff, including a senior contracts manager, a project manager, three quantity surveyors, three engineers, four foremen and a safety officer.

In developing grounded theory, Strauss and Corbin (1998) view both qualitative and quantitative research as having an important role.

FINDINGS

In keeping with the ontological levels identified by Jashapara (2004) current approaches to managing knowledge at individual, project and organisational levels are presented.

Individual Knowledge

Apart from on-the-job experience, the main way PJH develop individual employee's knowledge is through an extensive CPD programme. The overwhelming consensus among interviewees was that PJH are excellent in their provision of CPD and training. According to a project manager who has been with the company for 10 years: "I think they're good, they've a good attitude to staff, they support training, they support career development, so I think that overall, they're a good company to work with." Indeed all respondents to the survey cited that a good training and development programme was either very important or important in motivating them in their work. Of the 65 survey respondents, 63.1% are members of a professional institution, with 18.5% holding membership to more than one professional institution. Over a quarter of respondents (28%) are members of Engineers Ireland, followed by the CIOB with 23% and the SCS with 15%. Mentoring is well recognised as an effective method of transferring knowledge and experience from senior to junior employees. According to the Director: "it took us a while to get the mentoring going, because people didn't really understand what mentoring was all about, but we actually did some training of the senior people on mentoring through Engineers Ireland, and that helped, so it's actually working a lot better now." The use of performance appraisals allows individuals to both assess and review performance and training and development needs for the previous and coming year. PJH try to encourage a proactive approach to appraisals, once a year each staff member is appraised by their immediate supervisor, followed by a review meeting with a company director. Areas where training is required are identified, which is reviewed at the appraisal the following year to ensure that goals have been achieved. They were identified as being beneficial to people who are career-oriented: "if I'm honest the performance appraisals are very good for people that want to move up or gain more knowledge."

Project Knowledge

The main approaches identified for managing project knowledge are the use of a lessons learned database and site visits. As part of the KM criteria for CPD accreditation, PJH implemented a lessons learned database (LLDB) to capture experience from projects and share it throughout the wider organisation. Lessons are collected at post-project review meetings where key members of the project team discuss the best and worst experiences. Following this meeting, the lessons are documented in a standard template detailing the title, description and contact details for the individuals involved, and classified based on the trade/subcontract package with which it is associated (for example cladding, glazing, foundations etc.). The lessons are then posted on the LLDB where people are supposed to refer to them when a new subcontract package commences on their project. According to the Director, “before you start that package you log onto the database and have a look and say “yeah, I know that one, I know that one, oh, there’s a new one, I’ll read that” and hope you don’t make the same mistake again. So the theory is good but you are depending on people to take the time to look at it.” Despite nearly three-quarters of the survey respondents (73.8%) stating that they found it beneficial to them in their work, 36.9% of respondents stated that they used it “very rarely” with a further 16.9% having never used it. The main issues identified by the interviewees included a lack of time to use the LLDB, the relevance of the lessons to them and the fact that there was no requirement to contribute to or use the LLDB. In terms of the actual relevance of the lessons learned to them in their current position the Senior Engineer commented; “a lot of the things on the lessons learned are relevant to foreman level...they’re the guys out there dealing with those issues...that’s where the breakdown is, the people who really need to know are not accessible to a computer, its not in their job description.” In terms of finding the most recent lessons, 41.8% of survey respondents stated that the LLDB was not up to-date and 32.7% identified it as difficult to search. Visiting other construction sites is seen as an important part of KM, allowing participants to share knowledge and experience. The company encourages staff to visit other PJH sites to share experiences, albeit on an ad-hoc basis, with 49% of the survey respondents having visited another PJH site. During the interviews, it emerged that a number of participants had visited another site “to look at pods and a twin wall system...we got to know how they worked, it’s helped shorten the learning curve.”

Organisational Knowledge

The nature of construction makes it “difficult to get away from sites and you can’t really have more than one or two people from a site going to something, that’s difficult.” Just over half of the survey respondents (51%) indicated that they meet with their peers on a regular basis; with 97% of these reporting such interaction as beneficial to them in their work, particularly in discussing recurring problems, new construction methods and other issues. These views were confirmed during the course of the interviews, being viewed as “extremely beneficial.” Of the survey respondents who didn’t get to interact with others outside of their day-to-day roles, 83% indicated that they would like to do so. In general, the idea of annual meetings for the various disciplines was viewed as potentially useful but would have to be very structured. PJH organise regular knowledge sharing seminars for staff covering a wide range of topics, “particularly technical, we find it’s actually quite hard to get good technical courses, so we do a lot of that in-house, with our own senior managers.” In many cases, the content of the seminars is based upon specific packages within the LLDB, thus improving the dissemination of important lessons learned. All interviewees

spoke of how they were actively encouraged to attend relevant seminars, with 79.2% of survey respondents indicating that the seminars helped them improve in their own work. A number of problems with the seminars were identified as the timing of the seminars in the evenings, with many of the interviewees citing fatigue and long travelling times as being counter-productive to getting any value out of the seminars. A possible solution to this problem was raised by the project manager who suggested that “there should be more done on-site, particularly on a big site like this where you have a lot of staff...it’s not a thing that has to happen in head office.” It is important that seminars are pitched at the right level to the audience “if it’s not relevant or you know it already, you’re going to switch off.” The relevance of seminars to graduates is particularly important: “once you’ve seen it been done [formwork, concrete etc.] I find it’s easier to go to a seminar and talk about it...it’s hard to visualise something that you’ve never seen or experienced when you go into a room and listen to someone talk about it for an hour.” According to one interviewee “the seminars are effective if they get people at similar levels together, when they wouldn’t normally get together and they give people a chance to learn from the experience of others.” Throughout the course of working, people may encounter issues that they haven’t dealt with previously. In these instances there is often someone within the organisation who can offer assistance, having encountered such issues themselves.

DISCUSSION

Having considered the current approaches to managing knowledge at individual, project and organisational levels within PJH, it is evident that they provide a range of activities which can be considered as part of CPD and KM.

- Individual Knowledge: It is clear that PJH recognises the provision of CPD opportunities for staff as quite important, particularly as almost two-thirds of respondents are members of a professional body. Mentoring provides junior staff with the opportunity to seek guidance from more experienced colleagues while the annual performance appraisal affords staff the opportunity for reflection. Coupled with the fact that the company's CPD practices are accredited by Engineers Ireland, it is reasonable to suggest the presence of a supportive learning environment (McDougall and Beattie, 1998).
- Project Knowledge: The implementation of the LLDB demonstrates that PJH recognise the need to learn from their experiences on construction projects. The effective dissemination of such lessons learned appears to be problematic, particularly as many staff rarely use the database due to a lack of time and no requirement to do so. The use of the LLDB should become company policy with a requirement on staff to review it prior to particular trades and subcontract packages commencing on site. The structure of the LLDB and relevance of the lessons to individual staff also requires further consideration. Site visits were viewed in a positive light by those who had participated in them, although they are generally undertaken on an ad-hoc, as-needed basis.
- Organisational Knowledge: The geographical dispersion of construction sites from central management appears to be one of the main inhibitors of identifying and sharing knowledge within the organisation. Opportunities to interact with peers is viewed as valuable by staff, and of those who do so on a regular basis (51% of respondents), the majority (97%) found such interaction of benefit to them. In line with the findings of a case study conducted by McDougall and Beattie (1998), the interaction facilitates discussion and learning around technical and managerial issues. In an attempt to improve

knowledge sharing, PJH organise regular seminars for staff, particularly to support the dissemination of lessons learned. However as these seminars are held in head office in the evening time, many found themselves too tired to derive any benefit after a bust day on site. Furthermore the seminars need to take the experience of the participants into account, particularly for graduates who will generally have a low level of experience.

There are a number of issues arising from this case study which require further consideration in developing a grounded theory of knowledge management in construction. Engagement with CPD and KM activities may differ dependent upon the individual's role, their level of experience and membership of a professional body. This implies that the knowledge and learning needs of staff may differ and a "one size fits all" approach, such as that adopted with the LLDB may not be the most beneficial. Furthermore, the geographical dispersion of staff within the organisation, across projects and regions further exacerbates the ability of staff to identify expertise within the organisation and impinges upon the effectiveness of organisational knowledge sharing activities such as regular meetings and seminars. Based upon the evidence presented in the case study, it is clear that construction professionals, their employers and professional bodies have a role to play in engaging with, providing and accrediting CPD and KM activities respectively (Roscoe, 2002). Such activities not only contribute to developing and maintaining the knowledge skills and experience of the individual professional, but also are intrinsically linked to learning and knowledge at an organisational level (McDougall and Beattie, 1998).

CONCLUSIONS

In order to thrive in a highly competitive environment, construction organisations need to ensure that their employees possess the experience, knowledge and skills to deliver successful projects. Furthermore, the organisation should ensure that the collective learning and experience of all employees is exploited and shared to maximum effect. Through the use of grounded theory, a wider doctoral study aims to develop a model of KM for the leading Irish construction organisations. Eight categories emerged as part of the initial analytical process of the first phase of research including, knowledge, managing knowledge, CPD, supportive learning environment, the role of HRM, ICT, other organisational initiatives and the reality of the business. The second phase which is reported in this paper considered the potential for aligning CPD and KM through a review of literature and a case study of a leading Irish construction organisation. The case study found that the organisation in question provide a supportive learning environment for employees through the provision of a range of activities, such as training, mentoring, performance appraisals, lessons learned, site visits, and knowledge-sharing seminars. As Grisham and Walker (2005) noted, such activities provide an excellent opportunity for peer learning, and in an organisational context, allow for knowledge transfer and organisational learning (McDougall and Beattie, 1998). In this regard, such activities need to be carefully planned in terms of delivery, location, timing and most importantly, relevance to the participants. It is also important that the three main stakeholders in CPD as identified by Roscoe (2002) are involved; the organisation providing, the professional bodies accrediting and the individual construction professionals engaging in KM and CPD activities. This has led to the development of an emerging framework for the alignment of KM and CPD activities which can be seen in Figure 1. The capture and dissemination of lessons learned is one of the main areas which could benefit from the adoption of such a framework. By developing and delivering CPD accredited learning

resources based upon the lessons learned, the organisation, as a whole can learn from experience.

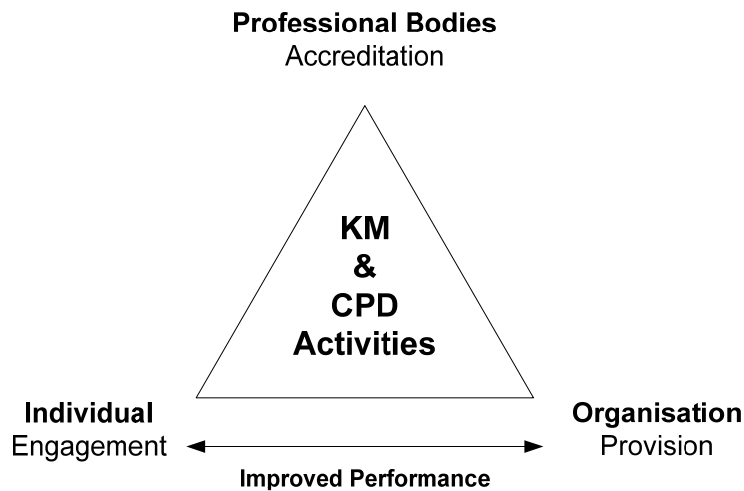


Figure 1: Emerging Framework for Alignment of KM & CPD Activities

In order to advance the development of this framework and a model for KM for the leading Irish construction organisations, further research is required. Specifically the findings from the second phase of the research need to be analysed in accordance with the strict guidelines on grounded theory, including open, axial and selective coding (Strauss and Corbin, 1998). Once completed, it is anticipated that the next phase of the research will involve exploring the role of HR and CPD specialists in managing knowledge and increasing awareness of informal learning strategies. It is expected that the alignment of CPD with KM could lead to the improved professional skills of staff, contribute to effective knowledge transfer and ultimately enhance organisational performance.

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