

PROJECT DEBRIEFING: A MULTI-DOMAIN REVIEW OF PRACTICES AND PROCEDURES

Rod Gameson¹, Subashini Suresh and Ezekiel Chinyio

School of Engineering and the Built Environment, University of Wolverhampton, Wolverhampton WV1 1SB, UK

Construction project teams have, historically, been temporary in nature, often formed for a single project. Significant research has been conducted on construction processes and procedures examining various stages of a project's development and delivery. Numerous authors have identified the importance of the construction project 'briefing' process, with regard to clearly understanding a clients' requirements, leading to the project team translating these into a satisfactory and completed facility. However, there has been limited investigation into the converse process of 'debriefing'; i.e. reviewing, reflecting and learning relating to how project teams have performed. The aim of the research being reported is to conduct a theoretical review of literature relating to the debriefing processes. A range of knowledge domains, both within and outside of a construction context, which document project review, after action review, and post-mortem practices and procedures have been investigated; for example: counselling, computer software development, the military and general project management. The research method is exploratory with the objective of developing, firstly, an understanding of the current body of knowledge. This leads on to an analysis of the literature to evaluate currently available debriefing practices, followed by the presentation of key factors relating to how such practices might be applied to construction projects and teams, particularly with regard to capturing and evaluating team members' experiences, and facilitating future improved performance. The outcome of this literature-based desk study is the identification of key issues which will allow the research to move into an 'experimental' phase where the key issues can be pilot tested. The research is seen as important to improve both the efficiency and effectiveness of project team members and, subsequently, contribute to more efficient and effective project team performance – closing the project team life-cycle loop.

Keywords: debriefing, knowledge capture, project teams.

INTRODUCTION

Much has been written on the importance of the initial stages of a construction project leading to the production of a set of client requirements: the project 'brief' (e.g. Barrett and Stanley 1999). Conversely, little attention has been paid to the other end of the project delivery process, namely the post-completion stage. There are developed processes for evaluating buildings post-occupancy, to be used by building occupants and facilities managers (Barrett and Baldry 2003; Bordass and Leaman 2005). However, there is limited evidence of the development and use of the 'debriefing' processes to be used by construction project team participants to evaluate their performance. Bordass and Leaman (2005) suggest that the feedback / review stage is not taken as seriously as it should be. Emmitt and Gorse (2003) discuss

¹ rod.gameson@wlv.ac.uk

'feedback meetings' taking place at the end of a project but state that, although such meetings are important, they are often avoided. The focus of this paper therefore is to investigate the concept of debriefing broadly across a range of knowledge domains to identify practices, procedures and key issues that could be applied to construction projects and their supply chain participants. It also outlines a research method to conduct an audit of construction project teams' current debriefing knowledge practices and procedures.

FACTORS INFLUENCING CONSTRUCTION PROJECT TEAM PERFORMANCE

Systems have been developed internationally to measure the performance of individuals (eg. consultants, contractors) (NSW: CPSC 1999; 2000), and projects (using key performance indicators (KPIs)) (DETR 2000), but research into project debriefing, relating to the construction industry, is limited (Gameson and Sher 2003). Much has been written on relationships between project participants initially prompted by issues such as alternative procurement systems, but of late this has developed into areas relating to partnering, strategic alliances (Bresnen and Marshall 2000a; 2000b) and supply chain management (Love et al 2002). Change has, in part, been influenced by increasing demands from the industry's clients for better, and more efficient, products and services (Latham 1994; Davis 1995; DETR 1998). A consequence of this has been that the boundaries between organisations are blurring; with a growth in 'network organisations'; for example, joint ventures, strategic partnerships, etc. (Gameson and Sher 2002).

Project management literature suggests a number of important factors to be considered when discussing project teams and their dynamics. Sotirouu and Wittmer (2001) conducted a study which found that the creation of professionally challenging projects was the single most important factor influencing the behaviour of project team members. Veil and Turner (2002) contend that although working in a project group may bring insecurity and stress, caused by new colleagues and contexts, it is more exciting than any other business situation; in that it is meaningful, a continuous process of learning and adapting in overcoming problems. White and Fortune (2002) identified common criteria used for defining project success and produced a list of 'critical success' factors. Criteria used for judging project success, and the top ten factors critical for successful project outcomes are summarised (in rank order highest to lowest) in Table 1. Many of the criteria and factors in this table are often cited in literature related to the management of projects (eg. Morris 1994; Walker 2007).

Table 1: Project success and outcome factors (White and Fortune 2002: 6-9)

Criteria used for judging project success	Factors critical to successful project outcomes
1. meets client's requirements	1. clear goals / objectives
2. completed within schedule	2. realistic schedules
3. completed within budget	3. support from senior management
4. meet organizational objectives	4. adequate funds / resources
5. yields business and other benefits	5. end user commitment
6. causes minimal business disruption	6. clear communication channels
7. meets quality / safety standards	7. effective leadership / conflict resolution
8. other criteria	8. effective monitoring and feedback
	9. flexible approach to change
	10. taking account of past experience

DEBRIEFING KNOWLEDGE DOMAINS

Literature reviews relating to processes and procedures relating to debriefing activities, in general, have been conducted and are now presented in three domains.

Domain 1: The management of projects

Cushman et al (2001) and Franco et al (2004) report a research project conducted in association with construction organisations applying the Problem Structuring Method (PSM) to conduct post-completion reviews. The research developed a Cross Organisational Learning Approach (COLA) using workshops utilising many elements of value management workshops; in particular the use of facilitators. COLA workshops iterate through 4 stages: focus, options, plans and commitment (Cushman and Franco 2004). Boyd et al (2004) conducted research that involved the capturing of tacit knowledge from construction site managers of Small and Medium Enterprises (SMEs) using stories to recount previous events, with the managers being debriefed to explicate learning, and to capture the knowledge for dissemination to a wider audience. Carrillo (2005) investigated how Canadian construction companies address Lessons Learned (LL) on their construction projects and concluded that its application to UK companies could improve future project performance by attempting to recreate successes and avoid the repetition of past mistakes.

Research by Schindler and Eppler (2003: 220) showed that project knowledge and experiences are not being effectively integrated into organisational knowledge bases, and, "...that there is a great discrepancy between the need for project debriefing and its actual deployment." Collier et al (1996: 65) state that it is good practice, in the software industry to conduct a post-mortem study at the end of each project, but contend that there is little literature available on how to conduct them. They cite research by Kumar (1990) that found more than 20% of software-related organisations did no post-mortems, and, of the companies that did conduct them, they did so on fewer than 50% of their projects. Desouza et al (2005:1) support the importance of conducting project postmortems, stating that they, "...aid in articulation of tacit experiences into explicit forms, this enables for experiences to be better re-used in the future." Gibbs (2006) reports the experiences of IBM, in software development, and presents the 'project postmortem' concept, the purpose of which being to reflect on a project's successes and failures, and "...collect the lessons learned, instill them in the organization's memory, and apply them to the next set of projects." Birk et al (2002) suggest that on software projects new knowledge and experience gained by team members often remains unnoticed and is rarely shared between individuals and teams. They state that by using post-mortem analysis experiences can be captured and improvements suggested. Kransdorff (1996) suggests that the retrospective nature of

many project post-mortems can affect the accuracy of such reviews due to the accuracy of memory recall of the participants. However, Salo et al (2004: 184) looked at a software development project where a self-reflection process called a 'post-iteration workshop' was conducted. Their empirical results showed that, with less than 4% effort, "...it is possible to hold post-iteration workshops that significantly help to improve and optimize practices and enhance the learning and satisfaction of the project team." Hormozi et al (2000) discuss the concept of project 'termination' identifying several factors that have a direct influence upon project viability: technology, organisation, market forces, planning, the project team and economic factors.

Domain 2: Knowledge management

Schindler and Eppler (2003) have distinguished between process-based and document-based debriefing methods. Document-based methods serve as appropriate representation formats or structures for project insights; for example: Micro Articles, Learning Histories and RECALL. Process-based methods focus on a procedural approach to capture key learnings from a project. These include: Project Review/Project Audit, Postcontrol, Post-Project Appraisal and After Action Review. Schindler and Eppler (2003) noted that After Action Review (AAR) is an action oriented approach that was originally developed by the US Army and is being used by British Petroleum. It was conceived for soldiers in crisis periods during and after missions, where a complete mission evaluation was not possible. AAR helps people to learn immediately from errors and successes. An empirical study conducted by Suresh (2006), on 26 SMEs in the UK construction industry, revealed that AAR was practiced, in different ways, in all organisations at partner/owner levels, albeit informally.

There are occasions when communication between key people takes place formally and regularly but tends to be social in nature. Knowledge tends to be passed on without any associated records or documentation because of the informal communication culture. However, recording valuable experience in electronic form (documents, databases, web pages, knowledge-based systems) can help prevent repetition of mistakes and the re-use of best practice while reducing costs and improving consistency. This can also help to train new staff and to preserve the company's expertise as key members/employees of staff leave the organisation. It can be argued that the main purpose of knowledge capture is not to manage knowledge itself but to facilitate the implementation of knowledge capture initiatives.

Challenges associated with knowledge capture can involve potential knowledge sabotage and the difficulty in capturing this in a knowledge base. In a study conducted by Suresh (2006), 84% (22 of the 26 organisations) stated that the effectiveness of knowledge capture and reuse by individuals within an organisation depended upon the following:

- The ability to consolidate the knowledge from a previous project. If there is inadequate time between projects, there will be little scope for effective knowledge capture on subsequent projects.
- The length of time an employee stays with the organisation. If an individual leaves a firm, there is always a potential loss of knowledge, even if efforts have been made to "mine" that knowledge beforehand.

- Top management attitude towards the importance of knowledge capture because of the additional overhead required for documenting their process and rationale; consequently, some key knowledge is often not captured.
- Even when knowledge capture does take place, it is limited to formal knowledge (e.g. documents). Contextual or informal knowledge, such as the rationale behind design or the interaction between team members in a design team, is often lost, rendering the captured knowledge not reusable, as is often the case in current industry documentation practices.

Egbu et al (2003), in one of their interim reports on the “Knowledge Management for Sustainable Construction Competitiveness” project, cited that a survey of 170 UK construction organisations carried out by Carrillo and Anumba (2002) showed that Communities of Practice (CoPs) is the most widely used technique for knowledge management particularly in large organisations. Large construction organisations with a range of specialist skills generally tend to have the means and resources to set up communities of practice and to benefit significantly from them. Spender (1996) and Baumard (1999) suggest that knowledge has a social dimension which may be created and held collectively. People who share work experiences, problem agendas and have similar learning opportunities may be said to form Communities of Practice (CoP). COPs are a good means of capturing knowledge (Anumba et al 2005).

COPs are also known as knowledge communities, knowledge networks, learning communities, communities of interest and thematic groups. They consist of a group of people of different skill sets, development histories, experience and backgrounds that work together to achieve commonly shared goals (Ruggles 1997). Only three of the 26 organisations investigated by Suresh (2006) had CoPs which included a technical group, project feedback procedure group and marketing group, which were formed within the organisations from various hierarchies to capture knowledge.

Domain 3: Counselling and critical personal incidents

Counselling or debriefing is used in situations where people have experienced a traumatic event; enabling them to reflect and vent emotions regarding: Post-Traumatic Stress Disorder (PTSD) say, following childbirth (Phillips, 2003), or psychiatric disorders such as alcohol problems, anxiety disorders and depression (Asmundson et al 2002). Debriefing is used as an intervention that reviews a traumatic incident and educates the debriefed about the expected emotional responses. The rationale is to reduce the level of distress and prevent the onset of PTSD (Wessely and Deahl 2003).

The concept of debriefing and counselling developed into ‘psychological debriefing’ in the 1980s (Phillips, 2003) and has become very popular. Wessely and Deahl (2003) argue that some companies require their employees to undergo compulsory debriefing following certain incidents due to a fear of litigation. In this regard, debriefing minimises risks following a traumatic experience but, significantly, it enhances accountability on the part of employers or workers. Psychological debriefing provides an opportunity to focus on the psychological welfare of trauma victims but it was never intended to be a stand-alone intervention. Rather it should be part of a comprehensive stress management portfolio that enables individuals to be assessed and supported, as well as allowing for the early detection and treatment of PTSD and other disorders. The debriefing can be carried out: by strangers or those known to the debriefed (family, friends, colleagues, etc); immediately after a traumatic event or delayed for a while; in a one-off session or series of sessions (Phillips 2003); with individuals or groups, and formally or informally (Greenberg et al 2003).

Psychological debriefing (The British Psychological Society 2002; Staal 2004) could last for hours, days or months, and the sessions should be structured to facilitate education and ventilation, and encourage a sense of social support (Raphael and Wilson 2001). Several studies have reported that individuals have found psychological debriefing quite helpful but it is suggested that in some cases it can worsen the situation of the intended beneficiary (Phillips 2003).

Raphael and Wilson (2001) identified three main models of debriefing: emergency, military and incidence response workers. Lawrence and Barber (2004) describe an approach to critical incident debriefing, as utilised by the fire and rescue emergency services in the north east of the UK. They identified ‘timing’ as a critical component of a debriefing management model. Dismukes et al (1997) developed a rating instrument called ‘Debriefing Assessment Battery (DAB)’ to facilitate crew analysis of instructor pilots to improve debriefing effectiveness.

DISCUSSION

Having reviewed literature relating to project team performance, and in three knowledge domains, of relevance to ‘debriefing’, this section briefly summarises the key issues. Table 2 below summarises the key debriefing-related issues emerging from the review.

Table 2: Summary of key issues emerging from the literature review

<p>Problem Structuring Method (PSM). Use of Value Management techniques (e.g. facilitation); use of pre-workshop questionnaires. Use of COLA system: project, profile, performance, indicators. COLA stages: focus, options, plans and commitment (Cushman and Franco 2004; Franco et al 2004)</p> <p>SME Debriefing. Use of audio diaries using questions: What happened? Context? What should not have happened? People involved reactions? Own feelings during / after event? Lessons learned? What do differently next time? Debrief after 4-5 audio diary recordings: acknowledge, reflect, conceptualise, generalise (Boyd et al 2004)</p> <p>Harvesting Project Knowledge. Prerequisites for systematic project learning: discipline, motivation, debriefing skills, know-how about adequate documentation formats. Key success factors: regular capture of project experiences, use external neutral moderator, perform lessons learned (LL) graphically, collective and interactive evaluation experience for participants, commitment to action consequences, appropriate time slots and proper documentation. (Schindler and Eppler 2003)</p>	<p>Lessons Learned (LL). 12 steps: call the meeting, invite right people, appoint facilitator, revisit project objectives and deliverables, revisit project plan or process, ask what went well, why did aspects go well, ask what could have gone better, find out what differences were, participants feelings acknowledged, determine what next, record the meeting. (Carrillo 2005)</p> <p>Postmortems. Preparation, data collection, analysis, project history report (Birk et al 2002). Defined process: documented procedures and guidelines, establish communication channels, participants assured that process is positive and blame-free, assure results will be utilised on future projects, balance cost of post-mortem (people time) with return on investment. Stages: project survey, collect objective information, debriefing meeting, project history day, publish results. (Collier et al 1996)</p> <p>Project Termination. Project success factors: technology, organization, market forces, planning, the project team, economic factors. Post-audit review: project performance, administrative performance, organizational structure, project and administrative teams, project management techniques. (Hormozi et al 2000)</p> <p>Reports v Stories. Use of checklists, workshops and interviews. Individual and team learning. Lessons learned: the environment, interpretation management, the time factor, cost/benefit analysis, patterns (Desouza et al 2005)</p>
---	---

The importance of some form of ‘debriefing’, ‘postmortem’, ‘post-audit review’ (an objective review of project successes and shortcomings) is strongly highlighted in the literature across the knowledge domains that have been reviewed. Given that there are already defined processes and procedures for debriefing activities, as summarised in Table 2 above, it is important to review these, focusing upon the construction project

review context, firstly to determine what, if any, tools and techniques are currently being utilised, before then moving on to model / framework development.

PROPOSED RESEARCH METHOD FOR A PILOT STUDY

The research informing this paper is in its pilot phase, which is broad; encompassing an aim, a set of objectives, data collection and analysis, and synthesis of outcomes.

Research Aim and Objectives

The aim of this pilot study is to investigate the extent to which all participants in a typical construction supply chain are aware of and utilise project debriefing tools, techniques, practices and procedures. To satisfy this aim the research has three specific objectives:

To conduct a critical review of debriefing-related literature relating to project teams and people performing in various domains in order to identify key issues and drivers relating to project debriefing (e.g. protocols, practices and procedures);

To collect and critically analyse data from a representative sample of different participants in a typical construction supply chain: clients, architects, quantity surveyors, consulting engineers, project managers, construction managers, sub-contractors and suppliers, in order to elicit their experiences of project debriefing tools, techniques, practices and procedures;

To discuss and compare theoretical constructs with the empirical research findings and develop a pilot project debriefing framework for construction project teams.

This research to date, reported in this paper, relates to objective 1: the literature review to identify key issues.

Data Collection and Analysis

To satisfy research objective 2 is intended to collect quantitative data, via a questionnaire survey, from representatives of different supply chain participants. The objective of this approach is to gain an insight into different views and experiences of project debriefing of all parties involved in a construction project, measuring the current utilisation of debriefing techniques: an 'audit' of construction industry practice. The survey will be conducted online as studies have shown that electronic surveys can elicit higher response rates (Cook et al 2000; Kaplowitz et al 2004). A random sample of supply chain participants will be selected from publicly available databases. For each participant group a minimum of 100 questionnaires will be distributed by email, with an anticipated response rate of at least 30% in order to conduct a meaningful analysis (Naoum 2007). The outcome of the data collection and analysis will be a critical review of the key issues leading to the development of an appropriate model, satisfying research objective 3, for further, and more rigorous testing beyond this pilot phase. Ethical approval will be obtained from the researchers' institute before any data is collected.

CONCLUSIONS

This paper has identified a need for further research that investigates how project team participants throughout the construction supply chain can learn and reflect upon their experiences. This is a fundamental part of business development and organisational learning to ensure that people and their organisations learn from their experiences, and feed lessons from this into strategies to continually improve their practices. Therefore the feasibility of the development of tools and techniques needed to collect, analyse

and apply 'debriefing' data requires further investigation. Such tools could include: development of databases to capture 'lessons learned'/'reflections'; adoption of Key Performance Indicators (KPIs) and the production of published guidelines detailing effective 'debriefing' tools and techniques.

REFERENCES

- Anumba, C.J., Egbu, C.O. and Carrillo, P.M. (Eds.) (2005) *Knowledge management in Construction*, Blackwell Publishing, Oxford, UK.
- Asmundson, G.J., Stein, M.B. and McCreary, D.R. (2002) Posttraumatic stress disorder symptoms influence health status of deployed peacekeepers and non-deployed military personnel. *Journal of Nervous and Mental Diseases*, **190**(12), 807–815.
- Barrett, P. and Stanley, C. (1999) *Better construction briefing*. London: Blackwell Science.
- Barrett, P. and Baldry, D. (2003) *Facilities management: towards best practice* 2ed. Blackwell Publishing.
- Baumard, P. (1999) *Tacit Knowledge in Organisations*. Sage Publications, London.
- Birk, A., Dingsoyr, T. and Stalhane, T. (2002) *Postmortem: never leave a project without it*. IEEE Software, May/June, 43-45.
- Bordass, B. and Leaman, A. (2005) Making feedback and post-occupancy evaluation routine 1: a portfolio of feedback techniques. *Building Research and Information* **33**(4), 347-352.
- Boyd, D., Egbu, C., Chinyio, E., Xiao, H. and Chin, C. (2004) Learning from SME managers through debriefing. In: Ellis, R. and Bell, M. (Eds.) *Proceedings of COBRA 2004 Conference*, Leeds, 7-8 September, Royal Institution of Chartered Surveyors
- Bresnen, M. and Marshall, N. (2000a) Partnering in construction: a critical review of issues, problems and dilemmas. *Construction Management and Economics*, **18**, 229-237.
- Bresnen, M. and Marshall, N. (2000b) Motivation, commitment and the use of incentives in partnerships and alliances. *Construction Management and Economics* **18**, 587-598.
- Carrillo, P.M. and Anumba, C.J. (2002), Knowledge management in the AEC sector: an exploration of the mergers and acquisition context. *Knowledge and Process Management*, **9**(3), 149-161.
- Carrillo, P.M. (2005) Lessons learned practices in the engineering, procurement and construction sector. *Engineering, Construction and Architectural Management*. **12**(3), 236-250.
- Collier, B., DeMarco, T. and Fearey, P. (1996) *A defined process for project post-mortem review*. IEEE Software, 65-72.
- Cook, C., Heath, F. and Thompson, R.L. (2000) A meta-analysis of response rates in web- or internet based surveys. *Educational and Psychological Measurement*, **60**(6), 821-836.
- Cushman, M., Franco, L.A. and Rosenhead, J. (2001) Learning from partners in the construction industry: a feedback approach to cross-organizational learning. Paper presented at 8th international conference in multi-organizational partnerships and co-operative strategy, September, Bristol.
- Cushman, M. and Franco, A. (2004) Sharing insights from managing major construction projects. In: Friend, J. and Hickling, A (Eds.) *Planning under pressure: the strategic choice approach*, 46-50.
- Davis, D. (1995) Form, function and strategy in boundaryless organizations. In: Howard, A. (ed.) *The changing nature of work*. San Francisco, CA: Jossey Bass. 112-138.

- Desouza, K.C., Dingsoyr, T. and Awaza, Y. (2005) Experiences with conducting project postmortems: reports vs. stories and practitioner perspective. *In: proceedings of the 38th international conference on system sciences*, Hawaii.
- Department of the Environment, Transport and the Regions (DETR) (1998) *Rethinking construction*. July. <http://www.detr.gov.uk> (Accessed 20 April 2008).
- DETR (2000) *KPI report for the minister for construction: by the KPI working group*. January. <http://www.detr.gov.uk> (Accessed 20 April 2008).
- Dismukes, R.K., McDonnell, L.K. and Jobe, K.K. (1997) *Facilitating LOFT debriefings: instructor techniques and crew participation*. NASA Ames Research Center, Moffett Field, CA.
- Egbu, C., Kurul, E., Quintas, P., Hutchinson, V., Anumba, C. and Ruikar, K. (2003) *Techniques and technologies for knowledge management*. <http://www.knowledgemanagement.uk.net/resources/WP3%20Interim%20Report.pdf> (Accessed 25 April 2008).
- Emmitt, S. and Gorse, C. (2003) *Construction communication* Oxford: Blackwell Publishing.
- Franco, L.A., Cushman, M. and Rosenhead, J. (2004) Project review and learning in the construction industry: embedding a problem structuring method within a partnership context. *European Journal of Operational Research* **152**, 586-601.
- Gameson, R. and Sher, W. (2002) An investigation into project team dynamics and the utilization of virtual environments. *In: Greenwood D. (Ed.) Proceedings of the eighteenth annual conference*, Association of Researchers in Construction Management (ARCOM), Northumbria University, UK. 2-4 September, **1**, 177-186.
- Gameson, R. and Sher, W. (2003) *Project team integration: communication, coordination and decision support. Scoping study part A: project team dynamics: final report*. Cooperative Research Centre for Construction Innovation (CRC-CI), Australia. February.
- Gibbs, D.R. (2006) *Project management with the IBM rational unified process: lessons from the trenches*. IBM Press.
- Greenberg, N., Thomas, S. L., Iversen, A., Unwin, C., Hull, L. and Wessely, S. (2003) Do military peacekeepers want to talk about their experiences? Perceived psychological support of UK military peacekeepers on return from deployment. *Journal of Mental Health*, **12**(6), 565-573.
- Hormozi, A.M., McMinn, R.D. and Nzeogwu, O. (2000) The project life cycle: the termination phase. *SAM Advanced Management Journal*, Winter, 45-51.
- Kaplowitz, M.D., Hadlock, T.D. and Levine, R. (2004) A comparison of web and mail survey response rates. *Public Opinion Quarterly*, **68**(1), 94-101.
- Kumar, K. (1990) Post implementation evaluation of computer-based information systems: current practices. *Comm. ACM*. February, 203-212.
- Kransdorff, A. (1996) Viewpoint: using the benefits of hindsight: the role of post-project analysis. *Managerial Auditing Journal* **11**(4), 42-46.
- Latham, M. (1994) *Constructing the team*. July. Her Majesty's Stationery Office (HMSO).
- Lawrence, L. and Barber, G. (2004) Debriefing in the fire service. *Counselling at Work*, Winter, 11-13.
- Love, P.E.D, Irani,Z., Cheng, E. and Li, H. (2002) A model for supporting inter-organizational relations in the supply chain. *Engineering, Construction and Architectural Management* **9**(1), 2-15.

- Morris, P.W.G. (1994) *The management of projects*. London: Thomas Telford.
- Naoum, S.G. (2007) *Dissertation research and writing for construction students* 2ed. Oxford: Butterworth-Heinemann.
- New South Wales (NSW). Construction Policy Steering Committee (CPSC) (1999) Contractor performance reporting and exchange of reports between Government agencies: Guidelines. 2ed. December. Department of Public Works and Services (DPWS). Report No 99118. Australia: NSW Government.
- New South Wales (NSW). Construction Policy Steering Committee (CPSC) (2000) Consultant performance reporting and exchange of reports between Government agencies: Guidelines. 2ed. October. Department of Public Works and Services (DPWS). Report No 00079. Australia: NSW Government.
- Phillips, S. (2003) Debriefing following traumatic childbirth. *British Journal of Midwifery*, **11**(12), 725-730.
- Raphael, B. and Wilson, J.P. (Eds) (2001) *Psychological debriefing: theory, practice and evidence*. Cambridge: Cambridge University Press.
- Ruggles, R.L. (1997) *Knowledge management tools, resources for knowledge-based economy*. Boston, USA: Butterworth-Heinemann.
- Salo, O., Kolehmainen, K., Kyllonen, P., Lothman, J., Salmijarvi, S. and Abrahamsson, P. (2004) Self adaptability of agile software processes: a case study on post-iteration workshops. In: *Extreme programming and agile processes in software engineering*. Springer Berlin/Heidelberg. 184-193.
- Schindler, M. and Eppler, M.J. (2003) Harvesting project knowledge: a review of project learning methods and success factors. *International Journal of Project Management*, **21**, 219-228.
- Sotiriou, D. and Wittmer D. (2001) Influence methods of project managers: perceptions of team members and project managers. *Project Management Journal* September, **32**(3), 12-20.
- Spender, J.C. (1996) Making knowledge the basis of a dynamic theory of the firm. *Strategic Management Journal*, **17**, 45-62.
- Staal, M.A. (2004) *Stress, cognition, and human performance: a literature review and conceptual framework* [NASA/TM-2004-212824]. August. NASA Ames Research Center, Moffett Field, CA.
- Suresh S. (2006) *Knowledge management in small and medium enterprises in the United Kingdom construction industry*, PhD thesis, Glasgow Caledonian University, Scotland, UK
- The British Psychological Society (2002) *Psychological debriefing: professional practice board working party*. Leicester: The British Psychological Society.
- Veil, C. and Turner, J.R. (2002) Group efficiency improvement: how to liberate energy in project groups. *International Journal of Project Management* **20**, 137-142.
- Walker, A. (2007) *Project management in construction* 5ed. London: Blackwell Science.
- Wessely, S. and Deahl, M. (2003) Psychological debriefing is a waste of time. *The British Journal of Psychiatry*, **183**, 12-14
- White, D. and Fortune, J. (2002) Current practice in project management: an empirical study. *International Journal of Project Management*. **20**. 1-11.