

ORGANIZATIONAL LEARNING INTENTIONS AND JOINT VENTURES IN HONG KONG INFRASTRUCTURE PROJECTS: A PILOT STUDY

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Organizations increasingly bridge capacity gaps when providing goods or services through collaboration. Forms of collaboration include partnerships, alliances and joint ventures. Infrastructure projects in Hong Kong often require clusters of resources, skills and capabilities that are difficult to obtain for any single organization to source using in-house resources. Large infrastructure providers have sought to overcome this problem by forming joint ventures (JVs) and other forms of relationships to co-operatively undertake these projects. One motivation for establishing these relationships is to spread financial and other risk. Another motivation is to capture learning so that this hidden and intangible asset may be applied later to improve their competitive advantage. Results from a pilot study investigating the nature of the JV relationship in Hong Kong are reported upon in this paper. This research focused upon organizational learning intentions of interviewed JV representatives. It explored why learning from JV partners was deemed important by respondents and intended strategies that facilitate this learning. Results indicate that respondents have a strong strategic desire for learning from partners in collaborative relations that deliver these projects.

Keywords: joint ventures, organizational learning, relationship management.

INTRODUCTION

Infrastructure development has required co-operation and collaboration between people with separate expertise to realize their goals. This was the case when building the simplest of rope bridges across a river centuries ago to building the complex Chep Lap Kok airport in Hong Kong. While subcontracting and outsourcing have been the most common response to joint effort on building and infrastructure projects, JV arrangements as joint companies or alliances sharing risk and reward have been an effective response to sharing risk and combining difficult to obtain skills.

This paper reports upon results from a pilot study undertaken that investigated key elements that contribute to the level of success or failure of JVs engaged in the provision of infrastructure projects in Hong Kong (HK). The pilot study involved interviewing nine key senior managers (generally the key individual that reports to a JV board) responsible for these large projects in HK. All of the companies involved are engaged in individual projects exceeding US\$250 million in construction cost. Each senior representative interviewed represented major trans-national infrastructure companies currently undertaking JV infrastructure projects on Hong Kong reporting at JV board level. These represented French, Japanese, British (UK), Hong Kong (HK)

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and Peoples Republic of China (PRC) contracting companies. The study used face-to-face taped (audio) interviews. Each lasted at least 2 hours using a structured questionnaire of 13 sections and 143 individual questions as the framework for discussion. Follow-up contact clarified issues and explored areas of interest where themes and issues needed to be verified or expanded upon. Reporting full results from the study is beyond the scope of this paper so the authors have decided to concentrate on one aspect that provided interesting insights—the organizational learning motivation for forming a JV.

This paper is presented as follows: First, a brief section on strategic relationship-based principles is discussed to frame the paper within a JV setting for analysis. Second, the pilot study approach and its results are presented. Third, analysis of the results are presented and conclusions drawn. This paper adds to project procurement theory by providing valuable insights from very senior level executives in these organizations on the nature of their motivation when engaged in collaborative joint ventures. It is often very difficult to gain access for in-depth discussion with such senior level individuals.

RELATIONSHIP-BASED PROCUREMENT AND THE PLACE OF THE JV

Management and organizational frameworks have evolved to deal with the complexity and scope of providing very large projects. Limerick *et al.* developed an interesting taxonomy of management evolution, producing a model for success in dealing with the turbulence and uncertainty of today's competitive climate (Limerick, Cunninton *et al.* 1998). Table 1 illustrates the progression from first to fourth management blueprint. The fourth management blueprint is the recommended direction for the 21st century. While the table does not indicate the role of organizational learning, which is the central theme to this paper, it does indicate the core management forms and styles that have characterized how people have worked together in the past. One key issue illustrated is that while earlier blueprints emphasize command and control, this management style restrains initiative where formal power is used rather than expert power where those with best information, knowledge and appreciation of the consequences of actions taken accept responsibility for coal-face decision making (Yukle 1988; Hersey, Blanchard *et al.* 1996; Greene and Elfrers 1999).

Table 1: Four Management Blueprints (Limerick, Cunninton *et al.* 1998, p30))

Blueprint >	First	Second	Third	Fourth
	Classical	Human	Systems	Collaborative organizations
Organizational forms	Functional Mechanistic Organic	Inter-locking Matrix	Contingency Divisional	Loosely coupled networks and alliances
Management principles	Hierarchy	Supportive relationships	Differentiation	Empowerment and collaborative individualism
Managerial processes/forms	Management functions	Democratic leadership	Open systems analysis	Management of meaning
Managerial skills	Person-to-person control	Goal setting Facilitation	Rational/ diagnostic	Empathetic Proactive
Managerial values	Efficiency Productivity	Self-actualization Social support	Self-regulation	Social sustainability Ecological balance

An intrinsic element of the Fourth Blueprint is organizational learning. This is achieved through sharing the diversity of available views within groups characterized

by independent collaborative individuals with high levels of communication and people skills. Companies that get the most out of alliances are those that learn from each other (Hamel, Doz *et al.* 1989). Limerick *et al.* argue that companies have to become action-learning organizations, that are self-reflective and can transcend and critique their own identity, values, assumptions and mission that is initiated and controlled by line managers themselves (Limerick, Cunninton *et al.* 1998, p179). These organizations do this through not only supporting critical appraisal but also, and more importantly, to provide feedback for lessons learned to be transformed into subsequent action. This requires organizations to welcome both challenge and experimentation through the establishment of the organization as a learning community. This would be composed of both inside-organization people and informed external participants who are free of the internal assumptions and mindsets of organizational members. The approach exemplified by the Fourth Blueprint is strongly supported by management theorists and commentators. For example, in the Karpin Report (Karpin 1995) many examples are cited of a gradual global shift that is taking place towards this new paradigm. Characteristics of the Fourth Blueprint model are offered as current world best practice (Karpin 1995; Lendrum 1998, Section II).

When we look at JVs and alliances in other industries, we see learning and the melding of unique skills as being a critical factor in their formation. For example in the airline industry service provision is its defining competitive edge. While much of this relates to access to markets and the ability of airlines in JVs or alliances to provide a much wider range of gateways and journey destinations that would otherwise be the case, another critical issue is product innovation and learning how to provide services in a smarter manner. In the airline example this has been achieved through innovative ticketing, e-commerce and options where leaders in this service delivery approach have been able to gain considerable competitive advantage over rivals. Thus, forming an alliance where different approaches to this new customer benefit and being able to experiment, trial and learn allows partnered organizations to gain valuable learning from each other (Oum, Park *et al.* 2000). Similarly, in the automotive industry, the notion of supply chain management has been extended to car manufacturers ensuring that they exchange their engineering staff with their suppliers to work in their suppliers' workplace to enable better cross-learning to take place so that these enterprise partners may jointly provide a better and more competitive product and realize learning from this presence in the supply chain's facilities (Womack, Jones *et al.* 1990; Womack and Jones 2000).

It is clear, therefore, that not only in the construction industry but also in other manufacturing and service organizations that the value of joint learning is a strategic asset and that an effective way of facilitating this is to form joint ventures, alliances or supply-chain associations which encourages knowledge transfer and knowledge being effectively diffused throughout these organizations.

THE PILOT STUDY APPROACH AND RESULTS

A case study approach has been shown to be effective when seeking to learn about how and why a phenomenon exists. Case studies provide a rich source of evidence. One input to case studies is in-depth interviews which may be structured or unstructured. Observation is also another valid form of gathering data. It is important that the unit of analysis is established and focussed upon. This pilot study is conducted with the JV organizations being the unit of analysis. Yin stresses that a pilot case study helps investigators to refine their data collection plans and is used to help

develop relevant lines of question (Yin 1994 p 74). This paper presents results from only a small part of the pilot study. The broader PhD study involves gathering data on at least five major JV-delivered infrastructure projects and involves interviews with key staff at several levels throughout their organizations as well as developing a database of direct observation of incidents, behaviours and archival sources.

A literature review relating to partnering, alliancing, and relationship based commercial arrangements as well aspects of trust, commitment and organizational learning and knowledge management was undertaken. Personal access to key managers representing JV operations on major projects was available as a result of one of the authors' network of professional contacts in Hong Kong. Numerous short discussions and meetings, in which ideas were explored, was able to be undertaken with several of the respondents to help shape the study survey instrument. This was combined with the principal investigator's own observations and reflection upon his extensive experience with similar projects. The instrument was, therefore, able to be well developed so that results obtained from the nine senior executives could be analysed and then used to inform following rounds of interviews, observation and other data gathering on how the JVs appear to function in practice.

The views of these nine experts are not offered as being generalisable as this sample size is too small for that purpose. Additionally, the cultural background of the respondents is also a factor that might influence the opinions and preferences indicated by their response (Hofstede 1991). Of the 9 executives interviewed 2 are French representing French Based companies, 1 is Japanese representing a Japanese organization, 4 are from the UK representing UK based companies, 1 is originally from the UK representing a local Hong Kong company, and 1 is Chinese representing a PRC organization. All respondents were asked to answer questions on the way in which their own organizations viewed JVs, however, the responses represent an organizational rather than a personal perspective. Nevertheless, large differences in responses were evident for some questions between organizational responses by country of origin and these are noted in the analysis of results. This paper does not attempt to shed any light on these results from a cultural perspective because the sample size of each country of origin is small, the experience of the companies involved in JVs also no doubt has some major impact and that history has not yet been explored. Results presented, therefore, are tentative, exploratory and aimed to provide interesting insights to assist in more detailed being undertaken as part of a Phd research program of investigation.

Tables 2 to 4 present data relating to attitudes of respondents reflecting their organization's motivation for cross JV partner learning. The structure of these tables is as follows. The questions asked and the measurement scale used is presented. Column 1 contains the question number. Columns 2 and 3 provide data from the French respondents, columns 3 through 6 from the UK respondents, column 7 from the Japanese respondent, column 9 for the PRC respondent and column 10 for the HK respondent. Columns 11 and 12 provide the mean score for the French and UK responses to questions. The sample average for each question is presented in column 13. The Likert type scale was deliberately calibrated to have 6 values from 1 = to 6 with no neutral point forcing respondents into making a non-neutral response.

The response to question A3 clearly indicates a general uniform positive attitude towards the importance of forming JVs to remedy identified skills gaps and to develop competencies for the future. The only organizations where that seemed unimportant

was Fr2's which attached no real importance and Jp1, which attached 3 or slightly less than neutral importance.

Yes/no Questions

Table 2: Attitude Towards Inter-Organizational Learning Within JVs

A3	Is gaining competence important – both to remedy skill deficits and to develop new competencies for the future, or through learning internally within the JV and JV / alliance partners. (1= not important; 6 = very important)											
D4	Does your company have adequate capabilities and skills to harness the future? (1= inadequate; 6 = adequate)											
D5	Do your JV partners possess specialized capabilities and skills? (1= inadequate; 6 = adequate)											
D6	Will your partners be willing to share them with you ? (1= willing; 6 = unwilling)											
D7	Does your dependence on a JV partners concern your company? (1= concerned; 6 = unconcerned)											
D11	Does your organization face skill gap? (1= not really; 6 = yes sometimes)											
D12	Are your partners' skills very different from yours? (1= not really; 6 = yes sometimes)											
D13	Do your partners have areas of competence that you don't understand, and vice versa? (1= not really; 6 = yes sometimes)											
D14	Does the JV partners organization (NCC), business processes, and work practices of your partners reflect the nature of their skill base? (1= no reflection; 6 = yes it does reflect)											
D15	How interdependent and interlinked are the various areas of skills, both for your partners and for your partners and for your organization? (1= not really interlinked; 6 = very interlinked)											
K5	Are any of the differences between you and your partners in how work gets done likely to make joint work in the alliance hard to perform? (1= not really; 6 = yes definitely)											
K6	Are these differences likely to make you uncomfortable about working together again in the future? (1= not really; 6 = yes possibly)											
K7	Might this, in turn, prevent learning? (1= not really; 6 = yes possibly)											
M1	As they enter the partnership, do your managers and specialists feel secure enough in their position with your company so that they will feel free to adjust to the partner's ways of working and to adapt their own behaviour in order to make the alliance work? (1= not very secure; 6 = comfortable)											
M3	Is mutual dependence accepted by members of the partner organizations ? (1= not really; 6 = mostly, yes)											
M7	Is the enhanced profile of the JV/alliance understood and shared by all at the personal level? (1= sometimes not ; 6 = mostly, yes)											
Q#	Fr1	Fr2	UK1	UK2	UK3	UK4	Jp1	PRC	HK1	FrAg	UKAg	SplAg
A3	5	1	5	5	6	6	3	6	4	3.00	5.50	4.56
D4	6	6	2	4	2	1	3	5	3	6.00	2.25	3.56
D5	6	5	2	4	5	3	5	6	5	5.50	3.50	4.56
D6	1	1	5	3	2	5	2	5	5	1.00	3.75	3.22
D7	1	1	1	3	3	1	5	2	3	1.00	2.00	2.22
D11	5	1	6	6	6	6	5	5	5	3.00	6.00	5.00
D12	6	2	4	6	6	6	3	2	5	4.00	5.50	4.44
D13	5	4	2	6	6	6	5	2	5	4.50	5.00	4.56
D14	4	5	2	4	6	6	5	5	5	4.50	4.50	4.67
D15	5	5	2	3	5	6	3	5	4	5.00	4.00	4.22
K5	1	2	4	4	5	6	3	2	3	1.50	4.75	3.33
K6	1	2	4	5	4	6	3	1	4	1.50	4.75	3.33
K7	1	2	4	5	4	5	2	2	4	1.50	4.50	3.22
M1	4	6	4	4	2	3	4	5	3	5.00	3.25	3.89
M3	3	5	4	4	4	2	2	4	4	4.00	3.50	3.56
M7	4	6	5	3	2	3	5	5	3	5.00	3.25	4.00

Responses by respondents for the D series questions (4 to 7) reveal a recognized need for JV partners with missing skills and competencies not present to bridging such gaps. Question D4 provides interesting replies. The 2 French organizations' country of origin respondents appear to be confident that they have all the required skills, and they also felt strongly that others skills from JV partners would have all the required specialized skills (question D5) and that they would be very willing to share learning (question D6). The 4 respondents from organizations with a UK country of origin felt very inadequate in terms of possessing these skills. They had a marginally optimistic view that other JV partners had specialized skills and a tendency to believe that their JV partners would be unwilling to share learning about these. The 1 Japanese organization respondent indicated that he felt that his organization had a modest degree of adequacy in required skills that their JV partners were relatively far more adequate in specialized skills but that they would be willing to share that learning. This was similar for the HK response although he felt that in the case of his organization, the JVs would be unwilling to share specialized skills and knowledge. The PRC respondent, like the French organization respondents, felt confident about their own organizations' skills and that of their JV partners' specialized skills, however, they felt that JVs would be unwilling to share learning.

Summarizing all nine responses to those questions, there is high confidence by respondents in the capacity of their organization to harness capabilities and skills for the future—that is to learn from JVs. They feel that JVs are generally willing (with mixed feelings from the UK respondents) to share learning. However, all respondents indicated high levels of concern regarding dependency on JV partners. Thus the need for learning and capacity to do so is shown as present. The D series questions (11 to 15) indicate consistent appreciation that there is a skills gap and, that this exists in technologies, business processes and technical competencies. Further, this knowledge gap is mutual between JV partners and that skills are strongly interlinked.

The response to question K5 is interesting. The general result was marginally above neutral though interesting variances occur by JV country of origin. Both French JVs anticipate low levels of problems likely to occur which was similar to the Asian group of JVs, however, the UK group appeared to anticipate strong levels of likely difficulty that may arise from difference in getting work done. The response to question K6 follow from K5, which is again reinforced by K7's resulting assessment. Clearly there is some interesting experiences that the UK JVs have experienced regarding learning and work methods that are worthy of further exploration and that is precisely what the fuller PhD study is designed to achieve. It is expected that more data will be gathered from a cross section of individuals in those JVs and documentary evidence pertaining to how organizational culture may have contributed to the perception that difficulties are likely to arise in JV partner teams working and learning together.

The 'M' series of questions present some interesting results. The response to question M1 suggests that manager security may be an issue and hence a barrier to openness that supports learning. One third of the responses are low, 4 out of 9 record a value of 4 (just above neutral) and only 2 of the 9 respondents express high levels of comfort. Question M3 supports this and helps explain the results in terms of reticence suggesting that at the JV forming stage, there is uncertainty where lack of openness and the emotional infrastructure for learning is constrained. The response to question M7 provided guarded optimism as 5 of 9 respondents indicate a generally high acceptance of diversity and difference in skills offered with the remaining 4 respondents indicating a more guarded acceptance by the JV managers and staff.

The impression that is indicated by the above seems to follow the literature's model of team building—forming, storming, norming, performing and mourning cycle of team cohesion and understanding growth (Dunford 1992, p118; Turner 1999, CH17). The literature on organizational behaviour helps us to understand how groups operate and how organizational cultures are framed and can be reframed through appropriate leadership and willingness to learn and experiment with new concepts, tools and ideas (Bolman and Deal 1991).

The general impression gained from Table 2 results suggests that learning is clearly important to JV partners. Question A3 and M7 show this strongly. The other question responses indicate some reticence but generally positive attitudes with a healthy concern for the way in which learning may be achieved in the JV context. The D series questions indicate that JV partners have undertaken a form of analysis and realized that because the JV partners are so interlinked there are knowledge gaps that need to be bridged and that JV partners can provide that learning. Having established the JV's initial attitude towards learning as a reason for forming a JV it is interesting to explore why this may be so.

Table 3: Reasons Why Learning May Be Important To JVs

B8	How focused is your marketing/business strategy for Brand, reputation, corporate image, credibility? (1= not important; 6 = very important)											
C1	Is it a superior arrangement when a partner can make unique contributions such as enhanced competencies, have good government contacts and "insider" status that cannot be traded easily between companies? (1= not really; 6 = highly desirable)											
C2	Is it desirable to have a partner making unique contributions that cannot be substituted? For example, there is no alternative partner and/or no alternative source for the contribution.? (1= not really; 6 = most definitely)											
C3	Is it desirable to have a partner making unique contributions that cannot be developed or copied independently within a reasonable time frame? (1= not necessary; 6 = highly desirable)											
Q#	Fr1	Fr2	UK1	UK2	UK3	UK4	Jp1	PRC	HK1	FrAg	UKAg	SplAg
B8	6	6	5	5	6	5	5	6	5	6.00	5.25	5.44
C1	6	6	5	6	6	6	6	5	5	6.00	5.75	5.67
C2	3	2	2	4	6	6	6	6	5	2.50	4.50	4.44
C3	2	2	2	4	6	6	6	6	3	2.00	4.50	4.11

Responses to question B8 clearly indicate that reputation, corporate image and credibility are very important to all JV respondents. While this may be expected it reinforces the aspect of credibility and the ability to provide a credible set of skills and to bridge knowledge gaps. Similarly question C1 responses indicate the high levels of desirability of JV partners contributing their learning and skills. This is again reinforced by responses to questions C2 and C3. The impression is one of a well-recognized need for skills matching demands and that JV partners each have a contribution to make. While this of itself explain why JVs are formed in terms of learning it is clear that there is an expectation of an opportunity to generate learning through exposure to new skills to JV partners from which they can learn to competitive advantage. The next set of results indicates how this may be achieved.

Responses to The D series (1 o 3) questions generally indicate that the more likely course of action in acquiring skills is through active means involving others rather than attempting to generate this learning internally. The Japanese respondent appears to stand apart from the 9 respondents and this may be in part because the Japanese construction industry tends to maintain very large R&D departments to develop innovation and new process improvement (Harkola 1994). There is also a clear

strategy for knowledge acquisition through pursuing JVs, alliances and relationships where joint learning is central (questions 8 to 10). A similarly strong consensus appears to prevail for the response to question G7 with bridges of co-operative learning being viewed as the preferred way forward and in this case the Japanese response was also very clearly positively in this direction.

Table 4: How Learning May Be Achieved Within JVs

D1	If skill gaps were identified within your company, how would you address them? (a) Get involved with a more experienced company. (1= likely; 6 = more than likely)											
D2	If skill gaps were identified within your company, how would you address them? (b) Purchase these skills by hiring the right people. (1= likely; 6 = more than likely)											
D3	If skill gaps were identified within your company, how would you address them? (c) Licensing appropriate/new technologies (1= likely; 6 = more than likely)											
D8	Do you need to learn capabilities and skills that you are dependent upon a JV partner yourself if you don't want your bargaining power in the JV/alliance to become weak and your position thus precarious? (1= do need to learn; 6 = do not need to learn)											
D9	If the required capabilities and skills are new, how much can you benefit from developing them jointly with partners (for example, in an engineering)? (1= not much; 6 = greatly)											
D10	As you plan your strategies (and technology road maps) for the next 5 years, have you considered a number of alliances with different partners allowing you to access the range of required capabilities and skills over this period? (1= not much; 6 = greatly)											
G7	Do you build bridges between partners at multiple levels? (1= not normally; 6 = absolutely)											
L3	Did you make an effort to learn how partner organizations really operate? (1= not really; 6 = yes, definitely)											
L4	Do you refrain from making premature judgements about the partner's ways of working? (1= not really; 6 = yes, definitely)											
L6	Do you and your partners create space and time (for instance, in joint workshops and seminars) for members of the partner organizations to share and understand their respective organizational contexts? (1= not really; 6 = yes, definitely)											
Q#	Fr1	Fr2	UK1	UK2	UK3	UK4	Jp1	PRC	HK1	FrAg	UKAg	SplAg
D1	5	1	4	4	6	6	2	5	6	3.00	5.00	4.33
D2	5	4	4	5	5	6	2	5	4	4.50	5.00	4.44
D3	3	4	2	5	4	3	3	4	3	3.50	3.50	3.44
D8	5	1	6	5	5	6	5	3	4	3.00	5.50	4.44
D9	5	2	1	6	5	6	5	4	3	3.50	4.50	4.11
D10	6	6	5	6	6	6	6	5	5	6.00	5.75	5.67
G7	5	5	6	4	6	5	5	6	4	5.00	5.25	5.11
L3	6	5	5	5	6	4	5	5	3	5.50	5.00	4.89
L4	6	5	5	5	6	2	5	5	3	5.50	4.50	4.67
L6	6	4	4	4	5	6	4	5	2	5.00	4.75	4.44

It is interesting to note that in terms of how learning may be affected by cultural sensitivity in terms of having an open mind towards the way that other companies operate, all non-HK respondents indicated a strong response to questions L3,4 and 6. The HK respondent recorded a lukewarm/cool response to these questions. This may represent a view that homegrown companies set cultural norms in terms of ways of working and it is up to foreign JV partners to adapt. This may present a barrier to learning for that organization.

Once project opportunities are identified and it becomes clear that no single contacting organization either does not wish to carry the entire financial risk or has insufficient available skills and competencies to undertake the project on their own, they seek other partners to form an alliance or JV. They then identify compatible partners and form the JV. The most obvious and tangible motivation is to use the combined mix of physical and intellectual assets to generate profits and reputation/brand image from

successfully delivering the project. The less obvious motivation is gaining value from realizing learning from JV partners—within organization learning and cross-organizational learning. Through this process intangible value is generated in the form of intellectual property, learning applied to future JV projects or in projects where a contractor delivers project as sole contractor. Value is gained by better understanding JV partners which may be of use for further collaboration or when competing against these organizations in the future. The appreciation of the value of these intangible assets versus more tangible assets such as profits by respondents is as yet unclear.

CONCLUSIONS

The results presented in this paper form only a small part of the pilot study. It has concentrated upon learning attitudes of JV partners and has sought only to explore issues of whether these organizations are open to cross learning, why they may or may not be so, and how they view achieved cross/joint learning.

The results clearly indicate that the 9 respondents have a strong desire to use JV relationships to achieve learning and that this is an important motivation in developing relationships with competitors to form alliances and JVs. The need for plugging skill gaps and gain valuable insights from procedures and ways of working from cross-cultures also appears to be valued and recognized as necessary. The HK market has been described as one of the most open and globally competitive in the world that prepares organizations for a future construction industry (Walker 1993, 1995).

It is interesting that those interviewed have chosen the JV as an approach to harmonize their skills and competencies with others that under many circumstances would be their competitors. Results presented help explain how and why this may be important in terms of learning. Relationship based approaches to procurement have been argued as a central strategy for success as construction industry players enter the 21st century to deliver complex and demanding projects from complex and demanding clients (Walker, Hampson *et al.* 2000). The approach adopted by the organizations represented by the 9 respondents to the pilot survey appears to meet the basis for the organizational form and perhaps the managerial processes and forms outline in the Fourth Blueprint (Limerick, Cunninton *et al.* 1998) and identified as necessary for the 21st century (Karpin 1995).

While it is not possible to report further at this stage in detail how learning occurs in JVs, it is expected that the PhD study will unearth much more valuable and rich data to help explain this. It is hoped that this paper has provided a useful exploration to the topic from the perspective of how JVs operate in practice on very large infrastructure projects in a globally competitive business environment.

REFERENCES

- Bolman, L. G. and Deal, T. E. (1991) *Reframing organizations: artistry, choice, and leadership*. San Francisco, Jossey-Bass.
- Dunford, R. W. (1992) *Organizational behaviour*. Sydney, Addison-Wesley Business series.
- Greene, R. and Elfrers, J. (1999) *Power the 48 laws*. London, Profile Books.
- Hamel, G., Doz, Y. L. and Prahalad, C. K. (1989) Collaborate with your competitors: and win. *Harvard Business Review*, Jan-Feb: 133-139.
- Harkola, J. (1994). *Diffusion of construction technology in a Japanese firm*. Unpublished PhD thesis, Department of Civil Engineering, Stanford, Stanford University.

- Hersey, P., Blanchard, K. and Johnson, D. E. (1996) *Management of organizational behaviour*. London, Prentice Hall International.
- Hofstede, G. (1991) *Culture and organizations: software of the mind*. New York, McGraw-Hill.
- Karpin, D. (1995) *Enterprising nation: renewing Australia's managers to meet the challenge of the Asia-Pacific Century, Taskforce Report*. Canberra, Industry Taskforce on Leadership and Management Skills - Ministry for Employment, Education and Training, Australian Federal Government.
- Lendrum, T. (1998) *The strategic partnering handbook*. Sydney, McGraw-Hill.
- Limerick, D., Cunninton, B. and Crowther, F. (1998) *Managing the new organization: collaboration and sustainability in the postcorporate world*. Warriewood, NSW, Business & Professional Publishing.
- Oum, T. H., Park, J.-H. and Zhang, A. (2000) *Globalization and strategic alliances: the case of the airline industry*. Oxford, Pergammon.
- Turner, J. R. (1999) *The handbook of project-based management: improving the processes for achieving strategic objectives*. London, UK, McGraw-Hill.
- Walker, A. (1993) *Project management in construction*. London, Blackwell Science.
- Walker, A. (1995) *Hong Kong: the contractor's experience*. Hong Kong, Hong Kong University Press.
- Walker, D. H. T., Hampson, K. D. and Peters, R. J. (2000) *Relationship-based procurement strategies for the 21st century*. Canberra, Australia, AusInfo.
- Womack, J. P. and Jones, D. T. (2000) From lean production to lean enterprise. *Harvard Business Review on Managing the Value Chain*. Harvard Business Review Boston, Ma, Harvard Business School Press: 221-250.
- Womack, J. P., Jones, D. T. and Roos, D. (1990) *The machine that changed the world: the story of lean production*. New York, Harper Collins.
- Yin, R. (1994) *Case Study Research*. Thousand Oaks, California, Sage.
- Yukle (1988) *Leadership in organizations*. Sydney, Prentice-Hall.