

Critical Analysis of Partnering Research Trend in Construction Journals

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Abstract: Over the past two decades, significant literature has been dedicated to research studies on construction partnering and related issues, and a plethora of underlying theories and industrial practices on partnering application have been reported. This paper aims to explore, analyze, and summarize the research trend of partnering related studies in construction using desktop search method from several leading construction-related journals. On the basis of an extensive and rigorous literature review, a series of partnering related journal articles published from 1989 to 2009 were analyzed in terms of the annual number of partnering related publications, the level of contributions made by various institutions and regions, and the research focus on their studies. A critical analysis of the reported literature revealed that, in general, the number of partnering related publications in these journals has been increasing from 1989 to just before 2007 when the number of publications peaked. The findings might imply that partnering is becoming more and more important to the construction industry at large. This study also indicated that researchers from the United States published the largest number of partnering related papers on a regional basis, followed by those from the United Kingdom, Hong Kong (China), Sweden, Australia, Mainland China, and Korea. Research topics published in these journals tend to focus on partnering conceptual models, reviews of partnering development and application, potential benefits of and barriers to implementation, critical success factors, and partnering performance measurement and evaluation, together with use of partnering across the construction supply chain, while the quantitative research techniques applied to this field of study involve primarily regression analysis, analytic hierarchy process (AHP), analytic network process (ANP), fuzzy set theory, and balanced scorecard method.

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Introduction

Since its naissance in the early 1980s (Cook and Hancher 1991), construction partnering has been gaining wide attention from theoretical exploration to practical application. However, the research topics under the partnering models are diversified, with insufficient analysis of partnering related issues. Integration and classification of the reported literature within the partnering domain may pave the way for future researchers to gain a clear understanding of the topic and to conduct associated research more intensively and efficiently.

Retrieval from academic journals can be regarded as the most effective approach for the research community, especially for new researchers in particular, to gain in-depth insight into research trends within a specific area or topic. Tsai and Wen (2005) advocated that a systematic analysis of papers published in academic journals would help researchers explore the current status and future trend of a chosen topic. However, in the field of partnering, no such critical analysis has been undertaken to date. Therefore, this paper attempts to comprehensively review the “partnering related” literature in construction and to investigate the research trend of partnering related studies in ten top-tier leading journals on construction management between 1989 (when the first paper on partnering was published in construction journals) and 2009, inclusive. This paper aims to provide clear and comprehensive guidance to address the following questions:

1. What was the coverage of partnering related studies published in construction journals during the period between 1989 and 2009?
2. How did authors from different countries (regions) contribute to partnering related studies and applications during the period between 1989 and 2009?
3. How did the themes/foci/interests of the partnering related publications change or evolve during the period between 1989 and 2009?

Background of Construction Partnering

Partnering was first adopted as an effort to reduce or eliminate the traditional adversarial working relationships between different contracting parties involved in the construction process (Cook and Hancher 1990) in the United States in the middle of the 1980s. One of the major users of partnering during the late 1980s was the United States Army Corps of Engineers. Since then, partnering has been widely applied within the construction industries of the United States, the United Kingdom, Australia, and Hong Kong, and it has recorded excellent performance outcomes. Numerous definitions of partnering were derived from different past studies. The Construction Industry Institute (1991) in the United States and the Construction Industry Board (1997) in the United Kingdom conducted some well-known research in partnering and developed their own definitions of partnering.

The Construction Industry Institute (1991) defined partnering as “A long-term commitment between two or more organizations for the purposes of achieving specific business objectives by maximizing the effectiveness of each participant resources. This requires changing traditional relationships to a shared culture without regard to organizational boundaries. The relationship is based on trust, dedication to common goals, and an understanding of one and other’s individual expectations and values.”

The Construction Industry Board (1997) defined partnering to be “A structured management approach to facilitate team working across contractual boundaries...it should not be confused

with other good project management practice, or with longstanding relationships, negotiated contracts, or preferred supplier arrangement, all of which lack the structure and objective measures that must support a partnering relationship.”

A review of the literature showed more similarities than differences in perceptions concerning the definition of partnering (Naoum 2003). Although many different definitions are given for illustrating the partnering concepts in construction, a common consensus exists on the key elements of partnering through cooperation and teamwork: commitment, mutual trust and respect, communication, equity, responsiveness to problems, continuous evaluation, common goals, and joint problem resolution (Cook and Hancher 1990; Construction Industry Institute 1991; Ng et al. 2002; Chan et al. 2002, 2003a; Uher 1994; Davis Langdon and Seah Consultancy 2006). With full understanding of each stakeholder’s goals and expectations, along with the mutual trust, and respect that developed between contracting parties comes the possibility of synergy. In contrast, the commonly perceived features of successful partnering include common objectives, mutual trust, effective problem resolution, and continuous improvement (Naoum 2003; Smith 2008).

In general, different forms of relational contracting exist that encompass partnering, alliancing, public-private partnership, joint venture, and other collaborative working arrangements (Alsagoff and McDermott 1994; Jones 2000; Rahman and Kumaraswamy 2004; Chan et al. 2009). Partnering in construction can be generally classified as project partnering and strategic partnering in terms of the number of projects for which the relationships are established (Matthews et al. 1999; Cheng et al. 2001; Davis Langdon & Seah Consultancy 2006). The former is for a single project (Construction Industry Institute 1991; Li et al. 2000; Walker et al. 2002; Chan et al. 2009), whereas the latter involves at least two projects (Construction Industry Institute 1991; Bennett and Jayes 1998; Li et al. 2000; Cheng et al. 2004; Chan et al. 2009).

The key philosophy under partnering may extend to project alliance or strategic alliance (alliancing) when the period and form of the relationship established among the parties involved change. Although both partnering and alliancing are some forms of relational contracting, Manley and Hampson (2000) pointed out that a major difference between partnering and alliancing is that partnering runs alongside standard contracts and has no contractual force in itself (i.e., noncontractual partnering), whereas alliancing arrangements are expressed in contractual form (i.e., contractual partnering and collaborative working coupled with incentivization and risk-sharing schemes as in the New Engineering Contract). In view of such distinct difference and the scope of investigation, this paper solely examines noncontractual partnering while not taking into consideration the study of alliance or alliancing in construction.

Although perceived as an effective approach to reducing cost, saving time, and improving the quality of the project implemented with partnering, solving all of the problems during project delivery is not a panacea. Many problems with construction partnering before and during its implementation were identified by empirical evidence from several researchers (e.g., Bresnen and Marshall 2000a; Ng et al. 2002; Larson and Drexler 1997; Chan et al. 2003b; Eriksson and Nilsson 2008a). A critical and systematic analysis of the research articles published in major construction journals may be beneficial to researchers by enabling them to identify contemporary research issues and problems with partnering.

Within the past two decades of 1989–2009, construction-related publications witnessed an increasing trend in partnering research studies, the topics of which are wide in scope, covering conceptual model development to practical application. The key areas of partnering research studies include the following:

1. Development of conceptual model of partnering (e.g., Crowley and Karim 1995; Cheng and Li 2001; Anvuur and Kumaraswamy 2007),
2. Development of the organizational structure and framework of the partnering process (e.g., Crane et al. 1997; Cheng and Li 2004),
3. Establishment of partnering performance index and measurement of partnering performance (e.g., Crane et al. 1999; Yeung et al. 2007),
4. Identification of critical success factors for implementation (e.g., Chan et al. 2004); benefits of partnering (e.g., Chan et al. 2003a) and barriers to partnering (e.g., Bresnen and Marshall 2000b; Ng et al. 2002; Larson and Drexler 1997; Chan et al. 2003b; Eriksson and Nilsson 2008a),
5. Evaluation of applicability of partnering (e.g., Koraltan and Dikbas 2002; Phua 2006; Lu and Yan 2007),
6. Review of partnering development and application (e.g., Weston et al. 1993; Wood et al. 2005; Chan et al. 2008; Eriksson et al. 2008b),
7. Partnering across the construction supply chain (e.g., Dainty et al. 2001; Palaneeswaran et al. 2003; Packham et al. 2003; Beachet et al. 2005; Mason 2007).

Research Methodology

This paper adopted the review methods used by Al-Sharif and Kaka (2004), Tsai and Wen (2005), and Ke et al. (2009) to illustrate the major research outputs published in the first-tier journals under the chosen topics. On the basis of the assumption that a research team may submit their research findings to a first-tier journal for consideration of possible publication in its area or in a journal with similar topics (Ke et al. 2009), this study first selected a powerful search engine to identify journals that have published the highest number of partnering related articles. The desktop search was further refined by making reference to the journal ranking list of Chau (1997) in the area of construction engineering and management. To facilitate a clear and in-depth illustration of partnering related research, this study adopted a three-stage literature review method to launch content analysis of partnering related papers published between 1989 and 2009, inclusive, which is presented in Fig. 1.

In stage 1, a comprehensive desktop search was conducted under the title/abstract/keyword field of the powerful search engine Scopus. Search keywords included partnering, project partnering and strategic partnering. Papers with these specific terms included in the title, abstract, or keyword were considered to have met the requirements of this research study. The search was further limited to the subject area such as engineering, environment, business, management, decision sciences, economics, econometrics and finance, and social sciences with the document type of article or review. The full search code is as follows.

TITLE-ABS-KEY ("Partnering" OR "Project Partnering" OR "Strategic Partnering") AND DOCTYPE (ar OR re) AND SUBJAREA (ener OR engi OR busi OR envi OR deci OR econ OR soci OR manag) AND PUBYEAR AFT 1988 AND PUBYEAR BEF 2010 AND (LIMIT-TO (LANGUAGE, "English")) AND (LIMIT-TO (SRCTYPE, "(j)))

Search result: 1,026 (searched on 27 January 2010)

Note that the search is strictly limited to the area of partnering in construction to capture all partnering related papers while excluding other unmatched publications irrelevant to partnering. Despite these restrictions, some unwanted publications may still exist in the search result because of the unmatched nature among the keywords and the discussions of the actual papers. In fact, during the process of classifying the literature, the authors found that unrelated papers comprise a certain proportion of the total papers within the search result. To narrow down the deviations, the search result was only analyzed in terms of top-ranked journals and the number of partnering articles published annually. Therefore, construction journals that have published the most partnering papers were selected for further analysis.

The search result derived from stage 1 indicated that the Journal of Management in Engineering (JME), Construction Management and Economics (CME), International Journal of Project Management (IJPM), and Journal of Construction Engineering and Management (JCEM) have published the most partnering related articles among the journals in the area of construction engineering and management (detailed information is provided in the section Discussion of Search Results). The journals noted previously are also among the top six journals in the ranking list of Chau (1997), which further reinforces the validity of both the search result and Chau's (1997) ranking. Two additional journals within the top six of Chau's (1997) ranking list are the Engineering, Construction and Architectural Management (ECAM) and Proceedings of the Institution of Civil Engineers-Civil Engineering (PICE-CE). Inclusion of the top six journals from the ranking list of Chau (1997) into the selected journal list was done because these journals were widely reviewed in the area of construction engineering and management, and each published a certain number of partnering related papers on construction. Apart from these, two other peer-reviewed and frequently cited journals related to construction, Project Management Journal (PMJ) and Building and Environment (BE), were added to the selected journal list in stage 2 because several articles with considerable value for reference were published in these two journals. The search result also indicated that the journal, Proceedings of the Institution of Civil Engineers-Municipal Engineers (PICE-ME), published a certain number of papers (exceeding 1% of the total publications) on partnering related studies and related to construction engineering and management. Thus, PICE-ME was also included in the final target journal list for consideration.

To sum up, the target journal list includes these ten top-tier leading construction journals: JME, CME, IJPM, JCEM, ECAM, PICE-CE, PICE-ME, PMJ, BE, and AIC. To illustrate the process of selecting the target journals for specific and comprehensive review of partnering studies in the second and third stages, the criteria for journal selection are summarized as follows:

1. Construction journals with a considerable number of publications on partnering related studies according to the search result in the first stage (the baseline as exceeding 1% of total publications) OR
2. Construction journals ranked within the top six in the ranking list of Chau (1997) OR
3. Construction journals acknowledged as first-tier grade and most valuable for peer review by the research community.

Criterion 2 was set up on the basis of the search result of the Scopus search engine. Among all journals publishing partnering related papers shown in Scopus, only the top six journals along with the journal Automation in Construction (AIC) from Chau's (1997) ranking list were included in the search result, whereas AIC was included in the target journal list according to criterion 3. With regard to criterion 3, the construction journals with high impact factors according to the most recent ISI Journal Citation Report are selected for further

analysis. To cover all first-tier journals in construction, this study included another three journals, AIC, BE, and PMJ, in the target journal list. The primary reason for excluding other construction journals from analysis is because either they are not among the first-tier journals with relatively high impact factors according to the ISI Journal Citation Reports or they have published very few, if any, papers related to partnering studies. Therefore, concerted efforts were made in this study to ensure that the specified journal selection criteria are as objective as possible.

In stage 2, a more focused and comprehensive search of all target journals was carried out using the same search engine, Scopus. The full search code is as follows.

TITLE-ABS-KEY ("Partnering" OR "Project Partnering" OR "Strategic Partnering") AND DOCTYPE (ar OR re) AND SUBJAREA (ener OR engi OR busi OR envi OR deci OR econ OR soci OR manag) AND PUBYEAR AFT 1988 AND PUBYEAR BEF 2010 AND (LIMIT-TO (LANGUAGE, "English")) AND (LIMIT-TO (EXACTSRCTITLE, "Journal of Management in Engineering")) (LIMIT-TO (EXACTSRCTITLE, "Journal of Construction Engineering and Management")) OR LIMIT-TO (EXACTSRCTITLE, "Construction Management and Economics") OR LIMIT-TO (EXACTSRCTITLE, "Engineering, Construction and Architectural Management") OR LIMIT-TO (EXACTSRCTITLE, "International Journal of Project Management") OR LIMIT-TO (EXACTSRCTITLE, "Proceedings of the Institution of Civil Engineers Civil Engineering") OR LIMIT-TO (EXACTSRCTITLE, "Proceedings of the Institution of Civil Engineers Municipal Engineers") OR LIMIT-TO (EXACTSRCTITLE, "Automation in Construction") OR LIMIT-TO (EXACTSRCTITLE, "Project Management Journal") OR LIMIT-TO (EXACTSRCTITLE, "Building and Environment"))

Search result: 143 (searched on 27 January 2010)

The more detailed search indicated that the Scopus search engine did not cover the journal PMJ, but several papers most relevant to partnering studies were found in this journal. Hence, partnering papers were particularly searched in this journal and the search result indicated that PMJ published seven partnering related articles between 1989 and 2009. By excluding those unrelated to partnering studies but still shown in the search result, a total of 115 partnering related articles were published in the target journals according to the Scopus search result. In the second-stage search, articles published under the broad categories of editorial book review forum discussions/closures letter to editor article in press index foreword introduction conference/seminar report briefing sheet and comment were excluded from the analysis.

Further, the Scopus covered issues of the journal ECAM only since 2003, meaning that articles of ECAM before 2003 are not shown in the search result. Thus, the analysis purely using this search engine was not adequate. To fill up this gap, a specific search into the individual target journal websites was further conducted in the third-stage of the literature review.

In stage 3, a thorough search into the ten particularly selected journals was processed to test the validity of the search result on the basis of Scopus. The more focused search using keywords Partnering OR Project Partnering OR Strategic Partnering in this stage also serves to complement the possible omissions of partnering papers covered by Scopus. Search during this stage further revealed the followed limitations of Scopus.

1. The journal PMJ is not included in Scopus.
2. Scopus covers issues for the journal ECAM only starting from 2003. Within the study period, seven partnering papers (six between 1989 and 2002 and one in 2009) published by ECAM were not included in Scopus.
3. Two papers on partnering studies published in the journal JME in 1995 and 2009 were not covered by Scopus. Another two papers most related to partnering studies from CME published in 2009 were not included in the Scopus search result.

Thus, a total of 18 papers were found not covered by Scopus, as shown in Appendix II, after the third-stage search into the target journals. Although seemingly acceptable, the fact that Scopus does not include the partnering papers published in 2009 may be attributed to delayed updating of the journal database.

Apart from the limitations unveiled by comparing the results in the second and third stages, that the Scopus search engine covered almost all partnering related papers (except for those noted previously) published in the selected construction journals was reinforced; thus, a critical analysis on the basis of this search engine is acceptable, representative, and valuable for reference.

After the three-stage search, a total of 133 partnering papers were identified as being published in the selected ten construction journals. A total of 28 papers shown in the search result for Scopus were excluded from further analysis given their irrelevance to partnering studies after a critical and consistent evaluation by the research team.

By referring to the scoring methods used by previous researchers, the research contribution by each country and institution was analyzed and quantitatively ranked in this paper. When identifying the actual contributions of the individuals from different countries in a multiauthored paper, this study applied the formula proposed by Howard et al. (1987). In this formula, the authors' credits are divided proportionately in multiauthored articles. Previous studies also adopted this formula to identify the research productivity in social psychology (Gordon and Smith 1989), research trend in science education (Tsai and Wen 2005), and research trend in public-private partnership in construction (Ke et al. 2009). They have reinforced the suitability and reliability of using the formula to rank the individual and institutional contributions to a specific research topic for subsequent studies. Given no better formula applied to score different contributions of authors, the one proposed by Howard et al. (1987) serves as a good reference for use and the respective ratios between authors appear to be reasonable and reflective on the basis of the order of authorship:

$$Score = \frac{1.5^{n-i}}{\sum_{i=1}^n 1.5^{n-i}} \dots\dots\dots(1)$$

where n = number of authors of the paper; and I = order of the specific author.

The formula determines the author's contribution by assuming that the first author made more contributions than the second author, and the second more than the third, and so on. Given that each paper has a score of one point, a detailed score matrix for authors is given in Table 1 for reference. The accumulated score for each country (region) along with the research institution was calculated and compared by years and journals.

Note that the papers found from the search result may differ in relevance to partnering studies. By first looking at the abstract and then the detailed manuscripts of the papers identified (if necessary), the authors found that most of the partnering related papers within the selected journals are consistent with the partnering topic. For more reliable inference and conclusion, the papers considered totally irrelevant to partnering, were excluded from further analysis. When examining each researcher's contribution to partnering studies purely on the basis of Eq. (1), the authors who published papers not relevant to partnering were deleted from the analysis because the number of papers within the search result but unrelated to partnering studies were not negligible for the final analysis.

Although the order of authorship may reveal, to a large extent, the difference in contribution of each individual concerned, this is not always the case because some particular circumstances under which the principal investigators may leave the priority of first authorship to other researchers other than themselves may appear. However, generally, little, if any, influence on the calculated contribution of the country (region) and institution imposed by the problem of authorship order exists, because most of the time, the authors for a single paper were from the same country (region) and even institution.

Moreover, because covering a complete set of partnering related articles on the basis of individual perceptions and judgment for identifying "partnering" papers is difficult, if not impossible, this study primarily looks for a research trend in partnering publications in the area of construction engineering and management through a critical review.

Discussion of Search Results

Annual Productivity of Construction Journals on Partnering Related Papers

According to the first-stage search result on the basis of the search engine Scopus, the total number of partnering related papers identified was 1,026 (papers from PMJ were not included), with a biennial increasing trend from 11 in 1990–1991 (0 in 1989) to 184 in 2008–2009. As the search result indicates, the year 1989 is a tipping point for the commencement of partnering studies in the selected journals; thus, the status of partnering publications in the year were specifically enumerated in Table 2. The more specific search into each of the target journals shows that among the 10,917 papers published in the ten selected journals (including PMJ), 133 (1.22%) addressed partnering subjects or associated issues. Obviously, the statistics in Table 2 show that research on partnering topics have greatly emerged within the first 10 years of the 21st century. The number of papers published on partnering in the target journals between 2000 and 2009 is 96, far more than 37 in the 1990s. Special attention should be given to the fact that those journals published 23 partnering papers in 2007, a peak within the studied period. These statistics reinforced that research interests in partnering topics have been growing consistently throughout the 20 years since its genesis.

Clearly, as Table 2 shows, an increasing number of journals have published partnering papers since 1990. Within the studied period, the journals JME, CME, IJPM, JCEM, ECAM, and PICE-ME have published the highest number of partnering papers, respectively 35, 22, 20, 15, 12, and 12. The number of partnering papers published in JME is much higher than any of the other selected journals, resulting in the greatest contribution by this specific journal to construction from partnering studies. The statistics in Table 2 also reflect that the journals BE

and AIC published four and three papers on partnering topics, respectively, only approximately 0.16% and 0.31% of the total number of papers published in these two journals. These two percentage values are far lower than 0.95% (JCEM) or higher in other journals. Such a distinct numerical difference may be attributed to the fact that, although Building and Environment and Automation in Construction are considered journals related to construction or building studies, they barely address the issues concerning construction partnering according to the scope of coverage stated in the introduction of these two journals.

Contributions of Institutions and Regions to Partnering Studies

Because published papers and research reports are among the key channels through which university research affects industrial research and development (R&D) (Cohen et al. 2002), that the number of academic research publications in a country (region) might imply the extent to which industrial innovation and practices in the research areas progresses in that particular location is logical.

Thus, to obtain a collective view of the current status of industrial practices of construction partnering in specific countries (regions), this section discusses the research contributions of each country (region) and institution by accumulating the score of each author devoted to research on construction partnering from that particular country (region) and institution. The formula for identifying the score of each researcher's contribution noted in the previous section on Research Methodology is the main tool applied to conduct the following analysis.

Regarding scoring the origin of partnering publications, the sum of the contribution value of all authors in the identical origin was used as the final score of that origin. For instance, if author A has the first authorship and second authorship, respectively, in two different papers where there are only two authors from two different origins, the origin of author A shall be assigned with a score of 1 (0: 6 t 0:4), and not 0 or 2.

After detailed calculations, the country or region of origin of partnering publications, as shown in Table 3, are outlined with the number of institution/university, total number of papers published, and score for each origin. According to Table 3, three countries (regions), the United States, the United Kingdom, and Hong Kong (China), with scores of 37.63, 36.44 and 30.50, respectively, published the highest number of partnering papers in the top nine selected journals within the studied period. The total number of partnering papers published with first authorship in the three countries (regions) covers 79.70% (106 in 133) of the total partnering papers in the target journals. The contribution of the three countries (regions) to partnering research is correspondingly much higher than that of other countries or regions. Such facts could be perceived as logical and understandable when looking into the status of partnering implementation to construction projects within the three countries (regions). Industrial practices with partnering implementation greatly boosted the development of partnering concepts and their application in those areas.

The publications in the ten selected journals witnessed an increase in researchers and authors from different nations devoted to partnering studies. Overall, the total contribution of researchers from The Hong Kong Polytechnic University, having published 20 papers and scoring 17.36 in total, was ranked the highest among all identified institutions/universities, as shown in Table 4. The University of Hong Kong and City University of Hong Kong were the second and third ranked institutions/universities on partnering studies. These three universities have played the leading roles in conducting research on construction partnering

not only based in Hong Kong, but also throughout the world. The U.S. Army Corps of Engineers, the pioneering institution that widely adopted partnering approach to military projects, scored 3.4 points and was ranked as the fourth after the top three universities in Hong Kong. The top 10 research centers publishing partnering papers in construction are listed in Table 4, along with the country of origins of these research centers, the number of researchers, published partnering papers, and the corresponding scores of each research center.

A citation index keeps track of which articles in scientific journals cite which other articles (Knowledgerush Online Reference 2010). The citation index has been increasingly recognized as highly important for evaluating the effect of research articles. However, given the several limitations of Scopus in terms of its coverage on the partnering related papers, the citation report of the most contributive papers are not convincing enough. To fill this gap, this study chose another search engine, Google Scholar, to report on the citation status of the selected journals, simply because Google Scholar covers the citation report of all partnering papers published in the target journals and analysis using this source is consistent and reliable in nature.

As Table 5 shows, the journal JME has been cited the most compared with other journals for which citation reports are available, with a total cited times of 900 on the basis of the Google Scholar search engine, followed by IJPM with the second highest number of cited times of 655, and CME with the third highest number of cited times of 577. In terms of the number of times cited per paper, IJPM was ranked as the first at 32.75 times per paper, ahead of CME and JME, with 26.23 and 25.71 times per paper, respectively.

As indicated by Google Scholar, the paper “Partnering in construction: A critical review of issues, problems and dilemmas” by Bresnen and Marshall (2000a) was cited the highest number of times within the studied period. The top 10 most cited partnering papers according to Google Scholar are briefly outlined in Appendix III.

Research Interests in Partnering Studies

Li et al. (2000) classified research on partnering before 2000 into two general groups: empirical and nonempirical studies. Among the empirical studies, four subcategories were presented to generalize the research topics, namely research on project partnering, research examining a dual partnering relationship, research having an international focus, and research emphasizing a special application. Whereas the nonempirical studies were proposed to embrace another four identical topics, being types of partnering, partnering models, partnering processes, and partnering structure. However, with another 10 years past, the scope of research on partnering has been extending to a much broader level, whereas purely relying on the previously noted principle to identify the research interests in partnering studies is no more comprehensive.

Therefore, this study identifies nine distinct categories for summarizing and differentiating the research interests in partnering papers within the studied period: (1) Theory and model; (2) Performance measurement and evaluation (Per.); (3) Benefits, incentives of implementation (Ben.); (4) Problems and barriers to implementation (Pro.); (5) Critical success factors (CSFs.); (6) Strategies and recommendations for implementation (Str.); (7) Review of development and application (Rev.); (8) Feasibility analysis (Fea.); and (9) Use across construction supply chain (uac.). Feasibility analysis primarily refers to exploring the

applicability of adopting the partnering approach to a single construction project or the entire construction industry of the country or region under study.

Although deciding on which topic research interest represents the scope of each paper (Themistocleous and Wearne 2000) seems uncertain and subjective, the analysis was undertaken by the same group of researchers and, thus, any variations in views could be minimized or even eliminated. In contrast, this study was conducted merely for comparison purposes. Thus, the classification of partnering papers on the basis of the research interests is believed to be appropriate and valuable for reference, to a certain extent. Each paper was only grouped under one main research interest. If the paper may cover more than one research interest, the best-fit one was chosen for including that paper. On the basis of this criterion of categorization, the major research interests under the nine categories were used to classify the papers related to partnering studies from the selected journals within the studied period, as shown in Table 6.

A comprehensive literature review of the published journal papers indicated that exploration into construction partnering primarily involved (1) refining partnering theory and process model (e.g., Abudayyeh 1994; Wilson et al. 1995; Crowley and Karim 1995; Crane et al. 1997; Cheng and Li 2002; Anvuur and Kumaraswamy 2007); (2) reviewing research, development, and application of partnering worldwide (e.g., Li et al. 2000; Bresnen and Marshall 2000a; Chan et al. 2008; Eriksson and Nilsson 2008b); (3) providing evaluation, strategies, and recommendations for partnering implementation (e.g., Matthews and Rowlinson 1999; Bresnen and Marshall 2000a; Koraltan and Dikbas 2002; Lu and Yan 2007); (4) identifying critical success factors or key characteristics of partnering (e.g., Cheng et al. 2000; Black et al. 2000; Chan et al. 2004; Chen and Chen 2007; Bresnen 2007); (5) establishing partnering performance index and evaluating partnering performance (e.g., Gransberg et al. 1999; Crane et al. 1999; Yeung et al. 2007, 2008; Nyström 2008); and (6) examining the use of partnering across the entire construction supply chain (e.g., Dainty et al. 2001; Palaneeswaran et al. 2003; Packham et al. 2003; Beach et al. 2005; Mason 2007). Table 6 portrays the major research evolution of the topics discussed by the papers in the 10 journals.

Current Status and Future Trend of Research on Construction Partnering

As shown through the partnering research over the past two decades of 1989–2009, in general, the theory and model of partnering is becoming relatively mature as embodied by few published papers investigating this area after 2007, whereas research on the actual partnering implementation is emerging, with more focus on the area of performance measurement and evaluation in which explorations were conducted by many researchers to make best practice of construction partnering in recent years.

Table 6 indicates that a conspicuous increase in research on a review of partnering development and application was seen during the second 10 years between 2000 and 2009 compared with that of the first 10 years (1989–1999), which may be attributed to the growing emergence of partnering projects in the construction industry within the past 20 years. With more partnering practices in construction, researchers conducted more empirical analysis into this research topic and provided effective guidance to both the academic and industrial community on partnering research and application. The subresearch area of partnering—critical success factors—was clearly explored only after 2000 and was barely discussed by researchers in the 1990s, which to some extent may indicate that as partnering

became a preferred option for procuring construction projects, project team members were more likely to be concerned with achieving success of partnering projects. Similarly, partnering performance measurement and evaluation evolved as a subresearch topic of partnering after 1994–1995, also implying the partnering participants concern about partnering performance and final success of partnering projects. Noticeably, the interest in partnering performance measurement and evaluation emerged in just the most recent several years and a trend seems to exist indicating that it will be a key subtopic in the future studies on partnering. This trend may be attributable to the performance-oriented nature of the construction industry.

The annual productivity of partnering studies indicates that the number of partnering papers peaked in 2007, with 23 papers published; this peak was followed by 13 papers in 2000 and 11 papers in 2001. In 2007, the Proceedings of the Institution of Civil Engineers-Municipal Engineers (PICE-ME) published a series of papers on partnering and partnership application in the construction industry, which implies the wide industrial practices of partnering around and nearly before the time. The decreased number of partnering publications after 2007 may be attributed to the relative maturity of the theory and model of partnering (with only one paper on the theory and model) and blunted interest of reporting partnering practices in the construction industry (with only two papers reviewing partnering applications among 14 partnering papers after 2007). These statistics might imply that partnering is becoming a mature and practically feasible approach for project procurement and management in construction with support from a solid theoretical background.

The core methodology used in partnering research primarily relied on empirical analysis of the industrial feedback and a hands-on partnering experience. The methods employed for empirical analysis cover for example, regression analysis, AHP (analytic hierarchy process), ANP (analytic network process), fuzzy set theory, and balanced scored method.

While partnering has been recording a wide application in some countries and regions (e.g., United States, United Kingdom, Hong Kong, Australia), the literature review indicates that partnering practices in many countries and regions (e.g., East Asian and African countries) are still in their infancy. Taking Singapore as an example, partnering is not formally applied in its construction industry (Davis Langdon & Seah Consultancy 2006), and thus the search results from the target journals revealed no partnering practices in that country. This may be largely because partnering, as a form of relational contracting, is relatively new in the Singaporean construction industry. In fact, Kumaraswamy et al. (2005) pointed out that Singapore appears to be more focused on functional/structural integration (e.g., of the design and build function), rather than on relational integration, as evidenced from the country's industry review report (Construction 21 1999).

The infertility of construction partnering in many countries and regions does not bring about an extensive analysis into the barriers to adoption of partnering as the content analysis of partnering papers indicated, even though some studies identified the potential barriers to successful partnering implementation.

In contrast, although the term partnering is assumed by most researchers to represent an alliance within the construction supply chain (Lu and Yan 2007), the comprehensive literature review showed that the reported partnering practices across the construction supply chain are very limited and only appeared within the most recent 10 years. Most of the attention in the literature was directed so far at exploring partnering between clients and main

contractors, although that the principles of collaboration may apply at other points in the supply chain is being increasingly recognized (Bresnen and Marshall 2000a). A general perception exists that partnering does not extend down to the supply chain, excluding some project participants (e.g., subcontractors, suppliers, consultants) from it. Nevertheless, perspectives from parties other than the client and main contractor are also required to develop a more holistic picture of project partnering (Sze et al. 2003). Study on the use of partnering to form an integrated supply chain in construction is of great value to the development and application of partnering and to the efficiency of the entire construction supply chain.

Gaps in partnering research as referred to previously provide promising ideas for future researchers to exploit on. Identification of barriers to adopting the partnering approach and strategic propositions for overcoming potential barriers, particularly on a regional basis, would facilitate enlarging the scope of partnering application worldwide, while a study of extending partnering down to the entire construction supply chain, with consideration of all contracting parties involved in the partnered projects, truly accords with and meets the objectives of partnering through cooperation and teamwork.

Barriers to Knowledge Transfer of Partnering Dance

Although the late 1980s had already witnessed the initiation and development of partnering in the construction industry by the United States Army Corps of Engineers—one of the major champions of the partnering movement (Larson 1995)—wide acceptance of partnering concepts and further implementation could not have been achieved in parallel with the development of such an initiative. Despite the continued popularity of construction partnering, no apparent industry trend exists to show that it is the dominant choice of procurement or management method (Phua 2006).

In fact, previous studies pointed out that a time lag exists between the outcomes of the relevant academic research and the first commercial introduction of the innovations (Mansfield 1991). Naaranoja et al. (2008) also pointed out that knowledge resources are difficult to utilize because we as human beings are not able to change our perceptions or mindsets easily and that the human communities might prevent rapid changes in knowledge transfer.

Another perspective to which one can resort lies in the negative perception and attitudes among industrial practitioners in adopting the partnering approach. Previous research noted that despite the strong advocacy of the use of partnering and of the potential benefits that it will bring, its implementation has remained modest across the construction industry (Phua 2006). Possible reasons for this occurrence may include

- The benefits that practitioners could gain from using partnering are still debatable;
- The nature of the recommendations about best practices made by researchers varies widely and remains largely at the prescriptive level on the basis of the experiences of selective, idiosyncratic projects that render the transfer of core knowledge difficult (Watson 1999; Phua 2006); and
- Practitioners are not able to easily change their perceptions and mindsets and might prevent rapid changes in knowledge transfer (Naaranoja et al. 2008).

In light of the previous analysis of barriers to transferring partnering research outcomes to practical and extensive application, future studies on partnering can be launched to explore

the pertinent reasons accounting for the discrepancy between the tangible benefits of partnering highlighted in research documents and the lack of adoption of partnering in reality.

Conclusions

Although implemented without formal contracts, unlike other procurement approaches, partnering has been gaining increasing popularity within the construction industry for achieving better value for money. Along with the development of construction partnering, research into this topic undertaken by academics also emerged in developing the appropriate strategies to partnering implementation. To gain insight into the research trend on construction partnering it was first applied for theoretical exploration, this paper conducted a three-stage review of the related articles published, first by using Scopus and then by undertaking a visual examination of all related papers in the 10 selected construction journals, namely, *Journal of Construction Engineering and Management, ASCE (JCEM)*; *Journal of Management in Engineering, ASCE (JME)*; *Construction Management and Economics (CME)*; *Engineering, Construction and Architectural Management (ECAM)*; *International Journal of Project Management (IJPM)*; *Proceedings of the Institution of Civil Engineers-Civil Engineers (PICE-CE)*; *Proceedings of the Institution of Civil Engineers-Municipal Engineers (PICE-ME)*; *Automation in Construction (AIC)*; *Project Management Journal (PMJ)*; and *Building and Environment (BE)*. Finally, the specific search into the target journals was processed to test the validity and fill in the gap of Scopus in reviewing the partnering studies.

During 1989 and 2009, 133 papers in relation to partnering studies were published in these journals. A comprehensive review of the papers indicated that research interests in partnering have been increasing steadily throughout the years. This study provided sufficient evidence to show the increasing effect of partnering on the construction industry at large. Also, this study identified that United States researchers published the most partnering papers, ahead of researchers from the United Kingdom, Hong Kong, Sweden, and Australia. In the academic community, The Hong Kong Polytechnic University, City University of Hong Kong, and The University of Hong Kong were identified as three most productive institutions in publishing partnering research studies in construction.

Nine categories have been classified as the primary research interests of partnering papers, including (1) Theory and model; (2) Performance measurement and evaluation (Per.); (3) Benefits, incentives of implementation (Ben.); (4) Problems and Barriers to implementation (Pro.); (5) Critical success factors (CSFs.); (6) Strategies and recommendations for implementation (Str.); (7) Review of development and application (Rev.); (8) Feasibility analysis (Fea.); and (9) use across construction supply chain (uac.). More and more rigorous methods are being used within the research, such as regression analysis, AHP (analytic hierarchy process), ANP (analytic network process), fuzzy set theory, and balanced scored method.

The study also provided a critical overview of the development of construction partnering in the academic field and, hence, established a solid reference platform for scholars and researchers to obtain more useful insights into partnering issues. A better understanding of the research trend of partnering may enable industrial practitioners to appreciate the key issues in partnering development. An analysis of the author's contribution to partnering research has also generated strong potential for both scholars and practitioners to seek further research opportunities for collaboration.

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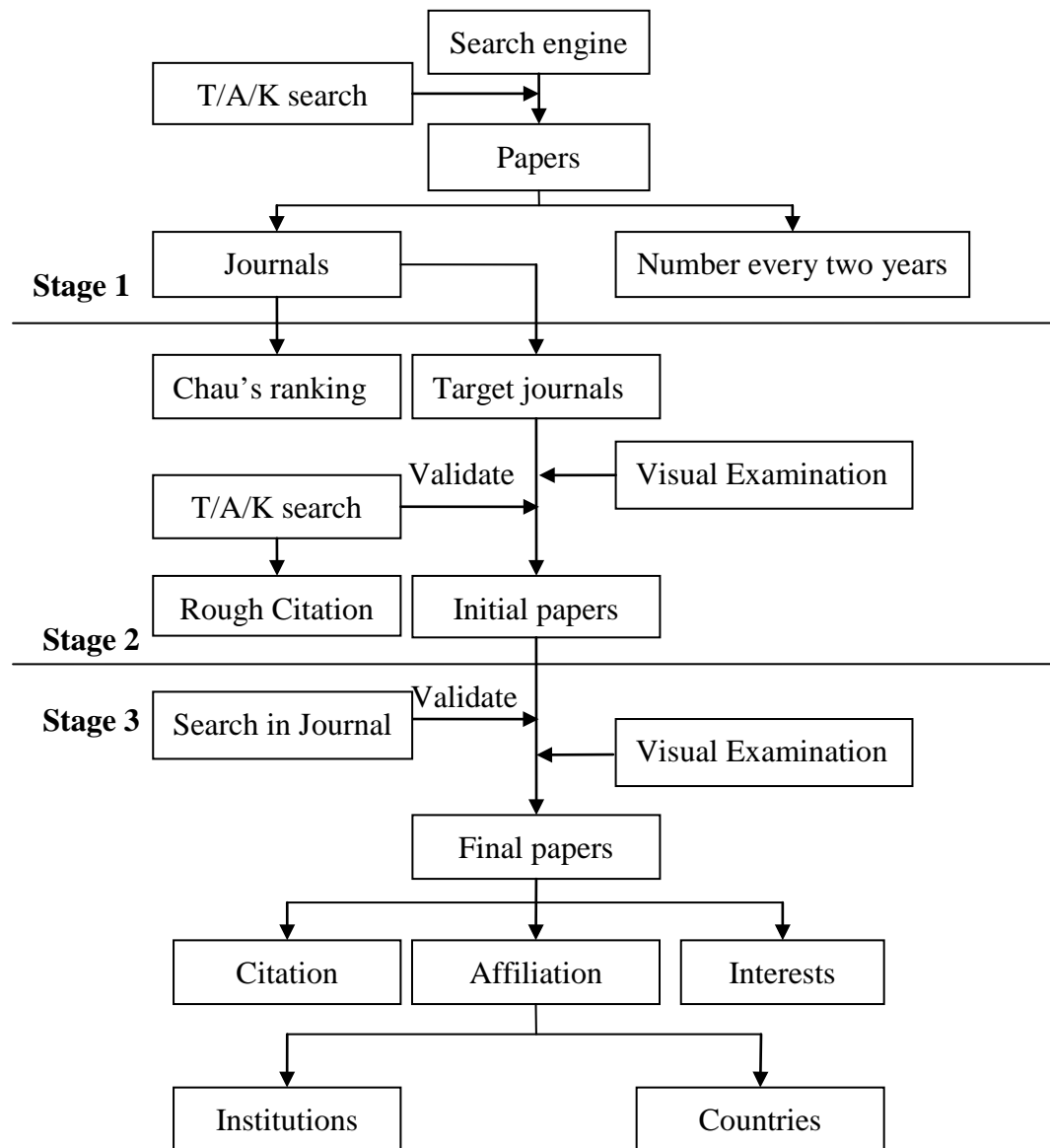
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Note: T/A/K-Title/Abstract/Keywords

Figure 1. Research framework for this study (referred from Ke et al. (2009))

Table 1. Score Matrix for Multi-Authored Papers (Adopted from Ke et al. 2009)

Number of authors	Order of specific author				
	1	2	3	4	5
1	1.00				
2	0.60	0.40			
3	0.47	0.32	0.21		
4	0.42	0.28	0.18	0.12	
5	0.38	0.26	0.17	0.11	0.08

Table 2. Partnering Related Papers Published in Selected Journals (excluding irrelevant papers)

		1989	1990-1991	1992-1993	1994-1995	1996-1997	1998-1999	2000-2001	2002-2003	2004-2005	2006-2007	2008-2009	Total
Search engine		0	11	17	41	100	78	131	118	165	181	184	1026
Selected Journals	Total	206	462	653	828	855	929	1034	1164	1361	1772	1653	10917
	Partnering related papers	0	1	5	9	13	9	24	15	15	28	14	133
	Ratio/%	0	0.22	0.77	1.09	1.40	0.97	2.32	1.20	1.10	1.47	0.85	1.22
JME	Total	33	67	60	119	145	156	84	48	45	48	52	857
	Partnering related papers	0	1	2	6	6	4	7	2	3	1	3	35
	Ratio/%	0	1.49	3.33	5.04	4.14	2.56	8.33	4.17	6.67	2.08	5.77	4.08
CME	Total	26	71	69	94	87	137	161	132	175	206	187	1345
	Partnering related papers	0	0	0	0	1	0	5	3	2	6	5	22
	Ratio/%	0	0	0	0	1.15	0	3.11	2.27	1.14	2.91	2.67	1.64
JCEM	Total	41	98	106	121	109	117	123	140	240	234	243	1572
	Partnering related papers	0	0	0	0	2	2	1	1	5	2	2	15
	Ratio/%	0	0	0	0	1.83	0	0.81	0.71	2.08	0.85	0.82	0.95
IJPM	Total	43	72	66	88	99	89	90	134	135	157	169	1142
	Partnering related papers	0	0	0	0	1	0	2	6	4	6	1	20
	Ratio/%	0	0	0	0	1.01	0	2.22	4.48	2.96	3.82	0.59	1.75
ECAM	Total	0	0	0	30	36	73	74	74	74	73	72	506
	Partnering related papers	0	0	0	1	1	1	3	0	1	3	2	12
	Ratio/%	/	/	/	3.33	2.78	1.37	4.05	0	1.35	4.11	2.78	2.37
PICE-CE	Total	0	0	90	99	58	61	76	75	102	104	90	755
	Partnering related papers	0	0	0	0	0	0	2	1	0	0	0	3
	Ratio/%	/	/	0	0	0	0	2.63	1.33	0	0	0	0.40
PICE-ME	Total	0	0	65	61	53	48	82	84	73	58	69	593
	Partnering related papers	0	0	0	0	0	1	4	0	0	7	0	12
	Ratio/%	/	/	0	0	0	2.08	4.88	0	0	12.07	0	2.02
Total		/	/	48	52	100	85	98	117	120	156	203	979

AIC	Partnering related papers	0	0	0	0	0	1	0	1	0	0	1	3
	Ratio/%	0	0	0	0	0	1.17	0	0.85	0	0	0.49	0.31
BE	Total	40	101	98	118	118	102	166	280	317	646	492	2478
	Partnering related papers	0	0	0	0	0	0	0	1	0	3	0	4
	Ratio/%	0	0	0	0	0	0	0	0.36	0	0.46	0	0.16
PMJ	Total	23	53	51	46	50	61	80	80	80	90	76	690
	Partnering related papers	0	0	3	2	2	0	0	0	0	0	0	7
	Ratio/%	0	0	5.88	4.35	4.00	0	0	0	0	0	0	1.01

Notes: The total number of papers in the above journals is calculated by excluding articles under the categories of “editorial,” “book review,” “forum,” “discussions/closures,” “letter to editor,” “article in press,” “index,” “foreword,” “introduction,” “conference/seminar report,” “briefing sheet,” “miscellany,” “comment,” “erratum,” and “announcement”.

Table 3. Research Origin of Partnering Related Papers published

	Institute/University	Researchers involved	Total Number of Papers	Scores
United States	40	67	39	37.63
United Kingdom	36	70	38	36.44
Hong Kong (China)	3	30	35	30.50
Sweden	7	8	10	9.39
Australia	5	12	8	5.31
China (Mainland)	3	3	4	2.14
Singapore	2	4	2	1.40
Korea	4	4	2	1.28
Botswana	1	1	1	1.00
Canada	1	2	1	1.00
Chile	1	4	1	1.00
Denmark	1	2	1	1.00
Portland	1	1	1	1.00
Taiwan (China)	1	2	1	1.00
Turkey	1	2	1	1.00
Netherlands	1	1	1	0.40
Tunisia	1	1	1	0.21

Table 4. The Top-10 Research Centres Publishing Partnering Related Papers in Construction (based on the original formula)

Ranking	Research centres	Countries	Researchers involved	Papers	Scores
1	The Hong Kong Polytechnic University	Hong Kong (China)	15	19	17.36
2	The University of Hong Kong	Hong Kong (China)	10	12	7.70
3	City University of Hong Kong	Hong Kong (China)	4	6	5.24
4	U.S. Army Corps of Engineers	U.S.	9	4	3.40
5	Clemson University	United States	5	5	3.32
6	Luleå University of Technology	Sweden	3	6	4.08
7	Oregon State University	United States	2	3	3.00
8	Loughborough University	U.K.	5	2	2.79
9	University of Warwick	U.K.	2	4	2.25
10	University of Greenwich	U.K.	2	2	2.00
	KTH-Royal Institute of Technology	Sweden	1	2	2.00
	Heriot-Watt University	U.K.	4	2	2.00

Table 5. Cited times of Selected Journals (Based on “Google Scholar” Search Engine)

Journal	Total cited times	Total No. of papers	Times per paper
<i>Journal of Management in Engineering</i>	900	35	25.71
<i>International Journal of Project Management</i>	655	20	32.75
<i>Construction Management and Economics</i>	577	22	26.23
<i>Journal of Construction Engineering and Management</i>	252	15	16.80
<i>Engineering, Construction and Architectural Management</i>	192	12	16.00
<i>Project Management journal</i>	154	7	22.00
<i>Building and Environment</i>	61	4	15.25
<i>Automation in Construction</i>	30	3	10.00
<i>Proceedings of the Institutions of Civil Engineers: Municipal Engineer</i>	15	12	1.25
<i>Proceedings of the Institution of Civil Engineers: Civil Engineering</i>	5	3	1.67

Table 6. Major Research Interests of Partnering Related Studies

Topic	1989	1990-1991	1992-1993	1994-1995	1996-1997	1998-1999	2000-2001	2002-2003	2004-2005	2006-2007	2008-2009	Total (1989-1999)	Total (2000-2009)	Total (1989-2009)
Theory and model	0	1	2	6	3	3	3	2	3	3	1	15	14	27
Performance measurement and evaluation	0	0	0	0	1	2	0	1	0	3	5	3	9	12
Benefits, incentives of implementation	0	0	0	0	2	0	0	1	1	1	1	2	4	6
Problems with and Barriers to implementation	0	0	0	0	1	0	1	2	0	2	2	1	8	8
Critical success factors	0	0	0	0	0	0	2	2	4	3	2	0	13	13
Strategies and recommendations for implementation	0	0	1	1	3	2	6	1	0	4	1	7	12	19
Review of development and application	0	0	2	2	3	2	10	3	5	10	2	9	33	39
Feasibility analysis	0	0	0	0	0	0	1	1	0	1	0	0	3	3
Use across construction supply chain	0	0	0	0	0	0	1	2	2	1	0	0	6	6

Appendix I. Partnering related papers identified from the selected construction journals between 1989 and 2009

No.	Journal	Year	Authors	Topic
1	ASCE's JME	2009	Yeung, J.F.Y., Chan, A.P.C., and Chan, D.W.M.	Per.
2	ASCE's JME	2008	Chan, A.P.C., Chan, D.W.M., Fan, L.C.N., Lam, P.T.I., and Yeung, J.F.Y.	Rev.
3	ASCE's JME	2008	Eriksson, P.E., and Nilsson, T.	Rev.
4	ASCE's JME	2007	Maturana, S., Alarcón, L.F., Gazmuri, P., and Vrsalovic, M.	Per.
5	ASCE's JME	2005	Xu, T., Smith, N.J., and Bower, D.A.	CSFs.
6	ASCE's JME	2005	Wong, P.S.P., and Cheung, S.O.	The.
7	ASCE's JME	2004	Rahman, M.M., and Kumaraswamy, M.M.	Rev..
8	ASCE's JME	2003	Chan, A.P.C., Chan, D.W.M., and Ho, K.S.K.	Pro.
9	ASCE's JME	2002	Cheng, E.W.L., and Li, H.	CSFs.
10	ASCE's JME	2001	Cheng, E.W.L., Li, H., Drew, D.S., and Yeung, N.	The.
11	ASCE's JME	2001	Brown, D.C., Ashleigh, M.J., Riley, M.J., and Shaw, R.D.	Str.
12	ASCE's JME	2001	Peña-Mora, F., and Harpoth, N.	Rev.
13	ASCE's JME	2000	Cheng, E.W.L., Li, H., and Love, P.E.D.	CSFs.
14	ASCE's JME	2000	Kumaraswamy, M.M., and Matthews, J.D.	Rev.
15	ASCE's JME	2000	DeVilbiss, C.E., and Leonard, P.	The.
16	ASCE's JME	2000	Lazar, F.D.	Str.
17	ASCE's JME	1999	Crane, T.G., Felder, J.P., Thompson, P.J., Thompson, M.G., and Sanders, S.R.	Per.
18	ASCE's JME	1998	Gardiner, P.D., Simmons, J.E.L.	Rev.
19	ASCE's JME	1998	Thompson, P.J., Sanders, S.R.	The.
20	ASCE's JME	1998	Slater, T.S.	The.
21	ASCE's JME	1997	Brooke, K.L., and Litwin, G.H.	Str.
22	ASCE's JME	1997	Crane, T.G , Felder, J.P , Thompson, P.J., Thompson, M.G., and Sanders, S.R.	The.
23	ASCE's JME	1997	Love, S.	Str.
24	ASCE's JME	1997	Lazar, F.D.	Ben.
25	ASCE's JME	1996	Miles, R.S.	The.
26	ASCE's JME	1996	Nielsen, D.	Str.
27	ASCE's JME	1995	Crowley, L.G., and Karim, A.	The.
28	ASCE's JME	1995	Wilson, R.A., Songer, A.D., and Diekmann, J.	The.
29	ASCE's JME	1995	Larson, E.	Rev.
30	ASCE's JME	1995	Ellison, S.D., and Miller, D.W.	The.
31	ASCE's JME	1994	Abudayyeh, O.	The.
32	ASCE's JME	1994	Harback, H.F., Basham, D.L., and Buhts, R.E.	Str.
33	ASCE's JME	1993	Woodrich, A.	Rev.
34	ASCE's JME	1993	Weston, D.C., and Gibson, G.E.	Rev.
35	ASCE's JME	1990	Cook, E.L., and Hancher, D.E.	The.
36	IJPM	2009	Pesämaa, O., Eriksson, P.E., and Hair, J.F.	The.
37	IJPM	2007	Lu, S., and Yan, H.	Ben.

38	IJPM	2007	Lu, S., and Yan, H.	Fea.
39	IJPM	2007	Kadefors, A., Björlingsson, E., and Karlsson, A.	Str.
40	IJPM	2007	Chen, W.T., and Chen, T.T.	CSFs.
41	IJPM	2007	Alderman, N., and Ivory, C.	Pro.
42	IJPM	2007	Bresnen, M.	CSFs.
43	IJPM	2005	Beach, R., Webster, M., and Campbell, K.M.	Uac.
44	IJPM	2004	Wong, P.S.P., and Cheung, S.O.	CSFs.
45	IJPM	2004	Bayliss, R., Cheung, S.O., Suen, H.C.H., and Wong, S.P.	Rev.
46	IJPM	2004	Kadefors, A.	Rev.
47	IJPM	2003	Cheung, S.O., Ng, T.S.T., Wong, S.P., and Suen, H.C.H.	CSFs.
48	IJPM	2003	Naoum, S.	The.
49	IJPM	2003	Packham, G, Thomas, B., and Miller, C.	Uac.
50	IJPM	2002	Ng, S.T., Rose, T.M., Mak, M., and Chen, S.E.	Pro.
51	IJPM	2002	Bresnen, M., and Marshall, N.	Str.
52	IJPM	2002	Jiang, J.J., Klein, G, Chen, H.G., and Lin, L.	Rev.
53	IJPM	2001	Li, H., Cheng, E.W.L., Love, P.E.D., and Irani, Z.	Str.
54	IJPM	2000	Black, C., Akintoye, A., and Fitzgerald, E.	CSFs.
55	IJPM	1997	Arditi, D., and Gunaydin, H.M.	Ben.
56	ASCE's JCEM	2009	Manley, K., Mcfallan, S., and Kajewski, S.	Ben.
57	ASCE's JCEM	2008	Eom, C.S.J., Yun, S.H., and Paek, J.H.	Per.
58	ASCE's JCEM	2007	Anvuur, A.M., and Kumaraswamy, M.M.	The.
59	ASCE's JCEM	2006	Tang, W., Duffield, C.F., and Young, D.M.	Rev.
60	ASCE's JCEM	2005	Wong, P.S.P., Cheung, S.O., and Ho, P.K.M.	CSFs.
61	ASCE's JCEM	2005	Arditi, D., and Chotibhongs, R.	Ben.
62	ASCE's JCEM	2005	Kumaraswamy, M.M., Ling, F.Y.Y., Rahman, M.M., and Phng, S.T.	Rev.
63	ASCE's JCEM	2004	Chan, A.P.C., Chan, D.W.M., Chiang, Y.H., Tang, B.S., Chan, E.H.W., and Ho, K.S.K.	CSFs.
64	ASCE's JCEM	2004	Cheng, E.W.L., and Li, H.	The.
65	ASCE's JCEM	2002	Glagola, C.R., and Sheedy, W.M.	The.
66	ASCE's JCEM	2000	Drexler, J.A., and Larson, E.W.	Rev.
67	ASCE's JCEM	1999	Conley, M.A., and Gregory, R.A.	The.
68	ASCE's JCEM	1999	Gransberg, D.D., Dillon, W.D., Reynolds, L., and Boyd, J.	Per.
69	ASCE's JCEM	1996	Ruff, C.M., Dzombak, D.A., and Hendrickson, C.T.	Rev.
70	ASCE's JCEM	1996	Pocock, J.B., Hyun, C.T., Liu, L.Y., and Kim, M.K.	Per.
71	CME	2009	Doloi, H.	CSFs.
72	CME	2009	Lau, E., and Rowlinson, S.	CSFs.
73	CME	2009	Bresnen, M.	Str.
74	CME	2008	Yeung, J.F.Y., Chan, A.P.C., and Chan, D.W.M.	Per.
75	CME	2008	Nyström, J.	Per.
76	CME	2007	Yeung, J.F.Y., Chan, A.P.C., Chan, D.W.M., and Li, L.K.	Per.
77	CME	2007	Mason, J.R.	Uac.
78	CME	2007	Kaluarachchi, Y.D., and Jones, K.	Per.
79	CME	2007	Eriksson, P.E., Pesämaa, O.	The.

80	CME	2006	Phua, F.T.T.	Pro.
81	CME	2006	Drejer, I., Vinding, A.L.	Rev.
82	CME	2005	Nyström, J.	The.
83	CME	2005	Wood, G.D., and Ellis, R.C.T.	Rev.
84	CME	2003	Chan, A.P.C., Chan, D.W.M., and Ho, K.S.K.	Ben.
85	CME	2003	Shields, R., West, K.	Rev.
86	CME	2002	Koraltan, S.B., and Dikbas, A.	Fea.
87	CME	2001	Kwan, A.Y., and Ofori, G.	Fea.
88	CME	2001	Dainty, A.R.J., Briscoe, G.H., and Millett, S.J.	Uac.
89	CME	2000	Bresnen, M., and Marshall, N.	Rev.
90	CME	2000	Bresnen, M., and Marshall, N.	Str.
91	CME	2000	Bresnen, M., and Marshall, N.	Pro.
92	CME	1997	Stipanowich, T.J.	Rev.
93	ECAM	2009	Eriksson, P.E., Atkin, B., and Nilsson, T.	Pro.
94	ECAM	2008	Eriksson, P.E., Nilsson, T., and Atkin, B.	Pro.
95	ECAM	2007	Eriksson, P.E., and Laan, A.	Str.
96	ECAM	2007	Swan, W., and Khalfan, M.M.A.	Str.
97	ECAM	2007	Jones, K., and Kaluarachchi, Y.	CSFs.
98	ECAM	2005	Fortune, C., and Setiawan, S.	Uac.
99	ECAM	2001	Liu, A.M.M., and Fellows, R.	Str.
100	ECAM	2001	Cheng, E.W.L., and Li, H.	The.
101	ECAM	2000	Li, H., Cheng, E.W.L., and Love, P.E.D.	Rev.
102	ECAM	1999	Matthews, J., and Rowlinson, S.	Str.
103	ECAM	1996	Matthews, J., Tyler, A., and Thorpe, A.	The.
104	ECAM	1994	Loraine, R. K.	The.
105	PICE-ME	2007	Harwood, K., and Follett, B.	Rev.
106	PICE-ME	2007	Cunningham, L.S., and Pomfret, M.A.	Rev.
107	PICE-ME	2007	Turner, J.H.W., Pearce, S., Fenton, M.J., and Sims, B.	Rev.
108	PICE-ME	2007	Rankin, J., Jameson, P., and Yarwood, N.	Rev.
109	PICE-ME	2007	Aggus, S.R., and Hiscocks, E.J.S.	Rev.
110	PICE-ME	2007	Gullick, D., Cairns, R., and K., P.D.	Rev.
111	PICE-ME	2007	Mugabi, J., Kayaga, S., and Njiru, C.	Rev.
112	PICE-ME	2001	Stephens, M., and Thomas, D.	Rev.
113	PICE-ME	2001	Kennedy, C., and Johns, A.	Rev.
114	PICE-ME	2001	Crane, A.	Rev.
115	PICE-ME	2000	Edmonds, M., and Hogan, M.	Rev.
116	PICE-ME	1999	Hartshorne, D.C.	Rev.
117	PMJ	1997	larson, E., and Drexler, J.A.	Pro.
1158	PMJ	1996	Back, W. E., and Sanders, S. R.	Rev.
119	PMJ	1995	Schmader, K.J., and Gibson, G.E.	Rev.
120	PMJ	1995	Romancik, D.J.	The.
121	PMJ	1992	Sanders, S.R. and Moore, M.M.	Str.
122	PMJ	1992	Moore, C., Mosley, D., and Slagle, M.	The.

123	PMJ	1992	Cowan, C., Gray, C., and Larson, E.	The.
124	BE	2007	Cheng, E.W.L., and Li, H.	The.
125	BE	2007	Ngowi, A.B.	Str.
126	BE	2006	Chan, A.P.C., Chan, D.W.M., Fan, L.C.N., Lam, P.T.I., and Yeung, J.F.Y.	Rev.
127	BE	2003	Palaneeswaran, E., Kumaraswamy, M.M., Rahman, M., and Ng, T.	Uac.
128	AIC	2009	Yeung, J.F.Y., Chan, A.P.C., and Chan, D.W.M.	Per.
129	AIC	2003	Cheung, S.O., Suen, H.C.H., and Cheung, K.K.W.	Per.
130	AIC	1999	Baldwin, A.N., Thorpe, A., and Carter, C.	Str.
131	PICE-CE	2003	Cathcart, A.	Rev.
132	PICE-CE	2000	Gellatly, G.M., Burtwistle, P., and Baldwin, A.N.	Str.
133	PICE-CE	2000	Barnes, M.	Rev.

Notes:

“The.” represents “Theory and model”;

“Per.” represents “Performance measurement and evaluation”;

“Ben.” represents “Benefits, incentives of implementation”;

“Pro.” represents “Problems with and barriers to implementation”;

“CSFs.” represents “Critical success factors”;

“Str.” represents “Strategies and recommendations for implementation”;

“Fea.” represents “Feasibility analysis”;

“Rev.” represents “Review of development and application”;

“Uac.” represents “use across construction supply chain”.

Appendix II. Partnering related papers in target construction journals uncovered by “Scopus” search engine

No.	Authors	Title of paper	Year	Journal
1	Doloi, H.	Relational partnerships: the importance of communication, trust and confidence and joint risk management in achieving project success	2009	CME
2	Bresnen, M.	Living the dream? Understanding partnering as emergent practice	2009	CME
3	Eriksson, P.E., Atkin, B., and Nilsson, T.	Overcoming barriers to partnering through cooperative procurement procedures	2009	ECAM
4	Liu, A.M.M., Fellows, R.	An Eastern perspective on partnering	2001	ECAM
5	Cheng, E.W.L., and Li, H.	Development of a conceptual model of construction partnering	2001	ECAM
6	Li, H., Cheng, E.W.L., and Love, P.E.D.	Partnering research in construction	2000	ECAM
7	Matthews, J., and Rowlinson, S.	Partnering: incorporating safety management	1999	ECAM
8	Matthews, J., Tyler, A., and Thorpe, A.	Pre-construction project partnering: developing the process	1996	ECAM
9	Loraine, R. K.	Project specific partnering	1994	ECAM
10	Yeung, J.F.Y., Chan, A.P.C., and Chan, D.W.M.	Developing a Performance Index for Relationship-Based Construction Projects in Australia: Delphi Study	2009	ASCE's JME
11	Larson, E.	Project Partnering: Results of Study of 280 Construction Projects	1995	ASCE's JME
12	larson, E., Drexler, J.A.	Barriers to project partnering: report from the firing line	1997	PMJ
13	Back, W. E., and Sanders, S. R.	Partnering in a unit price environment	1996	PMJ
14	Schmader, K.J., and Gibson, G.E.	Partnered project performance in the U.S. naval facilities engineering command	1995	PMJ
15	Romancik, D.J.	Partnership toward improvement	1995	PMJ
16	Sanders, S.R. and Moore, M.M.	Perceptions on partnering in the public sector	1992	PMJ
17	Moore, C., Mosley, D. and Slagle, M.	Partnering: guidelines for win-win project management	1992	PMJ
18	Cowan, C., Gray, C., Larson, E.	Project Partnering	1992	PMJ

Note: “CME” represents “Construction Management and Economics”, “ECAM” represents “Engineering, Construction and Architectural Management”, “ASCE’s JME” represents “Journal of Management in Engineering, ASCE”, “PMJ” represents “Project Management Journal”.

Appendix 3. Top 10 most frequently cited papers according to “Google Scholar” search engine

No.	Author names	Topic	Year	Journal	Number of times cited
1	Bresnen, M., Marshall, N.	Partnering in construction: A critical review of issues, problems and dilemmas	2000	CME	167
2	Black, C., Akintoye, A., Fitzgerald, E.	Analysis of success factors and benefits of partnering in construction	2000	IJPM	109
3	Bresnen, M., Marshall, N.	Building partnerships: Case studies of client-contractor collaboration in the UK construction industry	2000	CME	102
4	Bresnen, M., Marshall, N.	Motivation, commitment and the use of incentives in partnerships and alliances	2000	CME	83
5	Thompson, P.J., Sanders, S.R.	Partnering continuum	1998	JME	76
6	Kadefors, A.	Trust in project relationships-inside the black box	2004	IJPM	75
7	Larson, E.	Project Partnering: Results of Study of 280 Construction Projects	1995	JME	74
8	Naoum, S.	An overview into the concept of partnering	2003	IJPM	70
9	Cheng, E.W.L., Li, H., Love, P.E.D.	Establishment of critical success factors for construction partnering	2000	JME	66
10	Dainty, A.R.J., Briscoe, G.H., Millett, S.J.	Subcontractor perspectives on supply chain alliances	2001	CME	61