ELEVEN YEARS OF ARCOM: BIBLIOMETRIC MAPPING OF STUDIES PUBLISHED BETWEEN 2005 AND 2016

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The study aims at mapping the intellectual discourse that has emerged from Association of Researchers in Construction Management (ARCOM) conference within the last 11 years. To this end, the 1505 studies indexed in Scopus were examined through scientometric analyses of citation networks. The findings show that the most prominent areas of research including "sustainable development", "health and safety" and "architectural design" have been predominantly conducted from a project management perspective. New fields of research such as Building Information Modelling have gained momentum with several years of delay after their emergence across the construction context. Besides, published studies in ARCOM have for the most part cited studies from journals allocated to managerial areas of construction management as well as management and business journals. Technology and engineering journals nevertheless turned out to have a noticeably lower share of citation. Moreover, the network of collaborations among countries indicated the dominance of the UK and Australia and underrepresentation of North American, emerging markets and developing countries. By providing a view from a meta-perspective, the study exposes the areas in need of extra attention, provides directions for defining future research themes and suggests remedial solutions for addressing the spotted problems.

Keywords: ARCOM Conference, bibliometric mapping, publications, review

INTRODUCTION

The Association of Researchers in Construction Management (ARCOM) has been active since 1984 with the aim of bringing together active researchers in construction management field. As per the objectives set out, ARCOM is about lobbying for change in construction management field through advancing research (ARCOM 2017). This necessitates looking into existing literature from a broad view for discovering long-lasting research interests, patterns of scholarly activities as well as spotting trajectories of competing paradigms and paradigm shifts. That is, failure in gaining a wide view of the state of research, might end up in overlooking central aspects and duplication of efforts

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(Yalcinkaya and Singh 2015). To date, however, no systematic attempt has sought to present a picture of the corpus of literature produced through ARCOM in order to provide such a broad view and discover the areas in need of extra attention.

This study intends to address these things. As such, the study maps the state of existing studies published in ARCOM. The resulting accumulated knowledge will uncover patterns and relationships between concepts that have remained hidden within the ARCOM literature. The findings will produce evidence to inform, guide and improve future research areas to be pursued and promoted by ARCOM.

BACKGROUND

Construction management has grown from a new academic discipline to a relatively established research area. Such a quick growth has been catalysed by the formation of research organisations such as ARCOM in the 1980s, a point argued by Birnie (2000). ARCOM is devoted to research in Construction Management, a field that is a synergistic combination a wide range of disciplines (Raiden and Smith 2015). This aim has been pursued through holding annual conferences in cities around the UK every September. The outcome of these conferences has been published in 32 proceedings each containing research studies from an average of 150 delegates in each conference (ARCOM 2017) alongside several special issues of Construction Management and Economics journal (Raiden 2015). Authors and delegates from extremely diverse backgrounds attend and contribute to ARCOM body of knowledge (Raiden and Smith 2015; Smith 2014). That is because, demands and problems of the built environment call for appropriately interwoven areas and topics of inquiry resulting in a cornucopia of theories and disciplines in construction management (Dainty 2008; Newton 2016). With this in mind, for the last 33 years, each year ARCOM has organized and held a conference to promote and disseminate this growing body of research in construction management (Smith 2014). Such a relatively large and heterogeneous body poses critical challenges in terms of identifying the research directions, understanding the primary themes, spotting the gaps and view a broad picture (Lu *et al.,* 2014; Yalcinkaya and Singh 2015).

In addition, existing trends and engagements between ARCOM and external established outlets and fields are to be investigated. That is, construction management field must actively engage with external bodies of knowledge, outlets and other research communities (Newton 2016). Construction research is enriched through promotion of methodological and philosophical pluralism (Dainty 2008) and mobilisation of theories from other disciplines (Schweber 2015). This is of central importance for the construction research community as a pathway to a deeper understanding of problems facing the industry practice and resolve them, an objective pursued by ARCOM (ARCOM 2017; Raiden and Smith 2015). Few sources to reveal the general areas covered by ARCOM are available such as regular newsletter (Raiden 2015). However, studies presenting a systematic and holistic analysis of ARCOM body of knowledge are non-existent. On top of that, there is little prospect of addressing the objectives described above through conducing a manual qualitative review of literature. The discussions above bring to light the relevance of conducting the present study deploying the methodology as described next.

RESEARCH METHODS

The primary method applied in the present study was quantitative bibliometric mapping of published studies. This method was deployed in view of the considerations discussed below.

Bibliometric mapping

Traditional systematic reviews are typically written by very few domain experts, who might be affected by their own specialized areas of interest and their favourite perspectives of the field (Yalcinkaya and Singh 2015). This might end up in selective inclusion of studies and bias in interpretation in order to voice one's own views (He *et al.,* 2016). Use of science mapping techniques such as bibliometric mapping considerably reduces such biases by embracing the studies of authors across a wide spectrum of perspectives, disciplines and schools of thought (He *et al.,* 2016). Bibliometric mapping refers to a knowledge domain analysis and visualisation using large-scale scholarly datasets of published studies (Cobo *et al.,* 2011). This is a quantitative method conducted by computational tools, based on network analysis principles in which the footprints uncovered by scholarly publications are studied to trace the development of science in a domain over time (He *et al.,* 2016). A wide range of science mapping tools for bibliometric analysis is available, each one with a set of different capabilities and strengths (Cobo *et al.,* 2011). Common tools include VOSviewer, Bibexcel, CiteSpace, CoPalRed, Sci2, VantagePoint and Gephi (https://gephi.org/) (Cobo *et al.,* 2011). Of these, VOSviewer and Gephi were selected for the present study. VOSviewer, where VOS stands for "visualization of similarities", is a freely-available tool that offers the basic functionality needed for visualizing bibliometric networks (van Eck and Waltman 2014). Gephi is an open source network graph and analysis tool at the forefront of revolution in network visualization and analysis, which may be used to provide a thorough insight into the information achievable from a given network (Cherven 2015). As recommended by Cobo *et al.,* (2011) the general workflow in a bibliometric mapping study has to follow three main steps: (1) data acquisition, (2) network extraction and (3) analysis and visualisation. Researchers will be able to interpret and obtain some conclusions based on the information provided by the analysed and visualised networks.

Data acquisition

VOSviewer allows users to download bibliographic records directly from Web of Science, PubMed and Scopus. The selected database for the present study was Scopus due to its cover on ARCOM proceedings. As of 11 January 2017, 1505 documents were indexed in Scopus covering ARCOM proceedings published from 2005 to 2016. No limitation on time frame was applied. The starting point for the analyses was nevertheless confined to 2005, that is, the first year in which ARCOM papers were indexed in Scopus. The rationale for this approach was due to Scopus's capability to export all such data in form of a dataset which was downloaded and formed the source of the bibliometric mapping analysis as discussed next.

Network extraction

Different approaches can be taken to extract networks based on certain units of analysis (authors, documents, journals, and terms). Interested readers are referred to studies by Cobo *et al.,* (2011) and van Eck and Waltman (2014) for detailed discussions on common bibliometric mapping techniques and their applications. Having VOSviewer as the tool for network creation, the three techniques below were utilised. "The number of co-occurrences of two keywords is the number of publications in which both keywords occur together in the title, abstract, or keyword list." (van Eck and Waltman, 2014: 287). Author keywords and fractional counting options as recommended by van Eck and Waltman (2014) were deployed to extract the network of major areas of research. This resulted in extraction of 8450 keywords when the minimum number of occurrences was set to 30.

A common method for identifying the most influential sources of information for a particular body of literature is analysing co-citations, which focuses on the number of references that come together frequently (van Eck and Waltman, 2014). This method was applied to the dataset with selecting co-citation of sources and fractional coupling as recommended by van Eck and Waltman (2014), resulting in identifying 18390 sources (minimum number of citations set to 50).

To identify the most influential countries and mapping the network of collaborations among countries, the dataset was submitted to VOSviewer with the type of analysis as co-authorship, unit of analysis being countries and the counting method set to fractional counting. The minimum number of documents and citations of a country were set to 5 and 5, respectively. Out of 56 countries within the dataset, 18 met these criteria to be included in the network.

ANALYSIS AND VISUALISATION

The scholarly impact of ARCOM

In view of the downloaded dataset, 1505 documents published in ARCOM cited 27924 published studies, and were cited by 1235 documents according to the citation analyses provided by Scopus (by 26th June 2017). Using the citations per publication (CPP) values as suggested by Butler and Visser (2006), ARCOM had a CPP value of 0.82. This CPP value was higher than the average for the associated fields, compared against the overall CPP values for Architecture (0.196) and Engineering (0.09) fields (Butler and Visser 2006). Besides, ARCOM papers were found to have impacts beyond the construction contexts, being cited in various fields according to the subject area provided by Scopus. The fields with the largest number of citations were Engineeniring (923), Business, Management and Accounting (478), Social Science (129), Computer Sceince (127) and Envioemtnal Science (84). Nevertheless, there were citations from Energy (39), Medicince (23), Mathematics (19) and Arts and Humanities (18). These point to the widespread impacts of ARCOM in areas beyond construction management.

Major areas of research

As the result of the co-occurrence network analysis, 72 keywords connected through 1750 links formed the resultant network, which was submitted to Gephi for analysing and visualisation. Generic research terms such as “survey” and “interviews” were removed from the network and similar terms (such as construction safety and safety) were merged. This resulted in a network as illustrated in Figure 1. The average degree values calculated by Gephi were utilised to resize and recolour network nodes based on their degree values as an indication for the level of importance of nodes in network analyses (Cherven 2015). Nodes with a higher degree were demonstrated in larger sizes and brighter colours. The network in Figure 1 is also a distance-based map that shows closeness among nodes with a smaller distance (van Eck and Waltman 2014).

As illustrated in Figure 1, “project management”, “sustainable development”, “health and safety” and “architectural design” have been the most prominent research areas investigated by the studies published in ARCOM. Figure 1 demonstrates the centrality of “project management” as the main area of research in published studies in ARCOM. Project management is in a strong association with a wide range of research areas in the network (such as “knowledge management”), judging from the size of the links connecting the two areas. In essence, a major part of research areas are investigated against the backdrop of project management as illustrated in Figure 1. Several areas nevertheless have remained underrepresented judging from the network (see Figure 1).

Of particular interest are emerging trends in the construction context including “building information modelling”, “information technology”, “innovation”, “collaboration” and “public private partnership”. These were demonstrated as isolated areas with a low value of degree. Likewise, “developing countries” turned out to be an isolated and underresearched field compared against other research areas published in ARCOM. Another interesting finding concerns the lack of association among otherwise tightly-related fields. As an example, no strong link between collaboration and information technology and information management was found. Moreover, the network revealed that very few attempts to address sustainable development problems through innovation and building information modelling have been published in ARCOM as another area in need of attention.

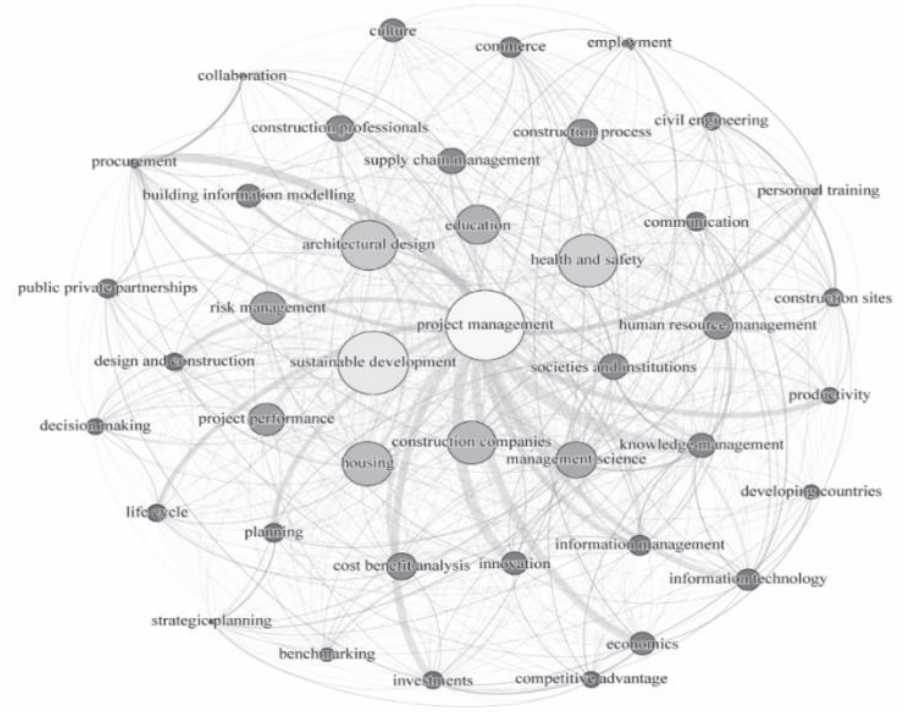

Figure 1: The network of major areas of research published in ARCOM

Overtime development of research areas

To explore the trend of changes in subjects and themes, data for each year were submitted to VOSviewer separately and networks of co-occurrences of keywords were created for each year. The three most prominent keywords for each year were extracted from the networks, as illsutrated in Table 1. Examination of Table 1 shows that the prominent themes have been evolving over time. Topics related to various features of construction management such as productivity, partnering, etc. have been the most prominent prior to 2007. Project management is the most influential theme for published studies in ARCOM after 2007, however sustainability appears to be among the prominent topics betwee 2010 to 2014. BIM turned out to be a promineint area after 2014 and became the most important topic in 2015 and 2016 in ARCOM, in consistency with the overall burst of research studies on BIM in recent years (Yalcinkaya and Singh 2015). The findings show that ARCOM prominent topics evolve in association with appearance of hot topics in the construction industry. Nevertheless, this change is lagging behind the industry. That is, while sustinability emerged as an important topic in construction management around 1994 (Hill and Bowen 1997), the topic becomes prominent in ARCOM in 2010. Likewise, BIM has been a hot topic since 2005, where it is ranked as a prominent topic

from 2014 onward. Given that construction research is supposed to address the concerns of the industry (Schweber 2015), such a delay is seen as a problem, to be addressed by ARCOM policy makers.

Table 1: Change of themes in ARCOM over time

Year	Most prominent themes
2016	Building Information modelling, BIM, Procurement
2015	BIM, Innovation, Sustainability
2014	Risk, Procurement, BIM
2013	Sustainability, Procurement, Project management
2012	Sustainability, Procurement, Supply Chain Management
2011	Procurement, Sustainability, Supply Chain,
2010	Sustainability, Project Management, Knowledge Management
2009	Project Management, Knowledge Management, Communication
2008	Project Management, Education, Health and Safety
2007	Project Management, Risk Management, Safety
2006	Productivity, Construction, Partnering
2005	Innovation, Knowledge Management, Construction

Influential journals

Analysing co-citations is a practical method to extract the most influential outlets in a dataset. With details as discussed, 38 sources connected via 649 links met the threshold to be included in the network. The network was submitted to Gephi for further analysis. To identify the sources with the highest level of influence, the concept of weighted degree was used. That is, the number of connections is a key measure of importance or influence within the network. The weighted degree of a node is based on the number of links, moderated by the weight of each link to indicate the sum of the weight of the links. Weighted degree provides a good proxy for relative importance in a network structure (Cherven, 2015). Table 2 illustrates the ranking of cited journals based on the weighted degree values calculated by Gephi for the constructed network.

As illustrated in Table 2, "*Construction Management and Economics*" stands out as the most prominent outlet influencing ARCOM research with a weighted degree of 913.51. "International Journal of Project Management" (weighted degree 572.23) and "Journal of Construction Engineering and Management" (weighted degree 466.77) were also the outlets with a high weighted degree compared against other outlets included in the network. As such, the literature published in ARCOM is mostly concerned with economy, project management and areas associated with management, as subsets of construction management discipline. This observation is supported in view of the the appearance of journals from the management discipline such as "Academy of Management Review" as well as business-oriented outlets ("Harvard Business Review"). This indicates the increasing attention of investigators who publish in ARCOM to mobilise theories from management-oriented outlets for addressing soft and managerial areas of construction management where technology-related areas and innovative methodologies and applications play a smaller role in ARCOM literature. In fact, the findings indicate that ARCOM has a tendency towards managerial areas of construction management rather than engineering and technology aspects. As illustrated in Table 2, "*Automation in Construction*" as the target of technology-oriented publications played a role in the same level with purely management journals and "*Information Technology in Construction*" was not included in the list with "*Construction Innovation*" being the least important within the network (even below " *Administrative Science Quarterly*").

Table 2: Fifteen top scholarly outlets influencing research in ARCOM (weighted degrees ranking)

Journal	Weighted degree	Rank
Construction Management and Economics	913.51	1
International Journal of Project Management	572.23	2
Journal of Construction Engineering and Management	466.77	3
Automation in Construction	193.51	4
Journal of Management in Engineering	177.43	5
Academy of Management Review	172.39	6
Harvard Business Review	110.77	7
Building and Environment	105.77	8
Strategic Management Journal	103.14	9
Safety Science	101.30	10
Academy of Management Journal	100.86	11
Building Research and Information	97.02	12
Organization Science	94.82	13
Administrative Science Quarterly	91.3831	14
Construction Innovation	82.9328	15

Scientific collaboration networks in ARCOM

Awareness of existing scientific collaboration networks in any field of research facilitates access to funds, specialties and expertise, enhances productivity and assists investigators to reduce isolation. This ultimately benefits scientific collaboration and boosts scholarly communications (Ding, 2011). With this in mind, this section presents an analysis of co-authorship network of investigators within the dataset. The resultant network was submitted to Gephi for visualization and average degree values were utilised to identify the most influential countries within the extracted network as illustrated in Figure 2.

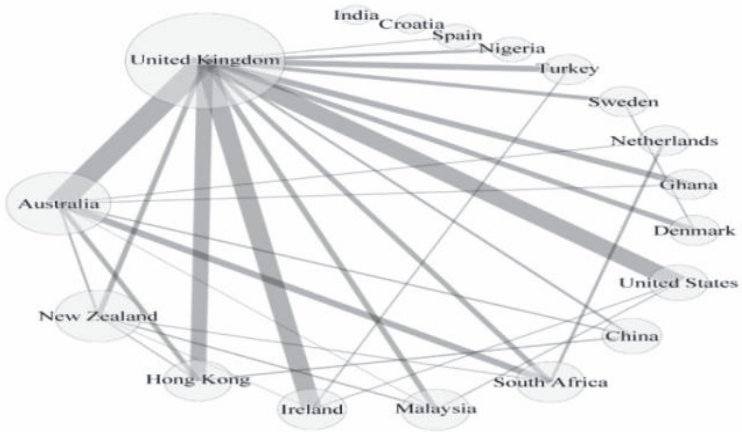

Figure 2: Collaboration network of ARCOM literature among countries

Nodes were resized based on their degree values with larger nodes showing higher average degree values. The network as illustrated in Figure 2 shows that the UK stands out as the most influential country within the collaboration network for publishing in ARCOM. Interestingly, the US and China were not found to be prominent players in the network. Australia and New Zealand researchers turned out to be influential in ARCOM where the strongest links of collaboration were formed by the UK and Australia, the UK and Hong Kong, the UK and Ireland and the UK with the US corroborating the central role of UK investigators as the driving force behind published studies in ARCOM. The findings reveal the low influence of North American investigators in ARCOM in view of Canada being absent from the network and the US showing low influence. Besides, large and emerging construction markets such as China, India and the Middle East had a limited role in forming the body of knowledge produced by ARCOM. The same case was

observed for developing countries from which very few were in the network albeit with a small role.

DISCUSSIONS AND RECOMMENDATIONS

The study stands out as the first of its kind, presenting a broad picture of the landscape of research published in ARCOM. The findings have three main implications for policymaking and directing ARCOM in the years to come. First, findings demonstrate that developing countries, particularly countries with an emerging construction industry and of largest size of construction market have been underrepresented in ARCOM. The case for China, India, the Middle East, etc. should be of particular interest given the size of these markets in the future of the construction industry (Wang 2014). ARCOM aims at enhancing construction management research (Raiden and Smith 2015). This calls for devising plans by ARCOM policy makers to attract investigators from aforementioned areas. One remedial solution might be incentives in form of discounted registration rates for investigators from developing countries as well as defining conference themes to promote conducting research on emerging construction markets. Location of the venue is another important factor affecting delegates in attending a conference (Severt *et al*., 2007). Therefore, defining venues outside the UK in future ARCOM annual conferences might be another approach to value contributions from delegates currently underrepresented in ARCOM.

Second, the findings provide evidence showing that research studies published in ARCOM have been mostly driven by or contribute to managerial areas of construction management. More so, the current published studies have been predominantly addressed various problems through the lenses of project management. The findings are in line with statements by Raiden (2015), who argued that project management draws a large number of submissions to ARCOM. Yet, building information modelling was not found to be a dominant area of ARCOM prior to 2014, in contradiction with anecdotal arguments (Raiden 2015). Similarly, sustainability has become a prominent areas for ARCOM with several years of delay. ARCOM policy makers have to deal with the problem of delay in addressing the concerns of the industry through aligning ARCOM priorities with present-day hot topics within the industry, a remedial solution to resolve the issue of delay as came to light by the findings of the study. The flow of information has been from few journals from construction management discipline alongside prominent management and business scholarly outlets. Publishing selected papers from ARCOM (the 29th and 30th conferences) in Construction Management and Economics indicative of the long-lasting association between ARCOM and such outlets (Raiden and Smith 2015; Smith 2014). This might also be a reason behind the profound influence of Construction Management and Economics in ARCOM as discussed. Technology and outlets focused on innovative methods in the construction context have not been influential sources of information for studies published in ARCOM. To provide advice for industry practitioners with regard to current problems facing the industry, however there is a need for greater focus on technological innovations and emerging trends within the industry. This proves a need for extra attention to studies pursuing technological innovation with theories borrowed and imported from the literature outside the boundaries of project management and management-focused areas.Third and finally for future ARCOM research agenda, the findings demonstrate the need for promoting studies that integrate several research areas to address problems. For example, integrating sustainability with innovation to solve problems or enhancing collaboration through information technology as future themes for ARCOM might be beneficial. Interaction with other disciplines, borrowing external theories and combining various methodological perspectives provides construction

management community with an expansive outlook (Raiden and Smith 2015) as an area calling for attention in view of the findings of the study.

CONCLUSIONS

The findings as reported in this paper have been drawn from 1505 studies indexed in Scopus and the networks of studies associated with them through citations. A number of scientometric analysis techniques were used to highlight and analyse the intellectual discourse from the proceedings of the ARCOM published between 2005 and 2016. Based on the scientometric analysis techniques, this study constructed the network of major areas of research published in ARCOM (see Figure 1). From the analysis, the most prominent areas of research were: (i) Project management; (ii) Sustainable development; (iii) health and safety; and (iv) architectural design. Secondly, "developing countries" were an isolated and under researched field. In contrast, the UK emerged as the most influential country based on collaborations (see Figure 2).

The results of this study are expected to enhance the level of understanding about state-of-the-art of ARCOM as a scholarly outlet in construction management. Furthermore, the discussions put forward provide directions for future developments and collaborations in the field through exposing overlooked areas, existing links with influential outlets and delegations and countries involved in ARCOM. However, this study has a number of limitations that can be addressed in future research. The analysis only covers the literature retrieved from Scopus as published during 2005 to 2016, thus does not fully reflect the entire available corpus of literature produced by ARCOM. Furthermore, the analysis is based on the citation dataset provided by Scopus and hence, the findings are affected by the limitations of Scopus in terms of coverage. Further research hence is required to address the limitations as acknowledged using various datasets. Even more, focusing on the gaps, problems and providing remedial solutions to address these drawbacks with ARCOM are fertile grounds for future investigations. Secondly, conducting cross sectional studies based on methods similar to that of the present study is beneficial in terms of continuous assessment of developments and directions of ARCOM. Finally, there is a further need for investigating the impact of funding priorities, government reforms and restructure of the institutional landscape that sponsors activity around the construction industry. More so, these could be extended by exploring whether the reforms in higher education all contribute to changing emphases over time. In order to enhance and facilitate further discussion of developments in other more mainstream disciplines and fields, it is recommended to use more rigorous science mapping tools such as CiteSpace. Whilst this approach was beyond the scope this study, it would nevertheless provide the opportunity of the creation of a network including ARCOM and other disciplines.

REFERENCES

ARCOM (2017) *The History of ARCOM*. Available from http://www.arcom.ac.uk [Accessed 2nd March 2017].

Birnie, J (2000) Assessing the extent of construction management research in the UK by means of the RAE and the ARCOM and COBRA conferences. *In*: Akintoye, A (Ed.) *Proceedings of the 16th Annual ARCOM Conference,* 6-8 September 2000, Glasgow, UK. Association of Researchers in Construction Management, Vol. 1, 3-10.

Butler, L and Visser, M S (2006) Extending citation analysis to non-source items. *Scientometrics*, **66**(2), 327-343.

Cherven, K A (2015) *Mastering Gephi network visualization : Produce advanced network graphs in Gephi and gain valuable insights into your network datasets*. Birmingham: UK Packt Publishing.

Cobo, M J, López-Herrera, A G, Herrera-Viedma, E and Herrera, F (2011) Science mapping software tools: Review, analysis, and cooperative study among tools. *Journal of the American Society for Information Science and Technology*, **62**(7), 1382-1402.

Dainty, A (2008) Methodological pluralism in construction management research. *In*: A Knight and L Ruddock (Eds.) *Advanced research methods in the built environment*. London: Wiley Blackwell, 1-13.

Ding, Y (2011) Scientific collaboration and endorsement: Network analysis of co authorship and citation networks. *Journal of Informetrics*, 5(1), 187203.

He, Q, Wang, G, Luo, L, Shi, Q, Xie, J and Meng, X (2016) Mapping the managerial areas of Building Information Modeling (BIM) using scientometric analysis. *International Journal of Project Management*, **35**(4), 670-685.

Hill, R C and Bowen, P A (1997) Sustainable construction: principles and a framework for attainment. *Construction Management and Economics*, **15**(3), 223-239.

Lu, W, Fung, A, Peng, Y, Liang, C and Rowlinson, S (2014) Cost-benefit analysis of Building Information Modeling implementation in building projects through demystification of time-effort distribution curves. *Building and Environment*, **82**, 317-327.

Newton, S (2016) The being of construction management expertise. *Construction Management and Economics*, **34**(7-8), 458-470.

Raiden, A (2015) 30th Annual ARCOM Conference: A reflection from the Chair, *ARCOM Newsletter*. Available from http://www.arcom.ac.uk [Accessed 17th March 2017].

Raiden, A and Smith, S (2015) Conference issue: 30th Annual ARCOM Conference. *Construction Management and Economics*, **33**(5-6), 329-333.

Severt, D, Wang, Y, Chen, P-J and Breiter, D (2007) Examining the motivation, perceived performance, and behavioral intentions of convention attendees: Evidence from a regional conference. *Tourism Management*, **28**(2), 399-408.

Schweber, L (2015) Putting theory to work: The use of theory in construction research. *Construction Management and Economics*, **33**(10), 840-860.

Smith, S D (2014) Conference Issue: ARCOM 29th Annual Conference. *Construction Management and Economics*, **32**(7-8), 653-657.

van Eck, N J and Waltman, L (2014) Visualizing Bibliometric Networks. *In*: Y Ding, R Rousseau, and D Wolfram (Eds.) *Measuring Scholarly Impact: Methods and Practice*. Cham, Switzerland: Springer International Publishing, 285-320.

Wang, N (2014) The role of the construction industry in China's sustainable urban development. *Habitat Internationa*l, **44**, 442-450.

Yalcinkaya, M and Singh, V (2015) Patterns and trends in Building Information Modeling (BIM) research: A Latent Semantic Analysis. *Automation in Construction*, **59**, 68-80.