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Preparing the Ground and Reviewing the Literature

Chapter 3 Reviewing the Literature

The literature review is an essential stage in conducting a research project and amounts, on average, to between 20 and 25 per cent of a dissertation content, although certain dissertation subjects may require a literature review amounting to up to 50 per cent of the content. The literature review involves reading and appraising what other people have written about your subject area. It can be both descriptive and analytical. It is descriptive in that it describes the work of previous writers and it is analytical in that it critically analyses the contribution of others with a view to identifying similarities and contradictions made by previous writers.

There are seven main activities involved in undertaking a literature review:

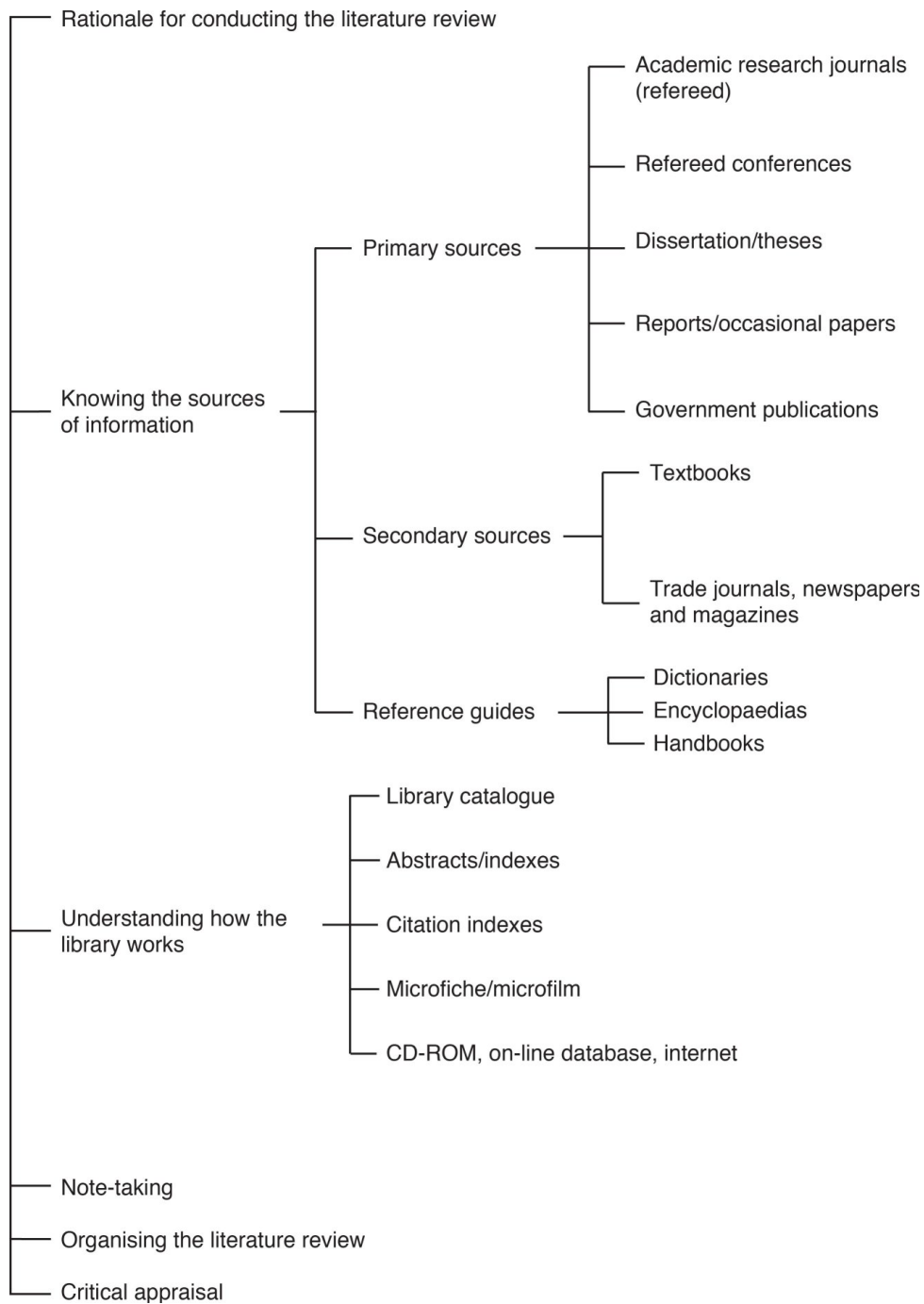
1. knowing the sources of information;
2. understanding how the library works;
3. knowing the search engines related to your discipline;
4. collecting existing knowledge on the subject and systematically organising the literature;
5. reading and note-taking;
6. designing the contextual framework for the literature
7. appraising and writing up the literature review.

This chapter focuses on discussing the above seven activities. The contents of Chapter 3 are illustrated in Figure 3.1.

Figure 3.1

Contents of Chapter 3.

fig3_1



Rationale for Undertaking a Literature Review

In order to be able to make an original contribution to knowledge in your research area, the literature review should demonstrate that you have a comprehensive grasp of existing knowledge. The literature review serves two purposes. First, it seeks systematic reading of previously published and unpublished information relating to your area of investigation. The gathered information will develop issues and themes and should drive you to the next important stage, namely research design. Second, the literature review will help you to improve your research study by looking into previous research design or questionnaires, which will give you some insights into how you can design your own study more effectively. The authors of past dissertations, theses and published journal articles gave their research work a great deal of thought, and you can frequently benefit from their thinking when conducting your literature search. In other words, a literature review attempts to integrate what others have done and said, to criticise previous scholarly works, to build bridges between related topic areas and/or to identify the central issues in a field. The following sections describe the activities involved in undertaking the literature review.

1. Knowing the Sources of Information

Starting the literature review process involves the identification of appropriate literature. Generally speaking, there are three types of literature sources available for you to look at. These are primary sources, secondary sources and reference guides.

Primary Literature Sources

Primary literature is the most accurate source of information as it publishes original research. The following publications fall within these primary sources.

Academic Research Journals (Refereed)

Refereed journals related to construction publish original research work and technical papers, which usually report innovative developments in the built environment field such as architecture, town planning, urban planning, civil engineering, construction and estate management. By publishing papers from both industry and academia, refereed journals provide an excellent source for discussing recent developments in your field.

Below is a list of refereed journals related to Construction (Architecture, Construction, Project Management, Quantity Surveying, Building Surveying, Commercial management and Facility Management)

- Journal of Construction Engineering and Management (ASCE)
- Journal of Professional Issues in Engineering (ASCE)
- Journal of Management of Engineering (ASCE)
- Construction Management and Economics
- Construction Economics and Building
- Engineering, Construction and Architectural Management
- International Journal of Project Management
- Journal of Performance of Constructed Facilities
- Journal of Management Procurement and Law
- International Construction Law Review

- International Journal of Law in the Built Environment
- International Journal of Architectural Computing
- Journal of Architectural Engineering
- International Journal of Construction Education and Research
- Facilities
- Construction Repairs
- Architectural Engineering and Design Management
- Journal of Cost Analysis and Management
- Economic Journal
- International Journal for Construction Marketing
- Journal of Construction in Developing Countries
- International Journal of Construction Management
- International Journal for Managing Projects in Business
- International Journal of Productivity and Performance Management
- Journal of Architecture
- Journal of Architectural Conservation
- Journal of Production Planning & Control, The Management of Operations
- Constructing Technology
- International Journal of Construction Education and Research
- Journal of Engineering, Design and Technology
- Smart and Sustainable Built Environment
- Building Research & Information
- Australasian Journal of Construction Economics and Building

👉 also see list of journals in the field of construction management in Farrell et al (2017, P47).

Refereed Journals related to Property, Estate, Urban and Town Planning

- International Journal of Urban and Regional Research
- Built Environment Project and Asset Management
- Journal of Urban Planning and Development
- Urban Studies
- URBAN DESIGN Journal
- International Journal of Strategic Property Management
- Journal of Property Research
- Journal of Property valuation and Investment
- Property Management
- Journal of Real Estate Literature
- Journal of Corporate Real Estate

Other Refereed Journals (mixed disciplines)

- Building and Environment
- Building Research and Information
- Construction Innovation: Information, Process, Management
- Architectural Engineering and Design Management
- International Journal of Environmental Research & Public Health
- Journal of Engineering, Design and Technology
- Journal of Asian Architecture and Building Engineering

- Int. Journal of Disaster Resilience in the Built Environment
- Journal of Housing and the Built Environment
- Journal of Property Investment and Finance
- International Journal of Sustainable Engineering
- Journal of Finance Management of Property and Construction
- Journal of Environmental Engineering
- Intelligent Buildings International
- Journal of Information Technology in Construction
- Structural Safety
- Building Research and Information
- Construction and Building Materials
- Journal of Composites for Construction
- International Journal of Civil, Structural, Construction and Arch. Eng.
- Journal of Structural and Construction Engineering
- Energy and Buildings
- Resources, Conservation and Recycling

Refereed Journals related to Civil Engineering

- Journal of Computing in Civil Engineering (ASCE)
- International Journal of Impact Engineering
- Structures
- Journal of Structural Engineering
- Cement and Concrete Research
- Structural Concrete

- Composite Structures
- Journal of Constructional Steel Research
- Journal of Structural Engineering
- Computers and Structures
- Soils and Foundations
- Automation in Construction
- Journal of Materials in Civil Engineering
- Journal of Bridge Engineering
- Research in Engineering Design
- Journal of Environmental Engineering and Science
- Construction and Building Materials

👉 also see list of journals in the field of civil engineering in Farrell et al (2017, P46).

👉 also visit <http://www.icevirtuallibrary.com/> for more list of journals

Refereed Conferences

The term 'conference' also applies to symposiums and congresses. In many fields, conference proceedings can be a main source of information and the main aim of these conferences is similar to that of academic journals (i.e. discussing current developments in your field of study). Papers published in proceedings contain a collection of themes such as mega projects, developing countries projects, productivity, design, procurement, economics, law, technology, sociology, psychology, organisation, management and many more. The majority of international conference papers are based on 'primary' research and are accepted for publication after they have been refereed by at least two members of the paper review committee. Therefore, the quality of some conference papers can be as good as refereed journal articles. The British Library Lending Division publishes an 'Index' of conference proceedings.

Below is a list of some international conference proceedings related to the Built Environment:

- Organisation and Management of Construction Symposium (known as CIB W65)
- Procurement Systems Symposium (CIB W92)
- Building Economics and Construction Management (CIB W90)
- Economic Management of Innovation
- Congress on Computing in Civil Engineering (organised by the ASCE)
- The Design and Environment Conference

- International Conference on Computers in Urban Planning and Management
- Association of Researchers in Construction Management (ARCOM)
- Information Technology in Civil and Structural Engineering Design
- International Congress on Construction
- Automation and Robotics in Construction
- International Cost Engineering Council Symposium
- Financial Management of Property and Construction

Below is a list of some international conference proceedings related to Civil Engineering:

- *International conference on Civil Engineering and Materials Science*
- Internal Conference on Concrete Engineering and Technology
- International Conference on Sustainable Civil Engineering Structures and Construction Materials
- International Conference on Sustainable Civil Engineering and Environment

Dissertations/theses

It is most important for undergraduate, postgraduate and higher degree students to look at other people's dissertations or theses, where appropriate. Dissertations and theses serve two purposes. First, they enable you to have an idea about the content of the work, the standard expected, the methodology adopted and the structure and style of writing-up. Second, you can benefit from the list of references and bibliography that are attached at the back of the work.

Most libraries have an on-site dissertation and thesis collection as well as a borrowing service through inter-library loans. Students registered for higher degrees can obtain a list of theses from the British Library Lending Division (BLLD). Another option for finding out about other theses is to contact academic institutions requesting a list of accepted dissertations or theses. The contact is usually made through the departmental secretary or the academic thesis supervisor. Once you have identified what you want, your library should do the rest by borrowing the material through the inter-library loan service. A dissertation or a thesis may take 4–6 weeks to arrive and overseas PhD theses may take longer.

Reports/occasional Papers

Technical reports and occasional papers can be of great use to you because they are comprehensive and often publish up-to-date information. Moreover, occasional papers and reports of certain research groups are sufficiently prestigious for the researchers concerned to favour them as a method of disseminating their results (Sharp et al, 2016).

Below is a list of institutions that disseminate such reports and occasional papers relating to Built Environment:

- Chartered Institute of Building (CIOB)
- Royal Institute of Chartered Surveyors (RICS)
- Royal Institute of British Architects (RIBA)
- Building Research Establishment (BRE)
- Construction Industry Research and Information Association (CIRIA)

Below is a list of institutions that disseminate such reports and occasional papers relating to Civil Engineering:

- Institution of Civil Engineering
- Institution of Structural Engineers
- Institution of Highways and Transportation
- Institute of Water and Environmental Management

Below is a list of institutions that disseminate such reports and occasional papers relating to Property, Estate, Urban and Town Planning:

- Royal Town Planning Institute
- Institute of Real Estate Management

Government Publications

Government publications are one of the largest and most important sources of information, especially for those students analysing secondary data. Government documents may be classified as (a) government administration records and (b) research records for specialists, including a considerable number of statistics and data of value to science and business.

Finding your way around government publications can sometimes be complicated and confusing. This is because of the sheer volume of information published under the category of government documents and because they are often placed outside the normal subject index system. For instance, most people ask for government documents by their popular name and not by their official name (the Latham Report instead of Constructing the Team, or the Egan Report instead of Rethinking Construction, or the Tavistock Report instead of Communication in the Construction Industry, and so on). Therefore, the best way to get around this problem is to ask for the monthly list or catalogue of yearly government publications of the UK, USA or elsewhere. For example, in the UK you should be asking for the monthly lists of materials published by the HMSO or the catalogue of British Official Publications not published by the HMSO (Sharp et al, 2016).

Secondary Literature Sources

Secondary literature sources are those that cite from primary sources such as textbooks and newspaper articles.

Textbooks (hard copy)

Most research is initially based on information from books which the researcher has either come across at the proposal stage or found in a dissertation/thesis bibliography. Textbooks are much easier to trace and obtain than other references. However, one significant difference between books and journals is that research work published in a journal is more recent. It takes less time to have a paper published in a journal than it takes to publish a book. A second difference is that journals contain a range of articles, whereas books often deal with a particular issue. In the initial reading phase involving books, more can be gained from reading edited collections as they are likely to contain a wide range of perspectives on a particular subject.

E-Books

A growing number of key textbooks are available online on the database of your university Library.

Note to students: see the best route into the database via the Electronic Resources link of your university.

Trade Journals, Newspapers and Magazines

These are mass media sources of information which often summarise research or provide views on a particular subject. It is very useful to refer to these sources at the start of your dissertation. Students often become interested in a particular topic as a result of reading an article in a newspaper, magazine or trade journal.

Below are some mass media sources that are related to the Built Environment:

- Contract Journals
- Building Magazine

- Architects Journal
- Construction News

Below are two mass media sources that are related to Civil Engineering:

- New Civil Engineers magazine
- Construction and Civil Engineers magazine

Below are two mass media sources that are related to *Property, Estate, Urban and Town Planning*

- *The Planner*
- *Planning and Urban Design*

However, caution should be taken in reporting the findings of mass media sources. Such sources are usually non-refereed and may easily distort or exaggerate scientific claims. Remember that most refereed journals' editorial boards practise peer review for the purpose of ensuring high-quality reporting.

Reference Guides

Reference guides are very useful sources of information for short and quick answers to basic questions. The function of the reference guides is to introduce the basic information about a particular subject area. Sources that fall within these guides are dictionaries, glossaries, encyclopaedias and handbooks.

Dictionaries and Glossaries

These provide a definition of terms and can be useful in helping you clarify your thoughts. Some of the preferred dictionaries are:

- The Concise Oxford Dictionary
- Webster's Third New International Dictionary of English Language
- The Random House Dictionary of English Language

Other specialised dictionaries are Kister's Dictionary Buying Guide, the Penguin Dictionary of Sociology and Dictionary of Social Behaviour and Social Research Method

Encyclopaedias

These give a concise description of the main aspects of a topic. The most up-to-date and authoritative English encyclopaedia is the New Encyclopaedia Britannica. Because encyclopaedias can go out of date fairly quickly, most scientific disciplines encourage and support a variety of specialised handbooks.

Handbooks

The function of handbooks is similar to that of encyclopaedias, except that they are more current. Handbooks, however, have limitations in that they are written by and for other scholars with similar interests and vocabularies (Smith, 1991, p. 46). These usually assume that the user understands the methods and logic of particular disciplines, and they may not have subject indexes.

2. Understanding How the Library Works

Having identified the sources of information, the next step that you need to take is to know how to find the material. It is absolutely vital that you understand the library and how to use its sources most effectively. Bell (2014) lists three important points that you need to bear in mind while conducting a literature research:

- 1 Find the most relevant published materials quickly.
- 2 Avoid getting 'bogged down'.
- 3 Get into the habit of recording information derived from your reading so that it can be easily found and understood weeks, months or years later.

Therefore, you may have to spend a few days getting to know the services offered by your library, what materials it holds and where, as well as the coding or shelving system it uses (usually the Dewey decimal system). Each library should contain the following:

- Library catalogue
- Abstracts/indexes
- Citation indexes

Library Catalogue

This lists all the material which the library has in stock including books journal titles, videos, and so on. Around the late 1980s, most academic libraries had replaced card catalogues with computer-based catalogues. However, they both register the same details. Typical computer-screen information displays record the location of book, title of book, author's name, number of pages, year of publication and library code number. Magazines, journals and newspapers are catalogued in the same way as the books but include detailed information about which issues/ volumes the library holds. Issues/volumes of journals that are not held in the library have to have a special reference to inform the user of the closest library which holds that particular journal volume.

Indexes and Abstracts

Indexes and abstracts can help you to trace articles in journals. They both give the title, author and issue/volume details, but abstracts also include a short summary, often fewer than 200 words, of the article. An abstract gives you information about the problem and the survey findings. Indexes and abstracts provide not only a short-cut means of access to information, since they curtail endless random searching through periodical titles on the shelves, but also a large number of references which would not be found by such a haphazard method (Haywood and Wragg, 1982). Most abstracting services classify articles in accordance with the subject they cover. The natural way to start your search on a particular subject is, first, to look at the journal abstract/index. Second, study the abstract and find out whether the article is likely to be worth reading or is merely duplicating material already studied. Third, if it is worth reading, you then start searching the volume you need in order to locate the pages of the article in that volume.

Example from ARCOM

It is strongly recommended to visit the following link from the ARCOM website (Association of Researchers in Construction Management):

☞ **visit <http://www.arcom.ac.uk/abstracts-search.php>**

This website address states the following:

“One of our most important publications is the CM Abstracts and Indexes. This contains the full titles, authors, abstracts and keywords of articles from several leading Construction Management journals, from recent ARCOM Conference Proceedings, and from PhD theses.”

Enter one or more words into any of the boxes below.

You may enter a phrase (several words) to search for an exact match.

Use + to separate two or more search terms.

Paper title:

Author:

Keyword:

Searches keywords and abstract text

☞ **Find out more in : <http://www.arcom.ac.uk/abstracts-search.php> or simply type ARCOM abstract in Google Search.**

Citation Index

Citation indexing reports alphabetical lists by author of papers cited in published articles. This source of indexing provides standard bibliographic information on individual articles written in a particular time period. Their permuted subject index classifies each of these articles by significant words used in each article's title, and the citation index lists by author or by referenced articles.

Citation indexing is important because it graphically depicts scientific networks by quantifying who cites whom (Smith, 1991). Almost all scientific articles or reports published at any time and cited during a particular year will have an accompanying bibliographic list of authors, books, articles, reports and the like which cite the article or author. The researcher may then create a snowball sample of citations in a particular area by looking up each new list of citations. For example, if you know that Professor X is an expert on leadership, you could look up his/her name in the Social Science Citation Index to start tracing a collegial network of experts.

👉 **Find out more about ‘sources of written information’ in Thomas, G. (2017, P60-61)**

3. Knowing the search engines related to Built Environment

In addition to Indexes and abstracts, all universities’ libraries and Learning Resources provide access to a range of resources to help you with your studies. “Summon” is one of the most common search engines in built environment that provides fast, simple access to relevant, scholarly material, the type of information academics are expecting to see in your dissertation. “Summon” searches across your university Library Catalogue, E-journals and E-books and so is an excellent way to start your search for information.

Electronic Resources

All libraries subscribe to a number of online databases providing a wide range of different types of information. These can be accessed via the “Electronic Services”

link on your university Library. For example, below are the databases which are most relevant to the Built Environment at the University of West London.

- **ABI/Inform Global** - Full text articles mainly relating to business but also including property, construction and planning journals.
- **British Standards Online** - includes the full-text of British, European and international Standards.
- **Construction Information Service** - provides information, regulations, legislation, standards, and guidance material (including BRE publications).
- **DCP (Development Control Practice) Online**— A comprehensive reference on planning: best practice, legislation, with expert analysis of how this is applied.
- **Digimap** - mapping service delivering maps and data from the Ordnance Survey. Also includes Historic Digimap.
- **Estates Gazette Interactive (EGi)** - UK news, research and information service for the commercial property market.
- **ICONDA** - contains summaries (and some full text) of journal articles on building, construction etc.
- **Lexis Library**—Law reports and full text articles, includes *Butterworths Property Law Service Bulletin*
- **InfoTrac** - full text access to 400 journals, covering a wide range of subjects.
- **Nexis UK** - full text of regional, national and international newspapers

- **RICS Red Book online** - RICS Red Book, Surveyors' Construction Handbook, Guidance Notes, Information Papers and Practice Statements plus case law database.
- **RUDI** (The Resource for Urban Design Information)- Multimedia resource for teaching, research, and professional activity in urban design and its related disciplines
- **Science Direct**—Full text articles on scientific, technical and environmental issues
- **Social Sciences Citation Index** (part of Web of Science) - contains bibliographic citations of articles in the social sciences
- **SwetsWise** - full text articles, including many on property, construction and planning.
- **Westlaw** includes legal journals, statutes, a case locator service and law report—includes *The Encyclopedia of Planning Law and Practice* and Woodfall's *Landlord and Tenant*

4. Collecting existing knowledge on the subject, systematically organising and summarizing the literature;

It is absolutely essential to start, from day one of your research, to maintain a literature file to store the material that you collect. If it is a 4-month dissertation, one large file will probably be enough to store all the information you gather. However, whether it is a dissertation, a thesis or a research project, the principle of structuring the literature file is the same:

1 Subdivide your file into a number of topical areas. For example, suppose you are investigating the use of procurement method for construction projects. In this case, subdivide your manila file into a number of sections. You may create a section on definition and types of procurement methods, another section on previous research that investigated the factors that determine the selection of the appropriate procurement methods for the project, another on previous decision making charts and so on.

2 In each of these sections you will include all the literature review that falls under the relevant topic area together with your summary note-taking literature review (see Table 3 .1). Such file(s) will later help you to:

- a Suggest hunches and possible research design to test these hunches.
- b Intellectually argue the acceptance or refutation of various authors' arguments.
- c Define key concepts and derive into logical relationships between these key concepts.
- d Write your literature review chapters. After all, your literature chapters will contain the same topic areas as in your file(s).

3 Create an index sheet at the front of the file. This sheet will provide you with a list of all the articles, book chapters and so on that are included in the file. Each piece of literature needs to have a separate code, which will be the same code as in the index sheet. The purpose of this exercise is to provide you with a clear view of what you have covered and where.

Insert Table 3.1 here - Example of a summary literature review ...

Table – 3.1 Example of a summary-note-taking of literature review

Note to students - This table can be inserted either in the introduction chapter or at the begging of the relevant literature chapter or in the Appendix.

*Year, *Publisher; *Volume No; *Issue No. (for articles)	Author/s	Title of Article, book, report etc.	Purpose – This could be the aim of the research, the purpose or the main question.	Research Methodology	Main Findings or conclusions (can be extracted from the ABSTRACT).
2016 (IJMPB) Vol. 3 Issue 5	Naoum., S & Egbu, c.	Modern selection criteria for procurement methods in construction. A state-of-the- art literature review and a survey.	The aim is to develop an up-to- date multi-attribute procurement decision-making chart for selecting the appropriate method for the project.	Literature and a survey of 57 construction professionals.	Modern initiatives such as sustainability, lifecycle costing, standardisation are being integrated with procurement. The selection depends on the nature of the issues or problem at hand. Decision making is not a punctual act. It is often a complex process. Effective decision making also demands quality and timely information, and a careful consideration of alternatives. A multi-attribute decision- making chart is presented.
2014 JMIE (ASCE) Vol. 31 Issue 3	Ruparathna, R. and Hewage, K.	Review of Contemporary Construction Procurement Practices.	Reviews traditional and emerging procurement methods, revising strengths and weaknesses of procurement methods.	Literature Review.	Modern initiatives such as sustainability, lifecycle costing, standardisation can be integrated with procurement.
2014 J. Construction Innovation Vol. 15 Issue 1	Van Duren et al	Perceptions of success in performance- based procurement: Differences between clients and contractors	The purpose of this study is to analyse, from the perspective of agency theory, differences between client and contractor in their perceptions of changes in uncertainty and in inclination to opportunistic behaviour while using a performance-based procurement procedure.	Through a survey, the perceived effects of the Performance Information Procurement System (PiPS) safeguards for both clients and contractors were investigated.	Both clients and contractors believe that applying PiPS introduces safeguards that reduce transaction uncertainty. The perceived changes in the discouragement to use opportunistic behaviour when using PiPS differ between client and contractor. Clients do not know and contractors are sceptical as to whether applying PiPS discourages opportunistic behaviour. This difference in perceptions can be explained by the often- traditional background of the two parties' project teams and the existence of information asymmetry.
2013 J. Construction Innovation. Vol. 13 Issue 4	Sebastian et al	Performance- based procurement for low- disturbance bridge construction projects	This paper aims to introduce a method of performance- based procurement, based on the most economically advantageous tender (MEAT), for low- disturbance bridge construction	Review of KPI for projects vs procurement method with further case study of 2 projects	The research findings demonstrate the possible inclusion of the KPIs of low- disturbance construction into the MEAT criteria. The MEAT principles can then be used in combination with either a traditional or an integrated procurement strategy.

			projects in urban environment.		
2013 ECAM Vol. 20 Issue 6	Weisheng, L., Liu, A., and Hongdi, W.	Procurement innovation for public construction projects: A study of agent-construction system and public-private partnership in China.	The purpose of this paper is to attempt to shed light on procurement innovation by examining two state-of-the-art procurement systems in China – an agent-construction system (ACS or in Chinese <i>Dai Jian Zhi</i>) and public-private partnership (PPP), with special consideration given to the (PESTEL).	The paper does so by using content analyses, semi-structured interviews, and a “PESTEL-Procurement Innovation” framework.	It is found that PPP has not been as popular as expected, while the ACS, which is little known to the international construction management community, is widespread in China. The study of ACS and PPP further reveals that congruence between a procurement system and its external PESTEL conditions is essential for procurement innovation.
2012 CEM (ASCE) Vol. 138 Issue 3	Love et al	Participatory Action Research approach to Public Sector Procurement Selection	Appropriate procurement selection reduces costs by 5%. Lots so procurement methods but not always suitable for public Sector needs	A robust procurement selection process is developed and examined using a participatory action research. Focus groups, comprised of key stakeholders involved with delivering an educational project, examined the approach’s applicability and use in determining a suitable method	Application of the approach presented in this paper, by the public sector agency responsible for delivering its social infrastructure projects, provides a clear indication of demonstrable impact. The procurement approach that is produced enables decision makers to constantly reevaluate outcomes in the form of recommendations that are grounded in practice, reflection, and detailed evaluation.
2011 IJPM	Eriksson, P. & Westerberg.. M.	Effects of Cooperative procurement procedures on construction project performance: A conceptual Framework	To develop a testable holistic procurement framework that examines how a broad range of procurement related factors affects project performance criteria	Based on a comprehensive literature review.	Cooperative procurement procedures (joint specification, selected tendering, soft parameters in bid evaluation, joint subcontractor selection, incentive-based payment, collaborative tools, and contractor self-control) generally have a positive influence on project performance (cost, time, quality, environmental impact, work environment, and innovation).
2008 IJMPB Vol. 2 Issue 3	Adekunle, S. Dickenson, M. Khalfan, M. McDermott, P. Rowlinson, S.	Construction project procurement routes: an in - depth critique	The purpose of this paper is to examine different categories of building project procurement routes based on organisational, contractual, financial and technical issues.	The paper is based on review of literature and conditions of contracts. The UK construction industry serves as a general frame of reference. The Royal Institution of Chartered Surveyors survey of <i>Contracts in</i>	Traditional routes remain the main type of procurement route for the construction project industry sector, within which different management and incentivisation systems are applied for greater efficiency. The conditions of contracts in the UK support this assertion by aligning different procurement routes to different conditions of

				Use from 1985 to 2004 is used to probe the value of contracts along different methods and different conditions of contracts in the UK.	contracts and additionally specifying different forms of agreements, special provisions and incentivisation in order to increase performance, reduce risks and improve compensation methods.
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Using software tools to organize the literature


There are free software tools available like ‘Zotero or Endnote’ to organise all necessary literatures for your research work which can allow you to manage and evaluate large amount of listed references. For example, Zotero is a free, easy-to-use, open-source tool to help you collect, organize, cite, and share your research sources. The Zotero Connector automatically senses content as you browse the web and allows you to save it to Zotero with a single click.


👉 To find out more about ‘how to use Zotero step by step’, Visit <https://libguides.uwlax.edu/c.php?g=274023&p=1829224> or simple type Zotero in Google Search.

👉 To find out more about ‘using software to help with references’, see section 3.11 in Farrell, et al (2017, pp60-62)

5. Reading and Note-Taking

After collecting and organizing the relevant material to your studies, you should then start making notes of what you have read. “Making notes should *not* be simply a shorthand *copy* of the original text. They should be an attempt to pick out the ‘bone’ of the text – or more specifically those points in the text which are relevant to your studies.” (Northedge, 1997)

 Find out more about ‘how to make notes’ in the Good Study Guide by the Open University Team led by Andrew Northedge (1997, P40-51)

 Find out more about ‘how to make diagrammatic notes’ in the Essential Study Skills – The complete guide to success at university by Tom Burns & Sandra Sinfield (2006, P79, 81, 127,138).

6. Designing the contextual framework of the literature

While collecting the relevant literature material, you should be in a position to design the ‘contextual’ framework of the literature. This framework provides a visual picture of previous research that has been conducted in your area of investigation. It also shows links between the issues / topic / subjects / chapters that you wish to include in your literature review and dissertation. This will help you organize your ideas for the ease of structuring and writing your literature chapters. The contextual framework will also help you design your questionnaire later. In short, it puts the sections of your literature review and chapters into ‘context’ like the one that is shown in Figure 3.2. In this example, the researcher identified 8 main subjects from the literature review that would determine the selection of the most suitable procurement method for a project.

Note to students: The contextual framework of the literature should tie with the summary-note-taking table shown in Table 3.1, as well as, with the reference list of your dissertation.

Figure 3.2 – Example of designing the contextual framework of the literature

Insert Figure 3.2 here

Note to students – The example in figure 3.2 can be inserted either in the introduction chapter or at the beginning of the relevant literature chapter or in the Appendix.

If your research involves testing a theory, then the contextual framework of the literature should help you develop your ‘theoretical framework’ that shows a more ‘focused and testable’ relationships with a set of hypotheses. The theoretical framework provides an analytical approach into the cause and effect relationship among the specific variables/factors. It outlines the independent, moderating and dependant variables of the your theoretical investigation (i.e. the research paradigm). (see chapter 4 – building the theoretical framework step-by-step).

In summary, below is the sequence of developing these two frameworks (i.e. the contextual framework of literature and the theoretical framework) and where do they fit within the overall research process:

Step 1. Initial reading leads to selecting your topic and establishing the research goals.

Step 2. Afterwards, you write your proposal with aim, objectives, assumptions or hunches.

Step 3. More reading leads to the development of the contextual framework of the literature. Sometimes, this framework can be developed at a very early stage of your research and can even be inserted in your proposal (this of course depends on how much reading you have done at the proposal stage).

Step 4. After designing the contextual framework of the literature, you can then start thinking of designing your questionnaire.

Step 5. If your research is analytical in nature and requires you to test a theory, then you would need to design the theoretical framework before designing your questionnaire. Your research hunches/assumptions (stated in your proposal and at the early stages of your research) become 'firmer, sharper and more focused' leading to the development of your 'theoretical' framework for you to investigate and test. In other word, these hunches/ assumptions will be converted to 'concrete' research hypotheses.

Step 6. You will then design your research strategy for data collection i.e. Survey, Interviews, Case studies, etc..(see chapter 4 & 5)

Step 7. Collect the data

Step 8. Analyse your data and discuss it.

Step 9. Reach your dissertation conclusions.

3. Writing Up and critical appraisal of your Literature Review

During or after you have compiled the sources of information, took notes and drew your literature framework, you will be ready to write your literature chapters and critically appraise the information. A literature review should be descriptive, analytical and critical in nature. It critically examines the contribution of other people's work with the view to identifying the following:

- 1 similarities in the statements made by previous writers;
- 2 common issue(s) raised by previous writers;
- 3 differences or contradiction of statements made by previous writers;

☞ See '**Judgment or opinion**' in Farrell et al (2017, P43).

- 4 criticisms made by previous writers.

The following example in Figure 3.3 might serve as a model to show the style of writing a literature and provide a critical appraisal section at the end. Also see (Chapter 9, p. ??? , for another example). In this example, the material is extracted from a journal paper by Naoum and Egbu. The title of the paper is "Modern selection criteria for procurement methods in construction. A state-of-the-art literature review and a survey." Published by the International Journal of Managing Projects in Business, Issue 3/4, April 2016. You may not be fully familiar with the field of study, but the review puts you in the picture as to what is expected from you.

INSERT fig3_3 HERE

Figure 3.3 - Example of writing a Literature Chapter– Extract from a published paper by Naoum, S. and Egbu, C. (2016)

CHAPTER 3 - Literature review into modern concepts associated with selecting suitable procurement methods for construction projects

EXAMPLE

3.1 Scope of Chapter

Note to students: start the scope of each chapter by summarising what was reviewed in the previous chapter. For example, you may state:

In Chapter 2 of this dissertation, an overview into the types of procurement methods in construction was provided. It outlined and discussed the four standard set of procurement methods, namely; a) the fragmented method such as the traditional contracts; b) fully integrated such as the design and build; c) partially integrated such as management contracting and d) the partnership philosophy.

This chapter addresses modern criteria and concepts that are associated with the selection of various procurement routes. Chapter 3 is divided into six main sections, these are:

- 1) Procurement methods and Sustainability;
- 2) Procurement methods and Supply Chain Management (SCM);
- 3) Procurement methods and Innovation;
- 4) Procurement methods and Buildability.

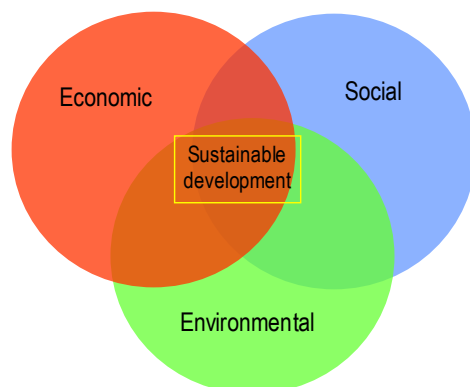
- 5) Outline of decision making charts and their limitation;
- 6) Critical appraisal of chapter

Below, is critical review of the above sections:

3.2 Procurement methods and sustainability

The topic of sustainable construction and development has been widely discussed by Lutzkendorf and Lorenz (2005), Lapinski (2006), Waddell (2008), BERR (2009). The most widely accepted definition is from the Bruntland's report (1987) who described sustainable development as, "development that meets the needs of the present without compromising the ability of future generations to meet their own". It is also widely accepted that sustainability has a triple bottom line: economic, social and environmental (Newport *et al.*, 2003). It is only when demands in all three of these areas are met that sustainable development is achieved (**Error! Reference source not found.a**).

Figure 3.1a – Sustainability development



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In order to link sustainability with procurement methods, Berry and McCarthy (2011) stated that, under traditional procurement, “there is little opportunity for the contractor to input into the design or planning phases of the project, resulting in limited opportunities for the contractor or its supplier partners to influence the sustainability of the overall project”. The report added that, design and build method is more desirable for clients who wish to have a project with a high level of sustainability. This premise also corresponds closely with Miller et al. (2009) in their statement “there is a pent up need to move from traditional procurement delivery models (in their various guises) to new methods that are able to incorporate innovative change processes that are required to address sustainable outcomes.” However, it must be noted that, currently there are strong barriers in place that can be detrimental to the benefits achieved through sustainability in construction projects. According to Sourani (2008), integrating sustainability seems far from reach in an industry considered as “inherently defensive” for change. Progress in this area has been hindered by many barriers, such as the industry's fragmented nature (Egan, 1998), lack of long term perspective (Lam et al., 2010), lack of clear concept definition of sustainable construction and regulatory constraints (Adetunji et al., 2003) and competitive bidding (NAO, 2005). Adding to these barriers, Bullen and Davis (2003) advocated that, sustainable construction requires change to construction methods and the use of resources, but more significantly the building process will need to change. In order to achieve this, significant change to the organization, structure and communication channels of the industry will need to be made. They also highlight that, the use of traditional procurement process creates a professional barrier to innovative sustainable requirements. Furthermore, Hamza and Greenwood (2007) stated that under the traditional and design and build procurement arrangements it may prove to be a very challenging task to design environmentally sensitive buildings as the “...iterations required are at odds with the contractor’s incentive to avoid delays and extra cost”. Embracing the principle of sustainable construction, from the governments perspective, will

facilitate a real cultural change in the construction industry towards the adoption of partnering as a procurement process (Ball and Fortune, 2000).

Finally, there is some debate among authors as to whether other integrated procurement consortium such as PFI are able to achieve sustainable end results. Berry and McCarthy (2011) quoted the PFI as an example of a project where “contractors and consultants are brought on early in the project, which allows them to use their expertise and influence design and construction methods to increase the overall sustainable performance of the project.” Although not entirely contradicting to this point, Miller et al. (2009) has a different view of PFI procurement in relation to sustainability, stating “the PFI process fails to take account of how service delivery, and therefore the way in which buildings are used will change over the course of a PFI contract and beyond. This often results in inflexible and unsustainable buildings that may become redundant long before the contract expires. Taking into account the overall lifespan of a PFI project, the sustainability result may not be as promising as originally perceived.”

3.3 Procurement method and Supply Chain Management (SCM)

Kranz (1996) defined SCM, as “the effort involved in producing and delivering the final product from the supplier’s supplier to the customer’s customer”. While Khalfan (2004) stated that, “(SCM) is directed toward the minimization of transaction cost and the enhancement and transfer of expertise between all parties”. It has been argued by Walker and Walker (2015) that successful SCM should be done under integrated project management, meaning it is centrally coordinated and that the relationship between firms is maintained for the construction duration so that design and delivery are more closely linked. Adekunle et al (2009) cites partnering and Walker and Walker (2015) cited Design and Build and partnering as ways of doing this. Indeed, the Egan’s report (1998) has challenged the industry to adopt a more collaborative and integrated approach. At that time, the report projected that, “by the end of 2004, 20% of construction projects by value should be undertaken by integrated teams and supply chains and this should be increased to 50% by 2007”. Subsequently, several supply chain management (SCM) initiatives such as alliancing / partnering, and incentive-based contracting have been sporadically implemented to ameliorate construction project performance.

There are however barriers to supply chain integration. An earlier study by Dainty et al. (2001) suggested that, an adversarial culture seems to be ingrained within the industry’s operating practices, and there is a general mistrust within the SME companies that make up the construction supply chain. This is due to an overriding belief that existing supply chain management processes seek to enhance main contractor profitability at the expense of other supply chain companies. In response to this, Love et al. (2004) and Ozorhon et al. (2014) both stated that a greater deal of client and project management leadership is required in order to drive the integration process, together with an insistence on transparent and mutually beneficial processes for all parties in the supply chain.

According to Al-Bizri and Gray (2010), current procurement approaches do not create an organizational framework to deal with the cultural issue and fragmentation of the building process. They suggested that grouping by a technology clusters approach as a way of tackling integration problem. Technology clusters form an organizational framework to deal with the full integration of supply chain for a component based construction. It is a multi-faceted group collaborating including the client, the design, the main contractor and the specialist trade contractors to achieve high value, defect free, assembly of the respective sets of components. In short, it splits the complexity of the whole process in to groups of supply chain to deliver complete sets of integrated technologies.

As SCM is a management philosophy, its principal can be applied to any procurement approach, although management oriented forms of procurement provides a better framework. It is unclear whether the competitive traditional procurement method of design-bid-construct would still be considered suitable for a project that requires an integrated supply chain for a successful delivery. As Forgues and Koskela (2009) put it “...traditional procurement processes reinforce socio-cognitive barriers that hinder team efficiency. It also illustrates how new procurement modes can transform the dynamic of relationships between the client and the members of the supply chain, and have a positive impact on team performance”. . In contrast to this, Larsson (2002) & Lohnert et al. (2002) suggested that, with the traditional fragmented procurement routes, the design process from sequential to iterative need to be redefined, while maintaining traditional project lifecycle and procurement modes. Bourn (2001) in his Modernization Construction report recommended design & build, prime contracting, public private partnership/ private finance initiative as the main procurement approaches for team integration. Under a similar philosophy, Oyegoke et al. (2009) put the case forward that procure 21 is an example of a hybrid model that embraces integration, which is a form of design and build that uses an integrated supply chain.

3.4 Procurement methods and Innovation

Innovation, in its simplest form, is about applying new sciences and solutions to constructions and it has become essential for construction organisations because of increasing pressures from clients to improve quality, reduce costs and speed up construction processes.

Recently, innovation has attracted many academic and practitioners through a number of popular management publications. According to Man (2008) innovation is “the process of bringing new creative ideas to reality and implementing them through new work practices, processes, business models and strategic partnerships to produce new products and services which are of value to society”. More broadly, Abbott et al. (2006) classified innovation as product innovation, procurement innovation and process innovation. This innovation is not just limited to the components of the building, but also the organization of the project and the management of the construction phase.

Other researches conducted empirical studies to measure the benefits of innovation. For example, Shafik and Martin (2006) analyzed two live projects and found that, the ‘Kincardine O’Neil project’ which was constructed under the traditional method, faced limited innovation and skill shortage, despite the fact that the project met the required completion time and budget. Whereas the ‘Rothesay Tower project’, which was based on a partnership arrangement, resulted in highly innovative project in both techniques and methods with joint solutions provided.

According to Naoum et al. (2010), the rate of implementing the concept of innovation within the UK construction industry during the 1980s' and 90s' was rather slow. This has been largely due i) attitude of the construction industry; ii) competition in tendering; iii) lack of knowledge and training; iv) perceived risk by the client; v) fragmentation and vi) legislations. As a mean to solve the innovation barrier in the construction industry, Yuventi et al. (2013) echoed the fact that, "integration" is the key. This involves consolidating vertically or horizontally fragmented supply chains into one company or longitudinal integration through long-term alliances. In addition to such integration, the authors went on to state that, " project networks should consider increased use of processes aimed at better managing stakeholder relationships, addressing broken agency, and optimizing system lifecycles, e.g., integrated project delivery, systems engineering, and lean construction. This is especially true with projects such as large-scale Photovoltaic PV system because their development affects stakeholders who are not directly involved in developing or operating the facilities, i.e., energy consumers with regard to the cost of energy."

Despite these organizational barriers to innovation, there has been an improvement in the new millennium to resolving the fragmented structure of the construction industry with significant attempts have been made to bring the design and construction together. This is particularly evident in the increases in design and build projects, management contracting and project management as noted in the work of Eriksson and Pesamaa (2007), Hamza and Greenwood (2007), Shafik and Martin (2006), and also on Partnering, PPP and PFI as noted by Ng et al. (2002), Kumaraswamy and Dulaimi (2001) and Weisheng et al. (2013). Apart from calls to adopt alternative procurement methods, several authors wrote on specific issues that are associated with innovation. For example, Love et al. (2004) and Sebastian (2010) wrote on Technology and methods of construction, Briscoe et al. (2004) on Value engineering, Egbu (2004) on Managing knowledge, Eriksson et al. (2007), Miller (2002) and Ng et al. (2002) wrote on Subcontractors, Love et al (2008) on Conflict, power and mistrust and Kumaraswamy and Dulaimi (2001) wrote on Disputes.

3.5 Procurement method and Buildability

Arguably, a design that is buildable would lead to saving in time, costs and cost of change. The CII (1986) defined buildability as “the optimum use of construction knowledge and experience in planning, design, procurement and field operations to achieve overall project objectives. It deals with the optimal integration of construction expertise and experience at various project stages to achieve the overall project goals”. In order to connect procurement methods and buildability, Ng et al. (2002) in their paper ‘Fuzzy Membership Functions of Procurement Selection’ made an attempt to place expert ‘value judgments’ on what they believe are ‘fuzzy’ procurement selection criteria. They placed the concept of buildability under the heading of ‘quality’ as buildability can enhance quality by designing a building to best utilize the expertise of the contractors. On this basis they confirmed that using an integrated procurement method is beneficial as the contractor is able to contribute to the

buildability of the design. This notion is in line with the later work of Miller et al. (2009) who provided evidence that, improved constructability due to contractor's input into the design, is one of the main advantages of using a design and construct approach to procurement.

Despite the construction industry welcoming initiatives to improve buildability and constructability, it is firmly believed that this entails a fundamental change of attitude and organizational culture.

3.6 Decision making charts and their limitations

3.6.1 Previous decision charts

With the increase in use of alternative procurement methods, a number of researchers have developed decision making charts in order to investigate the criteria for their selection and their rate of success in terms of time, cost, quality, safety, risk and maintainability during post-occupancy. Among the most popular ones were by NEDO (1985); Skitmore & Marsden (1988); Brandon et al. (1988); Franks (1990); Singh (1990); Bennett and Grice (1990); Naoum (1991); Griffith and Headley (1997); Love et al. (1998); Alhazmi and McCaffer (2000); Chan et al. (1995); Cheung et al. (2001); Chang and Ive (2002); Luu et al. (2003); Seo and Hyan, (2004); Luu and Chen (2005), Li et al. (2005); Heravi, and Ilbeigi (2012); Love et al (2012); Naoum and Egbu (2016).

3.6.2 Critical evaluation and limitations of decision charts

Arguably, these decision making charts for selecting the appropriate procurement method for the project have certain limitations. The author of this dissertation recognizes some of the challenges associated with decision making models, tool-kits, and support systems. They are often seen as not flexible, adaptable and responsive, not taking account of reality, and not taking account of the vagaries of contexts and competencies of the decision maker. There are also those who have criticized some of the assumptions underlining some of the decision support systems (Leeuwen and Timmermans, 2006). In addition, there are those who contend that a number of decision supports models are steeped in conservatism and errs on the side of caution; too structured and sequential in their orientation; and often sees the world as stable.

The author contends that decision making is not a punctual act. It is often a complex process. The nature of the issue or problem at hand, for which decision is needed, may change during the decision making process. Effective decision making demands quality and timely information, and a careful consideration of alternatives, as well as the consequences of the alternatives. The rational model or approach of decision making often assumes that the decision maker has accurate information and knowledge of the situation, however, it is often the case that decision makers satisfice and make do with the information at their disposal at any one time (Simon, 1956; Kahneman and Tversky, 1984). It is not the intention of this dissertation to argue for or against the rationale or rational approaches to decision making, as it is a complex area which cannot receive effective and due treatment in this dissertation. The author, however, argue that one of the positives of the developed chart is not to belittle or take away the social embeddedness associated with effective decision making, but to offer decision makers an opportunity to broaden their horizon on the different alternatives that could be considered, and the potential of different alternatives leading to different consequences. This is more so for an up and coming decision maker, or one who is newly exposed to a new context. In a way, this is part of exposing the decision maker to other pieces of information for consideration. Galbraith (1973) informed us of the importance of information in effective decision making, and the role of considering alternatives before a final choice is made.

3.7 Critical appraisal of chapter 3

This chapter has provided a literature review of the state of the art of procurement methods in the academic field with the aim of establishing a platform for scholars and researchers to obtain more useful insights into concerns of procurement methods. It has identified research trends in procurement methods which may allow research academics and industrial practitioners to appreciate the key concerns in the development of modern concept and principles such as supply chain, sustainability and innovation.

The sustained implementation of these concepts can go a long way towards combating short-termism and industry fragmentation over time. The view is that, this will drive change as clients and their project teams experience the benefits achieved through these concepts. Ultimately, this will equate to a shift towards a more wholly integrated industry where achieving best value and continuous improvement through team integration is of paramount importance. It is difficult to escape the premise that increased collaboration within the industry will be vital to achieve future gains, and for the industry to deliver improvements on the clients triangulated factors of cost, time and quality. If the industry is to deliver best value for clients in a changing world, better use and standardization of information technology is likely to be the solution.

In many areas however, there seem to be barriers in terms of widespread adoption of modern techniques when considering the procurement route for the project. This is partly due to associated risks and attitude towards change. In order for the construction industry to be able to meet the managerial, technical and social challenges, both the industry and its participants have to welcome 'change' and allow innovative procurement methods to grow. As noted by Ruparathna and Hewage (2013) and indeed by many well-known academic journals, this change needs to be a client-driven process supported by rest of the building team.

References of this example

Note to students: For references of this example on writing a literature chapter, read the following research paper:

Naoum, S. and Egbu, C. " Modern selection criteria for procurement methods in construction. A state-of-the-art literature review and a survey." International Journal of Managing Projects in Business, Issue 3/4, April 2016.

Note to students: The above example attempts to demonstrate 12 fundamental aspects of a good literature review:

- 1 A clear literature title.
- 2 Division of chapters into sections: it starts with 'Scope of chapter' and ends with 'Critical appraisal'. (See Chapter 9, p. ??, for another example.)
- 3 Sifting of information. This means that the researchers included materials which are directly related to their study.
- 4 Clarity in writing: it is precise and clear in presenting other people's work.
- 5 Clearly appraising the common issues raised by previous writers in the field, as well as the similarities and differences among them.
- 6 Coherence in writing: the material is presented in an orderly, logical progression to facilitate understanding and good reading.
- 7 Good grammar and punctuation.
- 8 Where relevant, the use of accurate linking phrases such as 'in contrast', 'it has been reported by', 'according to', 'there is much debate about', 'another school of thought suggests', ' whereas', 'another view', 'all evidence points towards', 'conflict in opinion was revealed when', ' this is contradicted by', 'two sources, namely ... and ... admitted that', 'alternatively' and the like.

 **Find out more about ‘linking words’ in Thomas, G. (2017, P66).**

9 The inclusion of a diagram, such as the one shown in Figure 3.1a to clarify the point to be made as well as to make the reading more interesting. You may also wish to include other interesting exhibits and illustrations such as tables, charts, literature map and so on that were developed by previous writers.

10 Acknowledging the work of others. Good citation and accurate referencing. Naturally, this list of references would be part of the overall referencing list, which would be inserted at the end of the dissertation. However, some students may prefer to include the reference list at the end of each chapter.

11 A good balance of old and new references.

12 A good balance of sources. For example, it includes material published by:

- refereed journals;
- conference proceedings;
- reports;
- secondary sources such as textbooks,
- web sites.

Note to students: For more insight into Naoum and Egbu ‘s research paper, please read the following publication:

Naoum, S. and Egbu, C. " Modern selection criteria for procurement methods in construction. A state-of-the-art literature review and a survey." International Journal of Managing Projects in Business, Issue 3/4, April 2016.

👉 See more examples of ‘writing the literature review’ in Laycock et al (2016, P56-59).

Summary

The literature review is one of the earliest stages in the research process and it amounts to a significant proportion of a dissertation content. This review basically searches for material that is relevant to the subject of your dissertation with the intention to describe and analyse what has been written by others. It can take some time to get to grips with. Hence, it is advisable to allow sufficient time to cover the activities involved in undertaking a literature review. These activities are (1) knowing the sources of information, (2) understanding how the library works, (3) knowing the search engines related to your discipline (4) organising the literature review (5) reading and note-taking (6) designing the contextual framework for your literature review and (7) appraising and writing up the literature review.

References

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- Cooper, H. (1998) *Integrated Research: A Guide for Literature Reviews*. Second edition. Sage.
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Sharp, J., Johns, P. and Howard, K. (1993) *The Management of a Student Research Project*. Routledge.

Smith, H.W. (1991) *Strategies of Social Research*. Holt, Rinehart and Winston.

Additional Reading

Biggam, J. (2014) *Succeeding With Your Master's Dissertation: A Step-By-Step Handbook*. *Read Chapter 6 (The literature review) and Chapter 7 (systematic review)*.

Burns T. and, & Sinfield, S. (2006) *Essential Study Skills – The complete guide to success at university*. Sage publications. *Read Chapter 3 (How to research and read academically and Chapter 5 (How to learn creatively)*.

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Laycock, E., Howarth, T. and Watson, P. (2016) *The Journey to Dissertation Success for construction, property and architecture students*. Routledge. *Read Chapter 5 (Evaluating the existing literature)*.

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Wallace, M. (2016) Critical Reading and Writing for Postgraduates. 3rd edition. Sage Publications Ltd. *Read Part 2 (Becoming a critical reader and self critical writer).*