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RESEARCH METHOD VERSUS METHODOLOGY: ACHIEVING QUALITY IN SCHOLARLY RESEARCH FOR CONSTRUCTION MANAGEMENT

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Abstract
This paper analyses the various papers presented at the last three ARCOM conferences (1993, 1994, 1995) for the way researchers in construction management address the issue of methodology in scholarly research. The outcome of the analysis provides evidence of the need to give greater attention to the issue of method versus methodology, for improving the quality of academic research in construction management. The culture of research in construction management has been described as reflecting a rational approach. This implies that several procedures are undertaken in academic research without establishing a clear and methodological basis for such procedures. As a way forward for achieving a balance in the general culture of research for the discipline, it has been suggested that more interpretive approaches should be incorporated into construction management research.

This paper argues that a clear appreciation of the distinction between what constitutes methodology, and the procedures that go with each methodology (which is referred to in this paper as methods), would contribute towards achieving such a balance in the culture of academic research in construction management. The paper sets this out by reviewing the application of the terms method and methodology in social and management research as a way forward for improvement.

Keywords: Construction management, research, method, methodology.

1 Introduction
Construction management research much like its wider dimension of higher education has experienced considerable change over the years. Such change has been necessitated by the need for construction management to reflect the changing needs of the industry at large, as well as ensuring further developments in the discipline by establishing appropriate theoretical foundations for its research.

ARCOM shares as part of its objectives, a development of the discipline of construction management through research. This is achieved by promoting, co-ordinating and disseminating information pertaining to research activities in the discipline, and addressing issues of research quality and innovation. This paper was motivated by participation in successive ARCOM conferences between 1993 and 1995. An observation consistently noted at these conferences, led the authors to the belief that further improvements in the issues of methodology and research methods would hold some considerable relevance to the quality of research and its development within the construction management discipline. Construction management, as an evolving academic discipline, has been described as maturing fast, with its nature and style of research settling into a particular pattern [Lansley 1994; Skitmore and Betts 1994]. Skitmore and Betts [1994] further opined that such maturing process opens up an opportunity for improvements and the application of greater rigour to research in construction management. Achieving such improvements would require construction

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management research to address among other things, the philosophical underpinnings of knowledge development for the discipline. To this end Gunning [1994] argues that much can be done for research in construction management, by addressing the current restricting patterns of fact formation, through the addition and introduction of new ways of interpreting reality. This paper identifies with that view, and gives attention to the fact that there is the need for appreciating a wider perspective of the underlying paradigms that form the basis of research. In this regard, the management and social sciences, present options for opening up the discipline through diversity in thinking for construction management research. The authors analyse papers presented at ARCOM for the years 1993, 1994 and 1995, for evidences of the philosophical contexts which have dominated research methodology construction management. This is followed up by a review of what constitutes research methodology from the social and management disciplines. It is expected that this will offer useful contributions to the current debate which is ongoing to define philosophical foundations for the discipline of construction management.

2. Characteristics of construction management research
Research in general, has been described by Smith and Brown [1995] as involving an investigation or study which leads to the discovery of facts or knowledge. This view of research to a large extent is what dominates construction management research, and rightly so. However, it would appear that an emphasis on the facts or knowledge, has often been encouraged to the considerable neglect of the theoretical foundations regarding how these facts are obtained. There are a number of explanations that can account for this current orientation of research in construction management.

Construction management is an off-shoot of building and civil engineering, which are, professional disciplines with roots in the natural and physical sciences. One of the striking characteristics of the physical sciences is a conspicuous lack of a formal attention to methodology and philosophical conceptions [Haralambos and Holborn, 1991]. This disposition towards research philosophy in the natural and physical sciences has, to a large extent, been inherited by construction management from the engineering tradition. Seymour and Rooke [1995] argue that research in construction management is dominated by a culture of rationalism. Such rationalism clearly reflects the orientation of the physical sciences, and assumes a particular methodological foundation for undertaking academic research, without making it explicit. The need to be aware of, and probably to make such methodological basis explicit, as a background to research is useful and will contribute to ensuring further development in construction management as an academic discipline. Reflecting on the essence of this need, Simister [1993] outlined that it is just as important to discuss the methods of research as it is to disseminate its results and conclusions.

Of equal importance is the placement of construction management in the right academic disciplinary context. It is here argued that construction management reflects a broader epistemological focus than the narrow rational approach of the quantitative methodology which dominates its research [Edum-Fotwe 1996]. Commenting on this narrow focus of its research and philosophical foundations, Betts and Wood-Harper [1994] opined that construction management, as an academic discipline, appears to be developing in an evolutionary way based on the culture of its industry’s practices, and largely unaffected by mainstream management theories. The reason for the lack of any significant impact from mainstream management, may be accounted for by the fact that construction management has traditionally seen itself as part of engineering. For such theories to have a place in construction management, research ought to reflect a broader epistemological appreciation, so as to bring about the desired balance in the culture of research for the discipline. As such, the proposition by Seymour and Rooke [1995] simply for the adoption of more interpretivist approaches to construction management research, though useful in its own right, may not be sufficient to address such a balance, unless it is undertaken against the backdrop of appreciating the wider context.
of the philosophies of knowledge development in other related fields. In particular, a significant proportion of construction management research involves human and organisational aspects of the industry's activities. Seymour and McCabe [1994] assert that for such research, it is not possible to be neutral and objective by taking the model of the natural and physical sciences to interpret organisation behaviour. They further contend the usefulness of the current rational approach for organisation research, by suggesting that such research; conducted on the assumption that it is possible to be neutral and objective, has negative consequences for practice. This is because they lack the socially constructed webs of meaning and symbolic relationships of humanistic systems.

Furthermore, construction management is predominated by applied research, and often governed by a funding drive. Applied research is often highly specific, with greater emphasis placed on demonstrable outcomes which frequently should have immediate applicability. Thus, spurred on by financial constraints, the likelihood to satisfy the requirement for a research contract, in order to attract future funding, becomes a stronger prospect, and sometimes to the detriment of the wider research learning experience and development for the discipline. The persistence of such an approach, if not adequately balanced, has the potential of narrowing the knowledge-base for any subject discipline. It is here suggested that for a balance in the culture of research for the discipline to be attained, this issue has to be given adequate attention.

The above issues may be addressed in one of two ways. First, there is the American model for research training, whereby research trainees (PhD students) are taken through a formal and comprehensive curriculum on methodologies and research methods [Geiger, 1992]. The responsibility of the students then is on the appropriate application of these methodologies for a research project. The advantage of such an option derives from the potential to create competency in research on a more wider basis. Equally, any further developments required in methodological perspectives for a discipline can be addressed through such curriculum. On the other hand the UK model places the responsibility of acquiring the knowledge of such methodological perspectives on the researcher, and often guided by his or her supervisor. This approach equally has its advantage, as it allows for greater initiative to be exercised on the part of the researcher. The risk inherent though, is the potential for a narrow and specific experience.

Excerpts from the account of Skitmore [1996] regarding research training and the research process, which typifies the UK model provides a useful illustration.

The first stage comprises the identification of research project and probably presents the most difficult stage. This involves the following major activities.

- Knowledge of available research methods and constraints.
- Knowledge of subject area and previous work, divided into own and others accumulated beliefs, cases, personal experiences, 'facts', assertions of various credibility, assumptions.
- Researcher's current and potential attributes, skills, prior knowledge, risk attitude, learning strategies, motivation.
- Supervisors experience, current and potential attributes, skills, prior knowledge, risk attitude, teaching and learning strategies, motivation.

In these early stages, the personal experience and knowledge of the researcher and supervisors dominate. This means minimising the technical learning necessary for both players whilst keeping up motivation for the long trail ahead.

The second stage involves exploration by the researcher. It is a journey into the unknown at first, for both players, followed by a gradual recognition of what is possible and not possible, interesting and trivial, what has been done before and all the untested assumptions passed by. For both players, the motivation is in finding something new. A new angle on an old subject. An old method not yet applied. An overlooked detail. A pivotal aspect. A discovery of research tools, and there are many, that have been used often in a different fields. Content analysis, discriminant analysis, econometrics, action research, qualitative data, focus groups, etc.
Skitmore [1996] recommends that staying within familiar territory, is a suitable way of avoiding unnecessary prolongation and ensuring success. Skitmore's outline of the UK model places a responsibility also on the supervisor not only to be astute in his or her specialism, but also on the different methodologies from other disciplines, a task which they achieve competently. Within ARCOM, such experience is equally widespread and can be exploited to enhance developing the foundations of research for the discipline.

3 The future and construction management
The construction sector is currently undergoing rapid and fundamental change in response to technological, commercial, environmental, social and legislative pressures. This transformation places an essential requirement on research for construction management - the ability to match up to this change drive. This is equally reflected by the capabilities expected from professionals in the industry. Increasingly, managers of the industry are expected to combine several specialisms that demand an understanding of the 'situations' existing not only in their industry, but also managing uncertainty, ambiguity, indeterminacy and change. The ability to digest both soft and hard information, for effective contributions in decision-making assume significance [Boyd and Wild 1993].

The rapid rate of knowledge advancement within the last twenty years has led to the boundaries of various subject disciplines extending beyond their traditional confines. As a result, a wider appreciation of construction management beyond the traditional professional requirement is increasingly becoming important for the construction manager of today. The move towards a wider experience beyond traditional subject disciplines is equally shared by the EPSRC [1995]. In particular, the Council encourages research of a multi-disciplinary nature in response to the recommendation of the Technology Foresight Panel on Construction [1995]. The panel on construction advocated for greater integration of the various academic disciplines in order to achieve greater competitiveness. Such cross-fertilisation should open up areas for innovative advancement for construction management.

To ensure a more balanced approach to research development in the industry, it is important that research should address knowledge development in a wider context beyond the confines of the traditional subject discipline. Flexibility and adaptability become more important. This may mean expanding the conceptual frameworks that form the background of knowledge development currently in construction management to cover other disciplines. The next sections provide a brief review of the methodological contexts of papers presented at ARCOM from 1993 to 1995. Drawing upon the review, two major perspectives from the fields management and the social sciences are presented options of conceptual frameworks that can inform research in construction management.

4 Methodological orientation - review of ARCOM 93-95
Simister [1993] outlined that within the literature of construction management, there is a dearth of material dealing with the techniques available for carrying out research. This was associated with the techniques for research being widely spread over a variety of disciplines. As such it is often difficult to know which ones can or indeed have been applied to construction management. Subsequently, Simister [1995] asserted that within construction management research there appears to be a limited number of methodologies which are particularly favoured and in current use. To corroborate this assertion, a review of the ARCOM papers from 1993 to 1995 was undertaken.

Table 1 presents the percentages of papers from the proceedings of the ARCOM conferences over the three years that have a section devoted to methodology. The view
Table 1. Proportion of ARCOM papers addressing methodology 1993-95

<table>
<thead>
<tr>
<th>YEAR</th>
<th>% PAPERS WITH SECTIONS ON METHODOLOGY</th>
<th>% PAPERS WITH SECTIONS ON METHODOLOGY THAT ASSUME RATIONAL PARADIGM</th>
<th>% PAPERS WITH SECTIONS ON METHODOLOGY THAT ADDRESS PHILOSOPHICAL ASPECTS</th>
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<td>1993</td>
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<td>32</td>
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<td>8</td>
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from the various papers suggest that research in construction management equates methodology to methods, judging by the negligible proportion of papers that address the philosophical foundations of their work, as against the papers with a section on methodology which do not. Distinguishing between what should constitute research methods and methodology should help with the Skitmore exploration stage, required at the initial stages of research. Because construction management predominantly reflects a social perspective, this distinction is undertaken in the next section within the context of social research.

5 Methodology versus methods: perspectives from other fields

Attaining excellence in construction management research requires focusing attention on a number of factors of both technical and non technical nature. The next sections of this paper gives attention to the distinction between methodology and methods. The decision to address only this issue is not to say that the other aspects of research are of a lesser importance to achieving quality in the discipline of construction management. The primary motivation in focusing on issues of methodology and methods derives from the authors' own experience, and that of a number of other researchers in construction management, and lessons from the ARCOM conferences. Hughes [1994] has provided a comprehensive coverage of the other issues for which interested readers can refer to.

Any academic subject requires a methodology to reach its conclusions: it must have ways of producing and analysing data so that theories can be tested, accepted or rejected. Without a systematic way of producing knowledge the findings of a subject can be dismissed as guesswork, or even as common sense made to sound complicated.

A definition of what constitutes a methodology for social and management research often becomes contentious. In one form, methodology is identical to the research model employed by a researcher in a particular project, including basic knowledge related to the subject. In this sense, every investigation has a distinct methodology, which will vary from study to study. In the light of this meaning, it can therefore be argued that there are as many methodologies as there are research projects, since most research projects are unique in nature and approach. Another perspective provides for methodology as principles closely related to a distinct management research paradigm. Here a methodology is supposed to offer clear guidelines on acceptable research practices which have to be accurately adhered to in order to achieve acceptable findings. It has already been mention that the terms methodology and method in construction management are employed to mean the same thing. Disciplines within the social sciences and management attempt to establish the difference presented in the two terms, by referring to the former definition above as methods, and the latter as methodology. Thus, methodology is concerned with both the detailed research methods through which data are collected, and the more general philosophies upon which the collection and analysis of data are based. The importance of this distinction derives from the fact that its appreciation influences the way research is undertaken in any discipline, and consequently, the research culture that develops therefrom. This distinction contributed
to the development of the social sciences as it struggled to get out of the shadow of the natural sciences. The natural and physical sciences appeared to be capable of producing objective knowledge which could be used to solve human problems and increase human productive capacity in an unprecedented way. Attention to the methodological foundations for generating new knowledge therefore played a diminished role in research. It was not surprising, therefore, that many early sociologists chose to turn to science for a methodology on which to base their subject. However not all sociologists agree that it is appropriate to adopt the methodology of the natural sciences. They advocate that human activity possesses attributes which make them fundamentally different from the natural sciences, and so requires a different type of methodology for discovering knowledge within that domain. In contrast therefore, management research and the social sciences are dominated by methodological treatises. The pre-occupation with methodology in management and the social sciences derives basically from the effort to deal with the influence of the subject on the object and the consequences of this influence for the process of knowing and the knowledge yielded.

Though there exists this difference in the basic attitude towards methodology in the natural and social sciences, in both of them theory and methods are directly linked and closely intertwined. Research procedures in natural sciences vary with the investigated phenomena and are related to ideas about the nature of those phenomena, and to the theory underlying their constitution. The same relationship obtains in management and social sciences. Procedures in the social research are related to the basic assumptions about the nature and constitutive features of social and organisational phenomena, and current theory of man, society and business. Construction management on the other hand has over the years displayed techniques or methods, which needs to be linked to theoretical foundations for discovering knowledge and research for the discipline.

It is possible to identify two broad traditions within the social sciences. On the one hand are those who advocate the use of quantitative approaches, such as numerical and statistical methods. On the other hand, there are those who support the use of more humanistic and qualitative alternatives. Within these two broad traditions, Easterby-Smith et al. [1991] defines two extremes of methodology for social and management research, which can inform construction management. Figure 1 illustrates the relationship between the extreme methodologies within the two broad traditions. Between those two extremes are various other philosophical contexts, which combine varying degrees of positivism and phenomenology. In Figure 1, the mid-way position of management, and for that matter construction management points to the need to address research with a multi-disciplinary framework.

![Figure 1: Research philosophies for different academic disciplines](image-url)

This paper subscribes to the view that methodology defines the philosophical and theoretical foundations upon which the research is conducted, in order for the
knowledge yielded to be *acceptable*. The essence here is acceptability. Within the broad perspectives of different methodologies, it is therefore possible to employ the same methods, such as interview technique, for data collection, and the same methodology can employ different methods. The structuring of the various methods, and the accompanying analysis of information within the two approaches would however, differ considerably. Methods are obviously different from methodology. In a sense, the methods for research, which comprise the tools for empirical data generation, are clearly a-methodological. The two broad traditions are further examined by presenting three illustrative methodologies for each.

5.1 Quantitative methodology
This is based on the positivist or neo-positivist philosophy. Three examples of this perspective is outlined below.

**Positivism**
This methodology is based on the premise that the discovery of facts and knowledge is attained by the collection of information about a phenomena which can be objectively observed and classified. Internal meanings and individual interpretations of the phenomena do not hold much significance. Statistics therefore, provide valid constructs of the real world. The correlation between different phenomena provides knowledge of causation. It is also referred to as the inductive methodology for research, and starts by the collection of data. The data which is obtained from primary sources, are then analysed, and out of this analysis theories or new knowledge are developed. Once the theory has been developed, it can then be tested against other sets of data to see if it is confirmed or not. Repeated confirmation leads to the acceptance of the theory.

**Deductive methodology**
A variation to the positivist methodology is the deductive approach. Although the logic of the deductive approach is similar in many ways to positivism, the differences have important implications. The deductive approach reverses the process of induction. It starts with a theory and tests it against the evidence, rather than developing the a theory as a result of examining the data. Most management research based on hypothesis testing fall under this category.

**Comparative methodology**
The comparative approach as its name suggests involves the use of comparisons. This may comprise comparisons of the same phenomena in different time periods or management contexts. The comparative methodology is based on an analysis of what has happened or is happening. The data employed for the research may come from either primary or secondary sources. The comparative methodology utilises the logic of the positivist and deductive approaches for systematic comparisons to establish correlations and ultimately causal connections or to rigorously test hypothesis.

5.2 Qualitative methodology
Qualitative methodology is associated with several methods which are employed in the social sciences and management, and are often considered to include any method that is not quantitative. It is often employed either as a supplement to quantitative research or as an alternative in its own right. In a supplementary role, it is based on the supposition that quantitative methodology is inadequate on its own for collecting, analysing and explaining information. As an alternative, it presents the view that quantitative methodology is totally inappropriate for researching any social and management issues. Because it is often more interested in contexts rather than causation, qualitative methodology usually utilise relatively smaller data sizes for its research. The examples of below cover both of these two roles.
Symbolic interactionism
Symbolic interactionism does not reject the attempt to establish causal relationships in research, in fact it forms an important part of its philosophical premise. However, it does not accept that quantitative measures alone are adequate for explaining social and managerial phenomena. The underlying assumption of this paradigm is that social and managerial phenomena are largely governed by the internal processes by which people interpret reality and give meaning to the processes they participate in. As such the descriptive views of these individuals are important for the discovery of facts and knowledge. It is thus important for explaining any causation that the correlation from the quantitative methodology can establish.

Phenomenology
Phenomenology represents the most radical departure from quantitative methodology. It rejects completely the use of the natural science methodologies for research. It also rejects absolutely, the possibility of producing causal explanations of social and management phenomena. Its basis is the interpretation of a social or managerial phenomena, which it argues that it can be understood only by discovering the meanings and motives that lie behind the phenomena. It disputes that quantitative approaches, which aggregate information into numerical values for explaining causation, can attain the greater ‘richness’ and ‘depth’ from the context-specific, and often textual format, information that is obtained from the subjective perspectives of the individual cases making up its data sample.

Hermeneutics
This methodology is based on the interpretation of texts as a way of discovering facts about social phenomena. Its central theme is that understanding of texts provides a means of understanding people and social life, and thus interpreting the objects and actions of society. It is usually applied to secondary data sources, however, appropriate methods can allow its utilisation for primary data research.

The above examples of methodologies can serve as a useful point for developing philosophical foundations for construction management. This paper has not presented examples and further discussion on the various methods as this is often effectively covered in the numerous papers presented at ARCOM.

6 A wider spectrum for construction management research
Figure 2 depicts the major subject disciplines that interact in construction management, which reflect the four major areas of Economics, Sociology, Philosophy, and Technical. Other subject disciplines, such as Political and Psychological, can be defined within these four categories, either as a sub-classification of one discipline, or a combination of two or more disciplines. This broad orientation of the discipline supports the concept of a wider perspective for the foundations of its research which is advocated by this paper. This perspective of construction management is equally reflected by Taylor and Merrifield [1994] who identify the various contexts within the discipline to include socio-political and economic, as well as a legal and institutional frameworks. The way forward for construction management is therefore, to adopt a divergent approach by adopting relevant aspects of these methodologies to enrich the development of its own research foundations. This perhaps is aptly reflected by Gunning [1994], who surmises as follows:

The first step that must be taken is to unfreeze current attitudes such as ‘there can be only one right answer’! Divergent thinking in problem solving requires that a variety of possible options be created and evaluated to arrive at an optimum solution. Trained minds are usually very good at evaluating options. Where they fall down is in developing a wider range of possibilities because of ‘over training’ in a particular discipline. One must rediscover the open mind of a child and question existing assumptions which limit the range of options produced.
It is essential to the vitality and vigour of research in construction management to maintain a strong foundation in research through the perspectives offered by other subject disciplines. Section 5.1 and 5.2 have presented some of the conceptual frameworks from which construction management research can learn in order to facilitate this quality for its research. The six examples provided however, do not encompass all the methodological options available which construction management can learn from. Further work in the form of a comprehensive guideline on methodological issues for construction management, should provide a useful purpose for its research. For the researcher, such a background to research provides a broader spectrum for challenging conventional understanding, and therefore should nurture greater innovation and an academic ethos, to benefit the specific research undertaken.

Secondly, it should endow the discipline with knowledge that can allow integration with other fields, thereby providing skills which are transferable in research and development generally. Naturally, the skills for achieving such effective integration requires a divergent approach to research. One that reaches across the boundaries of traditional academic disciplines.

7 Summary
The paper has established the need for construction management as an academic discipline to give greater attention to the philosophical underpinnings for knowledge development. From the analysis of ARCOM papers, construction management seems to project a view that research methods and methodology are the same. However, from social science and management perspectives, to which area it is argued that construction management shares common grounds, this view is clearly not right. The paper has reviewed and set out the distinction between the two terms, and provided examples of methodologies from which construction management can learn. It is argued that a wider appreciation of what constitutes research methodology for research in construction management would contribute not only to the quality of the research, but equally provide for greater divergence; a helpful ingredient for innovation; which can contribute positively to addressing the balance of the research culture in construction management.

References


