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## **THE ROLE OF RESEARCH DESIGN IN A PURPOSE DRIVEN ENQUIRY**

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### **Abstract**

*This paper examines the role of research design in a purpose driven enquiry. The paper bridge the gap in knowledge about the nature, importance, characteristics and classification of the research design. A survey of literature was used to identify areas of convergence and divergence of views of researchers in the same thematic areas. A qualitative research design was employed in this study. The study revealed that a good research design helps prevent frustration by provides the glue that holds the research project together through a structure plan that show how all of the major parts of the research project the samples or groups, measures, treatments or programs, and methods of assignment work together to try to address the central research questions.*

**Keywords:** Research, research design, enquiry, validity, reliability

### **Introduction**

Research can be described as an organised enquiry aimed at providing information for solving identified problem. It is an expansive drill consistent, systematic, and accountable to norms and standards of objectivity with respect to validity, reliability and logicity. In other words, for something to count as research in the first place, it must be systematic and methodical in its approach, procedures and must meets relevant norms and standards for validity and reliability. If an activity does not reflect a concern with these sorts of things or it is found wanting in any area, then it is not research (Hassan, 1995).

In relation to this idea of research, a lot of studies had been undertaken in the name of research or educational research but are not really research at all. This is because much of these works are not logical, systematic, or accountable to acceptable norms and standards. It includes much work

being done by students enrolled in university degree programs and by academics employed in various tertiary institutions. This is due to the fact that most of the people involved did not really understand the expansive nature of research and that research has to display certain kinds of qualities.

For an inquiry to qualify as a research, it must satisfy the following essential conditions:

- It must be based on a definite research problem or issue and good quality research questions;
- It must be informed in appropriate ways by theories and concepts;
- It must have an appropriate data collection, organising and analyzing techniques;
- It must offer an informed interpretation of results, and its findings must be consistent with the research question and implementation of the research design;

Once the concept of research is not understood, then it may not be very useful to keep reading more books and articles concerned with specific research methods and techniques. This is because one will not be able to understand how and where these methods and techniques fit into the overall activity of conducting methodical and systematic inquiry. These challenges can be reversed when there is an adequate knowledge of a research design and its significance in research. Based on the foregoing, this study seeks to further explain the concept of research design, indicating relevant literatures and studies as the basis for such crucial qualities.

### **Literature review**

Research design is a blue print of activities or specification of procedures and strategies to follow so as to obtain the most value answers to research question or attain the objectives of study with optimal control of variables (Hassan, 1995). In essence, research design translates research problems into data for analysis to provide answer to research questions at minimum cost. According to Kerlinger (1986) research design is a plan, structure and strategy of investigation conceived so as to obtain answers to research questions and to control variance. While Rosenthal and Rosnow (1991) opined that a research design serve as a blueprint which provides the scientist with a detailed outline or plan for the collection and analysis of data. Research design deals with a logical problem and not a logistical problem. When constructing a building there is no point ordering materials or setting critical dates for completion of project stages until when the nature of the proposed building is known with relative certainty. The first decision is whether the proposed structure is an office, a factory for manufacturing machinery, a school, a residential home or an apartment block. Until this is done with utmost certainty, all other activities such as plan sketching, town planning approval, material ordering cannot start.

Similarly, social research needs a design or a structure before data collection or analysis can commence. A research design is not just a work plan (a work plan details what has to be done to complete the project but the work plan will flow from the project's research design), as it also ensure that the evidence obtained enables investigator to answer the initial question as unambiguously as possible. Obtaining relevant evidence entails specifying the type of evidence needed to answer the research question, to test a theory, to evaluate a programme or to accurately describe some phenomenon. In other words, when designing research we need to ask: given this research question, what type of evidence is needed to answer the question in a convincing way?

Too often researchers design questionnaires or begin interviewing far too early before thinking through what information they require to answer their research questions. Without attending to these research design matters at the beginning, the conclusions drawn will normally be weak and

unconvincing and fail to answer the research question. Creating an effective research design is one of the most difficult and eminently useful tasks in drafting a proposal because an effective research design links abstract and stylized concepts to questions with the empirical world's complexities and challenges. Hence it must be specific and highly flexible in order to be expansive enough to adapt these very complexities while still pointing you towards relevant data.

However, there seems to be a tendency among academics to find many different ways of looking at research and thus create numerous categories and approaches to describing their research activities. At the European Conference on Research Methodology for Business and Management Studies at the IE Business School in Madrid (2010) a distinguished panel of academics discussed the importance of design research (DR) or design science research (DSR). All speakers argued for the importance of design and it is not easy to disagree with such a proposition. But it was possible to interpret what they said in different ways as the term design can play more than one role in the way we describe research. At the end, there are at least 3 ways design becomes a research issue.

The first is that any research programme which is intended to lead to a degree or a publication needs to be premeditated and the choices adopted in the plan may be referred to as the research design. If a research programme is undertaken without a cautiously conceived research design then its success will be a question of fate and sometimes some people are fortunate. The meaning of the word design in this context is not problematic.

The second way in which design needs to be considered is described by Peffers et al. (2004) when they claim for the needs for a design science research methodology (DSRM) which they describe as an important "discipline oriented to the creation of successful artifacts." It is not difficult to see that research aimed at the creation of successful pieces offers a different set of challenges to what researchers normally face in business and management studies. Hevner (2004) supports the view that design science research is different to information systems research and they call for collaboration between the two approaches. This seems to be a reasonable use of the word design and it is worth noting that in certain cases the results of this type of research may not lead to a completed artefact but perhaps only to a detailed blueprint for its development.

The third way the word design is used has roots in the work of Simon (1969) who wrote about the study of natural systems and the study of artificial ones. According to Van Aken (2005) and based on the Simon distinction, there are two domains of study which are the explanatory sciences and the design sciences. Explanatory sciences include physics, biology, economics and sociology. Examples of design sciences are engineering and medicine. Van Aken contends that there are differences in the core missions of these two groups of knowledge. He argues that "The core mission of an explanatory science is to develop valid knowledge to understand the natural or social world, or more specifically to describe, explain and possibly predict. The core mission of a design science, on the other hand, is to develop knowledge that can be used by professionals in the field in question to design solutions to their field problems".

This distinction is problematic because anything that bears the science should be explanatory and a mere expression explanatory science does not add any value. The term design science does not do much for us either mostly because the word design can be used in multiple ways as described above. Van Aken (2005) does not like the terms basic and applied sciences because there is no room for these terms "basic and applied" in the field of business and management studies.

This was borne out of the fact that business and management studies is primarily problem solving orientated. But there is more to this issue than just the objective of the paper, academic research for the purposes of degrees and/or publishing in peer reviewed journals need to make a contribution to the field of study. Some academics have trouble in defining what this means but it is relatively easily understood when it is pointed out that such research has to add something of value to the body of theoretical knowledge. In addition this research has to be presented in a scholarly fashion which takes cognisance of what the academic community already knows about this topic. The results of this research will “describe, explain and possibly predict” as van Aken (2005) claims for explanatory research.

For many years this was all that was required of quality academic research. However in the past decades, a new dimension has been introduced and that relates to the application of this new knowledge of management and/or business practice (Starkey 2001). To be assured of success in a degree or to have a paper published today the research ideally needs to point out how the addition to the body of theoretical knowledge can be used to solve practical problems. This does not in any way reduce the status of the research. It is not appropriate to regard this type of work as mere consulting because of its practical dimension. When developed in this way these research results can be used by professionals in the field in question to design solutions to their field problems. In fact the findings of the research orientated in this way will directly offer a solution to such problems. Of course not every academic in every university will agree with the need for the translation of the new theoretical contribution into practical guidelines for management but there is increasing support for this approach.

A good research design helps prevent frustration by provides the glue that holds the research project together through a structure plan that show how all of the major parts of the research project the samples or groups, measures, treatments or programs, and methods of assignment work together to try to address the central research questions. The probability of success of a research project is greatly enhanced when the “beginning” is correctly defined as a precise statement of goals and justification. Having accomplished this, the sequential steps necessary for writing a research plan and then successfully executing a research project are easier to identify and organize.

### **Classification or Types of Research Design**

Asika (2006) and Hassan (1996) classified research design into three main types namely survey, experimental and ex-post facto research design.

The survey research design entails a critical observation of events, objects, subjects and ideas without attempt to control the condition of such phenomenal. It is a description of a given state of affairs that exist at a particular time which required a direct contact with individual whose characteristic, behaviours and attitudes are relevant to the investigation. The observation under survey research could be cross-sectional if the observations are done at one or more point in time or longitudinal if the observations are carried out at different point in time. Cross sectional research design is descriptive, exploratory and explanatory while longitudinal survey focus on trend analysis cohort design and panel design.

The experimental research design is based on cause-and-effect relationship on selected subject matter as it employ the use of two groups namely experimental and control groups. The experimental is given treatment while the control is devoid of treatment in order to established nature of the relationship between the studied variables. It is widely use in the field of natural

science while the ex-post facto research design (causal comparative research) is employed when two group which differ on independent variable and an investigator wish to investigate the difference on one or more dependent variables or difference on one or more independent variables

### **Significance of Research Design**

The purpose of research design is to provide answers to research question validly, objectively, accurately and economically as well as serve as a control platform, maximize systemic variance, control extraneous variance and minimize error. Many contemporary books about research focus clearly enough on the research process as a logical process which is liken to a good argument which in the technical sense is an attempt to assemble a set of claims or premises and arrange them in such a manner that make the conclusion falls directly from these premises or can be inferred (deductively or inductively) from them in a coherent and non-contradictory manner. (Hassan, 1995).

Similarly, quality research contain strong evidence in the form of data that is relevant to a question or a problem, such evidence has been collected, organized and analyzed in ways that allow users/recipients to accept that the findings based upon them are reasonable inferences. Moreover, the data collection and analysis techniques are appropriate in terms of the kind of problem involved and the kinds of question(s) being asked.

Research aims to identify the various aspects of the world we want to understand more clearly and having identified these, to set about examining them methodically, systematically, and with the assistance of what we already know about the world. What we already know about the world has been organized, summarized, and made meaningful by use of theories, concepts, and bodies of information. In order to conduct further research into aspects of the world we need to find ways of

- (i) locating gaps in knowledge and understanding
- (ii) framing these gaps clearly and concisely as problems and questions
- (iii) working out systematic, methodical, and reasonable ways of exploring these gaps

Another way of saying this is to say that we need to find ways of arranging these three aspects into a research design (Asika, 2006).

The research design will be built on clearly and concisely framed problems and questions and a clear sense of the research purposes. This research purposes might be identified as a set of aims and objectives that relate the research focus in the form of our research question(s) and/or research problem. A clear and concise statement of research purposes is absolutely essential for doing good quality research.

The research design will also contain a theoretical and conceptual framework that helps simplify the questions, problems and purposes the study with the study, discuss the known about the matters, and helps to understand how particular concepts and elements of theory might be useful in the inquiry.

Guided by careful analysis of research questions and problems, conceptual and theoretical framework and reading of the research literature, the research design will also contain a strategy for collecting and organizing data that is relevant to the research problem(s) and/or question(s). This will be a strategy that enables us to collect the right kind of data for addressing the research

focus, collecting good quality data of an appropriate kind, and collecting an appropriate amount of data for investigating our research problem and question in a rigorous and illuminating way. To be more precise, the research design will contain as one of its key components a data collection design. On the basis of this data collection design and in accord with the various resources of time, money, energy, etc., available the data collection plan will be developed (Hassan, 1995).

In addition to the strategy for collecting and organizing data, there is a need for a data analysis strategy. The most important thing about this strategy is that it must cohere with or be consistent with the research purposes as well as the theoretical and conceptual framework and the kinds and amount of data collected.

In conclusion, the research design must contain a strategy for interpreting the analysed data in order to provide adequate findings and conclusions from the research which will allow for the advance recommendations or implications based on the study. The important point to note here about the idea of a research design is that all of its components must ‘fit’ with each other or ‘go together’ with each other in a coherent manner.

**Table 1: Research Design Table**

Research Purposes	Data Collection techniques	Data Analysis Approach	Informants
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**Source:** Lankshear (2011)

By placing the data analysis next to the research purposes column and data collection, this reminds the researcher of the need to collect data that is pertinent or relevant to research question. The data must fit the questions, methods and techniques of data analysis must be in line with our data. The informants in this context, refers to scholars (particularly, published literature) that are relevant to research who through their writing, provides the various options for the kind of theoretical approach essential to frame research and developed key concepts or constructs around which an inquiry is formed. The informants help in determining the ideal data collection and data analysis techniques that fit the research question. Usually, there may be more than one theoretical approach and conceptual framework that are applicable to a study, such situation warrant choosing the most attractive theory and framework by the researcher for personal and professional reasons or choosing a framework that has been widely used successfully by other researchers whose works are relevant and useful for addressing questions and problems similar to the present study. But whatever theory and conceptual framework developed for the study, it must cohere with the problem and question, and it must be capable of providing information on the appropriate data collection and analysis techniques.

The researcher needs to keep reading the literatures until he is confident of the research question and the kinds of theory and concepts fit the question. It also helps to make coherent and justifiable decisions about the kinds of data to collect and how to analyze it.

To understand and use this table to guide the study, it is useful to think in terms of a number of key questions that can be in each column. These questions act as a guide to action by helping the investigator to structure the research consistently. In other words, in order to conduct the research rigorously, there is a need to provide answers to each of these questions. The research will unfolds as the researcher provides answer to these questions, implement the tasks and follow the leads provided by our answers.

**Table 2: Research Design Table as Questions to be addressed when Developing our Design**

<b>Research Purposes</b>	<b>Data Collection techniques</b>	<b>Data Analysis Approach</b>	<b>Informants</b>
<ul style="list-style-type: none"> <li>• What is my research problem?</li> <li>• What are its key dimensions?</li> <li>• What specific questions does it generate?</li> <li>• Which of these questions can I hope to address well?</li> <li>• How can I analyze my problem and questions to specify a succinct set of research aims and objectives, and a finite set of research questions?</li> </ul>	<ul style="list-style-type: none"> <li>• What kinds of research data must I collect?</li> <li>• How will this data help me address my purposes?</li> <li>• How will I collect this data?</li> <li>• How much data will I collect?</li> <li>• How will I validate this data or establish that it is good quality data?</li> <li>• How will I organize this data so it will be in good shape for being analyzed?</li> </ul>	<ul style="list-style-type: none"> <li>• What forms of data analysis will I use?</li> <li>• What justifies these forms of analysis?</li> <li>• How will they help me achieve my research purposes?</li> <li>• How are these forms of analysis conducted?</li> <li>• What do I need to know, be able to do and have access to do in order to use these forms of analysis in an expert way?</li> <li>• What will these forms of analysis let me 'say' about the data (and not say)?</li> </ul>	<ul style="list-style-type: none"> <li>• Who helps us understand how to frame and refine research purposes?</li> <li>• What are some relevant books, articles, and chapters here?</li> <li>• Who provides theories and concepts relevant to our research problem and questions?</li> <li>• How do these guide us in deciding what kinds of data to collect and how to analyze it?</li> <li>• Who provides good advice on how to collect, validate and organize data?</li> <li>• Who provides good information about how to analyze data?</li> </ul>

**Source:** Lankshear (2011)

Table 2 above shows a concise summary of some key points discussed in this study about research and research design by focusing attention on the relationship between research problems, research questions, and research aims and objectives. In order to clarify what the study is about, there is a need for lots of analytic work by analyzing the research problem in order to discover the required components or dimensions. The identified components must be analysed in terms of the types of questions required in order to address them in a satisfied manner because without aims and objectives of study, the researcher will not know when his goals has been realized or the problem have been well addressed.

Of course, unless we are clear about our purposes and know what kinds of questions are involved we will lack a strong and clear base for deciding what kind of data to collect, how much of it to collect, and so on. Therefore, we need to be able to analyze and specify our questions and purposes in ways that guide our data collection. While this may seem obvious, it is surprising how often people fail to recognize the importance of the relationship between our purposes and decisions about data. In terms of a logical research process it is simply absurd to collect data before one has a question. This is like buying cooking ingredients before deciding the choice of meal. In addition, the data aspect draws attention to the fact that it is not rational to invest time in analyzing data unless one is confident that the data is reliable and of good value. It doesn't

matter how competent the analysis is once the data itself is poor. If the data is poor even excellent analysis won't be able to give a relevant research outcome.

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