

A GUIDE FOR SELECTING RESEARCH DESIGN IN INFORMATION SYSTEMS STUDIES

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ABSTRACT

Design is essential in research, yet, many researchers especially, postgraduate students continue to be challenged in selecting the most suitable research design for their studies. The process and decision to select research designs become more cumbersome and challenging when more than one design is required in a study. This challenge persists, primarily because there seem to be no guidelines for selecting the most appropriate design for a study. Consequently, many aspiring researchers sometimes select designs that do not align with the objectives of their studies. Thus, this study was conducted, to gain a deeper understanding of the challenges by gathering information from the postgraduate students. The qualitative methods were applied, to gain insights from researchers' and students' experiences (data). The interpretive approach was employed, to analyse the data. This paper reports on the findings.

KEYWORDS

Research Design, Research Methodology, Information Systems Studies, Selection Guide, Research Model

1. INTRODUCTION

Research design is one of the components of the research methodology. It provides a strategy for addressing a research problem and achieving objectives by integrating different components of the study coherently and logically (Indu & Vidhukuma, 2019). According to Cook and Cook (2016), research design provides the blueprint for conducting research and, it shapes the kind of knowledge that the study generates. The knowledge can either be from a positivist perspective which is developed by testing and confirming theories or from a subjective position, which seeks to induce a deep understanding of why things happen the way they do. Indu and Vidhukuma (2019) asserted that a research design is determined by the research problem and can be either qualitative or quantitative or a combination of both referred to as a mixed method.

Based on its influence, the choice of research design is critical in any study (Indu & Vidhukuma, 2019). Data collection is one area of its influence. Odoh and Chinedum (2014) noted that research design ensures that data are collected in a way that is consistent with acceptable practice in the field of study. Also, the research design influences the structure, such as data collection, and data analysis of a study and binds them together to solve a problem. Thus, Asenahabi (2019) suggests that researchers must have a good understanding of research designs and their significance, to overcome the challenges of selecting methods and techniques in research. Consequently, when a researcher selects the less appropriate research designs, usually, the type of data collected is weak, the analysis is skewed, the conclusions drawn unconvincing, and fail to answer the research questions (Jongbo, 2014).

Selecting a research design is a challenging process for many researchers. Cook and Cook (2016) identified a lack of a universally agreed approach and the use of various terms as some of the reasons why some researchers are consistently challenged with the selection of research designs. These challenges add to the complexity and confusion, which many aspiring researchers encounter. As a result, some postgraduate students select more than one design, which makes the process more challenging. Therefore, to understand and conduct research towards achieving the objectives, the most appropriate design must be selected (Cook & Cook, 2016). In the literature, various types of research designs are found, and each has strengths and weaknesses (Rezigalla, 2020), which must be understood before selecting any of them.

Although much work has been done in the areas of research methods and methodology, the challenges identified herein, persist. Primarily, because no work seems to provide a step-by-step guide as this paper does. Thus, this paper will be a significantly useful material for emerging researchers including postgraduate students. Also, undergraduate students who are interested in research will benefit from it.

The paper is organised into six main sections. It begins with the introduction of the study. Thereafter, the literature review covering the core aspects of the study is presented. In the third section, the methodology that was applied is discussed. The fourth section presents and discusses a guide proposed, which can be used for the selection of research design, in IS research. In the sixth section, the implications for research design practice are discussed. Finally, the paper is concluded in the fifth section.

2. LITERATURE REVIEW

Research design represents the structure and planning for addressing a research problem (Odoh & Chinedum, 2024). It adds to the comprehension of the procedure followed, which includes showing the process undertaken to obtain results or findings in studies. Consequently, research design plays a critical role in shaping the outcome of a study. Flick (2022) explains that the choice of research design reflects decisions about the priority being given to a range of dimensions in the research process. According to Odoh and Chinedum (2024), a research design integrates data collection procedures, data analysis, and interpretation of the findings or results. Thus, the research design induces credibility on how and why results or findings are achieved in a study. Additionally, Flick (2022) asserted that a research design is a way of acknowledging the underlying theoretical assumptions that have shaped perspectives and understandings of the research focus and processes.

There are many research designs, as covered in the literature (Sarfo et al., 2021; Frost, 2020; Flick, 2022). In information systems (IS) research some of the most common designs include action research (McNiff, 2013), case study (Schoch, 2020; Yin, 2017), ethnography (Denzin, 2017), grounded theory (Seidel & Urquhart, 2013; Strauss & Corbin, 1997), phenomenology (Van Manen, 2017), and survey (Zhang et al., 2017). These research designs vary in their focus and purpose and influence data collection approaches (Danford, 2023; Cook & Cook, 2016). Each design has its strengths and weaknesses, which makes the selection crucial, in any study. Thus, the study's objectives remain the most acute and appropriate set of criteria that guide the selection of research design.

One of the strengths of grounded theory is that it can be used for both collection and analysis of data (Leggio, 2022). The survey technique enables broad coverage for data collection and allows the researcher to administer standardized questionnaires to the respondents (Odoh & Chinedum, 2024). Phenomenology focuses on the shared meaning of multiple people's lived experiences with a phenomenon (Sarfo et al., 2021). Danford (2023) explains how the ethnography technique enables the researcher to explore patterns of activities, behaviours, and languages of a specific cultural group within their natural setting over time. The case study design enables an in-depth analysis of an event, program, process, activity, or common experience with a person or group of people (Danford, 2023). Leggio (2022) discussed how the case study technique provides an opportunity, to gain a deeper understanding of contemporary phenomena within a real-life context.

However, selecting a research design is not always straightforward because it is influenced by various factors, such as the objective and focus of the study. According to Cypress (2019), many emerging researchers are often challenged when they must select research designs, which sometimes contribute to a delay or agonizing circumstances in completing their studies. Verschuren (2003) reported that for many young researchers, there is ambiguity about the different research designs. From the grounded theory perspective, Timonen et al. (2018) argued that postgraduates and emerging researchers are often concerned or confused about how to apply the design. Rashid et al. (2019) asserted that researchers often opt for the case study design without a substantive understanding of the implications of how and where to apply the approach in a study.

An issue that adds to the selection complexity is that many postgraduate students understand the different designs from a theoretical standpoint. An empirical study by Iyamu and Shaanika (2018) revealed that many postgraduate students are theoretically knowledgeable about the methods and approaches but are practically challenged in their applications. With limited knowledge about the application of a design, researchers find themselves selecting designs that are not suitable for addressing their study objectives. Cypress (2018) explained that an understanding of research design is critical as it influences the basis for how data collection and analysis activities are conducted and the outcome of the study. Rashid et al. (2019) recommended that researchers should gain a deeper understanding of the research design, to select the most appropriate one, which makes it easier to justify alignment with the research methods.

3. METHODOLOGY

Based on the aim of the study which is to develop a model that would aid researchers in selecting the most appropriate research designs, the qualitative approach was followed. The Qualitative approach allows the researcher to identify issues from the participant's perspective and understand the meanings and interpretations that are given to events (Hennink et al., 2020). Qualitative studies are conducted in their natural environments to gain a deeper understanding of the participant's experiences and realities (Renjith, 2021). Thus, the qualitative approach is suitable for this study, to gain a better understanding of how and why postgraduate and emerging researchers select research design.

Within the qualitative paradigm, the case study was selected as the design for this study. A group of postgraduate students from a South African university was used as the case in the study. Schoch (2020) refers to the case study approach as an in-depth investigation of a contemporary phenomenon within a real-life context. The focus of this paper is more of an academic phenomenon. Thus, an academic institution is inevitably, best to be used as a case for the study. The following criteria were applied in selecting the case: (1) access to the university, (2) the university has post-graduate students enrolled for master's and doctoral programs in the Information Systems (IS) Department. Based on the criteria, a university in the Western part of South Africa was selected to partake in the study. For ethical reasons, a pseudo-name, CapeVarsity is used to represent the institution.

Data was collected using the focus group discussion technique. This technique is useful for bringing together homogeneous groups of participants with relevant expertise and experience on a given topic on which they can share detailed information (Busetto et al., 2020). According to Gill and Baillie (2018), a focus group can yield rich, in-depth data and illuminate agreement and inconsistencies. For this study, the focus group consisted of post-graduate students in the IS Department of the institution. The students attended a postgraduate research seminar, where the data was collected. During the seminar, the postgraduate students presented various components of their studies including research designs. Each presentation was engulfed with discussions and probing by other students. The probing focused on "why" and "how" certain research designs were or were not selected in the students' various studies.

The students were in different stages of their studies ranging from first to final years. This enabled rich discussions due to the level of knowledge and exposure of each student, about research designs. The focus group consisted of a total of fifteen people: one postdoctoral fellow, seven doctoral, and seven master students.

4. CRITERIA FOR SELECTING RESEARCH DESIGN IN INFORMATION SYSTEMS RESEARCH

This study aims to develop a guide for selecting research design in information systems studies. The guide is a three-step approach. The first step cohorts the components that must be aligned, towards selecting the most appropriate design. In the second step, the focuses of the most common research designs are described, for understanding purposes. The third step is the methodological approach. The three steps are discussed below and should be read in conjunction with one another, for ease of understanding.

Step #1: Components alignment

The core aspects of research are usually the problem, objectives, and questions, as shown in Figure 1. Thus, the focus of the research depends on the alignment of the core components: problem, objectives, and questions being investigated. Bougie and Sekaran (2019) argued that the research problem, objectives, and questions must be strongly aligned, to avoid deviation. It is therefore critical to ensure that there is no disparity between the components. The alignment promotes synergy among the three components, primarily directing the study towards the defined aim. Coe et. al (2021) explained how the alignment of components situates the problem, logically, in conducting the investigation. Bottomline, the components are interdependent and, therefore, should not be developed in isolation from each other.

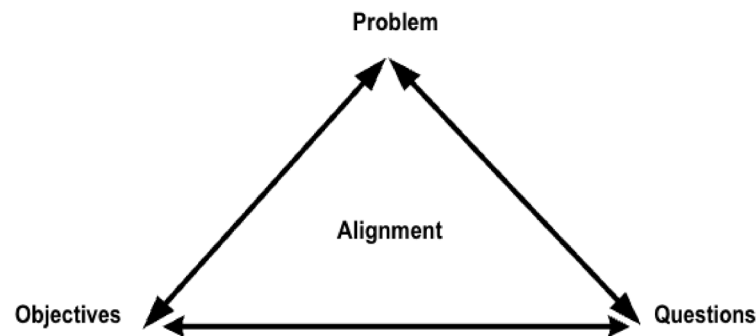


Figure 1. Components alignment

Despite its criticality, the alignment between the three components can be challenging, especially for emerging researchers. Complementarily with the objective, this paper intends to ease this challenge. For example, once the alignment is achieved, it becomes easier to determine the next step. It thus, influences the methodology applied in the research. The methodology articulates the logic and flow of the systematic processes followed in conducting a research project, to gain knowledge about the phenomenon being studied (Khatri, 2020).

Step #2: Research Design

There are different types of research designs a researcher can choose from. Significantly, some of the designs constitute similar attributes. This makes it difficult for some researchers to select the most appropriate design. When selecting a research design the researcher must have a good understanding of its primary focus. A design focus represents components that uniquely identify and set it apart from other designs. Table 1 describes some of the most common designs in IS research.

Table 1. Design focus

Design	Focus	Descriptions
Action Research	Cyclical, participative and collaborative	Action research follows a systematic and cyclical pattern of reflection, planning, action, observation, and data collection, evaluation that repeats in an iterative and ongoing manner (Johnson, 2020).
Archivary and documentary	Documentary of historical events	Focuses on documentaries that historical actors leave behind. The archives comprise documentation that an organisation has accumulated over time (Tennent & Gillett, 2023).
Case Study	In-depth inquiry into real life-context	In a case study, an object is studied exhaustively from multiple perspectives of complexity and uniqueness in a real context (Bondía & Gracia, 2022).
Ethnography	Historical events, cultural context	Investigate intact cultural or social groups to find and describe beliefs, values, and attitudes that structure the behaviour, language, and interactions of the group (Hancock et al., 2021).
Experiments	Numeric, manipulate variable, test hypothesis	Experiments take the form of altering the environment and observing subsequent reactions (May & Perry, 2022).
Grounded Theory	Theory development data grounded	Grounded Theory aims to generate theory that is grounded in data according to the views of the participants (Turner & Astin, 2021).
Phenomenology	Phenomenon lived experience	Explore the meaning of several people's lived experiences around a specific issue or phenomenon (Hancock et al., 2021).
Survey	Standardised wider coverage	The survey design allows for questions to be presented in a fixed and standard order to a larger and more diverse population (Braun et al., 2021).

Step #3: Methodological approach development

Step #3 consists of two tables: Tables 2 and 3. The two tables should be applied, linearly. In Table 2, there are three columns and three rows. The first column contains the focus of the objectives. Usually in IS, the focus of an objective is either to conduct an experiment or empirical study or a combination of both. In the second Column, the types of methods that can be employed are presented. There are three types of methods: quantitative, qualitative, and mixed methods (Taherdoost, 2022; Flick, 2022). In the third column, the three most common approaches in IS research, which are deductive, inductive, and abductive, are presented. When following a deductive approach, the researcher begins with a theory and then collects data that either supports or refutes the theory. In contrast, inductive research involves gathering data and building a theory based on the analysis of the data (Jones & McCrickard, 2021). Abduction represents a combination or synthesis of both deduction and induction and can be considered an equally important approach to research (Karlsen et al., 2021). As shown in Table 2, depending on the type of study, any of the approaches can be selected.

The three components of Table 2, objectives, method, and approach are interdependent, which means that one determines or influences the other, starting from the objective to the approach stages. For example, a research objective which is experimentally driven compels the researcher to collect quantitative data using a deductive approach. Khatri (2020) explains that if the researched phenomenon is about the relationship between different variables and testing of the hypothesis, it leads towards deductive whereas if the phenomena to be researched are about the human experiences and social-cultural processes, the focus is on multiple realities following the inductive approach. Therefore, research objectives, inherently influence the types of data and the approach to be applied in the study.

The rows in Table 2 are assigned codes, BA, BB, and BC. The codes are determinants and enable ease of reference. Code BA indicates studies that have objectives that are required to be solved by following the objectivism process. Code BB signifies that a study requires a subjective technique, which entails empirical evidence. Code BC infers that the research requires both quantitative and qualitative to resolve the problem being studied.

Table 2. Method selection

Code	Objectives/problem	Method	Approach
BA	Experiment	Quantitative	Deductive
BB	Empirical	Qualitative	Inductive
BC	Experiment and empirical	Mixed	Abductive

The latter part of Step #3 is Table 3. The Table consists of a list of the commonly used designs in IS research. The designs are grouped into three categories, Groups A, B, and C. Group A, Group B, and Group C contain qualitative, quantitative, and mixed methods, respectively.

Table 3. Research designs grouping

Group	Design				
Group A	Case study	Ethnography	Grounded theory	Phenomenology	Archivary and documentary
Group B	Action research	Survey	Simulation	Experiments	
Group C	Select at least one from each Group				

To select a research design, the codes presented in Table 2 should be aligned with the groupings in Table 3, thereafter, a conditional statement or approach should be applied as follows:

- i. If the code is equal to BA, then select a design from Group B.
- ii. If the code is equal to BB, then select a design from Group A.
- iii. If the code is equal to BC, then select at least one design, each from both Group A and B.

The guide provides a predefined control set, which eradicates or reduces the challenges often encountered in selecting research design. Thus, the selection of the research design is neither by an individual's preference nor lack of know-how. Selecting a research design is guided and controlled using the proposed three-step approach.

5. IMPLICATIONS FOR RESEARCH DESIGN PRACTICE

In practice, it's not sufficient to select a research design. The outcome of the study presents two primary types of implications to the focus audience, which are the postgraduates and emerging researchers. The implications are knowledgeability and alignment.

- i. Knowledgeability - There is a need for post-graduate students and other researchers to understand the different designs that exist. Choosing a design without understanding other designs limits the researchers from selecting the most appropriate, for the defined research problem. However, having a good knowledge of the different research designs requires comprehending the strengths and weaknesses including how and when to apply each design. This can be a complex process in practice. Thus, knowledgeability ensures a researcher selects the design based on its potency for addressing the research objectives and not because of its ease of use, popularity in the literature or familiarity.
- ii. Alignment – Alignment is the other implication in practice. This implication requires that the researcher must know how to align the different components (problem, objectives, questions) of the study. The components are interdependent and should not be developed in isolation. The disjoint between these components often complicates the design selection process leading to researchers opting for designs that might not be suitable and cannot justify their applications towards resolving the defined problem.

6. CONCLUSION

The choice of research design is critical for any study. It brings transparency to the research process in terms of how methodological components such as data collection and analysis were realised. However, research designs could negatively affect the outcome of the study if not understood or appropriately selected. This study presents the importance of understanding research designs and a guide on how to select a design in information systems studies. The guide is the primary contribution of the study. This is significant to postgraduate students and emerging researchers because it provides a step-by-step approach to selecting a research design.

The developed artefact, which is a guide is not tested and therefore remains theoretical. Therefore, to achieve its full benefit and contribution, it needs to be tested. The test can be conducted in further studies, to provide empirical evidence to improve the understanding and knowledge of researchers when selecting research designs. Another area of further studies can be an investigation into how the guide interlinked with the socio-technical theory that underpins research. The two are interrelated as critical factors of the research methodology, whereby the research design influences the data collection process while the socio-technical theory focuses on the analysis of the data collected.

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