

### **3. A Review of Research Design**

**Dr. T. M. Prashanth Kumar**

Assistant Professor,  
Department of Studies in Education,  
Vijayanagara Sri Krishna Devaraya University,  
Ballari, Karnataka.

***Abstract:***

*The research design is a vital part of research. Reviews of research design are studied here in this paper. The design and implementation of research involve two types human experimentation, animal experimentation. Research design entails a process or template of finding definitive answers to research problem and questions. In this attempt a researcher employs two major types of research design; qualitative and quantitative. In the construction of research design the researcher is expected to bear in mind the features in both the qualitative, quantitative and the combination of the two (mixed) methods. The research design is a vital part of research. Reviews of research design are studied here in this paper. The design and implementation of research involve two types human experimentation, animal experimentation. This type of research aims mainly discovering the fundamental motive and needs, using in increase the strength interviews for a particular the purpose. Review in the process of research design, and how to develop a research practice that will build skills in reading and writing about research literature—skills that remain valuable in both academic and professional careers. Literature review is approached as a process of engaging with the discourse of scholarly communities that will help graduate researchers refine, define, and express their own scholarly vision and voice. In this paper we will discuss A Review of Research Design.*

***Keywords:***

*Review, Research Design, Experimentation, Qualitative, Quantitative, Hypothesis, Literature, Research Infrastructure, Design Elements, Sampling, Data Collection, Data Analysis, Research Methodology.*

### **3.1 Introduction:**

Research is a watchful examination or query especially all the way during the search for original data in some branch of information. It is the methodical step regarding simplification and the formulation of a hypothesis. Research is organized attempt to increase original information. Research design entails a process of finding a definitive answer to research questions. In an attempt to do so, a researcher may employ two major types of research design; qualitative and quantitative. [1]

Features of Research Design The identification of a problem and formulation of the research questions is the starting point of a research design based on these two crucial steps the researcher can move on to make the research design that attempts to answer the research question. A good research design minimizes bias and maximizes the reliability of the data for the study. More often one design is not applicable to all studies therefore in constructing the design the following features are pertinent.



**Figure 3.1: An appropriately chosen, well-executed research design helps researchers conduct high-quality research. (Image by rawpixel.com on Freepik)**

### **3.2 Review of Research Design:**

A research design is a systematic elucidation of the whole research process that includes methods and techniques, starting from the planning of research, execution (data collection), analysis, and drawing a logical conclusion based on the results obtained.

A research design is a framework developed by a research team to find an answer/solution to a problem.

The research designs are of several types that include descriptive research, surveys, correlation type, experimental, review (systematic/literature), and meta-analysis. [2]

The choice of research design is determined by the type of research question that is opted for. Both the research design and the research question are interdependent.

For every research question, a complementary/appropriate research design must have been chosen. The choice of research design influences the research credibility, reliability, and accuracy of the data collected.

A well-defined research design would contain certain elements that include a specific purpose of the research, methods to be applied while collecting and analyzing the data, the research methodology used to interpret the collected data, research infrastructure, limitations, and most importantly, the time required to complete the research.

The research design can broadly be categorized into two types: qualitative and quantitative designs. In a qualitative research method, the collected data are measured and evaluated using mathematical and statistical applications.

Whereas in quantitative research, a larger sample size is selected, and the results derived from statistics can benefit society.

The various types of research designs are shown in Figure 2 [3]



**Figure 3.2: Types of Research Design**

### **3.3 Research Design Elements:**

Research design elements include the following:

- Clear purpose: The research question or hypothesis must be clearly defined and focused.
- Sampling: This includes decisions about sample size, sampling method, and criteria for inclusion or exclusion. The approach varies for different research design types.
- Data collection: This research design element involves the process of gathering data or information from the study participants or sources. It includes decisions about what data to collect, how to collect it, and the tools or instruments that will be used.
- Data analysis: All research design types require analysis and interpretation of the data collected. This research design element includes decisions about the statistical tests or

### *Research Design*

methods that will be used to analyze the data, as well as any potential confounding variables or biases that may need to be addressed.

- **Type of research methodology:** This includes decisions about the overall approach for the study.
- **Time frame:** An important research design element is the time frame, which includes decisions about the duration of the study, the timeline for data collection and analysis, and follow-up periods.
- **Ethical considerations:** The research design must include decisions about ethical considerations such as informed consent, confidentiality, and participant protection.
- **Resources:** A good research design takes into account decisions about the budget, staffing, and other resources needed to carry out the study.

The research refers to the methodical technique consisting of express the difficulty, prepare a hypothesis and accumulate the information or data, analyzing the information and realization positive termination each in the form of solutions towards the concerned difficulty or in assured generalizations for several hypothetical formulations which may be key factor of entrepreneurship.

Research is blind without assumption, so all research is generally based on assumption, about how best one is understood and the world has perceived. Almost two millennia philosophers have been arguing about the various question now a time to know how present social researchers approaching world around.

The aforementioned qualities are one of the major vital concerns in research work. Base on the research project the idea of validity to discuss for quality conclusion of a research. [4]

Maximum number of the students are rolling their eye and curl up into fatal position when discuss about the validity, because it is like an abstract and philosophical.

If any researcher could understand the principle that used to judge quality of research by validity, then he or she would do much more than the expected research project once that completed. Researchers must have been expert at research to assure quality research.

### **3.4 Research Design:**

The research design is intended to provide an appropriate framework for a study. A very significant decision in research design process is the choice to be made regarding research approach since it determines how relevant information for a study will be obtained; however, the research design process involves many interrelated decisions.

This study employed a mixed type of methods. The first part of the study consisted of a series of well-structured questionnaires (for management, employee's representatives, and technician of industries) and semi-structured interviews with key stakeholders (government bodies, ministries, and industries) in participating organizations. The other design used is an interview of employees to know how they feel about safety and health of their workplace, and field observation at the selected industrial sites was undertaken. [5]

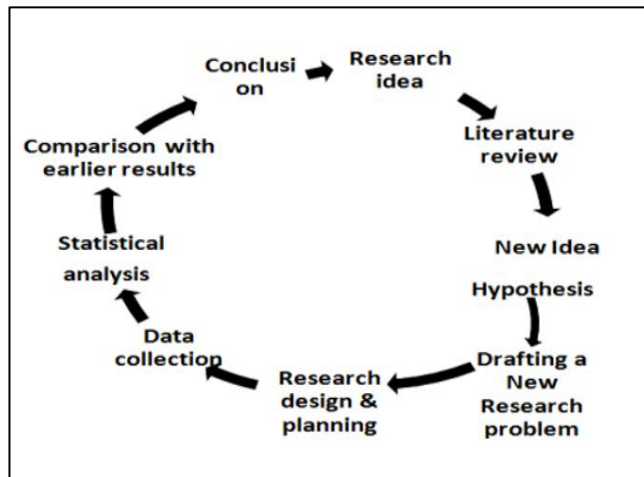
Research design talks about the overall strategy that you choose to logically integrate the various elements of your research so to make sure that you deal with the research issues efficiently.

Data collection for your research has two parts – Primary Data Collection and Secondary Data Collection. Primary data collection can be done from various sources like workplace, interview, questionnaires, and expert opinion.

Secondary data collection involves literature review, reports etc. Research is defined as a systematic, controlled, empirical and critical investigation of hypothetical propositions about the natural phenomenon. Research process consists of series of actions or steps necessary to effectively carry out research and the desired sequencing of these steps. [6]

#### **Research is a Cyclic Process:**

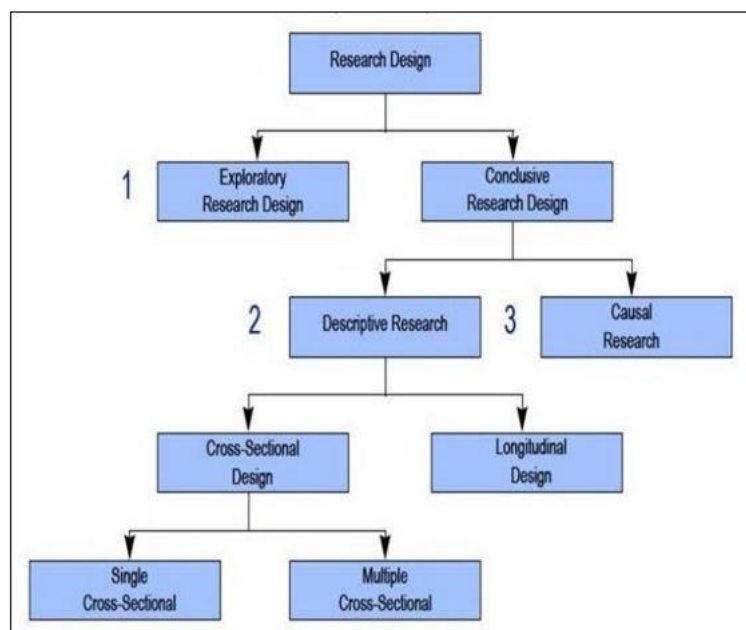
- It consists of number of closely related activities that overlap continuously rather than following a strictly prescribed sequence.
- Due to cyclic nature of research: It is difficult to determine where to start and when to stop.
- Cyclic mechanism: part of “built-in error correction” machinery.



**Figure 3.3: The flowchart below well illustrates the research process**

Research design addresses the planning of scientific enquiry, designing a strategy for finding out something specific. The design is the complete strategy of tackling the central problem. [7]

### 3.5 Classification of Research Design:



**Figure 3.4: Classification of Research Design**

### **Types of Research Design:**

A research design is essential to systematically investigate, understand, and interpret phenomena of interest. Let's look at different types of research design and research design examples.

Broadly, research design types can be divided into qualitative and quantitative research. [8]

**Qualitative** research is subjective and exploratory. It determines relationships between collected data and observations. It is usually carried out through interviews with open-ended questions, observations that are described in words, etc.

Qualitative research is expressed in words. It is used to understand concepts, thoughts or experiences. This type of research enables you to gather in-depth insights on topics that are not well understood.

Common qualitative methods include interviews with open-ended questions, observations described in words, and literature reviews that explore concepts and theories.

**Quantitative** research is objective and employs statistical approaches. It establishes the cause-and-effect relationship among variables using different statistical and computational methods. This type of research is usually done using surveys and experiments.

Quantitative research is expressed in numbers and graphs. It is used to test or confirm theories and assumptions. This type of research can be used to establish generalizable facts about a topic.

Common quantitative methods include experiments, observations recorded as numbers, and surveys with closed-ended questions.



**Table 3.1: Qualitative research vs. Quantitative research [9]**

Qualitative research	Quantitative research
Deals with subjective aspects, e.g., experiences, beliefs, perspectives, and concepts.	Measures different types of variables and describes frequencies, averages, correlations, etc.
Deals with non-numerical data, such as words, images, and observations.	Tests hypotheses about relationships between variables. Results are presented numerically and statistically.
In qualitative research design, data are collected via direct observations, interviews, focus groups, and naturally occurring data. Methods for conducting qualitative research are grounded theory, thematic analysis, and discourse analysis.	Quantitative research design is empirical. Data collection methods involved are experiments, surveys, and observations expressed in numbers. The research design categories under this are descriptive, experimental, correlational, diagnostic, and explanatory.
Data analysis involves interpretation and narrative analysis.	Data analysis involves statistical analysis and hypothesis testing.
The reasoning used to synthesize data is inductive.	The reasoning used to synthesize data is deductive.
Typically used in fields such as sociology, linguistics, and anthropology.	Typically used in fields such as economics, ecology, statistics, and medicine.
Example: Focus group discussions with women farmers about climate change perception.	Example: Testing the effectiveness of a new treatment for insomnia.

### 3.5 Advantages of Research Design:

Research design is a crucial step in conducting any research project, and it involves planning and organizing the research study to ensure its objectives are achieved efficiently and effectively. Here are some of the key advantages of research design:

**Clarity of Research Objectives:** A well-designed research project clearly defines the research objectives and the methods that will be used to achieve them. This helps to ensure that the research study is focused and that the results will be meaningful and useful.

**Improved Data Quality:** A well-designed research project ensures that the data collected is high quality, increasing the results' accuracy and reliability. This is because a good research design ensures that the data collection process is standardized and that the data is collected systematically and consistently.

**Efficient Use of Resources:** A well-designed research project helps to ensure that resources are used efficiently. This is because the research design ensures that the research study is structured in a way that maximizes the use of resources and minimizes waste.

**Increased Validity and Reliability:** A well-designed research project ensures valid and reliable results. This is because the research design ensures that the study is structured to reduce bias and other sources of error.

**Better Communication:** A well-designed research project ensures that the research study results can effectively communicate to various audiences. This is because the research design ensures that the research study is structured in a way that is clear and easy to understand. **Ethical Considerations:** A well-designed research project ensures that ethical considerations are considered. This is because the research design ensures that the research study is structured in a way that minimizes the risks to participants and ensures that informed consent is obtained. [10]

### **3.6 Disadvantages of Research Design:**

While research design has many advantages, some disadvantages need to be considered. Here are some of the key disadvantages of research design:

**Limited Scope:** A research design may need to be narrower in scope, which can limit the generalizability of the results. This can be a problem if the research study is intended to be applied to a broader population. [11].

**Cost and Time:** Research design can be time-consuming and expensive. The cost and time required for research design can be a barrier to conducting research studies, particularly for small organizations or those with limited resources.

### *Research Design*

**Complexity:** Research design can be complex, particularly for studies involving multiple variables or statistical analyses. This can make it challenging to design a research study that is both feasible and effective.

**Ethical Considerations:** While research design can help to ensure that ethical considerations are taken into account, it can also present ethical challenges. For example, some research designs may require participants to provide sensitive information or use placebo treatments.

**Potential for Bias:** Despite efforts to minimize bias, research design can still be subject to bias. This can be problematic if the bias is not detected or undermines the results' validity and reliability. **Limitations of Data Collection:** Research design can be limited by data availability. For example, data collection may be limited by the availability of participants or the quality of the available data. [12]

### **3.7 Conclusion:**

It is important for research design to bear in its construction the potential issues that may arise in collecting data, especially through interviews and observations. Researchers need to seek permission to conduct research on-site and convey to gatekeepers or individuals in authority how their research will provide the least disruption.

High-quality research is reasonable: good research should be logical. It involves that research is directed by the natural rules of rational reasoning. The we accepted logical method of introduction and assumption are huge price in transport out from the investigation.

Instruction is the procedure of calculation as of an element to the entire while reasoning is the procedure of analysis as of several principles to a conclusion.

### **References:**

1. Burns. N. & Grove S. (1999) Understanding Nursing Research 2nd edition. WB Saunders Company, Philadelphia.

2. Caracelli. V.J. & Greene. J.C. (1997) Crafting mixed method evaluation design in J. Greene and Caracelli (Eds) *Advances in mixed method evaluation: The challenges and benefits of integrating diverse paradigms. New directions for evaluation* San Francisco: Jossey-Bass.
3. Boote, D. N., & Beile, P. (2005). Scholars before researchers: On the centrality of the dissertation literature review in research preparation. *Educational Researcher*,34(6), 3–15.
4. Davis, J., Mengersen, K., Bennett, S., & Mazerolle, L. (2014). Viewing systematic reviews and meta-analysis in social research through different lenses. *Springerplus*,3, 511.
5. Grant, M. J., & Booth, A. (2009). A typology of reviews: An analysis of 14 review types and associated methodologies. *Health Information & Libraries Journal*,26, 91–108.
6. Papa, R., & English, F. (2010). The good, the bad, and the ugly: a critical review of trends in dissertation research in educational leadership, 2006-08. In F. English & R. Papa, *Restoring Human Agency to Educational Administration: Status and Strategies* (pp. 47-78). Lancaster, PA: Proactive Publications. Stata Corp. (2017).
7. Stata Statistical Software: Release 15. College Station, TX: Stata Corp LLC.
8. Tashakkori, A., & Teddlie, C. (Eds.). (2003). *Handbook of mixed methods in social and behavioral research*. Thousand Oaks, CA: Sage.
9. Walliman, research and the research Problem: 2011;1- 56.
10. Randy Frazee, research approach and methodology (Grand Rapids, Zondervan, 2005).
11. Corti, L., Van den Eynden, V., Bishop, L. & Woollard, M. (2019). Managing and sharing research data: a guide to good practice.
12. Kaverzneva, T., Rumyantseva, N., Uljanov, A. & Belina, N. (2019). Use of the logical-statistical model as a procedure for assessing occupational risks in the OSH management. In: *IOP Conference Series: Materials Science and Engineering*. [Online]. 2019, IOP Publishing, pp. 12091.
13. Leedy PD, Ormrod JE. *Practical Research: Planning and design*, 7th edition;2001