

QUALITATIVE AND QUANTITATIVE APPROACHES OF RESEARCH: A SYNOPSIS OF REQUIRED COMPETENCIES FOR CURRICULUM DEVELOPERS

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ABSTRACT: *The analysis of various syllabi on 'research methods', especially in social sciences contributed to the idea of writing this paper. In this article, a comparison of quantitative and qualitative research approaches is presented, with the focus to highlight the competencies and abilities required on the part of researchers to conduct research under any of these approaches. Quantitative and qualitative research approaches differ considerably regarding their philosophical paradigms, nature of data, sampling and sampling size, data analysis techniques, and final report. These differences require, in fact, the perception of those skills and competencies the teachers should focus on while developing curriculum and during teaching-learning process.*

Keywords: Research Paradigm, Theoretical sensitivity, empathetic understanding, linguistic-relativity hypothesis

INTRODUCTION

When teaching the research methodologies, the teachers usually focus on the process of research-the explanation of the steps to conduct the research. Less importance is given to highlight the skills and competencies and their development. Therefore, the researchers, after having studied a research course, can elaborate extensively the process of research, but do not have much information about qualities necessary to undertake the research process.

This study will focus on the types of qualities, skills and competencies the researcher should develop in them to conduct the qualitative and quantitative researches.

Nature of Data in Qualitative and Quantitative Researches

Think of the attributes of the things present around us, and the psychological constructs like anger, intelligence, love, or fear; and what we call cultural norms, traditions or values. All these come under the domain of qualitative data. This domain is the concern of qualitative research. The qualitative approach deals with, as the name depicts, qualitative data which Ryan and Bernard [1] broadly categorized under three main forms-text, images, and sounds.

These types of data are difficult or, sometimes, impossible to represent numerically. For example, beliefs, attributes symbols and images. In the words of Strauss and Corbin [2], Qualitative research means "any kind of research that produces findings not arrived at by means of statistical procedures or other means of quantification"(p.17).

On the quantitative side of the research, the nature of data involves quantification and statistical representation of the variables. It is the numerical data-led approach which transforms the qualitative data into quantitative form and processes it by using numerical techniques like statistical tools or graphical representations. Creswell [3] summarizes this explanation in a concise definition of quantitative research that is "explaining phenomena by collecting numerical data that are analyzed using mathematically based methods (in particular statistics)"

Basis for the Use of Qualitative and Quantitative Methodologies

The important consideration, when deciding upon the adoption of qualitative methodology, is if a little is yet known about the phenomenon or where existing theories do not contribute to analyze the phenomenon under study [2,4]. The

Qualitative methods are also suitable to effectively identify the intangible elements, and to gain in-depth understanding of the problem which otherwise may be difficult to investigate quantitatively. Some of the relevant area may be social norms, socioeconomic status, gender roles, ethnicity, or religion, etc.

Quantitative methods of research suit in those areas of investigation where the data need to be compared systematically, to make generalization to the population and to test the already existing theories on the basis of hypotheses. Creswell [5] writes that the researcher tests a theory by formulating a hypothesis, then collects data and analyzes it in order to support or refute the hypothesis. Creswell [5] further point out the criteria to select quantitative research, "if the problem calls for (a) identifying factors that influence an outcome, (b) the utility of an intervention, or (c) understanding the best predictors of outcomes" (p.20). All these are done when topic under study requires numerical data for its solution.

Research Paradigms of Qualitative and Quantitative Approaches

Paradigm framework covers the ontology, epistemology and methodology, etc. [6]. Ontological assumptions have strong influences in designing the very nature and explaining the aspects to understand the unique features of both qualitative and quantitative approaches. How these approaches differ to reach truth and constitute the knowledge is the concern of ontological background. Epistemological aspect of quantitative approach seeks its link with objectivity while the qualitative approach involves subjectivity [7].

The theoretical perspectives of quantitative and qualitative approaches build their framework on positivistic and post-positivistic (interpretive, Naturalistic or constructivist) philosophical foundations respectively [7]. Positivism refers to the existence of reality independently and claims the objectivity of truth. The researchers attached with this movement investigate knowledge through the phenomenon of cause and effect; develop hypotheses, measure the observation numerically and test the theories statistically. This process usually is recognizes as 'scientific method', with another name as quantitative research and positivistic or empirical research [5].

Interpretive or constructive approach claims that knowledge or truth is subjective reality, and individuals have their own

unique experiences which are socially and historically constructed. These unique realities help developing theories that are later used in quantitative researches.

The Role of the Researcher in Qualitative Inquiry

The role of researcher is pivotal in both qualitative and quantitative researches. The researcher designs, organizes and executes all the activities right from formulating the research questions to reporting the findings of the research. Therefore, a researcher must be fully aware of theoretical and practical aspects of the research process before partaking of a research activity.

The role of qualitative researcher is all-inclusive. Creswell [8] describes what a researcher has to perform during the course of research as who “undertakes qualitative research in a natural setting where the researcher is an instrument of data collection who gathers words or pictures, analyzes them inductively, focuses on the meaning of participants, and describes a process that is expressive and persuasive in language” (p.14)

Glaser and Strauss [9] and Strauss and Corbin [2] use another term ‘theoretical sensitivity’ to elaborate what a researcher performs while collecting data. Theoretical sensitivity is a multi-dimension activity that refers to the skills and qualities of the researcher like insight into the whole situation, the ability to give meaning to the data, capacity to understand, and the ability to separate what is pertinent from anything that is not pertinent in the enquiry.

Human side of the Issue

The qualitative researcher tries to provide descriptions of the experiences of the people on an issue being investigated, i.e., information about the “human” side of an issue. This is what Merriam [10] says the reporting of how people see the world around them and the experiences they get from a certain circumstance.

This requires, on the part of the researcher, to get closer to the participants in order to collect for himself the knowledge of the information of the subjective experiences of the participants involved in the study. The researcher tries to understand the phenomenon from participants’ view points. This is the concept of “empathetic understanding”-an understanding something from the view points of others. An American idiom “putting yourself into someone else’s shoes” reflects this understanding, (P.37) [11].

The quotation of Mintzberg [12] can better represent the above explanation that “we shall never understand the complex reality of organizations if we persist in studying them from a distance, in large samples with gross, cross-sectional measures. We learn how birds fly by studying them one at a time, not by scanning them on radar screens” (P.240).

The Linguistic-Relativity Hypothesis

Language has a very significant impact on our view of the world where we live. The language promotes the understanding of different aspects of the objects and situation in the world around us. This refers to linguistic-relativity

hypothesis which explains that every language has its unique way of describing the world and it influences how the individual conceptualizes the world. Every language reflects the values and culture of its place [11].

It becomes very important for the qualitative researcher to have the understanding of the language of the participants so that he / she can comprehend the actual meaning in the right context of words the respondents use to express their subjective ideas or experiences.

Role of Quantitative Researcher

The main concern of quantitative research is to maintain objectivity in the solving the research problem and to develop generalization. This can only be achieved if the researcher succeeds to observe the principles of neutrality or a value-free role and set aside the human biases.

The participants of a quantitative research act independently of the researcher, and are anonymous to the researcher who usually studies the phenomenon from a distance [11].

There is no need for the researcher to establish a rapport with the participants to collect the data. For this purpose, standardized tools of data collection and to measure variables are often used. In experiments researches, principle of random selection of participants for each group under study or double-blind placebo control method is followed.

The researchers use statistical techniques to analyze data and to draw conclusions. Manipulation with numbers minimizes the chances of subjectivity [11].

Sampling in Qualitative and Quantitative Research Methods

These two types of research methods adopt sampling methods based on their clearly distinguished natures. Qualitative research involves purposeful or purposive sampling that serves its particular need of data collection that who can better provide the information-rich case [13]. The sample does not show representativeness but the suitability, and is selected to serve the themes that emerge from the data analysis. This type of sampling is referred to as theoretical sampling [14]. The size of the sample does not matter in qualitative research.

Quantitative research needs representative sample of the target population that helps identify findings, and these findings are made generalizable to the target population by applying suitable analysis techniques. The probability sampling is appropriate to reach the object data and to draw generalizations [14].

Sample size is also very important to make the sample representative. A variety of statistical techniques exist how to calculate the appropriate size of the sample.

Quantitative and Qualitative Reports

Quantitative research report includes numbers which may be explained through graphs or tables, and the results through statistical analysis. The reports conclude their findings by analysing data rather than just describing the facts while focusing on answering the research questions. Qualitative research reports are written in narrative way.

Figure.1: Qualitative Research Process

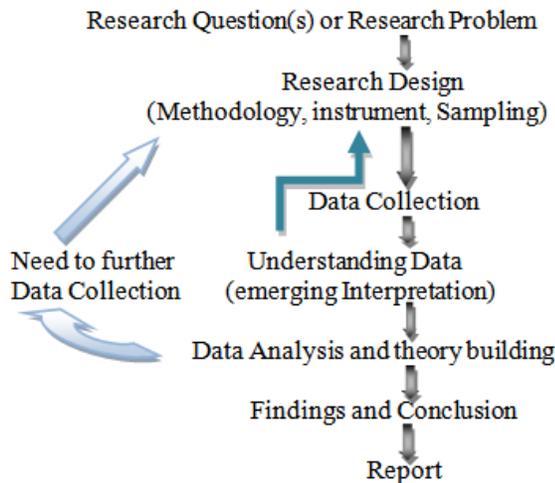


Figure.2: Qualitative Research Process



Ensuring Research Quality and Rigor

This is a very important aspect of both quantitative and qualitative research to ensure the quality of both process and product. The well-related concepts, in this regard, in quantitative research, are validity and reliability that are calculated by using some suitable statistical techniques. On the other hand, these concepts cannot be used as such for assessing the quality in qualitative research. It is important to note that “the tactics or strategies used to address validity and reliability in qualitative research are not the same as in quantitative research” (p.35) [15]. Sikolia; Biro; Mason; and Weiser [16] highlight this difference that “it is not possible to have a universal set of quality criteria for both qualitative and quantitative research” (p.4). Therefore, the related criteria to assess the worth in qualitative paradigm are trustworthiness and rigor as compared to validity and reliability in quantitative paradigm [17]. The associated parameters to ensure the trustworthiness in qualitative research are credibility, dependability, transferability, and confirmability [18].

It is imperative that the researchers, especially those conducting qualitative research, should know what they should follow to ensure the research quality and rigor in their research. The qualitative researchers usually do not bother to consider this aspect due to many reasons-one of those is that their teachers usually focus more on explaining the quantitative criteria of validity and reliability. That is why; the researchers customarily adopt quantitative parameters even in their qualitative research projects.

Anney [19] conducted a research to study the use of appropriate criteria to ensure the integrity of research findings by the master of education researchers in their dissertation under the qualitative methodology. Anney [19] found that most of them used quantitative trustworthiness criteria. The research findings showed 238 out of 245 researchers employed the quantitative trustworthiness criteria while only 7 of them used the qualitative criteria.

Comprehension of Competencies

In the following tables, various competencies and skills are listed. These competencies are identified by comparison between qualitative and quantitative approaches to research made in the previous discussion under different topics.

Table-1(Part-a): List of Competencies with reference to various aspects of Qualitative a Quantitative Research Approaches

Aspects	Qualitative Approach	Skills & Competences	Quantitative Approach	Skills & Competences
Research Paradigms	Post-positivistic (interpretive and critical paradigms)	Use of common sense reasoning, observational Skills, and triangulation	Positivistic	Understanding & application of Scientific knowledge
Method & Nature of Reality	Naturalistic	Understanding that Social reality is subjective to individual’s consciousness, experiences- <i>ideographic</i>	Scientific Empirical	Understanding that social reality is objective and external to the individual- <i>nomothetic</i>
Nature of Data	Qualitative /Non-numeric (Text, Images, Sounds, beliefs)	Competency in language skills	Quantitative/ Numeric Variables (Numbers, Formulas)	Mathematical and Statistical Skills
Sampling	Purposeful or purposive (suitability principle)	An understanding of Non-probability Sampling Techniques	Probability sampling	An understanding of probability Sampling Techniques
Sample Size	Lower number of Respondents Theoretical sampling	Theoretical Saturation- the point that determines the sample size	Higher number of Respondents Representative sample	Statistical Techniques to calculate the appropriate sample size

Table-1(Part-b): List of Competencies with reference to various aspects of Qualitative and Quantitative Research Approaches

Aspects	Qualitative Approach	Skills & Competences	Quantitative Approach	Skills & Competences
Researcher- Respondents' Relationship	Known to the Researcher	<ul style="list-style-type: none"> Ability to establish a rapport Interpersonal communication Skills 	Anonymous to the researcher	Neutrality or value-free role set aside human biases
Basis for use	<ul style="list-style-type: none"> To identify intangible elements To gain in-depth understanding 	Empathetic understanding (ability to understand something from the other's view points)	<ul style="list-style-type: none"> to test the already existing theories to make generalization 	Understanding from objective point of view
Focus/ Scope	Wide and Deep		Narrow	
Tools of Data Collection	Researcher as instrument of data collection	Interviewing and observation skills	Standardized tools of data collection	Skills to develop or use of already developed tests & how to interpret their scores
Data Analysis	Inductive process (inductive reasoning moves from the specific to the general)	<ul style="list-style-type: none"> Theoretical Sensitivity (ability to give meaning to the data and to choose pertinent data) the ability to understand the participants' language insight, contextualization and interpretation 	Deductive process (Deductive reasoning moves from general rule to the specific application)	Ability to formulate & test hypotheses
Ensuring Research Quality and Rigor	Trustworthiness: Credibility, Dependability Conformability Transferability	Understanding and ability to ensure that qualitative research has its own criteria for quality assessment	Validity Reliability and Generalizeability	Knowledge of & ability to compute Validity, Reliability
Form of final report	Narrative report including contextual description with supporting respondents' quotes	Ability to identify themes, categories & ability to interpret, organize and formulate a theory-a good understanding of structure of theory	Statistical report including Graphs, tables, and statistically significant findings	Ability to select appropriate statistics Ability to describe and infer statistically

CONCLUSION

The qualitative and quantitative research approaches vary in their epistemological, ontological, axiological and methodological context. To highlight these differences fulfills the purpose at the understanding level, but practically, it requires further comprehension of competencies and skills that researchers must have to conduct researches practically under any of these approaches. The competencies required to undertake qualitative research are different from those for quantitative research. Therefore, a more emphasis should be given to groom these skills along with the theoretical understanding of the difference in nature between these two main approaches. In this way, the researchers would be able to conduct research projects efficiently without facing many difficulties on practical grounds.

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