

The Interlinkages between Qualitative and Quantitative Research: A Review

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Abstract - Research design methods, such as qualitative, quantitative as well as mixed methods were introduced and subsequently each method was discussed in detail with the help of literature review as well as some personal and live examples to substantiate the findings of various literature. From various literature as well as from the own experiences, it is concluded that both qualitative research design method and quantitative research design method are equally important. It is not fair to criticize one method as the researcher is inclined towards the other method. It is practically evidenced that usage of both methods in the research, the researcher can substantiate the case better. However, duration part while using mixed methods to be kept in mind as it will take more time compared to the qualitative and quantitative methods. Hurrying and aborting in the middle due to time constraint ultimately result in poor research. It would be better if the world view towards these methods changes from criticizing mode to effective utilization mode, which will help research community in focusing and bring up better research outcomes rather than wasting time in arguing which method is scientifically acceptable and which method is biased. While I agree that the ontological, epistemological, axiological, and methodological assumptions for qualitative research method and quantitative research method, researchers should know fully about these methods and keep them as effective tools to utilize them in mixed mode, wherever it is appropriate and required to arrive at adequate research findings.

Key Words: Qualitative Research Method, Quantitative Research Method, Interlinking, Mixed Research Method

1. INTRODUCTION

Research Design is a conceptual framework in which the research is conducted. Research question needs to be finalized before selecting any research design method. There are basically three research design methods. They are qualitative, quantitative, and mixed methods respectively.

According to Nasser (2017), "both qualitative and quantitative researchers, think that they know something about society worth telling others, and they use a variety of forms, media and means to communicate ideas and findings (Becker, 1986, p.122)". The ontological, epistemological, axiological, rhetorical, and methodological assumptions of qualitative research are significantly different from quantitative research assumptions. Qualitative researchers use inductive approach and formulates theory from the collected data, analysis, literature, and observations. Whereas

quantitative researchers use deductive approach to test the existing theories by way of gathering the data to test it and return back to theory at the end of the study to check if the proposed theory is valid or to refute it. Mixed method is a combination of elements of both qualitative as well as quantitative research design approaches. Many researchers especially in social and behavioural domains, use mixed methods to address complex problems. Creswell (2014), in his book on 'Research Design', highlighted that both qualitative data and quantitative data collected have strengths and limitations. Mixing or blending the data to understand the complex problems is what is called the mixed research method.

Brief introduction about each type of research method was mentioned above. Furthermore, to bring in the understanding of interlinkages between qualitative and quantitative research methods, it is necessary to review each method in detail.

2. RESEARCH METHODS

2.1 Qualitative Research Method

Anderson (2010), in his research article "Presenting and Evaluating Qualitative Research", explained that Data collected and analyzed in Qualitative research are not easily quantifiable. Normally data collected shall be from social domain which involves people's behavior. It was explained that Qualitative research views at an attribute how it varies with different conditions rather than how big an attribute is. Nasser (2017), defined qualitative research as a process of inquiry to recognize the social or human issues through collection of data, analyzing and formulating a broad picture of the same.

Bogdan & Biklen (1992), in their book on "Qualitative Research for Education", discussed various approaches that a researcher follows in the education domain. The chapter reminds the author, his childhood case, where he was assigned to a teacher trainee who was working on her thesis for the award of the degree of bachelor of education (B.Ed) during 1993. He could remember that she interviewed him many times at various locations such as, at home, at school, at the playground. She used to ask multiple questions, which are even repetitive. This process happened for almost 6 months. He observed her noting the responses on some pre-typed paper and sometimes asking questions by showing some pictures. Author recollected that, he was asked by that

teacher, what he wants to be and answer from author was “an engineer”. The idea of reflecting on a real-life incident here is to connect the cases indicated in the textbook to validate how a researcher will do qualitative research and how data is collected. This is another case or example of qualitative research, where data collection happens, analyses to formulate a theory. Bogdan & Biklen (1992), says that “Qualitative researchers go to the particular setting under study because they are concerned with context. They feel that action can best be understood when it is observed in the setting in which it occurs”. This is exactly what happened in the case illustrated above. The researcher used to approach author for interviewing at various locations such as at his home, his school, and at his playground. The reason may be to observe the particular setting as a part of the researcher’s study.

Bogdan & Biklen (1992), says that “The qualitative research approach demands that the world be examined with the assumption that nothing is trivial, that everything has the potential of being a clue that might unlock a more comprehensive understanding of what is being studied”. Slightly deviating from the case illustrated above, to explain the current point. Considering any forensic or crime investigation as a complex research problem, the investigating officer observes closely and critically without leaving anything. This is not to take any chance of leaving any possible clue behind, which might be the critical aspect of their investigative research.

As we know, qualitative research follows inductive approach, Bogdan & Biklen (1992) explained the same only with the example of a picture puzzle. They say that qualitative research is not a collation of puzzles of a known picture. Instead, it is the construction of an image that takes shape as data is collected and examined. They also discussed few interesting questions like, what is the goal of qualitative research. Which research approach is better? Can they be used together? etc. They explained that the approach of qualitative researchers is different. While some focus on developing grounded theory, some other emphasizes on creation of sensitizing concepts. In a nutshell the main goal of the qualitative research is to promote the social change. While discussing which research approach is better, they gave an example of usage of microscope for studying stars and usage of telescope for studying microbes. Despite having all skills how to use telescope and microscope, and if employed at wrong location, then it won’t help in progressing the research. Qualitative and quantitative are two research methods which needs to be employed based on the type of research problem to be tackled.

Anderson(2010), discussed strengths and limitations of qualitative research. While there exists criticism for qualitative research for extensive use of interviews and focus groups than other methods, it has various strengths when utilized properly.

The strengths are:-

- ❖ In depth and detailed examination of the Issues can be done.
- ❖ Interviews are not restricted to few questions. Researcher can guide the process in real time.
- ❖ Interviews helps in emerging new information which triggers to revisit and revise the research framework.
- ❖ Data collected for few cases cannot be generalized to a large population. The finding can be transferred for a different problem setting.
- ❖ Positivist Inquirers often miss the complexities of research subjects that are found through qualitative research.

The Limitations are:-

- ❖ Research quality depends on the skills and personal bias of the researcher.
- ❖ Difficult to maintain the rigor.
- ❖ Analysis is time consuming, considering huge volume of the data.
- ❖ Not easily understood and accepted unlike quantitative research.

To summarize the qualitative research method, according to Nasser (2017), it is being used in social science domains to understand human behavior. Availability of literature is scare and hence, research problem needs to be explored unlike in quantitative research where research problem evolves from the available literature. The research questions begin with what or how, to aim at studying, grounded theory, ethnography, phenomenology, or case studies. Data Collection includes Observations, interviews, documents, and visual materials. Reliability issue still exists in qualitative research as instrument of data collection is researcher itself. Researchers can opt for qualitative type of research if they have good risk-taking appetite as the research process is lengthy.

2.2 Quantitative Research Method

According to Nasser (2017), “Quantitative research examines social or human problems by testing a theory composed of variables that are measured by numeric values”. In quantitative research, literature shall be used deductively, basis for advancing research question, to identify research gaps, to identify variables and relationships among them. Research questions can be formulated from the available theory and testing of the theory shall be done by analysing the gathered data using various mathematical, statistical or computational tools and techniques. The theory can be either validated or refuted based on the results of analysis at the end of the study. Quantitative research results shall be viewed as reliable as well as accurate in terms of validity and reliability.

Hammersley (1996), while discussing relationship between qualitative and quantitative research, observed that some researchers view quantitative approach as true way, while some other researchers viewed it as one of the ways of

research approaches. Longitudinal as well as cross-sectional surveys, correlation research, causal-comparative research and experimental research are some types of quantitative research methods which researchers use depends on the requirement of their research. Reliability and validity are main criteria of research findings for quantitative research. Researchers ensure the reliability and validity by controlling the sources of irrelevant variance through study design or by statistical methods such as ANOVA etc. However, Nasser (2017) opined that quantitative researchers are racially, sexually or culturally biased, which is an issue that they need to address. "Researchers may prefer Quantitative approach because it offers low-risk, fixed research methods potentially having minimal ambiguities and possible frustrations. It requires shorter duration."

2.3 Mixed Research Method

Bogdan & Biklen (1992), discussed about usage of both qualitative and quantitative research methods together. They referred some scholars such as "(Cronbach et al., 1980; Miles & Huberman, 1984, 1994; Reichardt & Cook, 1994)", who used both the methods together. Complex research problems can only be tackled effectively with use of both the research methods. Use of Qualitative data to supplement and validate the finding of quantitative data collected for same purpose. However, it is observed that because of complexity of using both the methods which is time consuming and hence researchers tend to produce research which do not meet the quality standards of either of the methods. Creswell (2014) also shared same opinion on usage of mixed methods which is actually time consuming.

Hammersley (1996) explained that for any type of research process: formulating problem statement, selecting cases, data collection, data analysis and reporting the research findings are common stages. It is now up to researcher what strategy they adopt and how they utilize the techniques to explain the research findings better. He also referred to various articles, to explain various combinations of strategies that researchers follow. For instance, studying a single case by collecting structured data and analyzing it by applying quantitative techniques (or) collection of unstructured data which can be coded subsequently to apply quantitative analysis. The researcher can also collect the unstructured large data and can analyze it in qualitative terms.

Author would like to quote an example of little study done by him to explain usage of qualitative and quantitative methods. Being in construction industry for a considerable amount of time, identified a tension, that there is no visible women leadership in the construction industry. Thurairajah, et al (2007), did a similar study in UK scenario. However, the situation in Indian scenario is not much different as on date. The topic being in Organizational Behavior and Leadership domain, normally qualitative research method shall be adopted. It requires various personal interviews to gather the views and findings to analyze and report the study. However,

there should be an initial study to check if the identified research tension is valid or not. So, listed out top 100 construction organizations in India and observed the composition of board of directors of each company from their respective websites. Interestingly, the ratio of women to men in board of directors varies between 0% to 29%. However, percentage of women in the position of whole-time director is 0% for all the companies. Not a single company has a women CEO/MD. Only NBCC is having a Women CFO. The reason why author explained this case here is, the research problem identified is more inclined towards qualitative research. However, to test the tension, author collected unstructured data, coded subsequently to analyze it quantitatively. For explaining the case better and to prove tension, author utilized the quantitative technique. This case reinforces the observations and finding of Hammersley (1996).

Brannen (2005), in his paper about mixing methods, explained that there are many possible outcomes when the methods are combined. Some of the possibilities (Morgan, 1998, cited in Bryman, 2001; Hammersley, 1996; as cited in Brannen, 2005) are Corroboration, Elaboration, Contradiction and Complementarity. When same results are derived from both qualitative as well as quantitative methods, then it is called as Corroboration. If qualitative data analysis demonstrates the findings of quantitative analysis in a case, then it is called as Elaboration. If both qualitative and quantitative analysis together produce insights despite differ each other, then it is Complementarity. Contradiction, as the name itself conveys, both qualitative and quantitative data findings conflict each other.

Walker (1997) also suggested that pilot study is required to be done before start of the actual research work and that will give idea about what needs to be done, how the problem needs to be approached and research will be more focused. Formulation of research question is the prime thing to do before deciding with type of research methodology and subsequently data collection.

Considering an example of construction related projects, where researcher wants to test construction time performance (Sidwell, 1982; Ireland, 1983; Naoum, 1991; as cited in Walker, 1997). Normally researchers adopt quantitative approach for such cases studies to identify which factors affect the construction time performance, because it can be verified by others. However, if the researchers move a step further to explain how these factors interact with each other and why some projects completed quickly than others, there deductive reasoning is required which can be handled using qualitative research.

To substantiate further on usage of both quantitative and qualitative techniques, author would like to mention another research experience here. Being interested and inclined towards research in identifying critical live problems and providing solutions, took a live topic related to water resources. Some naturally formed drain called enamadurru

from uplands travelled all the way down and having its confluence to Bay of Bengal. As a natural process there are many meanderings in its course and due to the same, the outflow is very less due to low velocity. Hence, the mouth of the river is getting choked from the eroded sand by another river nearby. To solve this issue, some other portion was cut to make a straight entry into sea. This triggered a new problem which resulted in backwaters and polluting the ground water with high saline sea water. Author have used Remote Sensing and GIS techniques as well as chemical analysis of water samples collected in every month to study how the salinity is varying, which is a quantitative study. However, being it a social problem effecting many people in that region, author have also conducted the questionnaire survey with the local people including village heads to understand their problem, which is a qualitative study.

Now, if we view the entire study on holistic perspective, we can call it as qualitative study with use of quantitative data to substantiate the findings from the data collected through interviews. And at the same time, we can also report it as quantitative study using purely technical language and may mention few lines in introduction and conclusions about the problem faced by the people in that region. So, it is up to the researcher how they view at the problem and how effectively utilize the available tools & techniques to effectively conduct the research and report the findings. From this experience, when we reflect, the author took quantitative approach while writing the thesis and not the qualitative way. This reinforces the observations of many authors who mentioned that many researchers think that quantitative approach is scientific and hence inclined towards the same.

3. CONCLUSIONS

To conclude, both qualitative and quantitative methods are having significant importance in research domain. Utilization of right technique for right problem will help in finding better solutions in shorter durations. Having done with some literature review about research methods, it was observed that some quantitative researchers have reservations in accepting qualitative methods. However, much research was done in past and many are ongoing using either of the methods or even mixed method. Instead of debating on which method is superior or which method is scientific, researchers should focus on solving the limitations (or) unresolved issues such as reliability and validity issues in qualitative approach and quantitative researchers are racially, sexually or culturally biased. Researchers should also focus on utilizing both the methods in their research to extract best out of the same, rather than inclining towards one type of method and criticizing another type of method. Some authors suggests that researcher should keep a wide range of options with them in terms of methodological and philosophical assumptions and utilize based on the practical character of research decision.

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BIOGRAPHIES



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