

The Critique of Qualitative Research Methods and Quantitative Research Methods

by Wei Huang

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I. Introduction

There are a number of definitions of "Research". According to OECD, research is "any creative systematic activity undertaken in order to increase the stock of knowledge." And John W. Creswell(2002) states that research "is a process of steps used to collect and analyze information to increase our understanding of a topic or issue". Another definition of research given by Rajasekar, is "a logical and systematic search"(Rajasekar et al., 2006) aimed at looking for new and useful information on a particular topic. In short, the research is a process of systematic inquiry to search for knowledge. The types of research can be categorized according to the nature, purpose, and other attributes. In a general way, research can be classified into two categories: basic research and applied research (Rajasekar et al., 2006) . The task of research method is to help researchers collect and analyze data correctly so as to answer research questions. The method of these two types of research can be qualitative or quantitative or even both, the decision to choose a method depends to a large extent on the judgement of researchers and the nature of the research topic. For some research topics, quantitative methods are more applicable, while other researches are more appropriately studied using qualitative methods or mixed methods. In this essay, I try to critique qualitative research methods, quantitative research methods and propose my research assumption.

II. Quantitative Research Method

1. Definition

Quantitative research method, as one of the most popular strategy employed in research to explain a particular phenomenon, focuses on quantitative collection by applying questionnaires, opinion polls, surveys, and computational technique and so on and data analysis by statistic software, such as SPSS. This research method is formed from a deductive approach, and shaped by empiricist and positivist philosophies, and can be widely used in fields such as economics, sociology, marketing, psychology, gender studies and political science. Briefly, quantitative research method is all about counting things (Lia Litosseliti, 2010) and analyse data.

2. Techniques for Data Collection and Analysis

Data collection is the first step for applying the quantitative research method in a research. The techniques for data collection can be categorized into four approaches: sampling methods, polls, surveys and observation.

The sampling methods are frequently used in anthropology research and other studies involving large data samples, since it is usually almost impossible to collect the entire data on every person or object in these studies. Selecting sample can efficiently reduce the number of study cases, and can still meet the objectives of the study. The sampling methods have two types: Probability Sampling and Non-Probability Sampling. The former employ the probability theory to filter the individuals from the population and establish the required samples, the participants in the sample were selected through a random selection process, each respondent had an equal chance of being selected in the sample. There are 4 kinds of probability sampling: stratified random sampling, systematic sampling, simple random sampling, and cluster sampling. In non-probability sampling, the experience and knowledge of the researcher is used to generate the sample. As a result of the researcher's involvement, all participants in the target audience have the opportunity to be selected in the sample. The non-probability sampling method includes convenience sampling, quota sampling, judgmental sampling and snowball sampling (Taherdoost Hamed, 2016).

Surveys are a process of collecting data from pre-defined participants and their insights into the research topic (Taherdoost Hamed, 2016). The total number of people a survey can reach depends on the time and objectives of the survey. This makes it one of the most important factors in conducting quantitative research. In order to successfully implement surveys in quantitative research, survey design and creation is an important element of conducting primary quantitative research. We need to develop close-ended questions for respondents, such as rating and semantic differential scale questions. Survey questionnaires are usually distributed in the following ways: purchasing participants, social media distribution, SMS survey, Email, embed the survey in a website etc.

Using polls can collect feedback from a sample of closed-ended questions. Opinion polls are usually implicit in exit and election polls. In these two polls, the data collected are gathered basically through one basic type of question.

Observation is a necessary and effective method of data collection in both the quantitative and qualitative research methods, but only structured observation is needed for gathering quantitative information. In structured observation, researchers need to be observant and skilled in identifying the target population, the interval of observation to collect the observed data and to determine the value of the observed data. On the other hand, the researcher should take a closer look at one or more specific behaviors in a more structured and comprehensive way in structured observation. There are mainly three categories of structured observation: personal

documents observation, public records observation, and physical evidence observation (Moballeghe et al., 2008).

Data analysis is the second step after completing data collection in studies. After the raw data has been collected, the data needs to be analyzed appropriately to derive statistical hypotheses from the study. And in the end, the results should be linked to the research objectives and the final results of the thesis should be derived. There are mainly 8 methods of data analysis in quantitative research: analysis of trend, conjoint analysis, gap analysis, text analysis, cross tabulation, MaxDiff analysis, TURF analysis, SWOT analysis (Gorard, S., 2003) .

3. Characteristics of Quantitative Research Method

According to Regoniel Patrick (2015), compared with qualitative methods, there are 7 characteristics of quantitative research method, including: Contains measurable variables, assumes a normal population distribution, presents data in tables, graphs, or figures, use repeatable method, can predict outcomes, use measuring devices. And Sam Gounder states that the key characteristics of quantitative method are controlled inquiry, operational definition, replication and hypothesis testing.

In my opinion, in contrast to the qualitative research method, the quantitative research method has two most distinctive features. Firstly, quantitative research method is a mathematical approach, which studies variable data (Lia Litosseliti, 2010) . It means, what quantitative research studies must be countable and must be variable. Furthermore, quantitative research examines two types of variables: categorical variables and continuous variables. In other words, if the subject of the study is not countable data, or if the data is immutable, then the study will not be able to use the quantitative method.

The second feature of quantitative research method is the reliability and the validity (Lia Litosseliti, 2010) . Reliability of quantitative research method is reflected in its repeatability. This means that our study is repeatable and if we repeat the process of data collection and analysis once, the results obtained will still be consistent with the previous study. The validity refers to the measurement validity and the instrument validity. Quantitative research method should ensure the validity of instrument and the measurement of study.

4. Strengths and Limitations

Quantitative research uses mathematical methods to analyse and process data, revealing the nature and patterns of things through their quantitative changes and characteristics. Based on the characteristics of the quantitative research method, the

advantages of the quantitative research method can be summarized as follows:

In the first place, the quantitative research method allows researchers to reach a greater data set. Because the data is in numerical form, we can apply statistical tests when making statements about the data. Large samples of data can be processed and analyzed by quantitative data analysis method.

Secondly, because the data obtained through quantitative research methods are neutral and free from personal bias, the final results drawn from quantitative research method are more convincing. There are many examples in the study where personal bias may be involved, which leads to inconclusive results. Due to the numerical value of the data, personal bias can be reduced to a large extent in research.

Thirdly, quantitative research method can enhance generalization of findings, the problem with other research types is that the data points they collect are unlikely to have a generalizing effect. When looking at target groups, quantitative information may provide an overview rather than specificity, but this also makes it possible to identify core themes, needs or wants. Each finding derived through this method can be taken beyond the participant group and into the whole demographic observed by this work. This makes it possible to identify problem areas before difficulties have a chance to begin (Savela,T., 2018).

On the other hand, the quantitative research method is not a almighty method for researchers to apply in any type of research and it has certain limitations and disadvantages, including the followings:

The standard questions identified by researchers may lead to 'structural bias' and misrepresentation, so that the data in fact reflect the views of the researchers rather than the respondents.

Quantitative research is susceptible to the limitations of pre-existing knowledge categories and norms. This makes quantitative research only able to test theories rather than create them, and to explain problems in a cursory manner rather than to understand social phenomena in depth (Savela,T., 2018).

III. Qualitative method

2. Definition of Qualitative Research Method

Qualitative research, as opposed to quantitative research, is a fundamental research method in the social sciences and is one of the most important steps in scientific research. It emerged in the 19th century and began to develop in the 1920s and 1930s as a result of the social research movement. In general, qualitative research is a type of exploratory research that uses special techniques to obtain information about

people's thoughts, feelings and other deeper responses to questions about attitudes, beliefs, motivations, behaviours and other relevant issues in the target population. The specific purpose of qualitative research method is to deeply study the specific characteristics or behaviors of the object and further explore the causes of its occurrence. If quantitative research solves the "what" problem, then qualitative research solves the "why" problem (Zhang yun, 2016). Qualitative research has developed a variety of theories, the better known of which are phenomena which involves describing the real experience of a phenomenon through narratives or interviews with people who have lived through a particular event or time period; Ethnography which is often used in anthropological research to understand and explain societies and to develop theoretical insights through descriptive research and direct interviews with specific cultural accounts; and Grounded Theory, which uses a systematic process to develop and inductively lead to a grounded theory about a phenomenon.

3. Techniques for Data Collection and Analysis

There are divers approaches for data collection in qualitative research, which can be one on one interviews, group interviews, observations, note-recording, documents, and artifact (Bogdan, R et al., 1980).

Interviews. There are three types of interviews, structured, semi-structured and unstructured (P. Gill, et al., 2008). A structured interview is generally a verbal questionnaire with a predetermined list of questions, the answers to which require further elaboration. Questions are generally not changed during the structured interview, or follow-up questions are asked on an ongoing basis. Unstructured interviews, on the other hand, do not reflect any preconceived theories or ideas and are conducted with little or no organisation. Semi-structured interviews will set a few key questions that help identify areas to explore, but also allow the interviewer or interviewee to think outside the box in pursuit of more detailed ideas or answers.

Observations. The researcher observes and records relevant information in the field, including recording what is seen, heard or encountered.

Analysis data techniques are also important in the qualitative research method. The coding and the content analysis are 2 important techniques for analysing data in qualitative research method.

Coding. Coding is a method of indexing or classifying text to relate meaningful ideas to data of interest. It helps researchers sift through the data to produce specific words or phrases from the data to identify different topics and the relationships between them.

Content analysis. According to Krippendorff (1980), Content analysis is a research technique for making replicable and valid inference from data to their context. It applies to the analysis of data from documents and written and oral communications. Content analysis is an important part of the conceptual analysis of qualitative data. It is often used in the field of sociology.

4. Characteristics of Qualitative Research Method

Qualitative research has the following characteristics:

Firstly, the data obtained through qualitative research method are generally diversiform. Qualitative research emphasis on the use of pluralistic methods, such as observation, interviews, physical collection, etc., in order to gain a comprehensive and in-depth understanding of the research problem.

Secondly, It emphasises on the study of the research subject in a natural context rather than in an artificially controlled environment. In qualitative research, the relationship between researchers and the research subject should be considered as an "inter-subjective" relationship, in which the research process is a process of interaction and mutual understanding between the two parties.

Thirdly, qualitative research is an evolving process. During this process, the sampling, the direction of data collection, the focus of data analysis and the way in which conclusions are constructed all change.

5. Advantages and Limitations of Qualitative Research Method

Qualitative research methods have the following main advantages:

Qualitative research method produces a detailed description of participants' feelings, opinions and experiences, and the interprets the meaning of their actions (Denzin, 1989), therefore, the subject material can be assessed in more detail (Md Shidur Rahman, 2017).

Qualitative research methods allow for the translation of personal experiences into usable data. The information gathered by researchers through the qualitative research process gives us a predictive perspective, even though those involved may have very different perspectives and experiences, for example, people who have grown up in similar environments tend to prefer particular situations and outcomes, and people with similar perspectives will have similar patterns of thinking. When these specific groups of people are identified, the personal data collected by qualitative research is predictive (Md Shidur Rahman, 2017).

Qualitative research methods can be an open-ended process. It have a flexible structure and the design can be constructed and deconstructed to a greater extent (Maxwell, 2012), if no useful insights are captured, the researcher can quickly change the question, alter the settings or any other variable to improve the response.

On the other hand, qualitative research methods still have limitations:

Because the data collected and analysed by qualitative research methods is subjective, it does not provide a statistical representation. As the collection of data is based on the personal observations of the researcher, while the subject is a specific group of people who react in a particular context, the conclusions obtained will be difficult to generalise to a wider range of contexts, while the objectivity of the findings will be limited.

Secondly, qualitative research methods are more costly in terms of labour and time, as they require data collection through direct observation and interviews, and data mining through qualitative research is labour-intensive and time-consuming. When conducting qualitative research, the amount of detail that is often collected is often overwhelming. Collating this data to identify key points can be a time-consuming exercise.

IV. Quantitative Method vs. Qualitative Method

Both qualitative and quantitative research methods are distinctive and can be applied to different types of research at different periods of social and disciplinary development. Quantitative research has long been valued in social and educational studies. Since the 1970s, social scientists have become aware of the limitations of quantitative research methods and have returned to a focus on qualitative research methods, which have gradually become more popular among scholars. Since the 1970s, social scientists have become aware of the limitations of quantitative research methods and have returned to a focus on qualitative research methods. However, how to choose the research method depends on the differences of research method, and the content and form of the research. In general, qualitative research methods and quantitative research methods mainly have the following differences.

1. Theoretical Basis

The two research methods have different theoretical foundations. The theoretical foundations of qualitative research methods include various schools of thought such as constructivism, post-positivism, hermeneutics, phenomenology, while quantitative method based on probabilistic statistical theory and positivism(Zhang yun, 2016).

2. Purpose

In general, quantitative research methods focus on and answers questions about the whole, the relatively macro, the relatively general, and the objective facts, especially about the relationships between variables, while qualitative research methods tends to focus on and answer questions about the individual, the relatively micro, the relatively specific, and the subjective meaning, especially about the interactions in specific contexts.

To some extent, the differences in the questions answered by the studies also reflect the differences in the objectives of the two types of research. To summarise, quantitative research aims more at describing the overall distribution, structure, trends and their related characteristics, revealing the relationships between variables and testing existing theoretical hypotheses, while qualitative research aims more at revealing the process of change of phenomena, their internal links, the subjective perceptions of the research subjects, interpreting the meaning of behaviour and developing and constructing new theoretical hypotheses.

3. Process

Quantitative research methods are highly systematic, fixed and structured, and they essentially follow a standard procedure that begins with the selection of a research question, continues through research design, data collection, data analysis and culminates in a study's findings. This systematic, fixed and structured nature of the research process makes quantitative research not only relatively easier to learn and test, but also easier to replicate. Qualitative research method, on the other hand, is highly flexible, open-ended and fluid, meaning that the various qualitative research approaches differ not only in terms of the specific steps they take, but also in terms of the broad stages of research. They do not usually follow strictly the 'standard procedures' described above for quantitative research, but rather the whole process is often changed, modified, adapted and iterated as the research proceeds, and the researcher does not use testable procedures for collecting and analysing data.

4. Tools used

In quantitative research, in order to ensure the objectivity and replicability of the research process and the research results, as well as to achieve the goal of discovering the overall characteristics, interrelationships and general patterns of social phenomena, researchers usually need to carry out rigorous sampling and measurement of the phenomena under study, in line with the requirements of statistical analysis, and also

need to use various standardised and highly reliable instruments such as questionnaires and scales design. For the analysis of the data, it is necessary to use statistical analysis methods based on mathematical statistics and the help of special statistical analysis software such as SPSS and SAS in order to draw the conclusions of the study.

On the contrary, in qualitative research, the researcher is not looking for the above-mentioned goals of quantitative research, but mainly for a certain in-depth understanding of the specific object of research, of the social phenomenon in a specific situation. Therefore, on the one hand, in order to better cope with and adapt to the diversity and complexity of the research subjects and social phenomena, and on the other hand, in order to better and more effectively understand the research subjects, especially their subjective perceptions from their point of view, qualitative research has to use the researcher himself as the main research tool.

V. Combination of Quantitative and Qualitative Method

1. Reasons of Combination

There are many differences between qualitative and quantitative research methods in terms of theoretical foundations, research objectives, main research goals and the tools used, but as important research methods in the social sciences, qualitative and quantitative research methods are inseparably linked in many ways. In the actual research process, we can combine the two research methods in a reasonable way to make the research more comprehensive. what's more, as these two research methods have both strengths and weaknesses, we should not only use one research method in social research when conducting research, otherwise the result will be one-sided and inaccurate.

Qualitative researches focus on textual analysis or narrative expression, emphasising the understanding, description and interpretation of the object under study. If researcher only apply qualitative research method, the research result will be easily influenced by the researcher's own subjective opinions, making it difficult to scientifically understand and study the regularity of things. On the other hand, quantitative research methods focus on the use of numbers to describe and quantify the object of study as far as possible, and to measure and calculate it in order to further analyse and grasp things. If only quantitative research method is used in research, it is easy to quantify and simplify the intricate social phenomena, and cannot describe and analyse the research object in detail in a dynamic manner. However, the advantages of these two research method can make up for each other's shortcomings. Therefore, I would like to combine the quantitative methods with qualitative method in my future research, this combination is also known as mixed research method.

2. Assumptions about the Use of Mixed Research Methods

In the future, I would like to conduct a study on "Gender differences in English vocabulary among non-English majors". In this study, I will combine quantitative and qualitative research to investigate the English vocabulary of male and female non-English majors.

In the data collection, firstly, I will use the sampling methods of quantitative research to select a sample of male and female students who are eligible to complete an essay on a specific topic within a specified period of time and collect the sample to analyse the students' writing vocabulary.

Secondly, I will use structured interviews as part of the qualitative research methodology to set specific English speaking questions for the sample students, conduct one-to-one structured interviews and record the interview responses.

In the data analysis phase, firstly, I will use the corpus research in quantitative research method to create a corpus of conventional and superlative vocabulary for the students by using corpus software. I then input the sample information into the computer and use corpus analysis software to analyse the diversity and complexity of the students' written and spoken vocabulary.

Next, I will use qualitative research data analysis methods to conduct content analysis on the sample information, to categorise and analyse the content of male and female students' writing and speaking, and to draw reasonable inferences about the preferences, habits and tendencies of male and female non-English majors in their use of vocabulary.

Ultimately, combining the quantitative and qualitative research methods, I was able to generalise gender differences in the lexical diversity, lexical complexity, lexical density and word usage preferences of non-English majors.

VI. Conclusion

Both qualitative and quantitative research methods have their own distinctive features, strengths and limitations. There is no such thing as the best research method, only the one best suited to a particular kind of research. The distinction between quantitative and qualitative research is not a mechanical dichotomy, but rather a premise and cause of dialectical unity. This is why qualitative and quantitative research methods are similar and complementary to each other. How to combine qualitative and quantitative research methods in a more scientific and rational way, to give full play to their strengths, and to make them better serve social science research, is a question worthy

of further exploration.

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