

Analysis of the similarities and differences between qualitative and quantitative research

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Abstract: Qualitative research and quantitative research are two of the most important and common research methods in social science disciplines, with certain differences in their origins, cores and scope of application. This paper further discusses the differences between qualitative research and quantitative research in the process of their development by analysing their philosophical origins and kernel, and finally explains how qualitative research and quantitative research are used, trying to clarify the advantages and disadvantages of both from various perspectives and how they should be better differentiated and applied in social science research in order to achieve better research results.

1. Introduction

Qualitative research and quantitative research are the two main research methods in scientific research, which are very different in terms of philosophical origin, theoretical basis, logical process and research methods^[1]. Quantitative research is a research method in which problems and phenomena are expressed in quantitative terms, analyzed, tested and interpreted in order to obtain research conclusions, while qualitative research is a research method in which the relevant meaning within an event is obtained by understanding the phenomena and analyzing behaviour and opinions. At the same time, some scholars argue that the two research methods cannot be completely separated, but that they are interconnected and unified. The first paragraph of this essay will begin with a definition of qualitative and quantitative research, the second and third paragraphs will discuss the advantages and disadvantages of qualitative and quantitative research in a number of ways, and the final paragraph will analyze the effectiveness of combining quantitative and qualitative research and whether a mixture of the two should be used in one study.

2. Key characteristics

In the following, the meaning of qualitative and quantitative research will be explained, mainly in terms of key characteristics. Qualitative research and quantitative research are both methods of researching a particular topic, the main difference between them being the use of numbers and their application in the research process. Qualitative research is derived from interpretivism and

constructivism and is more concerned with human experience. This philosophical school considers the study of reality to be based on the diversity of reality on the one hand and the constructive and subjective nature of knowledge on the other. Qualitative research uses a contextualized, unstructured data approach to articulate an understanding of the social individual or human society and to answer questions about 'why' [2], which means that qualitative research needs to seek to consider multiple aspects of things in a practical context, from the immediate and potential factors to the surface. direct and underlying factors in the context of the research environment, and to probe deeper and deeper into the surface phenomena. Qualitative research is often characterized by specificity, refinement and a greater focus on individual ideas and perspectives. Such characteristics make qualitative research require the use of unstructured information such as audio recordings, questionnaire responses, photographs, interviews, etc. to analyze people's more subjective feelings, opinions, etc. This approach requires a high degree of sensitivity to the subject matter and is used to investigate the underlying causes of the phenomenon, focusing more on the 'meaning' of the thing or phenomenon. Quantitative research is derived from positivism and uses experiments, surveys and other methods to describe and analyze the subject matter in order to draw conclusions. The reliability of quantitative research comes mainly from the use of numbers to quantify populations, and Zaslav (2020) argues that quantitative research usually uses numbers to describe social phenomena, making the subject matter more scientific and clear^[3]. Quantitative research is more suited to research on groups rather than individuals. It also means that this research method is more direct in establishing causality and is suitable for using a sample to reflect the whole, so that the research is more concerned with the 'frequency' of a particular object of study. Both qualitative and quantitative research is essentially an inquiry into causality, with qualitative research focusing on the individual and using questionnaires, in-depth interviews and other methods to explore the meaning of things, and quantitative research focusing on describing general patterns in groups and using data, graphs and other methods to analyze the object of study.

3. The advantages and disadvantages of qualitative research

This section will detail the advantages and disadvantages of qualitative research. Firstly, qualitative research is highly relevant and flexible. Qualitative research rarely allows the subject to be discussed outside of its original context, and the main purpose of the research method from its inception was to examine the different causes and solutions of the subject in different contexts^[4]. Qualitative research is also highly open-ended and in-depth, and can be developed in a number of ways. Verma & Bhattacharyya (2017) used in-depth interviews in their research and analysis of emerging economies and found that, when examining this more rudimentary research question, qualitative research can provide better breadth and depth^[5]. At the same time, qualitative research has disadvantages that cannot be ignored. On the one hand, qualitative research is time-consuming, the amount of textual data in qualitative research is very large and confusing, it is difficult to generalize and summarize from such a state of data, and as a researcher it is difficult to convince others without data and textual support. On the other hand, qualitative research poses significant ethical challenges, and in a study of femicide, Well (2017) found that while the use of in-depth interviews can be beneficial in the search for deeper causes, interviewing survivors or family members and witnesses can also be harmful to them, posing significant ethical challenges. The ethical dilemma is considerable. Qualitative research has a clear advantage in providing depth and detail, as well as facilitating discussion and the flexibility to adapt research questions in a timely manner. At the same time, the sample size of qualitative research is more cumbersome, making it difficult to generalize and draw conclusions from it, and to some extent less persuasive due to the lack of data to support it. It is also difficult to deal with ethical issues in relation to some hidden issues.

4. The advantages and disadvantages of quantitative research

This paragraph will provide an analysis of the advantages and disadvantages of quantitative research. Firstly, quantitative research has the advantage of being objective and extensive. Quantitative research allows for a clear selection of research variables, an objective and empirical analysis through statistical and mathematical analysis to determine causal relationships between things, and is very effective in validating and testing theories that already exist, Savela (2018) uses quantitative research in his study of campus landscapes and suggests that quantitative research in generalizing and summarizing the process can yield important general patterns and trends, yielding a widely used overview^[6]. Finally, quantitative research is well suited for research objectives that require analysis using large samples. Baker & SpringLink (Online service), (2016) used a large sample of 180 people in their study of whether gender differences have an impact on learning in different subjects, in which case the use of quantitative research allows for a rapid analysis of relevant data, saving costs and, more importantly, as the results of quantitative research are not open-ended, the reader does not have too much ambiguity about the conclusions of the final data interpretation. At the same time, there are limitations due to quantitative research. As quantitative studies cannot take into account a large number of potential factors, they can introduce unconscious bias in the event of outliers^[7]. For example, Sullivan (2018) suggests that in studying many causal issues in psychology, quantitative research does provide some relevant data under experimental conditions^[8], but is prone to one-sided understanding and distortion of the truth due to the inability to provide a richer context under real conditions. Quantitative research thus has the advantage of being less costly, less controversial and more suitable for drawing broad and objective conclusions, while at the same time the final results may be biased to a certain extent due to the inability to take full account of multiple variables in reality.

5. The distinction between qualitative and quantitative research

Finally, the article examines whether a distinction should be made between qualitative and quantitative research, and the effectiveness of combining the two methods. Balnaves and Caputi (2001) argue that qualitative and quantitative research are united in one, and that when studying the social sciences, researchers need to use a statistically accurate chart to make the audience better accept a point of view^[9]. However, as statistical one-sidedness is inevitable, qualitative research needs to be used to complement it. And, combining the two research methods can effectively link multiple related disciplines together, making the findings more comprehensive. For example, Dolfini et al. (2018) use a combination of quantitative and qualitative research to leverage the strengths of both studies, resulting in an interdisciplinary and comprehensive study of prehistoric warfare^[10]. At the same time, another section of scholars argue that combining qualitative and quantitative research is ineffective. As qualitative and quantitative research are essentially just differences in data collection and research methods, yet more often than not researchers and participants actually respond to both methods the same way due to their triangulation and will not change anything about the final results obtained^[11]. Crowe et al. (2017) use qualitative research to contextualise and nature and interspersed it with quantitative research, using statistical analysis to support the findings. This approach is essentially a juxtaposition of the two approaches or the use of certain quantitative research tools within the quantitative research process, rather than a full integration of the two. In response to this issue, this paper argues that it is not effective to integrate qualitative research with quantitative research. For example, Balnaves and Caputi (2001) use a portion of the literature to supplement overall quantitative research in the social sciences is essentially a complement to the analysis or interpretation of quantitative research findings and is part of quantitative research rather than a combination of the two. The multidisciplinary association conducted by Dolfini et al. (2018) is actually a combination of

multiple disciplines that use solely qualitative or quantitative research disciplines together for physical integration, rather than achieving an essential fusion of the two research methods. Therefore, at least in the social sciences, this paper argues that combining quantitative and qualitative research is not effective, or that the methods of combination need to be further explored.

6. Conclusions

This essay provides an explanation of the concepts of qualitative and quantitative research, the advantages and disadvantages of both and whether they should be combined in practical research. It is generally agreed that qualitative and quantitative come from different epistemologies. Qualitative research is based on descriptive analysis and its main objective is to gain a deeper understanding of social phenomena. Quantitative research is based on mathematical statistics and its main objective is to determine the causal relationships between variables. Qualitative research has the advantage of being in-depth, detailed and flexible in its experimental design, but its credibility can be easily questioned as the results are highly influenced by individuals. Conversely, quantitative research has the advantage of precision, generalisation and credibility, but can also be biased due to the artificiality of the research setting. Based on the characteristics of these two research methods, some scholars argue that they can be combined to circumvent the limitations, while others argue that combining the two is meaningless or simply does not allow for true integration, and in this section, this essay also presents arguments that do not support combining the two in the same study.

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