

Comparison of Study Methodologies

The choice of study method completely depends on the objectives and expected outcomes of a research study. The two major types of study methods are qualitative and quantitative. As the names suggest, qualitative studies collect qualitative data and quantitative studies collect quantitative or numerical data. This paper aims to discuss the structure of qualitative and quantitative research dissertations by comparing their data collection and analysis methods.

The research undertaken by Vangilder and Stimpson (2016) aimed to understand the influence of representational systems such as diagrams and symbols on epistemological changes in the thinking and reasoning processes of a specific group of students. This study used the grounded theory approach where data was collected and used to formulate theories for the observed phenomena (Peterson et al., 2010). Data was collected by means of semi-structured interviews, and analysis of survey responses and journal entries of the participants. This data was qualitative and represented the shift in thinking and reasoning abilities of students upon exposure to representational systems in their education. It also helped the researcher understand the evolution of the new paradigm of thinking in students, which gave insights into the thoughts that were evoked in the participants' minds regarding representational systems. As the entire data was collected in a text-based format, data analysis was done by identifying keywords and creating word groups to identify common themes and patterns in the data.

The objective of the research study conducted by Wigton and Krigbaum (2014) was to evaluate the efficacy of the 19-channel z-score neurofeedback (19ZNF) intervention in a clinical setting and to understand its effects on different neuropsychological constructs such as attention, behaviour, executive function, and electrocortical functioning. Data was collected by means of quantitative electroencephalographic (QEEG) scores both before and after implementing the intervention and the difference in the values was compared. Data analysis was done using statistical tests such as paired t-tests by using values of z-scores that were representative of electrocortical function.

There are several differences between the objectives and data management methodologies of both these dissertations and this has also been reflected in their literature reviews. Vangilder has included a detailed description of the theoretical and conceptual frameworks that guided his study such as personal epistemology, thinking and reasoning, representational systems, and self-efficacy and journaling. These descriptions were followed by a convergence of all these themes and data from the literature. He also threw light on these concepts in the foundation of introductory physics followed by a detailed discourse on methodologies used for the study. On the contrary, Wigton described in her dissertation the data collection method and instrument which is QEEG, the intervention that was evaluated in the study which is 19ZNF, learning theory and models of neurofeedback, and outcome measures and scales used for 19ZNF in the literature.

While both dissertations focused on conceptual frameworks pertaining to their work, there were several differences in the structures of their literature reviews. Vangilder's literature review was presented as a detailed qualitative description of concepts that were used to inform his work, whereas Wigton presented a vast amount of statistical data found in the literature. As Vangilder's approach was qualitative, his literature review needed to present all possible themes that have emerged in the literature which form a foundation for his work. As a result, his review focused on concepts surrounding his research questions and the various theories and hypotheses that have been proposed so far. On the other hand, Wigton's data collection and data analysis was quantitative and so, she presented all statistical data and comparisons that have been published relating to her work in order to provide a basis for interpreting her research data. Therefore, both authors have structured their literature reviews based on their expected study outcomes and the methodological approach they have adopted for their study.

References

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