



Neuroresearch: Another form of mixed method

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Abstract

Research in the field of Social Sciences is an interesting and complex academic study. Social Science research becomes more and more careful when researchers are not stuck with the only focus on the relationship between variables, but more than that is also deeply reviewed dimensions or indicators or items. For those researchers need a complex method that is a mixed method. One form of the Mixed method is called Neuroresearch. Basically, this Neuroresearch method uses content analysis method as qualitative research (exploratory), then deepens the result of content analysis with quantitative research method (explanatory and confirmatory research). Further explanatory and confirmatory research results are deepened through qualitative research in the form of implications of research results to create new policies, new strategies and new efforts through focus group discussion.

Keywords: Neuroresearch, Exploratory, Explanatory, Confirmatory

1. Introduction

Much of the social research is undertaken to look at unprecedented special phenomena [1, 2, 3]. Social research becomes an interesting and complex academic study when researchers are not fooled by focusing only on the relationship between rigid variables, and not just focusing on the relationship between independent variables and dependent variables. Because basically a variable that contains it in dimensions and indicators as a sign or characteristic of the variable itself which in the research method is called exogenous variables. Therefore, the nature of relationships between variables is not only interpreted by the relationship between independent variables with dependent variables but more than that that can be interpreted the relationship between dimensions and indicators and items and variables either alone or together with dependent variable [4]. This is reasoned because in building the theory study for each variable (dependent, independent, and intervening variable), the researcher performs a theoretical study based on the results of previous research which then is contextualized to the research population which in the research method is called construct theoretical [5].

Similarly, more important attention and distinguish Neuroresearch with other research methods and also become a Neuroresearch excellence is that the relationship between independent variables with dependent variable not merely interpret the relationship between the score (number) with the score (number). But in determining the relationship between variables must be interpreted in advance the empirical condition of each variable or tendency empirically from each variable involved in the research. The purpose of the importance of the known tendency of the empirical condition of each variable is to know the direction of the relationship itself whether contrary to theory or in line with the

theory. For example, the relationship between Intensity Parenting at Home (X) as an independent variable Juvenile Delinquency (Y) as a dependent variable. The Neuroresearch method emphasizes first finding the tendency of these two variables to discover how the tendency of juvenile delinquency rates in the population. To determine the tendency, the researcher specifies the category of juvenile delinquency variable into 3 (three) ie (a) naughty, (b) sometimes naughty, and (c) not naughty. Based on that category, then analyzed its tendency through Miu analysis (μ) as an illustration of the tendency of the condition of Adolescent Delinquency Rate in population. Furthermore, so also performed for independent variables. It should theoretically if parents increasingly have high intensity in fostering teenagers, then teenagers tend to become increasingly not naughty. But if one of the variables has a tendency that is contrary to the theoretical norm, then the results of the research becomes more interesting because it gives opportunities not because of independent variables that affect the dependent variable, but maybe its dimension, perhaps the indicator, perhaps the item. Through Neuroresearch, there is also an open possibility, not dimension or indicator or item or independent variable (X) as an exogenous variable affecting dependent variable but affecting dimension or indicator of its dependent variable (endogenous variable) also with exogenous variables. This is where the role of implementing Neuroresearch research methods as an alternative. The concept may be called a variable if the concept has variations in value, or the concept has been changed [6, 7, 8, 9,10].

It is this concept that underlies the need for a method with a new paradigm in research, called the Neuroresearch method. Neuroresearch itself is a term that seeks to describe the interlinked and complex hooks of a study that are not merely through qualitative-quantitative research methods that are often called mixed-methods, but more than that is through qualitative-qualitative-calibration research in quantitative-quantitative calibration -the qualitative

"pattern is then called neuroresearch. This difference is another alternative besides the mixed-method that has evolved so far. Thus how is the positioning and model of neuroresearch among the mixed methods developing today?

2. Literature review

Mixed methods as a research method are still wide open for development, as there is no consensus on the exact boundaries of the concept of mixed research methods [11]. Mixed methods as a research approach are still phenomenological, so it is still wide open to be developed [12]. In choosing a research approach it is advisable to return to how the researcher understands the research problem itself [13]. Mixed method is a research approach that combines or associates qualitative and quantitative forms. That is, its research design is based on assumptions as well as inquiry methods. Mixed methods provide assumptions about how data collection, data analysis, and how to integrate quantitative and qualitative approaches through multiple phases. The keywords of mixed methods are on collecting, analyzing data, and combining quantitative and qualitative data. The principle is the same, that is, quantitative research develops instruments and uses them to obtain valid primary data, while qualitative research positions the researcher himself as an instrument [14]. The premise of mixed methods research is the spirit of using quantitative-qualitative combinations to find better research results than using just one approach.

Quantitative research is post-positivism, meaning that researchers position themselves that a knowledge is based on (a) causal thinking, (b) the way it narrows and then focuses on the observed variables, (c) observes in detail by measuring to the variable, and (d) to test the theory or construct that is developed continuously. Research post-positivism (quantitative), the researchers worked top down that is from construct theoretical construct, build a frame of mind, formulate the hypothesis, collect data, calibrate the instrument, and analyze data. While qualitative research tends to be influenced by the constructivist philosophy of different views with post-positivism [15]. Constructivism tends to understand a phenomenon that is formed by participants and subjective views of the participants [15]. When participants give their understanding (answering something), then they are basically speaking according to the meaning they are experiencing. That is the results of qualitative research obtained from the perspective of individuals (participants), which then made a pattern, which ultimately formed the theory. For this reason, qualitative research is bottom up, using participants' views to form broader themes and generalizing a theory based on interconnection or linking between established themes that tend to be interdependent [16].

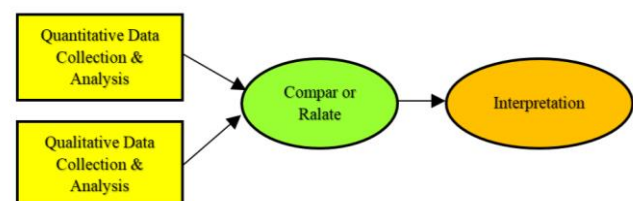
In contrast to the above two views (quantitative and qualitative), the position of the mixed method is strongly influenced by the philosophical view of pragmatism. The focus of the mixed method is on a fundamental question in research rather than solely oriented to the research method itself. Data collection is done to get answers to the problem studied completely and practically. For that mixed method (pragmatism) try to combine between deductive and inductive thinking [17]. With the mixed method is expected to produce more comprehensive facts in uncovering research problems, because researchers have the freedom to use all the data collection tools and use various types of data required. The mixed method also can answer research questions that can not be answered by quantitative or qualitative research individually. With a mixed method, researchers can conduct social collaboration, behavioral collaboration and humanistic collaboration, which is not widely practiced by quantitative or qualitative research individually. Mixed methods are interesting because researchers use different views or paradigms. It is important that the researchers construct the theoretical construct which takes the conclusion of the various inspirations from the theories and the results of prior research that are contextualized to the current condition of the research population whose contents are conceptual definitions,

dimensions, and indicators. Based on the position of the mixed method above against other research, it must be considered that there are at least 4 (four) issues that are related to (1) timing, (2) weighting, (3) mixing, and (4) theorizing [13, 14].

First, Timing. Researchers should consider the timing of both qualitative and quantitative data collection. Is the data collected in stages (sequential) or at the same time (concurrent)? If data is gradual, what quantitative or qualitative data will be collected first. Of course, this all depends on the research objectives and objectives of the researcher itself. If the first collected qualitative data, it means the goal is to explore the theme/ topic/variable by observing participants in certain locations. Afterwards, the researcher expanded his understanding through quantitative data, ie data collected from many participants (with representative samples). When data are collected concurrently, quantitative and qualitative data are collected simultaneously and simultaneously. The collection of data is most effective because it is efficient in terms of time. *Second, Weighting.* The mean weight is a quantitative and qualitative priority in the mixed method procedure. Perhaps in some studies, the weight is the same, but some other studies emphasize one method. Emphasis on one method depends on the researcher's interest and his research problem. Usually, there are some considerations, such as whether the qualitative and quantitative data will take precedence first. How far the treatment of each research result? Which are prioritized, whether inductive methods (constructing themes in qualitative) or deductive methods (test theory)? *Third, Mixing.* That is, the qualitative and quantitative data are merged into one goal, the separation is maintained, the results are combined. Perhaps two data are written separately, but both remain interconnected with each other. Researchers can also collect quantitative and qualitative data concurrently and combine them by transforming qualitative themes into numbers that can then be calculated statistically. Researchers can also "not combine" two different data, but the researcher's embedded secondary data into qualitative data. *Fourth, Theorizing.* Theoretical factors (literature review, literature, prior research, international journals, etc.) are very important in building a mixed method. Because this theory perspective will be the basis for the process mixed method. And theoretical studies have also been discussed also in the early part of research to form novelty, state of the art, and problem formulation.

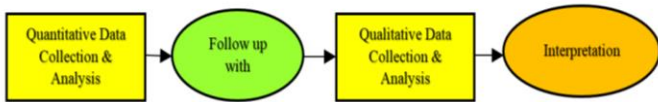
Based on the general direction of the mixed method as described above, and before positioning the Neuroresearch scheme against the mixed method model, we first explain the direction of the mixed method developed by Creswell. Broadly speaking, Creswell divides into 6 (six) Mixed Method design schemes described as follows [14].

2.1 Convergent parallel design

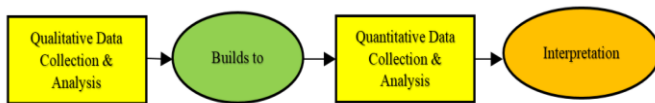


Collect quantitative and qualitative data simultaneously, combine data, compare results, and explain by describing as a result. The aim is to explain the quantitative results with qualitative data of a study to see whether the results are convergent and give similar results.

2.2 Explanatory sequential design



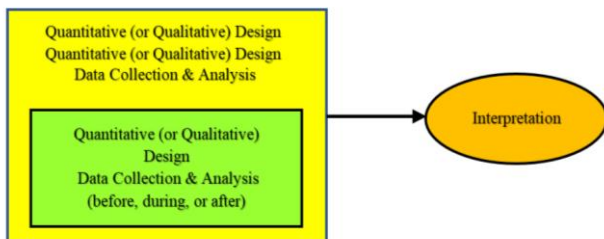
First, collect qualitative data to help explain or elaborate on quantitative results. The rationale for this approach is quantitative data and the results of the analysis provide an overview of the research problem. More to analyze, especially through qualitative data collection is to refine, expand, or explain the quantitative picture in general. This model has characteristics: the first stage of collecting data and quantitative data analysis and followed by the collection and second phase analyzing the second qualitative data, to strengthen the results of quantitative research conducted in the first stage.



2.3 Exploratory sequential design

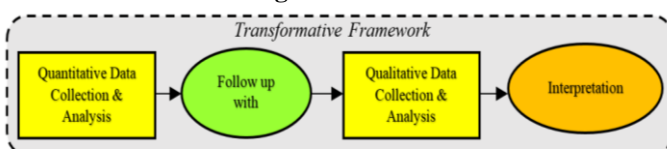
The Exploratory Sequential Plan begins with qualitative data and subsequently collects quantitative information. This method involves the procedure of first collecting qualitative data to explore a phenomenon and subsequently collecting quantitative data to explain the relationships found in qualitative data.

2.4 Embedded design



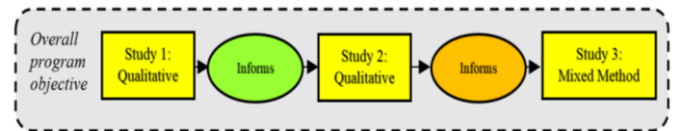
The embedded model is a research method that combines simultaneous quantitative and qualitative research methods (together or otherwise), but the weight of the method is different. In this model there is a primary method and a secondary method. The primary method is used to obtain the primary data, and the secondary method is used to obtain data to support data obtained from the primary method. This design is very useful if researchers want to embed the qualitative components in quantitative design, such as in experiments and correlational. For example, in experiments, researchers include qualitative data because to conduct treatments, to test the process of intervention, or to process variable relationships, or it could be to follow up experimental results. Embedded design performs both quantitative and qualitative data collection, but one type of data acts as a supplement in the overall design. There are two embedded models: (1) embedded experimental model and (2) correlational model. Embedded experimental models are qualitative data used in experimental design (both in pure experiments as well as quasi-experiments). The main priorities of this model are developed from quantitative, experimental methodologies, and qualitative data.

2.5 Transformative design



The transformative method is a combination of triangulation and embedded models. Two data collection methods were conducted in one phase of the study and at the same time. The weight of the method can be the same and may not be the same. Merging data can be done by merging, connecting or embedding (mixing with equal weights, connecting, and mixing with unequal weights).

2.6 Multiphase Design



The multiphase evaluation design is a mixed-method design used when researchers try to evaluate the impact of a program or project. The researcher mixed methods using multi-phase convergent, explanatory, or exploratory design in program implementation.

3. Research methods

This research uses content analysis method as a form of theory study about a mixed method. In theory, the content analysis focuses on the same opinion and is considered contradictory and insoluble about the topic being discussed and in this case, looking for a new mixed method¹⁴. This content analysis approach is used because the researcher intends to present a new paradigm of mixed method applied in Social Sciences research and not to other research possibilities [18].

4. Results and discussion

This distinction is an alternative to the mixed methods that have developed so far. Based on its function, Neuroresearch is conducted through three stages of research [19, 20, 21, 22].

Exploration research stage. The first stage is a qualitative stage in which Neuroresearch research is conducted through literature review and theoretical studies that will result in theoretical constructs [23]. This stage will produce an in-depth study of the variables so that it can find the construct⁵. The building is the conclusion of variables that are inspired by research journals, textbooks, theories, and other references that are contextualized with population conditions whose conclusions are definitions, dimensions, and conceptual indicators. The construction position in Neuroresearch is the academic estimate of the researcher. The theoretical construct of variables and their dimensions and indicators then becomes the main reference of the preparation of research instruments. The compiled instrument requires a test of the validity of the construct. Test constructs and validity are required to obtain valid and reliable instruments to be implemented at a later stage.

Explanatory research stage. The second stage has the function of deepening the findings of the first phase of exploratory research. This is done by testing the research instrument on the sample as part of the study population. The analysis of this stage will result in the tendency of each variable involved in the research and to find 'models of improvement' appropriate to the population context.

Confirmatory research stage. The third stage has the task of deepening the findings of explanatory research by involving the moderator variable in the form of demographic variables or also variable characteristics of the unit of analysis. This stage is important because it will analyze the difference between dependent and independent conditions which is the most dominant form of "model improvement". In confirmatory research, it is useful to help researchers to build the implications of research results in the form of new policies, strategies, and efforts. When finding the most robust demographic variable category, it is the researcher's base to

set new policy implementation targets and breakthrough research policy. This is where researchers can play a big role to build qualitative novelty. An example is if a study wants to see the role of X against Y, then in the research, Neuroresearch results are not limited to statements relating to the relationship between these two variables. However, Neuroresearch's research will try to examine more in the role of each dimension or any indicator that may have a stronger influence in forming the dependent variable. Even the Neuroresearch method will also find the study of the dimensions and which indicators play the most role in shaping the dependent variable images in the study.

Neuroresearch attempts to position itself among mixed method models that have evolved. This difference is another alternative to the mixed-methods that have evolved over the years. Based on its function, Neuroresearch is done through three stages as follows. *First*, Exploratory Research. This stage is a qualitative stage in the research neuroresearch conducted through literature review and study of various theories that will produce theoretical construct. This stage will result in a deeply variable review so as to find the construct. A construct is the conclusion of a variable inspired by research journals, textbooks, theories, and other references that are contextualized to population conditions whose conclusions are ultimately conceptual definitions, dimensions, and indicators⁵. The construct position in neuroresearch is the academic forecast of the researcher. The theoretical construct of variables along with dimensions and indicator is then become the main reference of research instrument preparation. The compiled instrument requires a test of construct validity. Test constructs and validity are required to obtain a valid and reliable instrument to be implemented in the next stage. *Second*, Explanatory Research Stage. This stage has the function of deepening the findings of the first phase of exploratory research. This is done by testing the research instrument on the sample as part of the study population. The analysis of this stage will result in the tendency of each variable involved in the research and to find the 'fix model' that fits the population context. *Third*, the Confirmatory Research Phase. This stage has the task to deepen the findings of explanatory research by involving the moderator variable in the form of demographic variables or can also variable characteristics of the unit of analysis. This stage is important because it will analyze the difference between the dependent and independent conditions which is the most dominant form of "fix model". In confirmatory research, it is very useful to help researchers to build the implications of research results in the form of new policies, strategies, and efforts. When finding the most powerful category of demographic variables, it is the basis of researchers to set targets for the implementation of new policies and breakthrough policies of research results. This is where researchers can play a big role to build novelty qualitatively. An example is if a study wants to see the role of X against Y, then in neuro-research research the results of research are not only confined to the statements relating to the relationship of both variables. However, neuroresearch research will attempt to examine more in the role of each dimension or each indicator that may have a stronger influence in forming a dependent variable. Even the neuroresearch method will also find the study of dimensions and which indicator is most instrumental in forming a picture of dependent variables in the study. The scheme as shown below. Based on the above explanation, the minimal scheme of Neuroresearch as shown below.

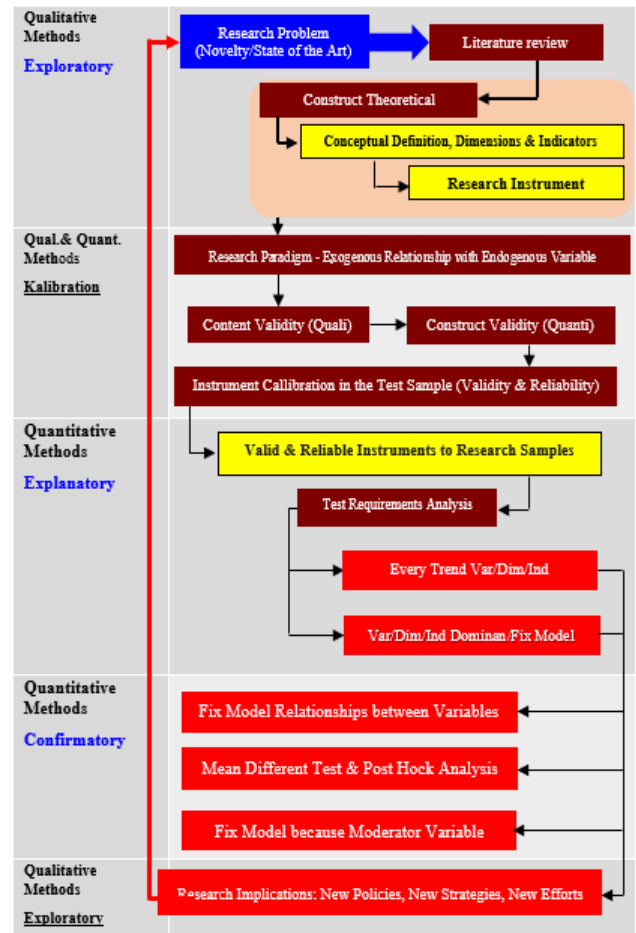
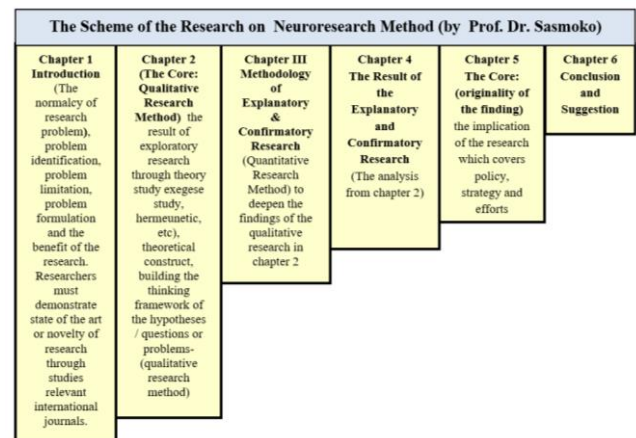


Fig. 1: Neuroresearch Scheme

5. Conclusion

The result from Neuroresearch above, then do the forming of reporting scheme for the implementation of its research as in the following scheme.



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