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MIXED METHODS RESEARCH IN EDUCATION

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ABSTRACT

Mixed methods research is still an evolving area. However, it has various characteristics like "paradigm pluralism", "focus on research questions than the research design" etc. Mixed methods research is not just one phase of a research but it enters into all stages of research process right from the stage of writing the theoretical framework to drawing inferences of the study. In the present paper an attempt is made to present about "what is mixed methods research", "when to use mixed methods research", "what are its types" and an attempt is also made to highlight some issues in mixed methods research.

Keywords: Mixed methods research, Paradigm, Mixed methods designs

INTRODUCTION

"With quantitative research long established as an approach and the qualitative research now being accepted by educational researcher's, mixed methods research is gaining its importance as a "third methodological movement" (Tashakkori and Teddlie, 2003 a). Mixed methods research is a "research paradigm whose time has come" (Johnson and Onwuegbuzie, 2004). Mixed methods approach is being used in various disciplines, including the health sciences, nursing, business, sociology, psychology and education (Creswell and Plano Clark, 2011).

WHAT IS MIXED METHODS RESEARCH?

"Mixed methods research is the procedure for collecting, analyzing and mixing both qualitative and quantitative methods in a single study or a series of studies to understand a research problem" (Creswell and Plano, Clark, 2011). The other names used less frequently for mixed methods research include multimethod, multiple methodology, blended research, triangulated studies, hybrid and integrative research (Johnson, Onwuegbuzie& Turner, 2007; Smith, 2006). Mixed methods research is an advanced research method where the researcher has to have the knowledge of both quantitative and qualitative research and it is not just a collection of both qualitative and quantitative data for a research but it consists of integrating or embedding the two approaches i.e., qualitative and quantitative to come out with a complete understanding of a research problem.

Mixed methods research helps to study complex problems by providing a scope for triangulating or corroborating the findings from multiple sources of evidence with the help of a single study. In education, many of the times a researcher is not just interested in exploring the outer or the visible aspects of a study but he/she many of times need to explore the meanings behind human behaviors and actions. The mixed methods research allows the researcher to use multiple tools and also provides the scope for the researcher to study the problem of research from multiple perspectives and methods.

The underlying philosophy behind mixed methods research is that both quantitative and qualitative aspects are complementary and not substitutes of each other. Mixed methodsapproach believes in pragmatism rather than engaging in debate over qualitative or quantitative inclinations. It believes that a research should enable the researcher to find out what he or she wants to know regardless of whether data and methodologies are qualitative or quantitative (Feilzer, 2010). It thus encourages the researcher to use all methods possible to address a research problem.The consequence of this is that the research is driven by the research questions rather than the methodological preferences and thus, one or more mixed methods questions which underline the need for collection of quantitative and qualitative data concurrently may follow the specific quantitative or qualitative questions. "Studies that address independently the same research question quantitatively and qualitatively would not be considered 'mixed

methods' asthere would be no integration of approaches at thedesign, analysis or presentation stage" (Tariq, S. and Woodman, J, 2010).

Johnson et.al (2007) gave nineteen different definitions of mixed methods research that vary according to what is being mixed, where and when the mixing takes place, the breadth and scope of mixing, the reason for mixing and the orientation of research. Tashakkori and Teddlie (2003), Teddlie and Tashakkori (2006), Creswell and Tashakkori (2007), Greene (2008), Yin (2006) etc gave different view about domains or dimensions of mixed methods research which ranged from four to seven.A careful understanding of these domains implies that mixed methods operate at all stages and levels of research and it's not just at the stage of data collection or a methodology. A mixed methods study can be quickly identified by the title, methodology section or research questions. Often the title of the article will use the words "mixed methods" or "quantitative and qualitative". The methodology section would reflect the collection of both quantitative and qualitative data. Usually in different sections or parts often the research questions or purpose will include reference to using mixed methods or having both quantitative and qualitative purposes (McMillan, J.H & Schumacher, S, 2010).The selection of sample in a mixed methods study includes both probability and non probability quantitative approaches of sampling and purposive qualitative approaches.

WHEN TO USE MIXED METHODS RESEARCH?

The mixed methods research can be used when a researcher want to answer not just "what" of his/her research but also along with it wants to answer question like "how" and "why" i.e., when the researcher requires hybrid mix (both quantitative and qualitative) of methods, tools, data and data analysis techniques. Thus, when the intension of researcher is to really understand the variables under the study from various perspectives then he/she can go for mixed methods research. Also, when the nature of research problem is such that, only a quantitative or qualitative methodology is not enough to address it then the researcher can use mixed methods research.

Often in the field of education, the research problems under the study are such that where the researcher at first has to study what the problem is and then do a follow up/in-depth study on why and how of the problem. Thus, when a researcher wants to follow up a quantitative/qualitative study with a qualitative/quantitative study to obtain more detailed and

specific information, he/she needs to use mixed methods research. Also, in many of the studies it becomes necessary for a researcher to collect both the qualitative and quantitative data concurrently or one after another for the better understanding of a research problem. Thus, mixed methods design not only allows investigation of complex research questions but also allows investigation of differenttypes of research questions.Another point in undertaking mixed methods research is that it increases/strengthens the research findings a researcher can write up and publish. Thus, mixed methods approach help to look at a research problem in a holistic way rather than in a uni-directional way.

However, undertaking mixed methods research is often expensive in terms of time, money and also expertize and hence before undertaking a mixed methods approach a researcher has to pose some reflective questions to himself/herself like, does my research problem demands me to answer just "what" of a research problem or does it require me to answer "why" and "how" aspects also?, can I answer my research questions using any one single approach? etc. Also, a researcher before planning to use mixed methods research should consider various aspects like his/her own research method skills, time, resources etc.

TYPES OF MIXED METHODS RESEARCH

Once a researcher decides that thestudy of research problem requires a mixed methods approach and developed proper theoretical framework of the study, the next step would be to decide about the best fit mixed methods design.Designing a research design is more challenging in mixed methods approach then in a single method design. Its design depends on various factors like the purpose of research, the sequence in which quantitative and qualitative methods are used, the emphasis given to quantitative or qualitative method etc. Hence, the design and conduct of any two mixed methods studies may never be exactly alike (Creswell and Plano Clark, 2011).

Creswell, PlanoClark, Gutmann, & Hanson (2003) have classified mixed methods design in educational research as sequential explanatory, sequential exploratory, sequential transformative, concurrent triangulation, concurrent nested, concurrent transformative. While,Teddlie and Tashakkori (2003a) classified them as parallel mixed designs, sequential mixed designs, conversion mixed designs, multilevel mixed design, fully integrated mixed designs. Teddlie and Tashakkori (2009) suggested six types of mixed designs namely, parallel mixed design,

sequential mixed design, quasi mixed design, conversions mixed design, fully integrated mixed design. Creswell (2015), presented six mixed methods designs namely "convergent parallel design", "explanatory sequential mixed design", "exploratory sequential mixed design", "embedded mixed design" (basic designs) and "multiphase mixed design" and "transformative mixed design (complex designs). Mills, G.E and Gay, L.R (2016) presented three basic mixed method designs i.e., explanatory sequential design, exploratory sequential design and convergent parallel design and three advanced mixed method designs i.e., experimental design, social justice design and multistage evaluation design. In the present paper an attempt is made to explain the basic level mixed methods designs.

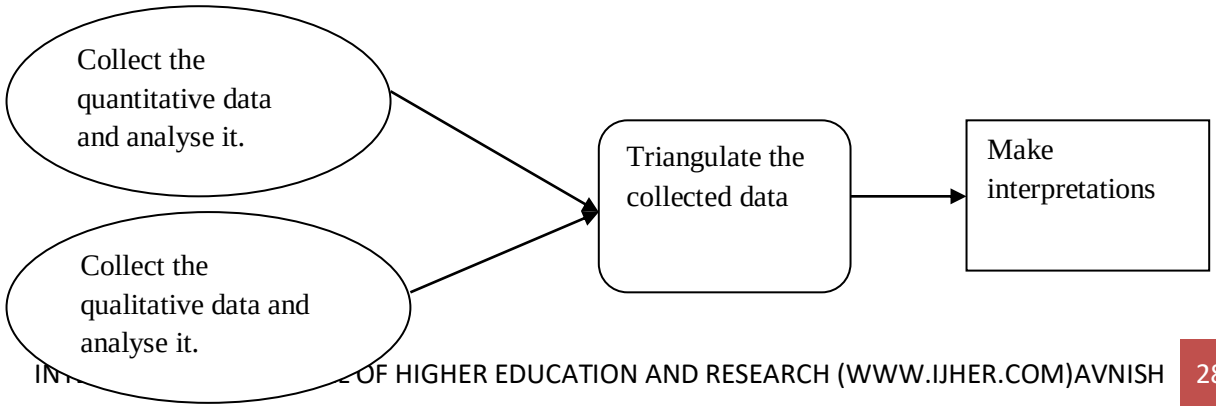
These methods are differentiated on the basis of aspects like importance given to type of data, the sequence of data collection and the analysis techniques.

Convergent parallel design (QUAN + QUAL)

The convergent parallel design is also called integrative or concurrent triangulation design.In this design the researcher gives equal priority to both qualitative and quantitative data and collects it simultaneously during the study and compares the results to determine the similarities and dissimilarities among the results yielded by two data sets.Thus, the data in this design is collected concurrently in same study rather than in separate studies or distinct phases (Mills, G.E and Gay, L.R, 2016) and when the results from different methods converge and support one another, researchers have triangulated the findings.

This comparison can be shown by discussing qualitative and quantitative results side by side in discussion section or merge the qualitative and quantitative results in a single table topic wise or transform one data set so that it can be directly compared with other data set (Creswell, 2015).

Its design can be shown pictorially as follows:



Placing equal emphasis on concurrently collected qualitative and quantitative data (Mills, G.E and Gay, L.R, 2016) and merging the two forms of data and taking decision about how to interpret or assess the diverging results (Creswell, 2015) are some of the major problems in this design.

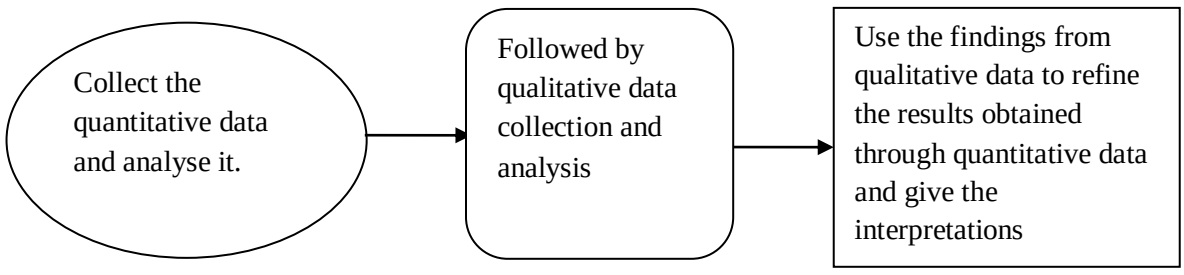
An example of research question that can be framed in this type of design is "To what extent are zeros used in grading? And what is the effect on student motivation?" Here the researcher may use both concurrent surveysand interviews of both teachers and students (McMillan, J.H & Schumacher, S, 2010).

Explanatory Sequential Design (QUAN ->qual)

In this design, quantitative data (QUAN) are collected first and are more heavily weighted than the qualitative data. The findings of the quantitative study then determine the type of data to be collected in second phase i.e., qualitative phase. Thus, here the data (quantitative and qualitative) is collected sequentially in two phases. In this design the researcher priority is on quantitative data (QUAN) collection and analysis and then proceeds for collecting a small quantity of qualitative data (qual) and uses this data to refine the results obtained from the quantitative data.This is the most popular form of mixed methods design in educational research (Creswell, 2015).

This type of design is generally used when the researcher wants to know the general picture of the research problem and then wants to furtherexplain about the research problem. Thus, when the researcher wants to elucidate the conclusions derived with the help of quantitative data using qualitative methods, the researcher can adopt this design.

Its design can be shown pictorially as follows:



An example of a research question in this design is “Teachers use zeros extensively in grading students. How extensively they use zeros in students grading followed by research questions like why do teachers use zeros? And how does this affect student motivation (McMillan, J.H & Schumacher, S, 2010).

To interpret the findings obtained through this design is comparatively easier than convergent design because the researcher need not converge or integrate two different forms of databut rather use the findings from qualitative data to refine the findings derived through quantitative data. Also, a researcher need not worry about how to interpret the divergent results. For this design to give its results properly, the researcher has to well plan about the follow up phase (qualitative phase) which builds on initial quantitative phase. Also this design is expensive in terms of labour, expertise and time.

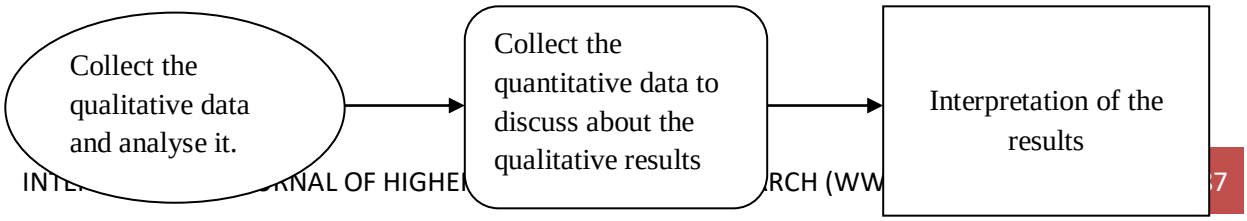
Exploratory sequential desing (QUAL ->quan)

As the name suggests, in this design the researcher wants to first explore the research problem by gathering qualitative data and then discuss the qualitative results indepth with the help of quantitative findings. Thus, qualitative data are collected first and given more emphasis (QUAL) than quantitative data. In such design the validity of qualitative results can be enhanced by quantitative results.

Generally, the purpose of this design is either to use the qualitative data exploring a particular phenomenon to develop a quantitative instrument to measure that phenomenon or to use the quantitative portion of the study to explore relationships found in qualitative data.

If the findings of the study are to be generalized, each phase of design has to strictly adhere to methodological assumptions for quantitative and qualitative designs used in the study. A popular application of this design is to explore a phenomenon, identify themes, design instrument and subsequently test it.

Pictorially this design can be represented as follows



An example of research question in this design is “How do teachers determine how much weight is given to each component that determines the grades? What are the teachers grading practices?”(McMillan, J.H & Schumacher, S, 2010).

Thus, in mixed methods research, a researcher has three options to prioritize the data i.e., he can give equal priority to both quantitative and qualitative data or he can give weighted priority to quantitative data than to qualitative data or vice versa. The nature of integration, when and how it occurs determine the type of design. However, it should be reflected in purpose statement, research questions, data collection process and in results and discussion session.

SOME ISSUES IN MIXED METHODS RESEARCH

Inspite of many debates, issues and controversies existing with regard to conceptual orientations, regarding methods and methodology of mixed methods research, one cannot deny that it is emerging as “third methodological community”. The numbers of significant works being published under this head are increasing day by day. In the following section an attempt is made to highlight some ethical and practical issues in mixed methods research.

Over a period of time, an acknowledgment exists that research questions guides the whole mixed methods research. However, still many questions exist like related to its format/shape, general attributes, components, functional utility etc.

Another issue in debate with regard to mixed methods research is should we create a new language for mixed methods research? or should we have a common language across three approaches?

Another issue in mixed methods research is related to “design”. Design of a research helps in creating a common language for the field and it acts as a blueprint for the researcher who wants to do the research. Over the years, many mixed methods research design have evolved which are either overlapping or divergent. Existence of too many designs on one side gives freedom to the researcher to do the study. However, it may also create a lot of confusion when it comes teach or learn about them. According to Greene (2007) designing a mixed methods research is an artful work rather than following a set of pre-defined prescription. According to Tashakkori.A and Teddlie. C (2010), if the researcher knows that majority of the research questions can be

answered using QUAN/QUAL methods and it needs to be supported with QUAL/QUAN methods, then priority of approach becomes an important aspect in mixed methods research. However, when it is unclear whether QUAN or QUAL sources will ultimately be most important in answering the research questions and coming out with inferences the priority of approach is not an important aspect in mixed methods research.

Mixed methods research is still an evolving field and this fact is reflected even in the data analysis techniques that are evolving in this area. Some of the data analysis techniques used in mixed methods research are crossover track analysis, Data importation, fused data analysis, single track analysis, integrated data reduction etc. However, an issue of discussion with respect to data analysis techniques in mixed methods research is can these varieties of data analysis techniques be merged and a single mixed data analysis framework can be evolved and if so what would be its structure?

The success of a research process depends to an extent on how correctly we draw the inferences from the results or outcomes. These inferences should be drawn keeping in mind the research questions. In mixed methods research, the first steps in drawing inferences could be to compare and contrast the results of both quantitative and qualitative data analysis and arriving at general answer to each specific research question. In the second step a researcher can compare and contrast the answers to different research questions.

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