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SIMPLIFYING THE COMPLEX MIXED METHODS DESIGNS

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Abstract

Research design is the technical aspect of a study which includes the planning of the research, visualising the data taking into consideration the problems that are associated in using the data in the study. There are three main research approaches, i.e., quantitative, qualitative and mixed methods. Mixed methods research involves combining or integration of quantitative and qualitative research procedures and data in a research study. The article illustrates the three main models of Mixed Methods Design i.e., Explanatory sequential, Exploratory sequential and Convergent mixed methods design. The main focus of the article is on Complex Mixed Methods Designs. Some of the designs are illustrated with figures for better understanding. A table to help investigators choose the appropriate mixed methods design is also provided. The Complex Mixed Methods designs involve more steps and procedures enabling them to fit in complex projects. Mixed methods research can produce a more complete knowledge as it includes both qualitative and quantitative approaches.

Key words: *Educational Research, Research Designs, Mixed Methods Research, Complex Mixed Methods Designs.*

Introduction:

Research design is the core of any research study. It is a technical aspect of the study which includes the planning of the research, visualising the data taking into consideration the problems that are associated in using the data in the study. Thus, it is a plan, structure and strategy of the study conceived in order to obtain answers to the research questions and controlling the variances.

While preparing the research design, the investigator must select the appropriate research approaches. There are three main research approaches, i.e., Quantitative, Qualitative and Mixed methods. Generally, the distinction between qualitative and quantitative approach is done by

stating that the quantitative approach uses numbers or data obtained from 'close ended questions' and qualitative approach deals with responses obtained from 'open ended questions' in terms of words. Mixed methods research is placed in between the continuum with quantitative at one end and qualitative at the other. This is because mixed methods uses both quantitative and qualitative elements. However, a better way to distinguish the two approaches can be done as follows:

Quantitative research: This approach tests objective theories based on the relationship between measurable variables. Usually, the data obtained from these variables are analysed using statistical procedures. The research report follows a set structure consisting of introduction, review of literature, methodology, results and discussions. So, this approach is deductive as one test theories and hypothesis to reach findings that can be generalized and replicated.

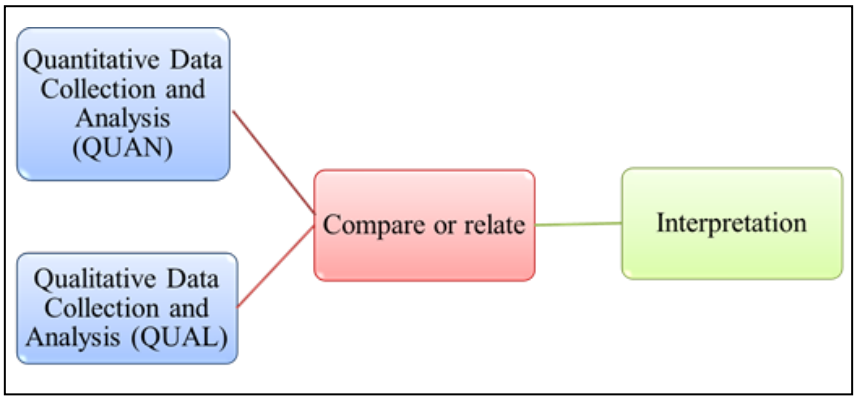
Qualitative research: This approach deals with exploring and understanding social or human problems. The data is typically collected in the participant's setting and the obtained data is analysed inductively. So, data is analysed from particular to general themes leading to the interpretation regarding the meaning of the data. The final report is very flexible in structure.

Mixed methods research involves combining or integration of quantitative and qualitative research and data in a research study. Qualitative data tends to be 'open ended' without predetermined responses while quantitative data usually includes 'closed ended responses' such as found on questionnaires or psychological instruments. The field of mixed method research is relatively new with the major work in developing it stemming from the middle to late 1980's. Its origin however goes back further. In 1959 Campbell and Fisk used multiple methods to study psychological traits – although their methods were only quantitative measures. Their work prompted others to begin collecting multiple forms of data, such as observations and interviews (qualitative data) with traditional surveys (Sieber, 1973). Early thoughts about the value of multiple methods – called mixed methods – resided in the idea that all methods had bias and weaknesses, and the collection of both qualitative and quantitative data neutralised the weakness of each form of data. Triangulating data sources – a means of seeking convergence across qualitative and quantitative methods – was born (Jick, 1979). By the early 1990's mixed methods turned toward the systematic convergence of qualitative and quantitative databases, and the idea of integration in different types of research designs emerged.

Although many designs exist in the mixed methods field, **three primary models** or the **core designs** are found in social sciences today:

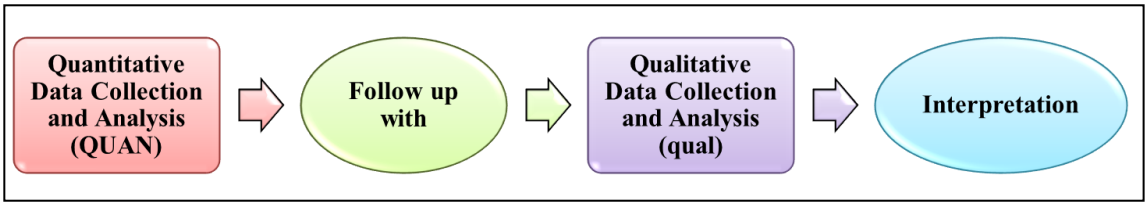
- Convergent Mixed Methods Design was also formerly termed as Convergent Parallel Mixed Methods Design (Creswell, 2014). This design is a form of mixed methods design in which the researcher converges or merges qualitative and quantitative data in order to provide a comprehensive analysis of the research problem. As depicted in figure 1 given below, in this design the investigator typically collects both forms of data at roughly the same time and then integrates the information in the interpretation of the overall results. It is a single-phase approach. Contradictions or incongruent findings are explained or further probed in this design.

Figure 1. Convergent Mixed Methods Design.



- Explanatory Sequential Mixed Methods Design is one in which the researcher first conducts quantitative research, analyses the results and then builds on the results to explain them in more detail with qualitative research. It is considered explanatory because the initial quantitative data results are explained further with qualitative data. Also, it is considered sequential because the initial quantitative phase is followed by the qualitative phase. The following figure 2 shows the explanatory sequential mixed methods design.

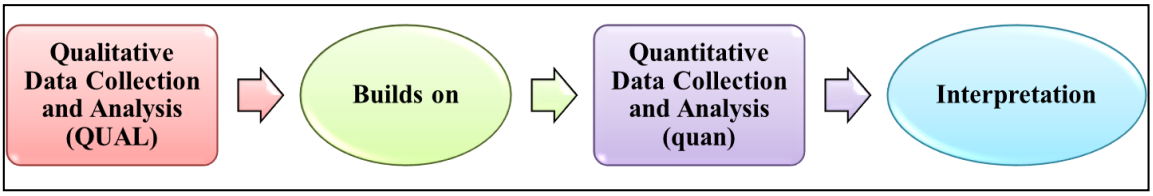
Figure 2. Explanatory sequential mixed methods design.



- Exploratory Sequential Mixed Methods Design is the reverse sequence from explanatory sequential design. As given in figure 3 in the exploratory sequential approach the researcher first begins with a qualitative research phase and explores the views of participants. The

data is then analysed, and the information is used to build into a second, quantitative phase. The qualitative phase may be used to - build an instrument that best fits the sample under study, to identify appropriate instruments to use in the follow up quantitative phase, or to specify variables that need to go into a follow up quantitative study (Creswell & Creswell, 2018).

Figure 3. Exploratory Sequential Mixed Methods Design.



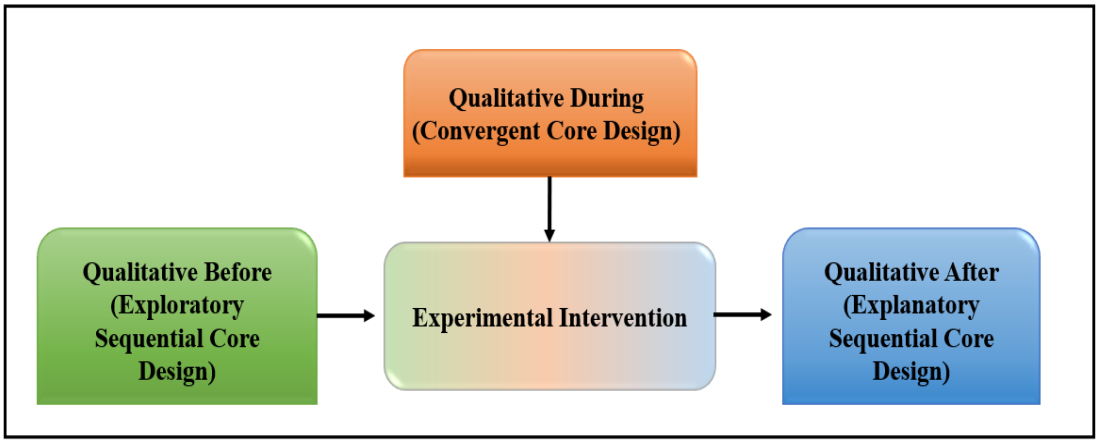
Complex Mixed Methods Designs consist of more steps and procedures. They incorporate the core designs into the 'processes' of research. So, these designs can fit into complex projects. Plano Clark and Ivankova's book (2016) conceptualized many types of applications of complex designs. The three frameworks for using these complex designs are:

- Intersecting a secondary method (mixed methods) within a primary quantitative or qualitative research design.
- Intersecting mixed methods with another methodology. For e.g., a core design could be added to a case study, action research, phenomenology or grounded theory.
- Intersecting mixed methods within a theoretical framework.

To understand these complex designs some examples of the application of the **complex mixed methods designs** are given below:

- The mixed methods experimental (or intervention) design involves the researchers collecting and analysing both quantitative and qualitative data and integrating the information within an experiment or intervention trials. The researchers add qualitative data to the experiment in different ways: before the experiment begins, during the experiment or after the experiment (Sandelowsi, 1996 as cited in Creswell & Creswell, 2018). As shown in figure 4, the basic ideas are to embed the core exploratory sequential design into the experiment to carry out exploration before conducting the experiment; to embed a convergent core design during the experiment to assess participants' experiences with the intervention; or to add an explanatory sequential design into the experiment after the study to follow up on the experimental outcomes.

Figure 4. Mixed methods Experimental intervention design.



- The mixed methods case study design involves the use of one or more core designs (i.e., convergent, explanatory sequential, explanatory sequential) within the framework of a single or multiple case study design. The intent to this design is to develop or generate cases based on both quantitative and qualitative results and their integration. There are two basic variants to this design. One is a deductive approach where researchers establish the cases at the outset of the study and document the differences in the cases through the qualitative and quantitative data. A second is more of an inductive approach where the researcher collects and analyses both quantitative and qualitative data and then forms cases - often multiple cases- and then makes a comparison among the cases.
- The mixed methods participatory-social justice design is a mixed methods design in which the researcher adds a core design within a larger participatory and/or social justice theoretical or conceptual framework. The intent of this design is to give voice to participants and collaborate with them in shaping the research and to build evidence from both quantitative and qualitative data.
- The mixed methods evaluation design consists of one or more core designs i.e. convergent, exploratory sequential and explanatory sequential mixed methods design. It typically focuses on evaluating the success of an intervention, a programme or a policy. Here both qualitative and quantitative approaches are used over time to support the development, adaptation and evaluation of programmes, experiments or policies. For e.g. The researchers might start by conducting a qualitative needs assessment study to understand the status of a variable. Using these results the researchers might develop an instrument and quantitatively assess the variable. In the third phase, the researchers might

develop a program based on what they have learnt and then examine both the process and outcomes of this intervention program. Across these phases, the researchers would make use of exploratory (phase 1 to phase 2), explanatory (phase 2 to phase 3) and convergent (phase 3) core designs (Creswell & Creswell, 2018).

According to Creswell and Creswell (2018) there are some important aspects which should be taken under consideration while choosing the mixed methods design. Table 1 shows the reasons investigators need to identify while choosing the mixed methods research design.

Table 1 Choosing Mixed Methods Project, Expected Outcomes, Type of Design

Reason for choosing mixed methods	**Expected outcomes**	**Recommended Mixed methods design**
Comparing different perspectives drawn from quantitative and qualitative data	Merging the two data bases to show how the data converge or diverge	Convergent parallel mixed methods design
Explaining quantitative results with qualitative data	A more in-depth understanding of the qualitative results (often cultural relevance)	Explanatory sequential mixed methods design
Developing better measurement instruments	A test of better measures for a sample of population	Exploratory sequential mixed methods design
Understanding experimental results by incorporating perspectives of individuals	An understanding of participant views within the context of an experimental intervention	Mixed methods experimental (intervention) design
Comparing one or more case studies	An understanding of differences and similarities among several cases	Mixed methods case study design
Developing an understanding of needed changes for a marginalized group	A call for action	Mixed methods participatory – social justice design
Understanding the need for an impact of a program, intervention or policy	A formative and summative evaluation	Mixed methods evaluation design

(Source: Creswell and Creswell, 2018 p 237)

Conclusion: `

These complex mixed methods design gives more flexibility to the investigators or researchers to choose a design as per the objectives and rationale of conducting studies. So, a mixed methods research design need not be restricted to follow only one primary model (i.e., explanatory sequential, exploratory sequential and convergent parallel mixed methods design), but can be a combination of these primary models as per the nature of the research study. Mixed methods research can produce a more complete knowledge as it includes both qualitative and quantitative approaches. It can help an investigator generate and test theories obtained from the data. It should be noted that, the investigator must have proper knowledge of the different

approaches and be patient as mixed methods researches are time consuming and expensive. However, the main advantage of mixed methods research is that it can complement the strengths of qualitative and quantitative research, resulting in enriching the body of knowledge.

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