

# **A BRIEF INTRODUCTION TO A MIXED METHODS DESIGN**

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## **INTRODUCTION**

Recently, a lot of English majored students at Vietnam National University of Agriculture have chosen a mixed methods research design to conduct their graduation papers. This inspired me to write a brief introduction to mixed methods research design in terms of the basic definition, characteristics, classifications and procedures so as to help them to do their research well.

A mixed methods research design can be defined as a procedure for collecting, analyzing, and ‘mixing’ both qualitative and quantitative data in a single study to understand a research problem (Brewer & Hunter, 1989). If students use this design, they need to understand both qualitative and quantitative research. While the former can be described as ‘research which uses procedures that make use of QUALITATIVE DATA, such as observations, interviews, or PARTICIPANT OBSERVATION’ and the latter may be defined as ‘research which uses procedures which gather data in numerical form’ (Richards, et al., 1992, p. 302-303). The main difference between these two approaches lies in the fact that qualitative research uses words rather than numbers (quantitative), or better yet, uses open-ended questions and responses (qualitative interview questions) and quantitative research uses closed-ended questions and responses (quantitative hypotheses). Therefore, it is useful to convey a complete set of core characteristics that describe mixed methods. This might include (i) the collection of both qualitative (open-ended) and quantitative (closed-ended) data in response to research questions or hypotheses, (ii) the rigorous methods (i.e., data collection, data analysis, and interpretation) of both quantitative and qualitative data, (iii) The two forms of data are integrated in the design analysis through merging the data, explaining the data, building from one database to another, or embedding the data within a larger framework, and (iv) These procedures are incorporated into a distinct mixed methods design that indicates the procedures to be used in a study. (Johnson, Onwuegbuzie, & Turner, 2007).

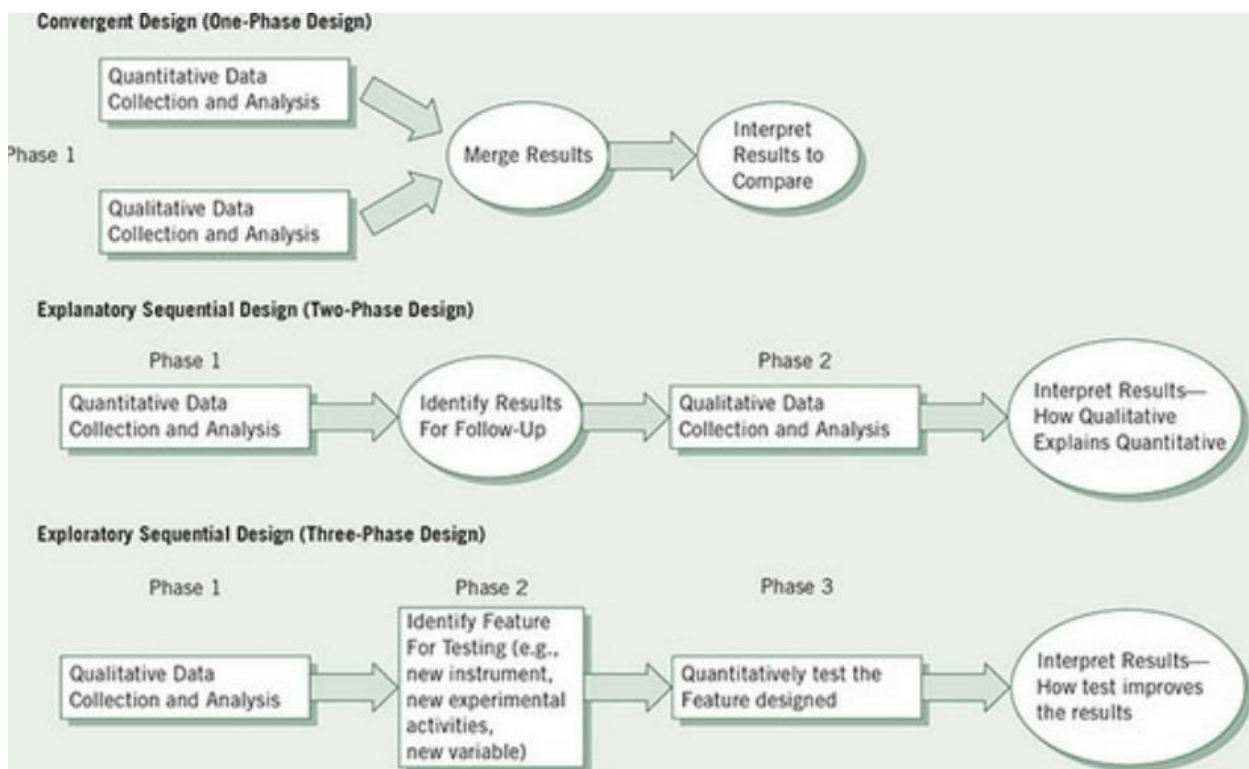
There are a number of reasons to choose mixed research design. First, at a general level, mixed methods design is selected because of its strength of drawing on both qualitative and quantitative research advantages and minimizing the limitations of both approaches. Second, at a practical level, mixed methods design appears to provide a sophisticated, complex approach to research that appeals to those on the forefront of new research procedure (Creswell, & Creswell, 2018). However, this design has some challenges including the need

for extensive data collection, the time-intensive nature of analyzing both qualitative and quantitative data, and the requirement for the researcher to be familiar with both quantitative and qualitative forms of research and the complexity of the design.

## TYPES OF MIXED METHODS DESIGNS

The upshot study of Creswell, & Creswell (2018) shows three core mixed methods designs such as the convergent design, the explanatory sequential design, and the exploratory sequential design as in Figure 1 in terms of a description of the design, the forms of data collection and data analysis and integration, interpretation, and validity challenges.

Figure 1. Three Core Mixed Methods Design



(Creswell, & Creswell, 2018, p. 300)

### The convergent design (one-phase design)

*Description of the design:* For the convergent design, a researcher collects both quantitative and qualitative data, analyzes them separately, and then compares the results to see if the findings confirm or disconfirm each other (Creswell, & Creswell, 2018)

*Data collection:* There are two types of data: (i) Qualitative data include interviews, observations, documents, and records. And (ii) The quantitative data involve instrument data, observational checklists, or numeric records, such as census data.

*Data analysis and integration.* There are three phases in analyzing the convergent design data. The first phase is to analyze the qualitative database by coding the data and collapsing the codes into broad themes. The second phase is to analyze the quantitative

database in terms of statistical results. The third comes the mixed methods data analysis. This is the analysis that consists of integrating the two databases.

This integration consists of merging the results from both the qualitative and the quantitative findings. One challenge in this design is how to actually merge the two databases since bringing together a numeric quantitative database with a text qualitative database is not intuitive. One way to merge the two databases is that the student first reports the quantitative statistical results and then discusses the qualitative findings (e.g., themes) that either confirm or disconfirm the statistical results. Alternatively, the student might start with the qualitative findings and then compares them to the quantitative results.

*Interpretation.* The interpretation in the convergent design is typically written into a discussion section of the study. In the results section, the researcher reports on the findings from the analysis of both the quantitative and qualitative databases, and the discussion section includes a discussion comparing the results from the two databases and notes whether there is convergence or divergence between the two sources of information.

*Validity.* Validity using the convergent mixed methods design should be based on establishing both quantitative validity (e.g., construct) and qualitative validity (e.g., triangulation) for each database.

### **The explanatory sequential design (two-phase design)**

*Description of the design:* The explanatory sequential design involves a two-phase data collection project in which the researcher collects quantitative data in the first phase, analyzes the results, and then uses the results to plan (or build on to) the second, qualitative phase. The overall intent of this design is to have the qualitative data help explain in more detail the initial quantitative results, thus it is important to tie together or to connect the quantitative results to the qualitative data collection. A typical procedure might involve collecting survey data in the first phase, analyzing the data, and then following up with qualitative interviews to help explain confusing, contradictory, or unusual survey responses.

*Data collection:* The data collection of the explanatory sequential design proceeds in two distinct phases with rigorous quantitative sampling in the first phase and with purposeful sampling in the second, qualitative phase.

*Data analysis and integration:* The researcher analyzes the quantitative and the qualitative databases separately in this explanatory sequential mixed method design. Then the researcher combines the two databases by the form of integration called connecting the quantitative results to the qualitative data collection. The quantitative results are then used to plan the qualitative follow-up.

*Interpretation:* The mixed methods researcher interprets the follow up results in a discussion section of 304 the study. This interpretation follows the form of first reporting the quantitative, first-phase results and then the qualitative, second phase results. However, this design then employs a third form of interpretation: how the qualitative findings help to explain the quantitative results.

*Validity.* In the explanatory sequential mixed methods approach, although the researcher needs to establish the validity of the scores from the quantitative measures and to discuss the validity of the qualitative findings, additional validity concerns arise. The researcher may also contribute to invalidated results by drawing on different samples for each phase of the study. If explaining the quantitative results in more depth, then it makes sense to select the qualitative sample from individuals who participated in the quantitative sample. This maximizes the importance of one phase explaining the other. These are a few of the challenges that need to be built into the planning process for a good explanatory sequential mixed methods study.

### **The exploratory sequential design (three-phase design)**

*Description of the design:* A three-phase exploratory sequential mixed methods is a design in which the researcher first begins by exploring with qualitative data and analysis, then builds a feature to be tested (e.g., a new survey instrument, experimental procedures, a website, or new variables) and tests this feature in a quantitative third phase. The intent of this design is to explore with a sample first so that a later quantitative phase can be tailored to meet the needs of the individuals being studied.

*Data collection.* In this exploratory sequential mixed methods design, the data collection would occur at two points in the design: the initial qualitative data collection and the test of the quantitative feature in the third phase of the project. In effect, the researcher employs a three-phase procedure with the first phase as exploratory, the second as instrument (or quantitative feature) development, and the third as administering and testing the instrument feature to a sample of a population. Sometimes mixed methods researchers use entirely different samples for the qualitative (first phase) and quantitative components (third phase) of the study. However, a good procedure is to draw both samples from the same population but make sure that the individuals for both samples are not the same. To have individuals help develop an instrument and then to survey them in the quantitative phase would introduce confounding factors into the study.

*Data analysis and integration.* In this exploratory sequential mixed methods design, the researcher analyzes the two databases separately and uses the findings from the initial exploratory database to build into a feature that can be analyzed quantitatively.

*Interpretation.* In this exploratory sequential mixed methods design, the researcher interprets the mixed methods results in a discussion section of a study. S/he, first, reports the qualitative findings, the development or design of the feature to be tested (e.g., the development of an instrument, the development of new quantitative measures), and then the quantitative test in the final phase of the study. The intent of the exploratory sequential mixed methods design is to determine if the qualitative themes in the first phase can be generalized to a larger sample.

*Validity.* Researchers using exploratory sequential mixed methods design need to check for the validity of the qualitative data as well as the validity of the quantitative scores. One concern of this approach is that the sample in the qualitative phase should not be included in the quantitative phase as this will introduce undue duplication of responses. It is best to have the sample of qualitative participants provide information for scale, instrument, or variable (or website) design, but the same individuals should not complete the follow-up instruments.

## **CONCLUSION**

In short, a mixed methods research design can be described as a combination of quantitative research and qualitative research in order to answer a research question. This approach integrates the benefits of both approaches, allowing for a more complete picture than a standalone quantitative or qualitative study. As mentioned and discussed above, each of the three core types of mixed methods designs such as the convergent design (one-phase design), the explanatory sequential design (two-phase design), the exploratory sequential design (three-phase design) has its own purpose, procedures, data collection, data analysis, integration, interpretation and validity. Therefore, the researcher needs to keep in mind the aim of the study, the research questions, the kind of data which is already available for the researcher to use, the kind of data which the research is able to collect him/herself, the timing of the data collection, and the importance given to each data type so that s/he can conduct the research successfully.

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