Explaining Exploratory Sequential Designs in Mixed Methods Research: Exploring Complex Phenomena

Rubina Ashraf [1] and Dr. Sabiha Zafar [2]

Abstract

This paper aims to explore the phases and challenges of employing the exploratory sequential design in mixed methods research (MMR) by evaluating relevant literature. An increasing number of third-type mixed-method exploratory sequential design evidence synthesis papers investigate complex phenomena through systematic reviews. Some of these syntheses utilize a comprehensive search technique to find Creswell's essays and books as well as other related literature. This study examines the challenges of applying exploratory sequential designs and the appropriate conditions for using exploratory design in educational research, such as integrating qualitative and quantitative phases, dealing with temporal limitations, and ensuring methodological rigor. A detailed framework is created to assist researchers in planning and conducting exploratory studies. The goal is to improve the practical usefulness and methodological strength of these designs in education research. This paper discusses the importance of purposeful sampling in qualitative evidence synthesis, arguing that it requires flexibility and is not directly borrowed from basic research projects. It also examines opportunities with purposeful sampling in exploratory sequential design, suggesting that this approach enhances conceptual diversity by comparing findings from purposefully sampled qualitative evidence synthesis. This study assists individuals in making decisions regarding the third mixed-method design, exploratory sequential design, and intentional sampling in a more methodical and transparent manner. Upcoming research could support or negate the hypothesis that this approach enhances conceptual diversity by comparing findings from intentionally sampled qualitative evidence synthesis to comprehensive literature sampling.

Keywords: *Exploratory Sequential Design, Qualitative, Quantitative, Mixed Method Research*

[1] Ph.D Scholar, International Institute of Science Arts And Technology, (IISAT) Gujranwala rubinaashraf011@gmail.com
[2] Assistant Professor, Department of Education, International Institute of Science Arts And Technology, (IISAT) Gujranwala abihazfar.phd@gmail.com

Introduction

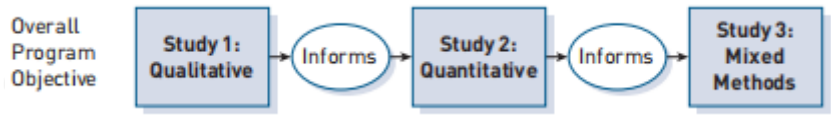
The educational community is adopting research-based techniques to improve standards, both qualitative and quantitative, and has introduced the third method, which is called mixed method design, to define research methodology. Mixed methods have been characterized as a tertiary methodology positioned between quantitative and qualitative research. (Teddlie & Tashakkori, 2009). Therefore, the comprehension and progression of the mixed methods domain represent a significant objective for both methodologists and researchers (Creswell & Garrett, 2008).

The debate between qualitative and quantitative researchers over ontological, epistemological, and axiological perspectives makes it difficult for many inexperienced educational researchers to choose an appropriate research design to explore reality through their projects. Social science research has developed over many decades by combining quantitative and qualitative methodologies and their related designs (Teddlie & Tashakkori, 2009). The advocacy for exploratory design investigations within the social sciences is experiencing a notable increase, particularly when pertaining to emergent research themes or when approaching a pre-existing problem from an innovative viewpoint. While exploration typically constitutes the initial phase of inquiry, it frequently integrates into a sequential progression of research stages.

Overall, an exploratory Sequential mixed methods design refer an initial qualitative phase of data collection and investigation, followed by quantitative data collection and analysis, culminating in the integration of data from both strands.

.

Figure 1.1 Steps of Exploratory Design



Source: Adapted from Creswell &Plano Clark (2011).

- **Qualitative research** explores individuals' or groups' interpretations of social or human problems through inductive questions, data collection, and interpretation. It emphasizes individual meaning and complexity.
- **Quantitative research** tests objective theories by examining variable relationships, typically measured on instruments. The final written report includes an introduction,

literature and theory, methods, results, and discussion..Qualitative researchers, according to Creswell (2008), utilize deductive testing, protect against bias, control for alternative explanations, and aim to generalize findings, similar to quantitative researchers, while exploring literature and theory, methods, results, and discussions.

- **Mixed methods** research combines qualitative and quantitative methods, involving philosophical assumptions and combining both approaches in a study. This approach enhances the overall strength of a study by combining both types of data.

The paper discusses exploratory design within mixed-methods research and the investigation of complex phenomena. Its goal is to give a model for analyzing explanatory sequential mixed-methods research designs, with an emphasis on selection strategies in mixed-methods studies. These strategies influence the sampling process, exclude the number and kind of sampling strategy and the sample size. Present a thorough categorization of sampling techniques, encompassing all possible methods. Both quantitative and qualitative research rely heavily on the sampling process.An exploratory sequential design involves gathering qualitative data, modifying it to fit the culture, and delivering a culturally sensitive quantitative measure or assessment, useful for creating experimental activities or survey instruments. (Cresswell, 2017).

This study explores challenges in implementing exploratory sequential designs in mixed-methods research in education. It identifies challenges like integrating qualitative and quantitative phases, chronological limitations, and methodological rigor. A comprehensive framework is developed for conceptualizing and executing exploratory studies, emphasizing phase description, iterative data analysis, and alignment with research objectives.

This study aims to provide a framework for analyzing an exploratory sequent mixed-method research designing, focusing on developing sample strategies for mixed-methods studies. In this design,The connection links an initial quantitative phase with a subsequent one, facilitating integration. The three-phase project involves qualitative exploration, adaptation of measures and instruments, and testing those adaptations. Adaptations in the second phase may include existing questionnaires, experimental activities, study variables, web tools, or websites.

Research Objectives

1. To elaborate the practical difficulties of exploratory sequential design in mixed-methods research in education
2. To develop a framework for an exploratory mixed methods design.
3. To explore the appropriate conditions for using exploratory design

Research Questions

4. What are the practical difficulties of exploratory sequential design in mixed-methods research in education?
5. How to develop a framework for an exploratory mixed methods design?
6. How to explore the appropriate conditions for using exploratory design?

Significance of the Study

The importance of this article lies in elucidating and comprehending the exploratory sequential design within the realm of mixed-method research by developing a comprehensive framework and facilitating tool development, particularly for novice researchers. Furthermore, this study delineates the optimal conditions for employing an exploratory design.

Literature Review

Exploratory sequential design is a mixed-methods approach where qualitative data are first collected and then analyzed to help create a quantitative instrument for further investigation (Creswell & Plano Clark, 2011; Teddlie & Tashakkori, 2008). This conceptualization allows for a deep perceptive of participants' lived experiences before measuring broader patterns. The integration of findings happens at multiple levels, increasing the overall depth of the study (Fetters, Curry, & Creswell, 2013). The sample design in exploratory research often uses purposive sampling methods to select individuals, groups, or settings that are "information-rich," thereby improving the understanding of the phenomenon being studied. There is an article that helps integrate qualitative and quantitative perspectives to examine reality from a different angle, known as the pragmatic paradigm, in this challenging context (Subedi, 2016). Five qualitative inquiry content—narrative research, phenomenology, grounded theory, ethnography, and case study are discussed in the Fourth Edition of this popular book (Creswell & Poth, 2018).

Narrative Research: Focuses on personal stories and experiences, often used in psychology and education.

Phenomenology: Explores lived experiences to understand the essence of a phenomenon.

Grounded Theory: Purpose to create theories grounded in data systematically gathered and analyzed.

Ethnography: Involves immersive observation to understand cultural practices and social interactions.

In their Fourth Edition, Creswell and Poth (2018) provide a comprehensive analysis of exploratory mixed methods designs and five qualitative inquiry traditions: narrative research, phenomenology, grounded theory, ethnography, and case study. They delve into the philosophical foundations and essential components of each approach, supported by varied data sources.

Exploratory sequential design is a three-phase mixed

Mixed methods design encompasses the collection and analysis of qualitative data prior to a phase dedicated to developing a quantitative tool based on the findings. This iterative approach may include creating an instrument that integrates qualitative insights and facilitates later quantitative data collection. It is also referred to as instrument development design.

Determination of the exploratory sequential design.

The exploratory sequential design aims to utilize qualitative results to shape a subsequent quantitative method. Its main goal is to create a culture-specific quantitative measure or tool informed by qualitative data, enhancing its relevance to the studied group. This design is particularly useful for exploring phenomena when existing measures or instruments are inadequate or unavailable (Greene et al., 1989).

The Exploratory Sequential Design Modified

The designing is implemented in two distinct phases, with examples from various studies. In the revised variable improvement different, the researcher delineates new variables or a novel conceptual or theoretic model during the preliminary qualitative phase of the investigation. This new variable is subsequently utilize in a future quantitative study.

Writers have characterized this process as the formulation of an emergent theory or a taxonomy, and the researcher assesses the prevalence of the findings and/or evaluates the theory with a larger sample (Morse, 1991). This methodology is employed when the researcher

develops quantitative research questions or hypotheses derived from qualitative findings and subsequently undertakes a quantitative phase to address these enquiries.

The survey-development variant involves process measures and questions in a qualitative form, followed by administrate the instrument to a representative sample. Intervention development involves collecting qualitative data to develop an intervention. Digital tool development begins with a qualitative exploration, then uses this data to design a functional tool and test it in practice.

Some Examples of Exploratory Design

Enosh et al. conducted a study on social workers' exposure to client violence using a three-phase mixed methods approach. The research involved interviews with 38 participants who had experienced violence in the past year, and led to the development of a Client Violence Questionnaire (CVQ) and an exploratory instrument. The study emphasizes the importance of integrating both qualitative and quantitative data to fully understand the experiences of social workers regarding client violence.

Resolved of Design

This chart resolved for choosing a mixed methods research design, focusing on choosing one of the three basic designs, and justifying their use.

Diagram 1.2 The use of Exploratory Design

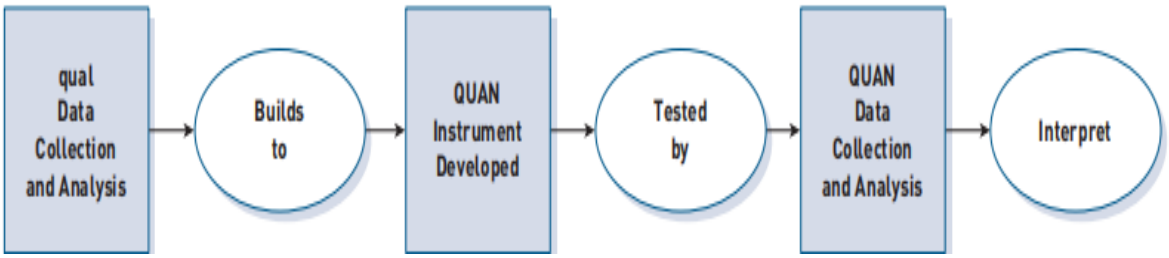


Diagram for a Study That Used the Exploratory Sequential Design Diagram

Source: Adapted from Creswell & Plano Clark (2011).

Sampling in Mixed Methods research for Qualitative Method

Purposive sampling was initially adopted for the qualitative phase in the third mixed-method design of exploratory sequential. A mixed-methods research study that starts with a qualitative (QUAL) phase is described in this data collection. Purposive sampling was used to choose 38 individuals for one-on-one semi-structured interviews in this first round of data collection. Four major themes were identified after the qualitative data underwent thematic analysis and coding, which produced transcripts.

In an exploratory sequential design, group action entails progressing through various stages to develop a new quantitative feature based on initial qualitative findings. Researchers must decide which qualitative aspects to utilize and define the quantitative entity to be tested. Following the completion of the final quantitative phase, the integration of both qualitative and quantitative results occurs, leading to comprehensive conclusions.

Table 1.1 *Exploratory Sequential Design Stage, Purpose with examples*

EXPLORATORY SEQUENTIAL DESIGN
STAGE, PURPOSE, EXAMPLE

Stages	Purpose	Example
New Variable Development	Develop new variables or a conceptual framework from qualitative data for subsequent quantitative testing..	Identifying predictors of family literacy from a qualitative case study; testing them with quantitative path analysis (Goldenberg et al., 2005).
Survey Development	Utilize the qualitative phase to develop survey questions and measures, then survey with a large sample.	Developing a survey based on focus group data to study participant reactions on violence in Jordan (Clark et al., 2012).
Intervention Development	Gather qualitative data to develop meaningful interventions or experimental activities tested quantitatively	Designing group-based mental health intervention for war-affected youth in Sierra Leone based on qualitative interviews (Betancourt et al., 2014).
Digital Tool Development	Use qualitative findings to develop and test digital tools or instruments	Creating and testing a VR video game prototype for medical education, informed by qualitative interviews (Kron et al., 2010).

Data extracted from different sources mentioned in the table to define different stages or phases of exploratory sequential design, and then the purposes of the phases, with proper examples

Philosophical Framework of Mixed Methods research

The study's epistemological basis rests on a mixed-method approach that addresses what should be done, how it should be done, and when within the exploratory sequential design. Researchers can choose the worldview that best fits their specific research context. The constructivist

perspective, commonly linked with qualitative research, highlights that experience is societal conception through individual and collective experiences and interpretations. In a mixed-methods study, a researcher might incorporate multiple worldviews rather than just one, and in other projects, they might adopt a single worldview (Creswell, 2018). When considering concepts like ontology, epistemology, axiology, and methodology, it's crucial to identify which worldview(s) align most closely with a mixed methods approach. These questions have long intrigued mixed methods scholars (Tashakkori & Teddlie, 1998, 2003a, 2010b), and their conclusions show considerable diversity.

Engaging in mixed methods research requires researchers to articulate their perspectives on worldviews and their approach to mixed methods. A systematic literature review is key for evidence-based practice, guiding policy-making and research by minimizing bias and enhancing rigor through effective evidence gathering. This involves developing search strategies, exploring multiple databases, identifying unpublished studies, and conducting manual searches. Exploratory mixed methods align with two overarching theories, with detailed processes provided in an accompanying table (Aromataris, 2014). In exploratory mixed methods, researchers adhere to two types of overarching theories, with the process detailed in the following table.

Table 1.2 Worldwide approaches for (MMR) Qualitative and Quantitative

Aspect	Constructivist Methodology	Post-positiviste Methodology
Starting Point	Starts with participants' perspectives and lived experiences	Starts with an existing theory or hypothesis
Approach	*Bottom-up* (inductive) – build a theory from data.	*Top-down* (deductive) – test theory using data
Methods Used	Qualitative (e.g., interviews, observations, open-ended data)	Quantitative (e.g., surveys, experiments, measurable variables)
Focus	Understanding meanings, multiple realities, and context	Measuring cause-and-effect relations, generalization
Role of Researcher	Researcher co-constructs meaning with participants; subjectivity acknowledged	Researcher strives for objectivity; controls bias as much as possible.
Outcome	Development of themes, patterns, and potentially new theories	Validation, modification, or rejection of existing theories

provided the data mentioned in the table from the book of Creswell A Concise Introduction of Mixed Method Research.(Creswell & Poth, 2018).

A mixed methods research approach combines quantitative and qualitative data collection in a unified phase, merging these databases to address research questions. This methodology reflects a pluralistic worldview that may evolve during the study, initially rooted in constructivist principles to capture diverse perspectives. As the research progresses, foundational assumptions may transition to post-positivist views, leading to varied interpretations of results through either a single set of assumptions or a dialectical lens.

Methodology

Systematic Review

A Systematic Review technique is employed to identify exploratory sequential design, also known as 'secondary research,' synthesizing existing scholarly investigations. Often required by funding organizations, it provides a rigorous summary of research evidence on a specific question through systematic methods of identification, appraisal, and synthesis.The conclusions drawn from systematic reviews are typically incorporated into the… (Clarke, 2011). A systematic review provides a thorough and strict summary of existent research evidence on a specific question. The study focuses on an exploratory sequential design with a qualitative emphasis, utilizing a QUAL → quant approach to explore the research topic and identify measurable variables. (Creswell and Clark, 2017).

Data Extraction and Synthesis: Relevant data are extracted from the included studies. If statistical pooling (meta-analysis) is not possible due to heterogeneity of studies or data types, a narrative synthesis is employed. Narrative synthesis involves describing and summarizing findings from multiple studies in a textual format, often exploring themes, patterns, and relationships across studies.

The following table clearly defines the systematic review technique data taken from different sources.

Table 3.1: A list of articles defines a systematic review

Authors	Title	Sources Title	Statements Proposed
(Wang, 2025).	*Writing systematic reviews*.	https://doi.org	A systematic review is a thorough, strict, and open way to put together and summarize all the data on a certain research subject.
(Petticrew & Roberts, 2008)	*Systematic Review in the social Sciences*	*A practical guide*. John Wiley & Sons	Systematic review is the most dependable source of evidence for clinical practice because it offers a thorough summary of all primary research related to a specific research question.
Pearson, L Elliott et al.2017	*Living systematic reviews 1. Introduction the why, what, when, and how*	*Journal of Clinical Epidemiology 91, 23-30.*	systematic reviews that are endlessly intelligence, merged relevant new information as it becomes accessible
(Munn et al.,2018	What kind of systematic review should I conduct? A proposed typology and guidance for systematic reviewers in the medical and health sciences	*BMC Medical Research Methodology*	This paper explores a concept still rarely considered by Novitiate authors and in the literature: Important the type of systematic review to attempt based on the research question or precedence.
(Gough & Richardson, 2024)	Systematic reviews. In *Advanced research methods for applied psychology* (pages 71-86)	Routledge	Systematic reviews aim to consolidate existing research knowledge to inform personal, policy, or practice decisions and to provide clarity on what is known before initiating new research.
Khan et al.2003	Five steps to conducting a systematic review.	*Journal of the Royal Society of Medicine*,	The clear and methodical approach is what sets systematic reviews apart from conventional reviews and opinions
(Caldwell et al., 2020)	Easy guide to conducting a systematic review.	*Journal of Pediatrics and Child Health*	Systematic reviews are at the top of the evidence pyramid because they are thought to give the best evidence.

Key Characteristics

A clear research question is essential for systematic reviews, which aim to synthesize evidence on a specific subject to enhance validity and reliability. In social sciences, the review process involves defining scope, formulating questions, selecting and appraising studies, data extraction, synthesis, and reporting. A comprehensive search strategy is crucial for minimizing

bias, and the selection of studies follows predetermined criteria to ensure quality. The methods are documented for transparency, allowing reproducibility. Mixed methods studies in systematic reviews combine quantitative and qualitative data for a holistic understanding, typically following an exploratory sequential design.

The systematic literature review is the gold standard for establishing evidence-based pattern, guiding policy decisions and research directions. It enhances credibility by minimizing bias through a rigorous methodology that includes searching for relevant information, developing search strings, and identifying unpublished literature. The review process aims to synthesize available research evidence, raise the validity and dependability of collection. In social sciences, there are three main approaches: traditional, extended/adapted, and integrative. The process encompasses defining the review scope, formulating questions, selecting and appraising evidence, data extraction and synthesis, followed by reporting and dissemination.

Conclusion

To achieve the first objective of this article, examine the practical difficulties of exploratory sequential design in mixed-methods research as the researcher's collection of data in both ways is critical and requires analytical skills to describe the results with logical thinking. Therefore, MMR can make research results more reliable by using several types of data and methods together (Mixed Methods, 2024). The sampling technique is also crucial for describing the results of a mixed-methods study, particularly when it employs an exploratory design. Researchers should employ a small, targeted sample in the initial phase and a larger, diverse sample in the subsequent phase to improve the generalizability of quantitative findings. While the quantitative phase typically involves more participants, both samples must derive from the same population. This design necessitates significant time investment, possibly including a third phase for feature development. Researchers need to select appropriate qualitative results from the qualitative phase to inform the quantitative features and produce relevant quantitative measures or materials. Competence in qualitative, quantitative, mixed methods research, and instrument development is essential.

To obtain the second objective of the study, for developing a framework of exploratory design, there are three parts to an exploratory project: a qualitative phase, a quantitative feature phase (when you create a variable, tool, intervention, or digital tool), and a concluding quantitative test phase. Some difficulties or challenges while using exploratory sequential design in MMR

Challenges in using exploratory sequential design

The 'problem of legitimation' involves creating results that are reliable and credible. Integration is the third big challenge in mixed methods research (Onwuegbuzie, 2007). A main issue is helping people understand mixed methods. One practical way to address this is by highlighting strong examples from academic studies. Often, it's hard to find literature that fits the study's goals. This research looks at the behaviors and challenges researchers face with exploratory sequential design. It also aims to help improve research methods and understand complex phenomena using systematic review techniques.

This research aims to describe current behaviors and difficulties faced by researchers when using exploratory sequential design in mixed methods, as well as to assist in developing research methods and understanding complex phenomena through systematic review techniques. The condition for combining qualitative and quantitative data is provided at the first of an exploratory sequential design intent statement, along with the rationale for the initial qualitative strand. It is important to clearly state the overall goal of this two-phase design in the purpose statement, even if the details of the second, quantitative phase cannot be fully described, since the qualitative phase guides the quantitative one. These can be outlined as preliminary statements if readers need to define quantitative research questions and hypotheses during the preparation stage (which is often the case in thesis or funding proposals).

Teddlie (2003) describes about 35 mixed methods research designs. The researcher selects specific individuals, groups, and settings in this phase to enhance understanding of the phenomenon rather than generalizing to a population. This approach is common in qualitative methods within mixed-method studies, emphasizing the importance of sampling strategies that affect the sampling process's structure, including sample size, types, and quantity.
A thorough classification of all existing sampling strategies is presented. Sampling is vital for both quantitative and qualitative research. However, there appears to be a misconception about the differences in sampling methods suitable for quantitative versus qualitative studies. When a study aims to generalize findings—whether quantitative, qualitative, or both—to the larger population from which the sample is drawn (i.e., to make inferences), researchers should prioritize using a random sampling method for that component. Therefore, the exploratory research sampling choices should be based on the purpose, goal, objective, and question or

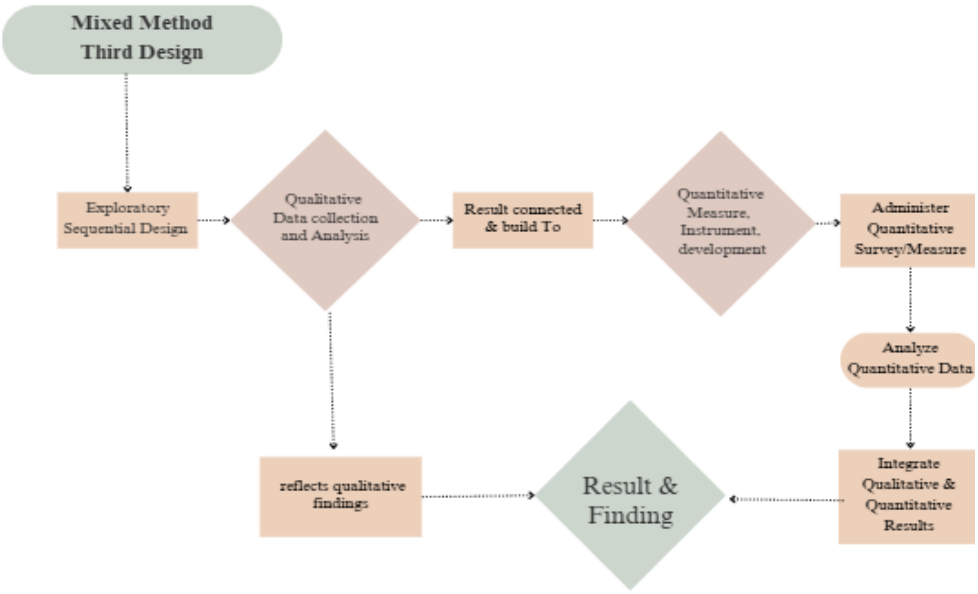
questions. Ensuring the sample provides enough data for theoretical saturation and detailed, descriptive insights might improve representation.

The application of an exploratory design presents several inherent challenges.

- Researchers must allocate significant time for the sequential methodology, possibly including a third phase for developing a new feature, to ensure adequate planning.
- The quantitative phase necessitates a preliminary specification, which can be challenging to establish precisely for initial institutional review board approval.
- Researchers should use a small, purposive sample in the initial phase and a larger, distinct sample in the subsequent phase to enhance the generalization of quantitative findings, ideally from the same population.
- The researcher must carefully select the qualitative results to inform the development of a quantitative feature, ensuring they are judiciously used to generate measures or materials.
- The design necessitates extensive researcher proficiency in various research methods, including qualitative, quantitative, mixed methods, and instrument development, to ensure high-quality scores from developed materials.

The following flowchart delineates a particular modality of data acquisition. The exploratory design, akin to the explanatory design, possesses several inherent advantages, notably its distinct benefits. Its sequential phases render the exploratory design remarkably amenable to description, implementation, and reporting. While this design predominantly emphasizes qualitative methodologies, the incorporation of a quantitative element can enhance the acceptability of the qualitative conceptualization among audiences predisposed to quantitative perspectives. This design proves particularly efficacious when the necessity for a subsequent quantitative phase arises from insights gleaned during the initial qualitative phase. A potential outcome of this research process is the development of a novel instrument (e.g., a measure, variable, set of engagement activities, or digital tool), enabling the researcher to integrate both qualitative and quantitative data for the comprehensive explanation of the findings or results of a specific investigation.

Figure 4.1 Flowchart *of the Third Design of Mixed Method of Exploratory Sequential Design*



FLOWCHART OF EXPLORARTORY SEQUENTIAL DESIGN

Data extract from the book Designing and Conducting Mixed Method Research to explain the flowchart. (Creswell & Poth, 2018).

The appropriate conditions for using exploratory design are highlighted to achieve the third objective of the study. Appropriate conditions for using exploratory design include collective ideation and organizational support, which help ensure that the data produces meaningful outcomes or generates useful results. When a topic is new or ambiguous, an exploratory design administer is a good choice. It is perfect for problems that haven't been thoroughly examined, such as determining how well users receive a novel technology. The issue is not well stated. When you have a broad concept but need to hone it into a specific, testable research topic for further investigations, use an exploratory design. Priorities must be established. Exploratory research can assist you in deciding which factors or locations are most crucial to investigate if you have several options. We need new insights. This approach enables you to challenge preconceived notions and produce fresh ideas if the body of research on an issue appears lacking.

Table 4.1 Implementation of Exploratory Sequential Design

APPROPRIATE CONDITIONS FOR IMPLEMENTING AN EXPLORATORY SEQUENTIAL MIXED METHODS DESIGN

Situation	Procedure	Product/outcome
Qualitative Phase	• Identify Qualitative Research Question • Obtain Permission • Select a qualitative sample • Collect open-ended qualitative data using Protocols • Analyze qualitative data (thematic analysis, coding	• Codes, themes, groups, and visual case models • A deep understanding of the phenomenon
Development Phase (Integration)	• Identify qualitative results to build on • Develop a new quantitative feature: tool, variables, interference, digital tool, or survey. • Pilot test and refine the quantitative feature	• Developed an instrument, new variables, intervention materials, digital tool
Quantitative Phase	• Formulate quantitative research questions/hypotheses based on qualitative findings • Select a quantitative sample (larger, for generalization) • Collect closed-ended data using the developed instrument/tool • Analyze quantitative	• Quantitative data on a developed instrument or intervention • Statistical results, validated measures
Interpretation and Integration	• Summarize and interpret quantitative results • Discuss the extent and ways quantitative results generalize or test qualitative results	• Integrated conclusions connecting qualitative insights and quantitative validation

Source: Adapted from Creswell & Plano Clark (2011).

The exploratory sequential design is a three-phase methodology that commences with qualitative exploration, moves on to quantitative development, and concludes with quantitative validation. Differentiable designs are grounded in purpose, rationale, philosophical foundations, and procedural execution. For all these problems, a thorough examination of the appropriate conditions is essential.

Discussion

Mixed-methods research designs help organize data collection, analysis, interpretation, and reporting. Researchers can select approaches focused on methods or on the research process. This book uses a typology approach, offering various basic options. The typology includes

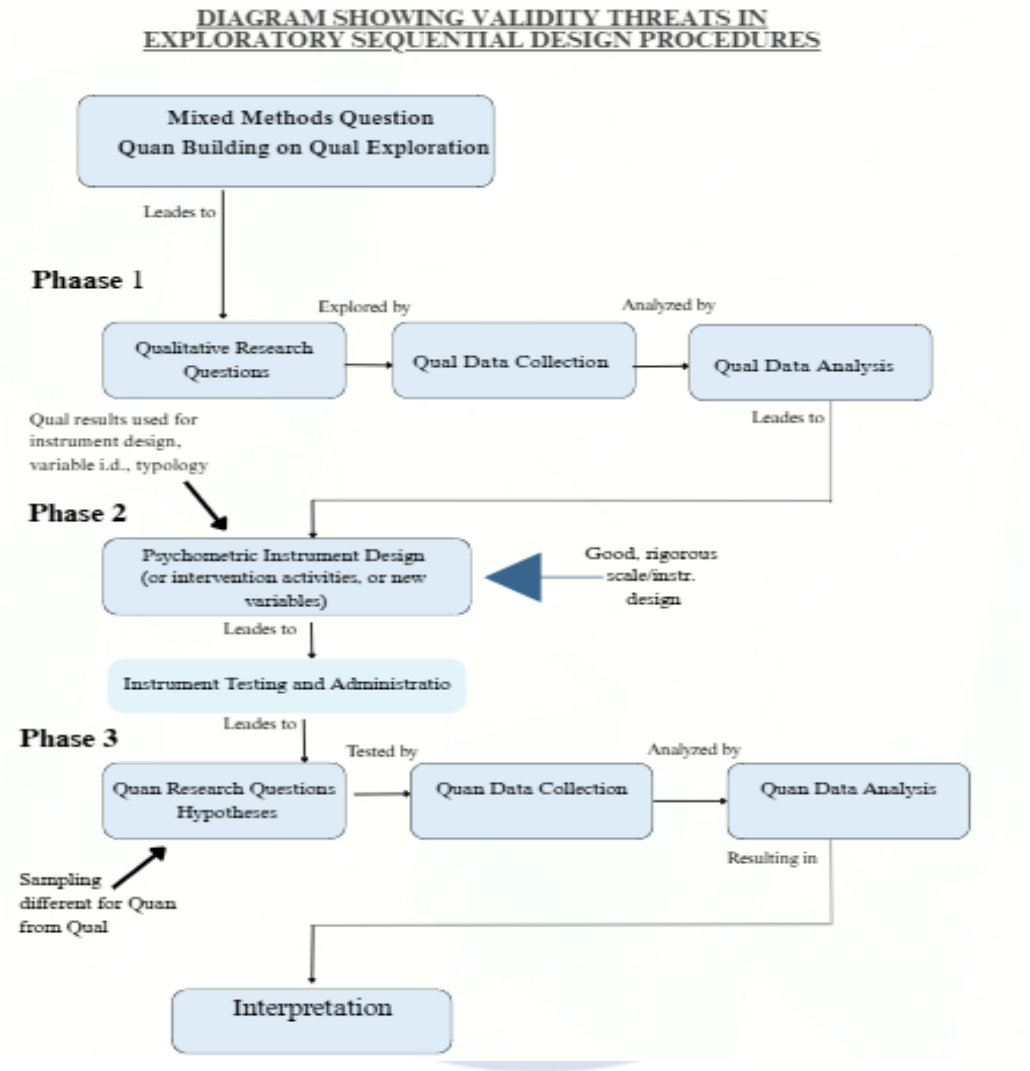
three main designs, including the exploratory sequential design. This design unfolds through a three-phase journey. It leaps from qualitative exploration to quantitative testing. Each design brings its own purpose, rationale, and assumptions into play. They vary in procedures, points of integration, strengths, and challenges. Exploratory research is like a treasure hunt, unearthing hypotheses. Delving into datasets reveals connections between variables. This design promotes discoveries with fewer strict methodological constraints. Researchers can examine related variables to increase the likelihood of obtaining significant results.

The exploratory sequential design takes flight with a focus on qualitative data. In its blossoming phase, it gathers rich insights, paving the way for analysis.Once these key findings are clear, the investigator moves into a new phase. They built a quantitative component based on the valuable qualitative insights gathered.This quantitative exploration could reveal new variables, innovative tools, systematic interventions, or even digital solutions like mobile apps and websites.In the final phase, the investigator carefully evaluates this new development using quantitative methods. They analyze how these findings enhance the original qualitative insights or deepen understanding, all shaped by participant perspectives.For example, an investigator might collect personal stories from adolescents facing nicotine addiction. They would examine these narratives to identify conditions, contextual factors, strategies, and outcomes related to their quitting journey.They would recognize emerging collection as unique.variables, the researcher would then craft a quantitative survey. This tool would be deployed to measure the generality of these variables across a broad spectrum of teen smokers.

The references for the study involved thorough procedures, including both quantitative and qualitative validation methods, participant selection, systematic statistical analysis, follow-up with quantitative outcomes and meta-inferences (Creswell, 2011). Consequently, the researcher underscores the advancements in validity methodology, which encompass the systematic identification of potential biases.threats through diagrammatic representations of research designs. This ensures clear communication of procedural points and recommends strategies for addressing them. For example,

Figure 1 illustrates a basic exploratory sequential design for psychometric instruments. Possible issues include inappropriate qualitative findings, failure to follow rigorous scale and instrument development protocols, and incorrect quantitative sample sizes. Following diagram’s data extract from the book.

Figure 1.4 Validity Threat in Exploratory Sequential Design Procedures



Data extract from the book of Creswell & clark Designing and Conducting Mixed Methods

Recomendations

- Based on the conclusion above, this paper recommends that social science researchers adopt a multiple-methods approach for data collection when conducting exploratory research. Meanwhile, the use of these three approaches for data collection—namely, interviews, observation, and surveys is to meet the doctrine of exploratory research design and to satisfy the researcher's curiosity, as well as their desire for a deeper understanding of the phenomenon.
- To maximize the benefits and minimize the drawbacks of each research method, the researcher observed that several approaches were employed in a single study for data collection, which included the use of qualitative and/or quantitative sources. Therefore, by

using a variety of data collection techniques, researchers are able to address issues that cannot be resolved with just qualitative or quantitative methods.

- This design is recommended for tool development, especially for the novice researcher.

References

Aromataris, E., & Riitano, D. (2014). Systematic reviews: constructing a search strategy and searching for evidence. *AJN The American Journal of Nursing*, *114*(5), 49-56 CA: SAGE.

Berman, E. A. (2017). An exploratory sequential mixed methods approach to understanding researchers' data management practices at UVM: Integrated findings to develop research data services. Clarke, J. (2011). What is a systematic review?. *Evidence-based nursing*, *14*(3), 64-64.

Caldwell, P. H. Y., Caldwell, P. H. Y., & Bennett, T. (2020). Easy guide to conducting a systematic review. *Journal of Paediatrics*

Creswell, J. (2009). Research Design: Qualitative, Quantitative, and Mixed Methods Approaches. UK: SAGE Publications Ltd.

Creswell, J. (2011). Planning, Conducting, and Evaluating Quantitative and Qualitative Research. New York: Pearson.

Creswell, J. W. (1998). *Qualitative inquiry and research design: Choosing among five traditions*. Thousand Oaks, CA: Sage.

Creswell, J. W. (2002). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research*. Upper Saddle River, NJ: Pearson Education.

Creswell, J. W. (2007). *Qualitative inquiry and research method: Choosing among five approaches* (2nd ed.). Thousand Oaks, CA: Sage.

Creswell, J. W. (2021). *A concise introduction to mixed methods research*. SAGE Publications.

Creswell, J. W., & Garrett, A. L. (2008). The "movement" of mixed methods research and the role of educators. *South African journal of education*, *28*(3), 321-333.

Creswell, J. W., & Poth, C. (2018). *Qualitative Inquiry and Research Design (International Student Edition): Choosing Among Five Approaches*.

Creswell, J. W., Klassen, A. C., Plano Clark, V. L., & Smith, K. C. (2011). Best practices for mixed methods research in the health sciences. *Bethesda (Maryland): National Institutes of Health*, *2013*(2011), 541-545.

Creswell, J., & Clark, V. (2017). Designing and Conducting Mixed Methods Research (3rd ed.). London: SAGE.

Creswell, J., & Tashakkori, A. (2007). Editorial: Developing Publishable Mixed Methods Manuscripts. Journal of Mixed Methods

Elliott, J. H., Synnot, A., Turner, T., Simmonds, M., Akl, E. A., McDonald, S., ... & Pearson, L. (2017). Living systematic review: 1. Introduction—the why, what, when, and how. *Journal of Clinical Epidemiology*, *91*, 23-30.

Enosh, G., Tzafrir, S. S., & Stolovy, T. (2015). The development of the client violence questionnaire (CVQ). *Journal of Mixed Methods Research*, *9*(3), 273-290.

Fetters, M. D., Curry, L. A., & Creswell, J. W. (2013). Achieving integration in mixed methods designs—principles and practices. *Health services research*, *48*(6pt2), 2134-2156.

Goldenberg, C., Gallimore, R., & Reese, L. (2005). Using mixed methods to explore Latino children's literacy development. *Discovering successful pathways in children's development: Mixed methods in the study of childhood and family life*, 21-46.

Gough, D., & Richardson, M. (2024). Systematic reviews. In *Advanced research methods for applied psychology* (pp. 71-86). Routledge.

Greene, J. C., Caracelli, V. J., & Graham, W. F. (1989). Toward a conceptual framework for mixed-method evaluation designs. Educational Evaluation and Policy Analysis, 11(3), 255–274.

Khan, K. S., Kunz, R., Kleijnen, J., & Antes, G. (2003). Five steps to conducting a systematic review. *Journal of the royal society of medicine*, *96*(3), 118-121.

Mason, P., Augustyn, M., & Seakhoa-King, A. (2010). Exploratory study in tourism: Designing an initial, qualitative phase of sequenced, mixed methods research. *International Journal of Tourism Research*, *12*(5), 432-448.

Mixed Methods (pp. 353–390). (2024). SAGE Publishing. https://doi.org/10.4018/979-8-3693-2414-1.ch010

Morse, J. M. (1991). Approaches to qualitative and quantitative methodological triangulation. Nursing Research, 40, 120–123.

Morse, J. M. (1994). Designing funded qualitative research. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 220-235). Thousand Oaks, CA: Sage.

Munn, Z., Stern, C., Aromataris, E., Lockwood, C., & Jordan, Z. (2018). What kind of systematic review should I conduct? A proposed typology and guidance for systematic reviewers in the medical and health sciences. *BMC Medical Research Methodology*, *18*(1), 5.

Onwuegbuzie, A. J., & Collins, K. M. T. (2007). A typology of mixed methods sampling designs in social science research. *The Qualitative Report*, 12(2), 281-316. Retrieved from http://www.nova.edu/ssss/QR/QR12-2/onwuegbuzie2.pdf

Onwuegbuzie, A. J., & Hitchcock, J. H. (2015, QR/QR12-2/onwuegbuzie2.pdf *Quantitative and qualitative approaches in the social and behavioral sciences*. Thousand Oaks, Research,

106-111. https://doi.org/10.1177/1558689806298644 September). A meta-framework for conducting mixed social science research. The Qualitative Report, 12(2),

Petticrew, M., & Roberts, H. (2008). *Systematic reviews in the social sciences: A practical guide*. John Wiley & Sons

Subedi, D. (2016). Explanatory sequential mixed method design as the third research community of knowledge claim. *American Journal of Educational Research*, *4*(7), 570-577.A

Tashakkori, A., & Teddlie, C. (2008). Quality of inferences in mixed methods research: Calling for an integrative framework. *Advances in mixed methods research*, *53*(7), 101-119

Teddlie, C., & Tashakkori, A. (2009). *Foundations of mixed methods research: Integrating quantitative and qualitative approaches in the social and behavioral sciences*. Sage.
Typology of mixed methods sampling designs in
Wang, C. W. (2025). *Writing systematic reviews*. 219–238. https://doi.org/10.4324/9781003375654-11