

MIXED METHODS RESEARCH (MMR) '3rd methodological orientation'

a research approach whereby researchers collect and analyze both quantitative and qualitative data within the same study to understand a research problem Johnson et al defined it as: the type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches (use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the broad purposes of breadth and depth of understanding and corroboration."

□ The researcher Mixes qualitative and quantitative data at the same time (concurrently) or one after the other (sequentially).

□ the inclusion of open ended questions in a survey tool or the collection of demographic data from interview participants, but rather involves the explicit integration of qualitative and quantitative elements in a single study.

Multi Methods: Uses more than one method

□ Can be 2 qualitative or 2 quantitative

Mixed Methods: Uses both qualitative and quantitative

□ mixing and integration of data so that one type of data informs another

□ **MMR:** has a short history as an identifiable methodological movement which can be traced to the early 1980s and has been described as a 'quiet' revolution due to its focus of resolving tensions between the qualitative and quantitative methodological movements .

PHILOSOPHY IN MMR

• represents an opportunity to transform these tensions into new knowledge through a dialectical discovery.

• A pragmatic perspective draws on employing "what works," using diverse approaches, giving primacy to the importance of the research problem and question, and valuing both objective and subjective knowledge

When do you use MMR?

• You have a sense that scores are not telling you the entire story. If you just asked a few people about the concept you might obtain a better understanding MMR provides a more complete understanding of the research problem than either quantitative or qualitative alone.

• Interpretation of data from one design only might be misleading, for example, a structured questionnaire about teachers' emotions regarding teaching practices may only show negative or positive emotion without adequately explain the event that triggered the emotions.

Criteria	Qualitative research	Quantitative research
Purpose	To understand and interpret social interactions	To test hypotheses, look at cause and effect and make predictions.
Group studied	Smaller	Larger
Variables	Study of the whole (not variables).	Specific variables studied.
Form of data collected	Open ended responses, interviews, participant observation, field notes.	based on precise measurement using structured and validated data collection instruments.
Type of data analysis	Identify patterns, features and themes	Identify statistical relationships
Results	Particular or specialized findings that are less generalizable.	Generalized findings that can be applied to other populations.
Scientific method	Bottom-up, researcher generates a new theory from the collected data.	Top-down the researcher tests the theory with the data.

Rationale	Explanation
Triangulation (convergence)	Using quantitative & qualitative methods so that findings may be mutually corroborated (Quantitative analyses employ descriptive and inferential statistics, whereas qualitative analyses produce expressive data that provide descriptive details (often in narrative form) to examine the study's research objectives)
Expansion	• The first phase has findings that require explanation qualitatively (to explain results or how mechanisms work) in causation models. • Unexpected findings that need to be explained
Exploration	An initial phase is required to develop an instrument, identify variables or develop a hypothesis that requires testing (Explore qualitatively then develop an instrument)
Complementarity	Using different methods to address different parts of the phenomenon. to integrate two different but connected answers to a research Q: one reached via a quantitative approach and the other by means of a qualitative one.
Offset weaknesses	Ensures that weaknesses of each method are minimized. (compensation)

Planning of MMR

• 4 Qs must be addressed by the researcher during the planning stage of MMR:

1. In what sequence qualitative and quantitative data collection be implemented?
2. What relative priority will be given to the qualitative and quantitative data collection and analysis?
3. At what stage will the qualitative and quantitative data be integrated
4. Will an overall theoretical perspective be used to guide the study?

• Priority (dominance) in mixed methods design is the relative weight assigned to the qualitative and quantitative research components.

Notations of MMR **check the table in slide 23 VIP

- The use of upper case refers to emphasis (primary or dominant method), whereas lower case refers to lower emphasis, priority or dominance
- → data collected Sequential + data collected simultaneously.
- = converged data collection () one method embedded in the other

sequential explanatory design 'quan → qual' (explanatory design).

- The most frequently applied mixed methods design in both health and social sciences literature .
- it's favorable because quantitative design in the first stage will portray the objective statistical findings from the group in general. Afterwards, a qualitative approach can be used to discover subjective nuances from participants as individuals and explain the phenomenon behind the numbers that cannot be described merely by the quantitative data.
- Viewing the study as a two phase project.
- It is denoted by 'QUAN → qual' which represents the quantitative study occurs first and has greater weight in addressing the study's aims, and the qualitative study follows to explain quantitative results.
- Used when you want to explain the initial quantitative results in more depth with qualitative data (e.g. statistical differences among groups).
- The rationale for this approach is that the quantitative data and their subsequent analysis provide a general understanding of the research problem. The qualitative data and their analysis refine and explain those statistical results by exploring participants' views in more depth.
- especially useful when unexpected results arise from a quantitative study.
- Data analysis is usually connected, and integration usually occurs at the data interpretation stage.
- To reiterate, key characteristics:
 - Data collection priority (Quantitative data).
 - Sequence (First quantitative data then qual).
 - Use of data (to refine, elaborate).
- Questions to consider when collecting the qualitative data:
 - What results need further explanation?
 - What qualitative questions arose from the quantitative results?
- Interview schedule questions depend on and are developed based on the quantitative findings.

EX1: Researchers may ask persons with hearing loss to rate their conversational abilities before and after an aural rehabilitation program (QUAN) and then have the same participants take part in one on one clinician led follow up interviews to discuss reasons for specific ratings (qual).

- study aimed to : 1) identify the proportion of individuals with cerebral palsy, spinal cord injury, MS, or arthritis who report difficulties with accessing and/or utilizing needed health care services; 2) identify reasons for access or utilization difficulties and consequences that these may produce.
- The quantitative component involved a survey that identified a group of 'access stressed' individuals who reported substantial problems in accessing and/or using health care services.
- The qualitative study component focused on this group to examine what specific barriers made access problematic and what consequences resulted from not receiving care when needed.

EX2: A researcher may conduct a focus group of special education teachers to generate discussion of perceived barriers to implementing speech and language services in the schools (QUAL). Then, using the ideas generated in the focus group, a large scale survey might be sent to all the teachers in a district asking them to rate the impact of predetermined barriers (quan)

EX3: A study sought to: 1) understand the motivating and inhibiting factors to physical activity and exercise in people after spinal cord injury (SCI), and 2) develop, test and implement a survey tool that examines self-reported physical activity after SCI and its relationship with secondary conditions.

- Qualitative (exploratory) data collection preceded the quantitative study component.
- The focus groups specifically explored barriers and facilitators of exercise. Understanding these factors was critical to inform development of the survey tool, which included items on 'chronic and secondary conditions', 'health risk behaviors', 'hospital and health care utilization', 'physical functioning', 'exercise activities and patterns', 'rehabilitative therapy', 'wheelchair use', 'community integration'

Drawback of sequential explanatory design.

- It is more time consuming when compared to concurrent designs.
- Potential for loss of participants.
- Can be difficult to fully plan qualitative arm, it's dependent on quantitative results.

Data integration MMR

- Integration: how the researcher relates the quantitative and qualitative datasets.
- There is a continuum of integration. That is, the extent to which the two methods and datasets are related to each other varies.
- At one end of the continuum there are "component designs" (in which integration occurs only during data analysis and interpretation).
- Component designs offer minimal integration, integrated ones offer max integration.
- At the other end of the continuum there are "integrated designs" (in which integration is built into the entire design structure)
- John Creswell identifies four types of integration:
 1. Merging data: quantitative & qualitative results brought together and compared.
 2. Explaining the data: qualitative data are used to explain quantitative data results.
 3. Building the data: qualitative findings are used to build the quantitative phase.
 4. Embedding the data: a set of data is used to augment or support the other set.

Sequential exploratory design- data collection.

- the data collection would occur in 2 phases with the initial qualitative data collection followed by the second quantitative data collection. The challenge is how to use the information from the initial phase in the second phase.
- qualitative data analysis can be used to develop an instrument with good psychometric properties (validity, reliability). And will yield quotes, codes, themes.
- The development of an instrument can proceed by using the quotes to write items for an instrument, the codes to develop variables that group the items, and themes that that group the codes into scales.
- A researcher can analyze the qualitative data to develop new variables, that will be explored further in a quantitative phase .
- is the sample for the qualitative phase is the same for the quantitative phase. This cannot be, because the qualitative sample is typically much smaller than a quantitative sample needed to generalize from a sample to a population. Sometimes mixed methods researchers will use entirely different samples.

data analysis

- the researcher analyses the two databases separately and uses the findings from the initial exploratory database to build into quantitative measures.

Interpretation

- Researchers interpret mixed methods results in the discussion section.
- The order: first report the qualitative findings and their use, (e.g., the development of an instrument). then quantitative results of the final phase.

sequential transformative design

- 2 distinct data collection phases either type of data can be collected first.
- Both types of methods are combined in this design, but the research is also explicitly driven by a transformative theoretical perspective.
- theoretical perspective (lens) is used to guide the study (transformative framework).
- Purpose is to use the methods that will best serve the theoretical perspective of the researcher.
- After separate analysis of qualitative and quantitative data, integration of outcomes will take place during the interpretation phase.
- The researcher uses a theoretical based framework to advance needs of underrepresented or marginalized population (women, people with disabilities, racial and ethnic minorities, religious minorities).
- Seeks to address issues of social justice and call for change.

- Strength: very straight forward in terms of implementation and reporting.
- Weakness: time consuming. Little guidance due to relative lack of literature on transformative nature of moving from 1st phase of data collection to 2nd. EX: A sequential transformative study was conducted to examine the cultural influences on mental health problems. The study commenced with a quantitative telephone survey of the community which included the General Health Questionnaire. • quantitative phase was followed by qualitative interviews which were theoretically driven, enabled researchers to explore cultural health experiences related to non-use of mental health facilities by Vietnamese and West Indian participants living in an urban area of Montreal.

Concurrent triangulation design "Parallel"

- qualitative and quantitative data are collected simultaneously (= priority).
- The results are then integrated in the final interpretation.
- Merging of results during analysis and interpretation to provide an integrated conclusion and involves comparing, contrasting and synthesizing the 2 strands.
- Used when the researcher wants to validate quantitative findings with qualitative data. Particularly useful for decreasing the implementation time.
- Data collection priority (=)./ Sequence (concurrently)/ Use of data (compare similar/dissimilar). EX: In their longitudinal study of maternal and child well being conducted semi structured in depth interviews with mothers and collected quantitative data using several validated scales (e.g. Parenting Stress Index, Edinburgh Post Natal Depression Scale (EPDS), Rosenberg Self Esteem Scale) at the same home visit.
- The authors identified numerous family stressors in interviews, which were corroborated in quantitative maternal stress index scales. Similarly, the objective measures (EPDS) addressing emotional well-being that indicated a high level of maternal depression were supported by findings from the interviews, in which mothers reported low energy levels, despondency and anxiety attacks. The authors note that concurrent use of qualitative and quantitative measures adds to the depth and scope of finding

Concurrent transformative design

- Guided by a theoretical perspective of change.
- Concurrent collection of both quantitative and qualitative data.
- Similar to sequential transformative designs, useful for giving voice to diverse or alternative perspectives, advocating for research participants, and better understanding a phenomenon that may be changing as a result of being studied.
- Aims to address social issues faced by the group of people.

Concurrent embedded/ nested design

- Quantitative and qualitative data are collected and analyzed at the same time. However, priority is usually unequal and given to one of the two forms of data either quantitative or qualitative data.
 - both methods of data are collected simultaneously, but one is embedded in the other in a way that allows the researcher to address a question that is different from the one answered by the dominant method.
 - The integration of data occurs in the analysis.
 - Primarily purpose is: gaining a broader perspective than could be gained from using only the predominant data collection method.
 - Secondary purpose is use of embedded method to address different Qs.
- EX: Strasser et al. conducted a concurrent nested design to explore eating related distress of advanced male cancer patients and their female partners.
- primary method was focus groups attended by patients and their partners with the conduct of these groups and the analysis of the data based on grounded theory (qualitative).
 - The secondary or nested focus of the study was the differences in patients' and their partners' assessment of the intensity and symptoms and degree of cachexia related symptoms of eating related disorders of patients. This secondary information was collected by a structured questionnaire which was completed at the time of the first focus group.
 - The eating related distress differed for patients and their partners as indicated in the qualitative findings, and this was complemented by the quantitative findings .

Research Q in MMR

- Think about order of data collection:
 - If sequential, ask first question first, then second .
 - If concurrent, ask questions based on weight or importance if quan more heavily weighted , start with quan research hypothesis, if qual more heavily weighted, start with qual research Q.

Data analysis in MM

- It is unusual for qualitative and quantitative data to be analyzed together.
- Typically, we use analytic methods appropriate to our data collection strategy
- Each of our analyses must, therefore, meet standards of rigor specific to the overall approach
- The key is actually how we:
 - Use each form of analysis
 - Integrate our INTERPRETATION of our analyses

Advantages of MMR

- Compares quantitative and qualitative data.
- Reflects participants' point of view.
- Fosters scholarly interaction.
- Provides methodological flexibility.
- Collects rich, comprehensive data.
- Words, pictures, and narrative can be used to add meaning to numbers.
- Numbers can be used to add precision to words, pictures and narrative.

Weakness of MMR

- A researcher has to learn about multiple methods and approaches and understand how to mix them appropriately.
- Methodological purists contend that one should always work within either a qualitative or a quantitative paradigm.
- MMR can be difficult for a single researcher to carry out, especially if the two approaches are expected to be used concurrently.
- Mixed method research is more expensive and more time consuming.
- Little guidance on transformative methods in the literature.

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