

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.

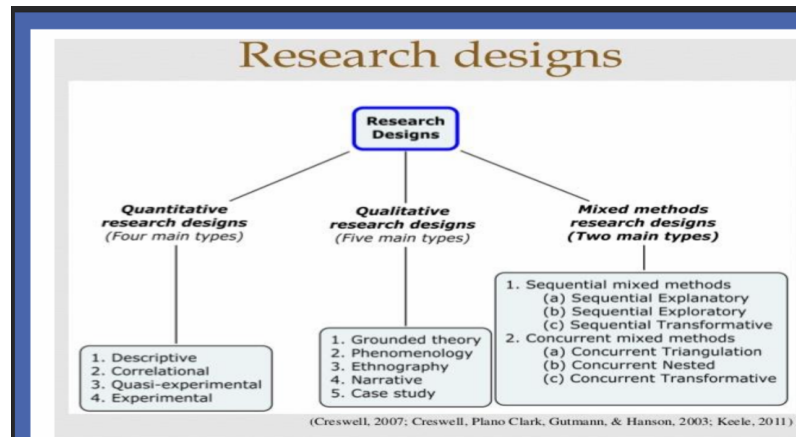
EX2: A researcher may conduct a focus group of special education teachers to generate discussion of perceived barriers to implementing speech and language services in the schools (QUAL). Then, using the ideas generated in the focus group, a large scale survey might be sent to all the teachers in a district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



More Examples:

Collaboration amongst clinical nursing leadership teams: a mixed-methods sequential explanatory study

Design

An explanatory sequential mixed-methods design was used (Creswell & Plano Clark 2011), in two phases. Phase One entailed collection of quantitative data, with Phase Two collecting qualitative data for the purpose of explaining initial findings in greater depth (Creswell & Plano Clark 2011).

Data collection

Collaborative behaviours were measured in Phase One using questionnaires mailed to all eligible participants between May and June 2012 via the hospital internal mail system; participants were asked to return them anonymously. To further explore and explain the collaborative behaviour findings, Phase Two employed focus group meetings conducted in April and May 2013, to follow up on initial findings.

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Questionnaires

The extent of collaboration between these NLTs was measured using the Collaborative Behaviour Scale (CBS) (Stichler 1990). The CBS was developed to measure respondents' perceptions of collaborative behaviours in relationships between health care professionals. Collaborative behaviours were sought between: NUM-NE; NUM-CNC and NE-CNC, all vice versa. Demographic information identified age, gender, length of experience, specialty work area, highest educational attainment and any postgraduate leadership courses/workshops/learning activities completed.

Focus groups

Following Phase One quantitative data collection, all NUMs, NEs and CNCs were invited by e-mail to participate in focus groups relating to the Phase One findings. Two focus groups were conducted post-analysis to further explore and explain the quantitative survey findings. Both focus groups involved participants from each of the NLT professional groups and allocation was agreed in relation to availability on specific dates.

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Data analysis

Descriptive analyses of the quantitative data were performed using the Statistical Package for the Social Sciences (SPSS version 19.0; Chicago, IL, USA). Means, minimum and maximum, and frequency scores were used to describe demographic characteristics, with Fisher's exact tests being used to seek differences between groups. Total scores were calculated by adding the scores for the 20 individual items on the CBS (Stichler 1990). The CBS score median and interquartile ranges were calculated for each group. Non-parametric tests were used to compare the total CBS scores of participants.

Thematic analysis of focus group transcripts used the approach of Braun and Clarke (2008). This process involved: (1) familiarisation with the data; (2) generating initial codes; (3) searching for themes; (4) reviewing themes; (5) defining and naming themes; and (6) producing the report.

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Example of Sequential Explanatory mixed methods design protocol

UNDERSTANDING THE FACTORS THAT INFLUENCE CLINICAL DECISION-MAKING - A SEQUENTIAL EXPLANATORY MIXED METHODS STUDY PROTOCOL

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ABSTRACT

Background: Despite soaring healthcare costs, patient outcomes are suboptimal in the USA. Efforts to limit healthcare costs and improve quality of care have had limited success. An improved understanding of factors that influence clinical decision-making may provide insight into optimizing the quality and costs of care. The process of healthcare decision-making is contextual, complex and poorly understood. This study aims to explore the factors that influence clinical decision-making in the setting of limited evidence of effectiveness, limited or conflicting guidance, significant resource burden and variation in values and preferences.

Rationale for study design: This sequential explanatory mixed methods study includes a case-based survey (quantitative phase). The results of the survey will guide the sampling and questions for the semi-structured interviews (qualitative phase). The interviews will provide an in-depth explanation of the survey results. Combining the two methods provides complementary information and deeper understanding of the phenomenon of clinical decision-making.

Methods: The quantitative strand will consist of case-based surveys in the fields of oncatology and cardiology. Participants are asked to rank the best management choice for each question followed by a rating of the influence of different factors on a 7-point Likert scale. Follow-up questions explore knowledge and influence of evidence, guideline recommendations and costs on decision-making. Analysis of the survey results will address sampling and the focus of qualitative interviews. The interviews will be analysed using qualitative description.

Discussion: To our knowledge, this is the first study using a mixed methods approach including a case-based survey of physicians practicing in diverse settings to explore the factors that influence clinical decision-making. The results of this study may assist with strategies to implement high value care resulting in improved patient outcomes and limiting costs.

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