| Method: | Mixed Methods Research |
|---|---|

NERUPI network
Evaluating & Researching University Participation Interventions

**What is it?:**

Mixed methods research is methodologically eclectic research which collects and analyzes both qualitative and quantitative data. These data can be integrated at various levels and stages of the study, concurrently in a single study or in a sequence of studies.

**How can it be used?:**

Mixed methods are most likely to be the approach of choice when you want to integrate process and impact evaluation, especially if you are aiming to integrate stakeholder perspectives into the process, thus requiring collection of qualitative data collection alongside quantitative approaches as part of the evaluation.

**Strengths:**

Mixed methods research cuts through paradigm disputes regarding quantitative and qualitative methodologies and attempts to learn from both approaches in a mutually complementary way. Notably mixed methods combines quantitative research which attempts to show the contribution made by the activity (for example through survey based, experimental, quasi-experimental, and correlational research designs) with qualitative research which attempts to analyze the causal chain and address such issues as the processes involved, the quality of the implementation, and facilitators to adoption by the intended beneficiaries (for example through interviews, case studies, focus groups, participatory approaches). Therefore, words/narratives, photos etc can be used to add meaning to numbers, while numbers can bring objectivity and precision to qualitative accounts.

Mixed methods seeks to address weaknesses inherent in either quantitative and qualitative methodologies and to capture information that might be missed by using only one research design. In that sense it can handle a wider range of research questions, and enhances the body of knowledge, because the evaluation is not limited to one methodology.

Qualitative research can help to generate hypothesis that can be tested through quantitative methods (and will inform for example the design of questionnaires and quantitative tools). Quantitative research can help to support the conclusions of qualitative research by uncovering the relationship between variables and the scope of the phenomenon being investigated.

Being able to triangulate data and evidence from different sources is a key strength of many mixed methods research designs. Note mixed methods research is not automatically triangulation, it depends on the range of perspectives obtained.

Mixed methods can lead to the development of more robust conclusions than with a single method, and can help strengthen findings around the transferability of the model being evaluated. It can also lead to more questions of interest for future studies.

**Weaknesses:**

More of a challenge than a weakness, using mixed methods adds to the complexity of the evaluation design, and therefore the cost and time involved. The qualitative and quantitative aspects need to be carefully managed as part of the overall evaluation design to ensure that the different data collection methods do not disrupt or prejudice the other.

Purists argue that quantitative and qualitative methods come from completely different epistemological and ontological paradigms (positivist versus constructionist) and that methods can only be integrated at a superficial level (i.e. that the research will still be located within a single paradigm). Pragmatists however contend that quantitative and qualitative research designs can answer different question on the same topic.

Mixing quantitative and qualitative methods is not easy and the evaluator needs to appreciate the different paradigms and procedures for validating both methods.

**Mixed Methods:**

Various approaches to mixed methods research can be envisaged. The most common designs can be broadly classified as follows:

| Design | Description | Rationale |
|---|---|---|
| Exploratory sequential design | Firstly qualitative research is undertaken to investigate the phenomenon and afterwards quantitative data is gathered to explain the qualitative findings | Helps to generate hypotheses that can then be tested quantitatively; qualitative research in the first phase helps to inform quantitative research in the second phase (e.g. to develop survey questionnaires); the qualitative findings are prioritised and the quantitative research helps with conclusions about the generalizability of the qualitative findings |
| Explanatory sequential design | Quantitative data is gathered first and then qualitative research is undertaken to enhance and expand on the quantitative findings | Quantitative data is prioritised and qualitative data is used to shed further light on and contextualise the quantitative findings |
| Embedded design | Quantitative and qualitative data are gathered separately (could be concurrent parallel design, sequential or multi-phase) but then the findings are integrated from both strands | Offsets weaknesses of either method; allows for findings to be compared; can help to triangulate the evidence. The purpose is to support the findings based on both strands (i.e. each on its own is not sufficient to answer the research questions). |
| Transformative design | Uses any of the above designs but in an evolving context | This is essentially an iterative approach with the intention of being open to possible changes in perspective as the research progresses |

Expertise: High. Requires competency in both quantitative and qualitative methods.

Requirements: Mixed methods require different skillsets, which could mean bringing together a team of evaluators who combine different types of expertise in quantitative, qualitative and mixed methods research. At the analysis and reporting stage, expertise is required to ensure the data is integrated as part of the analysis (ideally different data and evidence is used in the round rather than being two parallel strands).

Ethical Considerations: Ethical considerations for quantitative and qualitative methods also apply to mixed methods research because it combines both methodologies. Issues include the need to obtain permission through informed consent, protect anonymity and confidentiality, avoid disruption and over-burdening research participants, communicate the purposes of the study accurately, avoid deceptive practices, respect people's rights and respond to potential power concerns.

Work Planning: Choice of methodology depends on the purpose of the research: choose the methods that best answers your research questions. The first step is to decide if mixed methods research is viable. It's a good idea to set out a clear justification for combining different methods. Plus, the design needs to address questions to do with the validity of the methods you have chosen, which means thinking about the appropriateness of the research design, the sample size or sampling format you will use, how you will integrate the data.

The data gathering procedures need to be planned carefully, to avoid the methods disrupting each other or influencing the results. In particular you should consider the sequence - there are several ways of organizing mixed methods research as discussed above and in the practice examples. Decisions therefore need to be taken on whether you are aiming to prioritise one method (for example, using qualitative data to support quantitative findings or visa versa) and whether to sequence the methods or run them concurrently.

Sufficient time needs to be allowed for the evaluation, especially if it's a sequential or multi-phase design. The reporting and analysis phase will also be more time consuming because data needs to be integrated. Make sure you keep detailed notes on the evaluation as you go along as this will help in documenting what you did in the writing up stage.

| | |
|---|---|
| Analysis: | The quantitative data will need to be analysed using quantitative and statistical analysis techniques, whilst qualitative analysis will be needed for the qualitative research – for example, using thematic analysis to draw out patterns and insights. Your analysis for the evaluation report should overtly combine the two sets of data in order to inform the findings. In embedded and convergent designs the findings from each strand should be compared and conclusions drawn as a result. For sequential designs, one type of data dominates and the results from the other method is used to support and enhance these findings. A common example is using quotes and narratives from interviews and focus groups to support survey results. Use of case studies can be another way of integrating quantitative and qualitative data in context. |
| Reporting: | The evaluation report should clearly communicate that both quantitative and qualitative data was used in the study, and describe the methods and procedures in detail, indicating which data carries more emphasis. Include discussion and assessment of how the findings have been integrated from both quantitative and qualitative designs and assess the quality of the design and how it meets the objectives for the evaluation. Any potential threats to the validity of the design and conclusions should be highlighted (and any actions taken to strengthen validity). For example, the sample and context needs to be adequately described and attrition rates specified. As with other evaluation reporting, pay particular attention to a detailed description of the intervention (including it's intensity and duration and so on), the context and the implementation details (who delivered what etc) as this will help the reader to assess whether the intervention benefits are transferable. |
| Useful Link(s): | O'Cathain et al (2010), 'Three techniques for integrating data in mixed methods studies'. Explains how to integrate data from different components of a mixed methods study (in the context of health sector research). https://www.bmj.com/content/341/bmj.c4587<br><br>R. Burke Johnson and Anthony J. Onwuegbuzie (2004), Mixed Methods Research: A Research Paradigm Whose Time Has Come, Educational Researcher, October 2004 |

**Explanatory sequential design (quantitative followed by qualitative)**

The aim was to investigate whether a half-day workshop session held with biological science students from non-traditional backgrounds being trialled within a multisite university partnership helped the students to feel more confident working in a laboratory setting. The first stage was quantitative research with first year students, through an online survey, which measured perceptions of self-confidence in a laboratory context and attitudes and perceptions about the scheme. Following on from the survey, and using it as an interview recruitment tool, indepth personal interviews were undertaken with 10 new non-traditional undergraduates working in laboratory settings to discuss their experiences with stressful laboratory situations. The qualitative data was used to explain the quantitative data in the final report.

**Exploratory sequential design (qualitative followed by quantitative)**

The aim was to identify the main sources of stress for new undergraduates from non-traditional backgrounds transitioning to HE, and mechanisms and processes for alleviating stress and supporting retention. A series of focus groups were held with new undergraduates meeting targeting criteria to discuss their transition issues. Based on the qualitative research, a survey was developed and administered online to all first year students who had accessed student support services. The qualitative data informed the collection of quantitative data, which was then used to verify the scale and patterns of the phenomenon identified in the qualitative data. The data was used to discuss emerging for different groups in transition to higher education, the scale and patterns of these and the role played by student support services in addressing them.

**Concurrent Design Example (equal weight to quantitative and qualitative)**

The aim was to test the effectiveness of an online peer mentoring support programme for undergraduates, which matched existing students with new undergraduates from non-traditional backgrounds, and was designed to support transition to HE for the new students. The quantitative research was based on pre and post surveys of attitudes and stress levels and intention to remain at university. In parallel, indepth interviews were undertaken with participants in the online scheme focusing on their user experience and perceptions. A series of focus groups were held with the peer mentors. In the final report, the results from the qualitative analysis were set out alongside results from the quantitative survey and the findings and conclusions was based on a synthesis of the evidence.