AI Researchers
Embedding Responsible AI in Research

AI READINESS TOOLKIT

UC3-02 Use case 3: Data preparation and content analysis

AI-assisted mixed-methods evidence integration

Bringing survey results and qualitative evidence together without overstating the conclusion

AT A GLANCE

A case study on combining survey results with qualitative evidence from interviews or focus groups. Using a fictional example, it shows how to prepare the material, ask AI for defensible analysis options, build an integration matrix and avoid conclusions the data cannot support. It suits researchers new to mixed methods. No unpublished or sensitive data enters an unapproved tool, and interpretation stays with the researcher.

TYPE
Case study

FORMAT
PDF

CONTRIBUTING PARTNER
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WHO IT IS FOR
Researchers combining quantitative and qualitative evidence

FRAMEWORK BARRIERS
Trust in AI, Know-how, The rules, This task

HUMAN-ONLY BOUNDARY

No unpublished or sensitive data in unapproved tools. Interpretation and conclusions stay human.

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The practical problem

Researchers often finish data collection with two useful but uneven evidence streams: a small survey and a set of interviews or focus groups. The difficult part is not asking AI to "analyse the data". The useful task is asking AI, under human control, to recommend a defensible way to combine the materials: what can be claimed, what should be avoided, which analyses fit the data, and how the findings should be organised.

> **USE CASE OUTCOME**
>
> A researcher produces a mixed-methods analysis plan, a cautious integration matrix and draft wording for an empirical section, while keeping all substantive decisions, interpretation and claims under human responsibility.

WHAT MAKES THIS A USE CASE

It starts from a realistic research bottleneck: survey and interview evidence exist, but the integration strategy is unclear.

It gives a fictional but complete example that can be reused safely in training.

It shows the actual material to prepare, what to ask AI, what to cross, and what to reject.

It defines a human boundary: AI recommends the methodological route; researchers remain accountable for the analysis.

Fictional case: the OpenLab Access project

OpenLab University has introduced a digital platform for booking shared research equipment. The platform is meant to increase fairness, transparency and traceability. Six months later, many researchers still use informal routes: direct messages to technicians, supervisor requests, corridor conversations and personal networks.

ELEMENT	FICTIONAL CASE DETAIL
Research question	How do researchers decide between the official booking platform and informal access routes for shared equipment?
Survey	64 valid responses from doctoral researchers, postdocs and lab managers; non-probability sample.
Qualitative material	12 semi-structured interviews with users, technicians, lab managers and research-office staff.
Available files	Questionnaire, cleaned spreadsheet, interview guide, interview list, transcript excerpts, qualitative matrix and preliminary chapter outline.
Research need	Decide how to combine descriptive survey patterns with qualitative mechanisms in a defensible empirical chapter.
The AI task is not asked to produce final findings. It is asked to act as a methodological advisor: diagnose the evidence, recommend suitable analyses, propose an integration structure and warn against unsupported claims.	

FICTIONAL EVIDENCE SNAPSHOT

SURVEY FINDING	INTERVIEW EVIDENCE
72% report using the official platform at least once; 46% still contact staff directly before booking.	Technicians say the platform records time slots but not whether calibration, training or sample preparation are ready.
58% agree that the platform improves fairness; 41% say urgent cases are not handled well.	Researchers describe informal requests as a way to solve exceptions, not necessarily to bypass fairness.
Only 34% say booking rules are clear for complex experiments.	Lab managers say categories work for routine tasks but fail for unusual instrument setups.
68% value booking records for accountability.	One postdoc says the booking history protects them when a sample is lost or equipment fails.

All numbers, participants and excerpts are invented. They are included only to demonstrate the integration workflow.

Material to give AI—and material to keep out

The strongest version of this use case does not start with raw transcripts. It starts with a curated, anonymised methodological package. The package lets AI reason about the analysis design without exposing unnecessary personal or confidential data.

MATERIAL	USE WITH AI?	PURPOSE
Research question and objectives	Yes	Anchors the recommendation to the actual project.
Questionnaire structure and variable labels	Yes	Shows what the survey can and cannot measure.
Cleaned descriptive tables	Yes	Lets AI recommend analysis without changing the data.
Sampling description and response count	Yes	Helps AI identify limits on inference and generalisation.
Interview guide and anonymised profile table	Yes	Shows qualitative scope and participant diversity.
Thematic matrix with anonymised excerpts/IDs	Yes, if authorised	Allows integration between survey patterns and qualitative mechanisms.
Raw identifiable transcripts	Normally no	Use only in approved secure environments after anonymisation and consent checks.
Consent forms, names, emails, institutions	No	Not needed for methodological recommendation and may create avoidable risk.

Stop rule If consent, confidentiality, data classification, tool approval or retention rules are unclear, use only synthetic, aggregated or paraphrased material. AI can still recommend an integration strategy from metadata and anonymised summaries.

THE FOUR TABLES TO PREPARE

TABLE	COLUMNS
Survey findings	finding_id | variable/question | statistic | n_valid | subgroup | interpretation_limit
Qualitative evidence	segment_id | participant_type | theme/code | anonymised_excerpt | context_note
Integration matrix	finding_id | related_segment_ids | relationship | mechanism | limitation | human_decision
Decision log	date | AI_recommendation | accepted/revised/rejected | reason | reviewer

Ask AI for a methodological recommendation

This is the key move. Instead of asking AI to "write the results", ask it to diagnose what is methodologically defensible. The output should look like supervisory advice: what is possible, what is risky, and how to structure the empirical analysis.

> PROMPT 1 — METHODOLOGICAL AUDIT Act as a methodological advisor for an applied mixed-methods project. Use only the materials supplied: research question, survey description, cleaned descriptive tables, sampling notes, interview guide, anonymised qualitative matrix and project objectives. Produce: (1) what the survey can defensibly support; (2) what it cannot support; (3) what the qualitative material can support; (4) what it cannot support; (5) recommended quantitative analyses; (6) recommended qualitative analysis approach; (7) recommended integration strategy; (8) wording cautions. Do not invent statistics, quotations, references or final conclusions. Flag every claim that would require human verification.

EXAMPLE AI RECOMMENDATION: SURVEY COMPONENT

RECOMMENDED	AVOID
Descriptive statistics: frequencies, percentages, valid n, medians for Likert items.	Regression models presented as explanatory or predictive evidence.
Exploratory bivariate comparisons where groups are large enough to describe cautiously.	Strong hypothesis testing across many small subgroups.
Spearman correlations only as exploratory indicators, not as causal evidence.	Claims about all researchers, all laboratories or all universities.
Plain-language limits: non-probability sample, small n, perceptual measures.	Language such as proves, demonstrates, validates or determines.

EXAMPLE AI RECOMMENDATION: QUALITATIVE COMPONENT

RECOMMENDED	AVOID
Structured thematic analysis using a matrix of codes, excerpts and participant types.	Treating interview comments as counts or prevalence estimates.
Combine deductive codes from objectives with inductive codes emerging from interviews.	Using attractive quotations without traceability to transcript context.
Use evidence to explain mechanisms behind survey patterns.	Presenting the qualitative material as representative of the whole institution.

RECOMMENDED	AVOID
Document negative cases and exceptions.	Removing contradictions to make the narrative tidy.

Ask AI to recommend the integration architecture

The most useful output is often a proposed structure for the empirical chapter or case-study report. AI can suggest where the survey should lead, where interviews should explain mechanisms, and where the researcher should explicitly state uncertainty.

> PROMPT 2 — INTEGRATION ARCHITECTURE Based on the methodological audit, propose a structure for the empirical findings section. Use a complementary mixed-methods logic: the survey maps patterns of perception or use; the qualitative evidence explains mechanisms, tensions and exceptions. For each proposed subsection, state: main question, survey evidence to use, qualitative evidence to use, integration purpose, cautions and possible wording. Do not write final findings and do not invent evidence.

EXAMPLE AI RECOMMENDATION:

SECTION	SURVEY ROLE	INTERVIEW ROLE	MAIN CAUTION
4.1 Sample and material	Describe respondents and valid n.	Describe interview profiles and diversity.	No representativeness claim.
4.2 Formal use and informal routes	Show how often platform and direct contact are reported.	Explain why direct contact persists.	Do not frame informal routes as misconduct.
4.3 Fairness, urgency and exceptions	Show fairness and urgent-case items.	Explain tension between equal treatment and situated exceptions.	Do not infer causality.
4.4 Readiness beyond availability	Use rule-clarity and complex-experiment items.	Use excerpts on calibration, training and sample preparation.	Avoid claiming the platform failed.
4.5 Accountability and traceability	Use item on value of booking records.	Use exceptions where records protect users.	Preserve positive and negative evidence.
4.6 Integrated synthesis	Summarise descriptive patterns.	Summarise mechanisms and limits.	Answer the research question cautiously.

WHY THIS ARCHITECTURE WORKS

It does not treat interviews as decorative quotations after survey charts.

It does not pretend that the survey proves causal relationships.

It uses each evidence stream for what it can do best: pattern mapping and mechanism explanation.

It makes contradictions visible, which strengthens rather than weakens the analysis.

Cross the materials in an integration matrix

> PROMPT 3 — BUILD A DRAFT INTEGRATION MATRIX Using the approved survey finding table and qualitative evidence table, draft an integration matrix. For each survey finding, list related segment IDs, classify the relationship as convergence, complementarity, divergence, expansion or silence, identify the possible mechanism, note contrary evidence and state the human check required. Do not change statistics, invent quotations or infer prevalence from qualitative evidence.

EXAMPLE AI OUTPUT:

SURVEY PATTERN	QUALITATIVE MECHANISM	RELATIONSHIP	INTEGRATED INTERPRETATION
46% contact staff directly before booking.	Direct contact helps users check readiness, calibration and training needs.	Complementarity	Informal contact may function as coordination around readiness, not simply avoidance of the platform.
58% say the platform improves fairness; 41% say urgent cases are poorly handled.	Interviewees describe urgency as an exception the platform categories do not capture.	Divergence + complementarity	Fairness and speed are both valued; the tension appears when standardised rules meet unusual cases.
34% say rules are clear for complex experiments.	Lab managers say routine categories work better than unusual setups.	Convergence	Low rule clarity is consistent with the qualitative distinction between routine and complex use.
68% value booking records.	A postdoc describes records as protection after sample loss.	Complementarity	Traceability is not merely administrative; it can protect users when accountability is contested.

HUMAN REVIEW QUESTIONS

Does each qualitative segment really address the survey finding, or only a nearby topic?

Is the relationship label justified by evidence, not by the story the researcher wants?

Are negative cases included?

Would the wording still be true if one quotation were removed?

Are n, sample limits and qualitative scope visible in the interpretation?

Turn AI advice into cautious academic writing

> PROMPT 4 — CAUTIOUS WORDING CHECK Review the draft findings text as a methodological caution editor. Identify claims that overstate the survey, overgeneralise from interviews, imply causality, hide uncertainty, omit valid n, or treat qualitative evidence as prevalence. Return a table with sentence, issue, why it matters and a more cautious revision. Do not add new evidence.

EXAMPLE AI RECOMMENDATION:

RISKY WORDING	BETTER WORDING
Researchers bypass the platform because it is ineffective.	In this fictional corpus, some participants used informal contact when the platform did not capture readiness, urgency or complex setup needs.

RISKY WORDING	BETTER WORDING
The survey proves that informal access is widespread.	The survey indicates that direct contact remained common among respondents, but the non-probability sample does not support population estimates.
Interviews confirm that fairness is not important.	Interviews suggest a more nuanced tension: participants valued fairness, but questioned how standardised rules handled exceptions.
The platform failed to solve access problems.	The evidence points to a partial fit: the platform supported traceability and routine booking, while complex or urgent cases still required human coordination.

EXAMPLE PARAGRAPH

Possible integrated finding: The fictional evidence suggests that informal access routes persisted not simply because users rejected the official platform, but because the platform captured availability better than operational readiness. Survey responses indicated continued direct contact with staff before booking, while interviews explained this behaviour through calibration, training, sample preparation and urgent exceptions. This interpretation remains exploratory: the survey is not representative, and the qualitative evidence identifies mechanisms rather than their prevalence.

QUALITY GATE

The survey is presented as descriptive or exploratory, with valid n visible.

The qualitative material is used to explain mechanisms, meanings and exceptions.

Each integrated claim links to both a survey finding ID and qualitative segment IDs where relevant.

AI recommendations are recorded separately from human decisions.

No final claim relies on AI output that the researcher has not checked against the material.

The report states what the evidence cannot show.

Reusable protocol

STEP	ACTION	OUTPUT
1	Inventory the available survey, interview and project files.	Evidence inventory
2	Remove or withhold identifying and restricted material.	Safe AI package
3	Create survey finding and qualitative evidence tables.	Two traceable evidence tables
4	Ask AI for a methodological audit, not final findings.	Recommendation memo
5	Human researcher reviews what is possible and impossible.	Approved analysis boundaries
6	Ask AI for an empirical-section architecture.	Proposed chapter/report structure
7	Build a draft integration matrix linking findings to mechanisms.	Joint display / integration matrix
8	Check negative cases, limits and overclaiming.	Issue log
9	Write cautious integrated findings.	Draft findings text

STEP	ACTION	OUTPUT
10	Record accepted/rejected AI suggestions.	Decision log and audit trail

TEMPLATE: METHODOLOGICAL RECOMMENDATION MEMO

SECTION	QUESTIONS TO ANSWER
Evidence available	What survey, qualitative and contextual material exists? What is missing?
Quantitative strategy	Which descriptive or exploratory analyses fit the sample and variables?
Qualitative strategy	Which coding/theme approach fits the corpus and research question?
Integration logic	Will the design use complementarity, convergence, divergence, expansion or explanation?
Chapter/report structure	What order best lets each evidence stream do its proper work?
Limitations	What must not be claimed? What wording should be avoided?
Core principle Use AI to sharpen methodological judgement, not to outsource it. The value is in better questions, clearer limits and a more traceable integration of evidence.	

About this resource

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