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Research Methodologies in Education: A Comprehensive Review of Quantitative, Qualitative, and Mixed Methods Approaches

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Abstract:

This article examines the philosophical foundations, characteristics, research designs, data procedures, and quality criteria of quantitative, qualitative, and mixed methods approaches in educational research. It also compares their strengths, limitations, and methodological challenges and develops a conceptual framework for selecting an approach that aligns with educational research objectives and questions. The study adopts a library research design and draws on methodological books, peer-reviewed conceptual and theoretical articles, and relevant review studies. The literature is selected purposively according to its relevance, methodological contribution, scholarly credibility, and availability. The analysis combines thematic analysis, comparative analysis, and critical conceptual synthesis. Rather than claiming an exhaustive systematic search or reporting unverified selection counts, the article transparently presents a structured interpretation of established methodological literature. The central argument is that methodological choice should follow the nature of the educational problem and the evidence required. Quantitative, qualitative, and mixed methods can each support rigorous inquiry when researchers align philosophical assumptions, research questions, design, data strategies, analysis, and quality criteria.

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1. INTRODUCTION

Educational research investigates learning, teaching, curriculum, assessment, institutions, policy, and the social conditions that shape educational outcomes. These subjects rarely present one-dimensional problems. Some questions require measurement of variables and estimation of relationships. Others require close interpretation of experience, meaning, interaction, and institutional context. Still others require researchers to combine numerical patterns with contextual explanations. Methodological choices therefore shape the evidence researchers produce and the conclusions that readers can reasonably draw.

Quantitative, qualitative, and mixed methods approaches offer distinct but potentially complementary ways to investigate educational phenomena. Quantitative research examines measurable variables through structured instruments, sampling strategies, and statistical procedures. Qualitative research

explores meaning and context through interviews, observations, documents, and interpretive analysis. Mixed methods research intentionally combines quantitative and qualitative components and integrates their findings to address a research problem more comprehensively (Creswell & Creswell, 2018; Creswell & Plano Clark, 2018). These approaches differ in their assumptions about knowledge, the role of the researcher, the nature of evidence, and the standards used to evaluate research quality.

The distinction among the three approaches should not become a rigid hierarchy. Quantitative designs can describe patterns but may not fully explain how participants understand those patterns. Qualitative designs can illuminate context and meaning but do not necessarily estimate population parameters. Mixed methods designs can connect these forms of evidence, but the use of two data types alone does not constitute meaningful integration. Zhou et al. (2024) show that integration in educational mixed methods research requires deliberate decisions about research questions, sampling, data collection, and the mixing of findings. Hirose and Creswell (2023) likewise emphasize the need for a rationale, clear design, integration procedures, and defensible meta-inferences.

Recent methodological work identifies continuing challenges in educational research. Gierus et al. (2025) report increased use of mixed methods across selected educational subdisciplines while identifying continuing concerns about methodological quality. Maher (2025) argues that rigor in interpretive educational research depends on coherence, reflexivity, transparency, authenticity, credibility, and ethical awareness. Van Haastrecht et al. (2024) also show that validity frameworks in technology-enhanced learning remain fragmented. Together, these studies indicate that methodological choice and methodological execution require equal attention.

Existing publications often explain individual approaches or focus on particular methodological issues, such as mixed methods integration, qualitative synthesis, or measurement validity. This article addresses the relationship among these components through a common analytical structure: philosophical paradigms, research purposes, designs, sampling, data collection, data analysis, quality criteria, strengths, limitations, and methodological alignment. Its intended contribution is a decision framework that helps educational researchers select an approach based on the problem and the type of evidence required.

The article pursues five objectives: (1) analyze the characteristics, philosophical foundations, and methodological principles of quantitative, qualitative, and mixed methods approaches; (2) identify common designs within each approach; (3) compare data collection, analysis, and quality criteria; (4) examine strengths, limitations, and implementation challenges; and (5) formulate a framework for selecting a methodology that aligns with research objectives, questions, and the characteristics of educational problems.

The review is guided by five questions:

RQ1. What are the philosophical foundations and fundamental characteristics of quantitative, qualitative, and mixed methods research in education?

RQ2. What research designs are commonly employed within these approaches?

RQ3. How do the approaches differ in data collection, data analysis, and research quality criteria?

RQ4. What are the strengths, limitations, and methodological challenges of each approach?

RQ5. How can researchers determine the most appropriate methodological approach based on educational research objectives and questions?

The discussion is structured to address these research questions progressively. It first examines the philosophical foundations and defining characteristics of

quantitative, qualitative, and mixed methods research, followed by an analysis of the research designs commonly used in educational studies. The subsequent sections compare data collection procedures, analytical techniques, and quality criteria, before evaluating the strengths, limitations, and challenges associated with each approach. The final discussion synthesizes these findings into a methodological alignment framework that connects educational research problems and questions with appropriate paradigms, designs, data sources, analytical procedures, and standards of research quality. This structure is intended to provide both a comparative understanding of the three approaches and a practical basis for methodological decision-making in educational research.

2. METHOD

This study employs qualitative library research with a structured and critical conceptual approach. It examines methodological literature on quantitative, qualitative, and mixed methods research in education to compare their philosophical foundations, designs, procedures, and quality criteria. The study focuses on published methodological knowledge rather than human participants or institutional field data.

The sources comprise scholarly books, peer-reviewed conceptual and theoretical journal articles, and relevant review studies. Publications from 2015 to 2026 are prioritized, while earlier foundational works are retained when they remain essential to the discussion. Literature is selected purposively based on its relevance to the research questions, methodological contribution, scholarly credibility, and availability. Sources are excluded when they are unrelated to the three methodological approaches, lack sufficient methodological detail, contain unverifiable bibliographic information, or are duplicate records.

Literature identification draws on Scopus, Web of Science, ERIC, ScienceDirect, SpringerLink, and Google Scholar. Search terms include “educational research methodology,” “quantitative research in education,” “qualitative research in education,” “mixed methods research in education,” “educational research design,” and “validity, reliability, and trustworthiness in educational research.” Boolean operators and citation tracking may be used to refine retrieval and identify relevant foundational publications. The selected sources are examined against the research questions and recorded in a literature matrix containing author, year, methodological approach, paradigm, design, sampling, data collection, analysis, quality criteria, main arguments, limitations, and relevance to the study. Search dates, exact queries, and applied filters should be retained in a search log to support transparency.

The literature is analyzed through thematic analysis, comparative analysis, and critical conceptual synthesis. Thematic analysis identifies recurring concepts concerning paradigms, research designs, sampling, data collection, data analysis, and research quality. Comparative analysis examines similarities and differences among quantitative, qualitative, and mixed methods approaches using these shared dimensions. Critical synthesis evaluates the strengths, limitations, and methodological tensions reported in the literature. The findings are then integrated to develop a conceptual framework for aligning educational research problems and questions with appropriate methodological choices. The analysis is qualitative and conceptual; it does not estimate pooled effects or claim statistical representativeness.

The trustworthiness of the study is supported by selecting identifiable scholarly sources, assessing their relevance and methodological contribution, comparing arguments across publications, and maintaining a traceable record of

source selection and interpretation. Peer-reviewed status is considered alongside conceptual clarity and the adequacy of supporting evidence. Consistency is maintained between the research questions, analytical categories, synthesis, and conclusions. As this study is a conceptual library research project rather than a systematic review, it does not claim exhaustive database coverage or report PRISMA selection counts.

3. RESULTS AND DISCUSSION

The analysis below synthesizes established methodological literature identified through the library research process. It compares concepts and arguments across sources and develops a conceptual framework. It does not report empirical results or numerical frequencies of publications.

3.1 Philosophical Foundations and Characteristics

Research paradigms establish fundamental assumptions about reality, knowledge, and the relationship between researchers and the phenomena under investigation. Quantitative research is predominantly associated with positivist and post-positivist orientations, emphasizing variable measurement, hypothesis testing, and systematic statistical analysis. Post-positivism acknowledges that observations remain fallible, making research findings provisional rather than absolute. Methodological rigor consequently depends on operational clarity, appropriate sampling, measurement quality, and defensible statistical inference (Creswell & Creswell, 2018; Cook & Campbell, 1979).

Qualitative research is commonly grounded in interpretivist and constructivist perspectives, which emphasize the contextual nature of meaning and human experience. Researchers interpret participants' experiences within their social, cultural, and institutional environments. Reflexivity is therefore essential in recognizing how researchers' assumptions, positions, and interactions influence knowledge construction. Maher (2025) emphasizes coherence, transparency, credibility, authenticity, and ethical awareness as foundations of qualitative rigor, while Varpio et al. (2022) highlight continuous reflexive engagement throughout the research process.

Mixed methods research frequently adopts a pragmatic orientation by prioritizing the research problem and the complementary value of different forms of evidence. This approach combines quantitative and qualitative data through procedures such as connecting samples, building sequential research phases, merging datasets, embedding one methodological strand within another, or integrating interpretations. Its methodological strength depends not merely on collecting two types of data but on establishing a clear rationale and meaningful integration that generates additional understanding (Johnson et al., 2007; Morgan, 2007; Creswell & Plano Clark, 2018).

The principal philosophical and methodological characteristics of these three approaches are summarized in Table 1.

Table 1. Philosophical Foundations and Characteristics of Research Approaches

Dimension	Quantitative	Qualitative	Mixed Methods
Typical philosophical orientation	Post-positivist	Interpretivist / constructivist	Often pragmatic; may draw on multiple paradigms
Primary purpose	Measure, estimate, test, compare	Understand meaning, experience, process, context	Integrate complementary forms of evidence
Evidence	Numerical and	Narrative, visual,	Numerical and

	structured	documentary, observational	qualitative datasets
Researcher role	Seeks standardized procedures and controlled inference	Acknowledges interpretive and reflexive role	Plans and explains the role across both strands
Logic of inference	Deductive, statistical, hypothesis testing	Inductive, abductive, interpretive	Combines deductive and inductive reasoning
Main quality focus	Validity, reliability, precision, bias control	Credibility, dependability, confirmability, transferability, reflexivity	Quality of each strand and quality of integration

Source: Synthesis based on Creswell and Creswell (2018), Johnson et al. (2007), Morgan (2007), Creswell and Plano Clark (2018), Maher (2025), and Varpio et al. (2022).

The comparison in Table 1 demonstrates that the three approaches differ not only in their philosophical orientations but also in how they construct and evaluate knowledge. Quantitative research emphasizes standardized measurement and statistical inference, whereas qualitative research prioritizes contextual interpretation, reflexivity, and the construction of meaning. Mixed methods research extends these perspectives by integrating numerical and qualitative evidence to address research questions that require complementary forms of understanding. These distinctions indicate that methodological selection should consider the nature of the research problem, the type of evidence required, and the criteria appropriate for evaluating research quality. Nevertheless, the characteristics presented should be understood as general methodological orientations rather than rigid boundaries.

3.2 Research Designs in Educational Research

Research designs provide the operational structure through which educational research questions are translated into systematic procedures. Each methodological approach encompasses distinct designs that reflect differences in research objectives, evidence requirements, and analytical strategies. Quantitative designs generally emphasize measurement and the examination of relationships or effects, qualitative designs focus on understanding experiences and contextual processes, while mixed methods designs establish connections between numerical and interpretive evidence. The commonly employed designs and their respective research purposes are presented in Table 2.

Table 2. Research Designs and Their Typical Purposes in Educational Research

Approach	**Common Designs**	**Typical Research Purpose**
Quantitative	Experimental; quasi-experimental; survey; correlational; descriptive; causal-comparative	Measure variables, test hypotheses, estimate patterns and relationships.
Qualitative	Case study; phenomenology; ethnography; grounded theory; narrative inquiry; qualitative description	Interpret meaning, experience, processes, and context.
Mixed methods	Convergent; explanatory sequential; exploratory sequential; embedded; multiphase	Integrate numerical and contextual evidence to address complex questions.

Source: Synthesis based on Cook and Campbell (1979), Denzin and Lincoln (2018), Yin (2018), and Creswell and Plano Clark (2018).

Table 2 illustrates that research designs differ according to the nature of the questions and the evidence required. Quantitative designs include experimental and quasi-experimental approaches for examining intervention effects, alongside survey and descriptive designs for identifying characteristics and patterns. Correlational designs investigate relationships among variables, while causal-comparative designs examine potential differences associated with existing conditions. However, correlational evidence alone cannot establish causal relationships. Consequently, design selection must consider the strength of inference supported by the research procedures (Cook & Campbell, 1979).

Qualitative designs provide different strategies for understanding educational phenomena within their contexts. Case studies investigate bounded systems through multiple sources of evidence (Yin, 2018), whereas phenomenology explores lived experiences and ethnography examines cultural practices and social interactions. Grounded theory develops explanatory accounts through iterative data collection and analysis, while narrative inquiry focuses on how individuals construct and communicate experiences through stories. Qualitative descriptive research, meanwhile, provides an account of phenomena using a relatively direct descriptive orientation. These designs require coherence between participant selection, data collection, analytical procedures, and the intended form of interpretation (Denzin & Lincoln, 2018).

Mixed methods designs offer alternative structures for integrating quantitative and qualitative evidence. Convergent designs collect both forms of data within a comparable research phase before integrating the findings. Explanatory sequential designs begin with quantitative analysis, followed by qualitative investigation to explain selected results. Conversely, exploratory sequential designs begin with qualitative inquiry, with their findings informing a subsequent quantitative phase. Embedded and multiphase designs incorporate methodological strands within broader interventions or extended research programs. Their selection depends on the timing, priority, and function of integration within the overall research design (Creswell & Plano Clark, 2018).

These comparisons indicate that selecting a research design involves more than identifying a preferred methodological approach. Researchers must establish consistency between research objectives, questions, evidence requirements, and analytical procedures. Quantitative designs are appropriate when measurement, comparison, and estimation are central; qualitative designs are suitable when meaning, experience, and contextual processes require interpretation. Mixed methods designs become relevant when neither numerical nor qualitative evidence alone provides sufficient understanding of the research problem. Accordingly, methodological rigor depends on the alignment between the research question and the design selected rather than the complexity or number of procedures employed.

3.3 Data Collection and Analysis

Data collection and analysis constitute essential components of educational research because they determine how evidence is generated, examined, and interpreted. Each methodological approach employs different techniques according to its research objectives, data characteristics, and analytical requirements. Quantitative research emphasizes structured instruments and statistical procedures, whereas qualitative research relies on contextual data and interpretive analysis. Mixed methods research coordinates both approaches through separate analytical procedures followed by systematic integration. The principal differences

in data collection, sampling, analysis, and research outputs are presented in Table 3.

Table 3. Data Collection and Analysis across Research Approaches

Dimension	Quantitative	Qualitative	Mied Methods
Collection	Tests, scales, surveys, structured observations, records	Interviews, focus groups, observations, documents, artifacts	Coordinated use of quantitative and qualitative techniques
Sampling	Probability sampling where population inference is intended; other strategies when justified	Purposive, theoretical, criterion, or information-rich case selection	Sampling strategy for each strand and a rationale for connecting samples
Analysis	Descriptive and inferential statistics	Coding, thematic, narrative, constant-comparative, or interpretive analysis	Separate strand analyses followed by planned integration
Main output	Estimates, patterns, associations, effects	Themes, meanings, processes, contextual explanations	Integrated interpretations and meta-inferences

Source: Synthesis based on Creswell and Creswell (2018), Creswell and Plano Clark (2018), Varpio et al. (2022), Maher (2025), and Zhou et al. (2024).

Table 3 demonstrates that differences among research approaches extend beyond the types of data collected to include sampling decisions, analytical procedures, and the nature of research findings. Quantitative research commonly employs structured questionnaires, achievement tests, rating scales, standardized assessments, administrative records, and structured observations. These instruments facilitate the systematic measurement of variables and indicators established before data collection. Analytical procedures include descriptive statistics, group comparisons, correlation, regression, and multilevel modeling, depending on the research questions, measurement scales, sampling designs, and statistical assumptions. The resulting findings generally take the form of numerical estimates, patterns, associations, or effects. Researchers must also account for missing data, measurement limitations, uncertainty, and effect magnitude to support defensible interpretations.

Qualitative research adopts a different strategy by prioritizing contextual understanding and information-rich evidence. Data are commonly generated through semi-structured or unstructured interviews, focus groups, observations, field notes, documents, artifacts, and audio-visual materials. Purposive and theoretically guided sampling are frequently employed to identify participants or settings that provide relevant insights rather than statistical representation. Analytical procedures may involve coding, constant comparison, narrative analysis, interpretive analysis, and thematic analysis. These processes enable researchers to develop codes, categories, themes, and contextual interpretations from the collected material. The credibility of the resulting interpretations depends partly on transparent analytical procedures, reflexivity, and sensitivity to the contexts in which data are generated (Varpio et al., 2022; Maher, 2025).

Mixed methods research coordinates quantitative and qualitative data collection and analysis within an integrated research design. Each methodological strand is

initially analyzed using procedures appropriate to its data characteristics, after which the findings are connected, merged, embedded, or woven together. Integration may reveal convergence between findings, provide complementary explanations, expand the scope of interpretation, or identify discrepancies between datasets. Joint displays can further clarify relationships between quantitative and qualitative results. Zhou et al. (2024), through their review of 119 educational mixed methods articles, identify the importance of research questions, sampling strategies, and different integration procedures. Their findings reinforce the need to plan integration throughout the research process rather than treating it as a final-stage comparison.

The comparison highlights that data collection and analysis must remain consistent with the epistemological and practical objectives of each research approach. Quantitative procedures are appropriate when the investigation requires measurement, statistical estimation, and examination of relationships. Qualitative procedures are more suitable when the objective involves interpreting experiences, meanings, and contextual processes. Mixed methods research becomes particularly relevant when the research problem requires both numerical patterns and contextual explanations. Therefore, methodological rigor depends not only on selecting appropriate instruments or analytical techniques but also on establishing coherence between research questions, sampling strategies, data collection, analytical procedures, and the intended research outputs.

3.4 Research Quality and Validity

Quantitative research quality concerns the defensibility of measurement and inference. Validity concerns the interpretations and uses of scores or findings, while reliability concerns consistency of measurement. Researchers should consider construct representation, internal validity, external validity, statistical conclusion validity, instrument quality, sampling error, and threats such as confounding or attrition. These criteria should fit the design and the intended inference. A reliable instrument does not automatically provide valid evidence for every purpose.

Qualitative research uses quality criteria that reflect interpretive and contextual inquiry. Lincoln and Guba (1985) identify credibility, transferability, dependability, and confirmability as central dimensions of trustworthiness. Credibility concerns the plausibility of interpretations. Transferability depends on sufficiently rich contextual description. Dependability requires transparent documentation of procedures and decisions. Confirmability requires a traceable relationship between evidence and interpretation. Reflexivity and ethical transparency further strengthen qualitative rigor (Maher, 2025; Varpio et al., 2022).

Mixed methods research must establish the quality of each strand and the quality of integration. Researchers should justify why they combine methods, explain the timing and priority of each strand, document integration procedures, and show how integrated interpretations follow from the evidence. The quality of a mixed methods study cannot be inferred from the presence of two datasets. It depends on the coherence of the design and the added value of integration (Hirose & Creswell, 2023; Zhou et al., 2024).

3.5 Strengths, Limitations, and Methodological Challenges

Quantitative approaches support systematic measurement, comparison, estimation, and hypothesis testing. They can help researchers examine patterns across large samples and evaluate interventions when designs and assumptions support such inferences. Their limitations include dependence on operational definitions, the risk of reducing complex educational processes to a narrow set of indicators, and the possibility that statistical significance may receive more

attention than substantive importance. Researchers also need adequate sampling, measurement, and analytical expertise.

Qualitative approaches can reveal meanings, interactions, institutional processes, and contextual conditions that standardized measures may overlook. Their limitations include the demands of intensive data collection and analysis, the need for reflexive interpretation, and the restricted statistical generalizability of many designs. These limitations do not make qualitative evidence weaker by default. They define the scope of the claims that researchers can responsibly make. Maher (2025) argues that rigor requires coherence and reflexivity rather than the uncritical transfer of quantitative criteria into interpretive inquiry.

Mixed methods approaches can address complex questions by combining the breadth of quantitative patterns with the depth of qualitative explanations. Their limitations include additional time, cost, coordination, methodological expertise, and the risk of weak integration. A mixed methods project can become two parallel studies if the strands do not inform one another. Reviews of educational mixed methods emphasize that integration requires deliberate planning at the question, sampling, data collection, analysis, and interpretation stages (Zhou et al., 2024; Gierus et al., 2025).

3.6 Methodological Decision-Making Framework

The synthesis supports a methodological alignment framework. The framework does not rank one approach above another. It begins with the educational problem and the type of answer required. Researchers then formulate questions, clarify assumptions about knowledge, select an approach and design, determine the data and sampling strategy, choose collection and analysis procedures, and establish quality criteria. The final decision should show a coherent relationship among all components.

Table 4. Methodological Decision-Making Framework for Educational Research

No	Decision Stage	Guiding Question	Methodological Implication
1.	Problem	What educational phenomenon requires explanation or understanding?	Define scope, context, and practical or theoretical problem.
2.	Question	Does the question ask how much, whether, why, how, or what meaning?	Identify the type of evidence needed.
3.	Paradigm	What assumptions about knowledge and reality guide the inquiry?	Clarify post-positivist, interpretive/constructivist, or pragmatic orientation.
4.	Approach and design	Which approach and design fit the question?	Choose quantitative, qualitative, or mixed methods and specify the design.
5.	Data and sampling	Which sources and cases can provide relevant evidence?	Align sampling, participants or records, and data sources with the design.
6.	Collection and analysis	How will evidence be generated and interpreted?	Select instruments, protocols, analytic procedures, and integration points.
7.	Quality	What criteria support credible and defensible conclusions?	Apply validity/reliability, trustworthiness, or integration criteria as appropriate.

Source: Author's conceptual synthesis.

Table 4 illustrates that methodological selection involves a sequence of interconnected decisions rather than an isolated choice of research approach. The process begins with identifying the educational problem and formulating research questions that determine the type of evidence required. These initial considerations establish the basis for clarifying philosophical assumptions and selecting an appropriate methodological approach and research design. Consequently, methodological choices should reflect the characteristics of the research problem rather than researchers' preferences for particular approaches.

The subsequent stages emphasize the alignment of data sources, sampling strategies, collection techniques, and analytical procedures with the selected research design. Researchers need to ensure that the evidence generated is relevant to the research questions and that the analytical procedures support the intended interpretations. Quality assurance then establishes the criteria for evaluating the credibility and defensibility of research conclusions. Quantitative studies emphasize validity and reliability, qualitative studies prioritize trustworthiness, while mixed methods research additionally requires attention to the quality of integration between methodological strands.

An important characteristic of the framework is its recognition of methodological alignment as a continuous rather than strictly linear process. Researchers may reconsider earlier decisions when emerging evidence reveals inconsistencies between research questions, available data, and analytical procedures. Such adjustments require transparent documentation to maintain methodological coherence. For mixed methods research, the framework further emphasizes the need to demonstrate how integrating quantitative and qualitative findings generates additional understanding beyond the contribution of either methodological strand independently.

3.7 Theoretical Contributions and Practical Implications

The proposed contribution lies in organizing methodological choice through a shared alignment structure. It brings together philosophical assumptions, research questions, design, data procedures, and quality criteria. This structure helps prevent common mismatches, such as using a correlational design to make causal claims, selecting interviews without a clear interpretive purpose, or combining datasets without a defined integration strategy. It also positions methodological quality as a relationship among research components rather than a checklist applied only at the end.

For educational researchers, the framework can guide proposal development, research training, supervision, and methodological review. Supervisors can use it to assess whether students have connected their questions to suitable designs and quality criteria. Journal reviewers can use it to examine the logic between claims and evidence. Educational institutions can use it when evaluating research proposals and supporting methodological capacity. These implications are conceptual recommendations, not measured intervention effects.

This library research offers a structured conceptual comparison rather than an exhaustive systematic review. The source selection depends on relevance, scholarly contribution, and the researcher's documented judgment. The study therefore does not claim complete coverage of every publication from 2015 to 2026. Future research can extend the framework through a fully documented systematic review or empirical evaluation in educational research settings.

4. CONCLUSION

Quantitative, qualitative, and mixed methods approaches provide different but complementary ways to investigate educational problems. Quantitative research supports measurement and statistical analysis. Qualitative research develops contextual understanding of meaning, experience, and process. Mixed methods research integrates both forms of evidence when the research problem requires their combined contribution. Each approach requires designs, data procedures, and quality criteria that match its philosophical assumptions and research questions.

The central conclusion is that researchers should select methodology through methodological alignment rather than preference for a particular approach. The proposed framework connects the educational problem, research questions, paradigm, approach, design, sampling, data collection, analysis, and quality assurance. It can support more coherent research planning and more defensible interpretation. However, the framework remains a conceptual synthesis and has not been empirically validated as an instrument.

The article contributes a conceptual framework for aligning educational research questions with paradigms, methodological approaches, designs, data procedures, and quality criteria. Further studies can test the framework through systematic evidence synthesis or empirical assessment among educational researchers.

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