

Clarifying research problems and questions in education: A systematic review of definitions, quality criteria, formulation strategies and frameworks

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ABSTRACT

In educational research, there is often confusion about the distinction between a research problem and a research question. This uncertainty hampers conceptual clarity, alignment, and the overall methodological coherence of a research project. The Objective of the Review: Is to investigate and synthesise definitions, quality criteria, formulation strategies, and frameworks related to research problems and questions. A systematic review of the literature was conducted spanning 2000–2026. The review focused on English-language studies, and data were obtained from Google Scholar, ERIC, EBSCOhost, and the Directory of Open Access Journals. Texts were reviewed after being screened independently by both reviewers against predefined criteria. Using Cohen's κ , inter-rater reliability was assessed, and disagreements were resolved by consensus. The study was appraised using CASP checklists. The data were synthesised and analysed thematically and tested for stability through a sensitivity analysis. From the selected studies, 55 met the inclusion criteria. The following themes emerged from the data: the distinct significance and purpose of problems versus questions; the multiple origins of problems and how they are transformed into researchable questions; the criteria for strong formulation of research problems and questions; and frameworks for developing research problems and questions. The review suggested practical templates and checklists for writing research problems and questions. The evidence in the review included diverse sources, methods, contexts, and data types, as education literature remains limited. Also, formal frameworks for problem statements are limited; therefore, literature is, in some cases, adapted from other fields. Research problems and research questions are conceptually distinct yet interdependent. Applying explicit criteria, alignment checks, and appropriate frameworks can strengthen design decisions, analytic focus, and reporting quality in education research. The research used a correlational survey design.

KEYWORDS: Research methodology; Research problem; Research question; Frameworks; Alignment; Education research

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1. Introduction

Academic research is commonly understood as a systematic investigation aimed at describing, discussing, and explaining an observed phenomenon of interest (Muzari et al., 2022; Parathasarathy

et al., 2023). Central to this process is the careful formulation of a suitable research problem. In this regard, Adu and Okeke (2022) noted that the first and most vital step in educational scientific research is the identification of a specific area of interest and a corresponding problem. Building on this idea, researchers argue that research problems (PBs) should be complemented with well-constructed research questions (RQs). Together, they serve as the starting point of rigorous scientific research (Han-Jing, 2023; Parathasarathy et al., 2023). Abdallah (2024, p. 1) emphasised that “In any educational research, the process of identifying a research problem and formulating clear research questions and objectives is crucial to setting the basis for a rigorous and meaningful inquiry”. Several scholars (Bhagyamma & Ramesh, 2023; Kross & Giust, 2019; Parathasarathy et al., 2023) contend that both RPs and RQs facilitate effective planning and resource allocation and enhance research quality by guiding researchers in their pursuit of knowledge.

It is essential to note, however, that not all studies require research questions. For instance, certain types of studies, such as conceptual and theoretical investigations, often rely on a research problem and an overarching aim rather than specific questions (Grant & Osanloo, 2014; Ravitch & Riggan, 2016; Taherdoost, 2022). Conversely, empirical studies typically rely on research questions to structure data collection and analysis, thereby ensuring rigour and clarity (Bahishti, 2022; Aguinis, 2025). That said, Gill and Gill (2020) cautioned that empirical studies risk losing focus and producing unreliable or non-generalizable findings if they lack well-defined questions. Against this backdrop, it becomes clear that, despite researchers' agreement on the importance of research RPs and RQs, their distinct purposes are often misunderstood.

Han-Jing (2023) opined that part of the confusion surrounding RPs and RQs stems from their close relationship, which can leave novice researchers struggling due to limited understanding (Ellis & Levy, 2008; Pardede, 2018; Adu & Okeke, 2022). This challenge is likely compounded by divergent viewpoints among researchers. For example, Madhu et al (2024, p. 1) defined a research problem as “a specific question, issue, or area of inquiry that a researcher wants to investigate or explore through the process of research”, while Akhidime (2017, p. 633) in contrast, remarked that a “research problem could present itself as a condition to be improved upon, a difficulty or deficiency to be overcome, or a gap in knowledge that exists in scholarly literature that is to be filled, or theory that requires meaningful understanding”. These contradictory perspectives illustrate the conceptual vagueness in the literature, leading postgraduate students, for instance, to struggle to articulate clear RPs and RQs (Akram et al., 2023; Ellis & Levy, 2008). It's not strange, therefore, that scholars such as Rustipa et al. (2023) blamed the lack of scholarship as a contributing factor. On this point, Singh (2023) contended that research primarily focuses on identifying concepts and the characteristics of research problems and research questions, rather than on their conceptual differences. This lack of clarity has serious implications, including poorly aligned studies, shallow methodological reasoning, and misinterpretation of research aims.

This manuscript seeks to address this gap by clarifying the conceptual differences between the problem statement and the research question. By examining their respective functions, structures, and roles within the research process, we aimed to present practical frameworks to guide researchers in conducting methodologically sound studies. To achieve this aim, the review seeks to answer the following questions:

Primary Research Question

How are research problems and research questions defined, distinguished, and effectively formulated within the field of education, and what quality criteria, strategies, and frameworks does the literature identify to guide their development?

Sub-questions

Research Question 1 (RQ 1): What is the significance and purpose of clearly defining research problems and research questions within the research process?

Research Question 2 (RQ 2): How do research problems and research questions typically originate, and what sources or conditions give rise to them?

Research Question 3 (RQ 3): Which criteria should be applied to formulate effective, rigorous, and actionable research problems and research questions?

Research Question 4 (RQ 4): How can conceptual or theoretical frameworks and checklists be used to guide the development and refinement of research problems and research questions?

1.1. Conceptual Framework

To address these questions, the systematic review adopted a structured approach, grounded in a conceptual framework. This ensured an appropriate lens through which the data were interpreted and analysed (Ravitch & Riggan, 2017). Drawing on Antonenko's (2015) work, the Conceptual Framework was aligned with the topic's significance. This included justifying the problem (under the introduction), defining relevant concepts, establishing a theoretical rationale for the research, selecting appropriate methods, and interpreting the results in relation to the theory (Antonenko, 2015). Extending from these considerations, this study is based on two primary concepts: research problems and research questions. Lund (2022) described RPs as an important means, pointers or guides to attaining valuable knowledge, while Goldschmidt and Matthews (2022, p. 2) stated: "... questions are the basis on which inquiry takes place in all domains". For conceptual clarity, the characteristics of both problem statements and research questions are described, and a comparative analysis is conducted throughout the study. The emphasis on defining research questions and problem statements (Kross & Giust, 2019) highlighted the theoretical importance of clear, methodologically grounded questions in guiding research design.

Figure 1 *The Conceptual Framework*

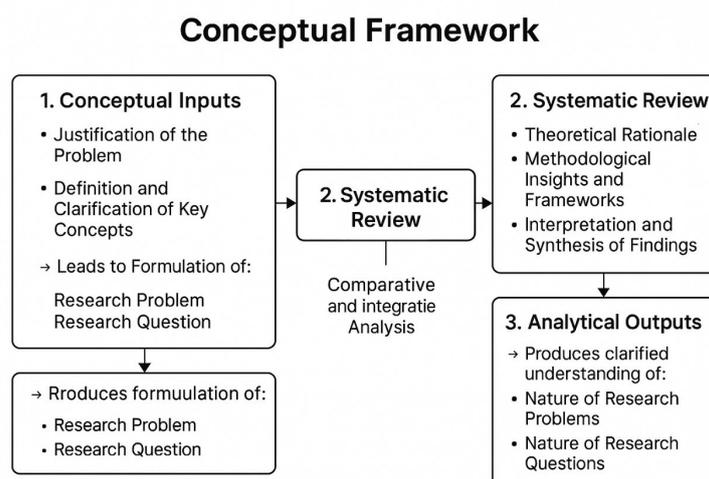


Figure source: Antonenko, 2015

1.2. Literature Review

Aligned with the conceptual framework, this study is anchored in theoretical dimensions that collectively underpin the formulation and role of research problems and research questions. First, a discussion of the research problem's dimensions.

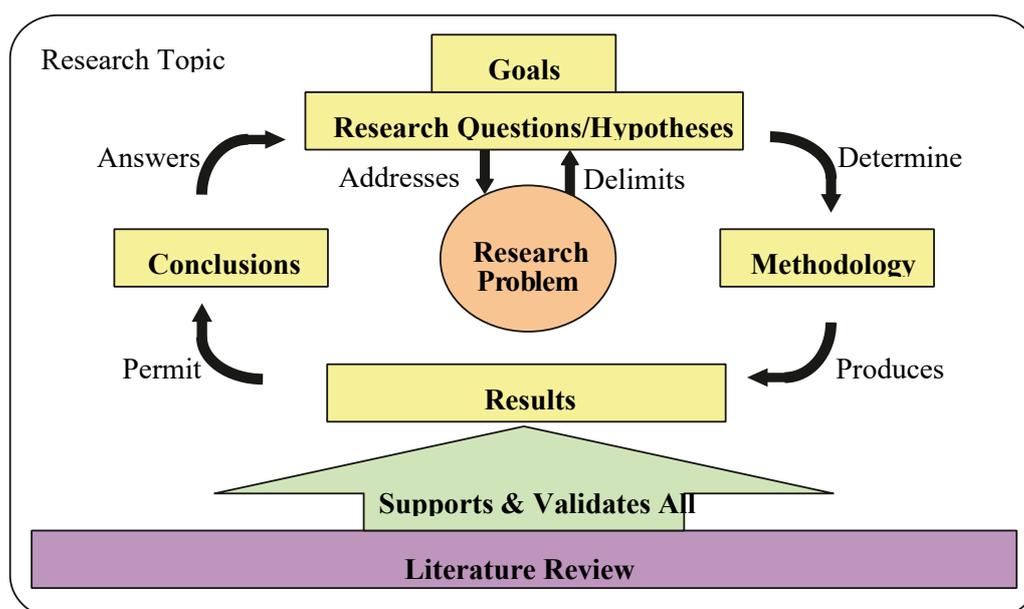
1.2.1. The Foundational Role of a Research Problem

“I keep six honest serving-men (They taught me all I knew); Their names are What and Why and When And How and Where and Who” (Kipling, 1902/1988, p. 3, in Ellis & Levy, 2008). This verse stresses the critical role of the research problem statement in guiding scholarly research by clarifying what is studied, why it is important, when and where it occurred, how it developed, and who is involved (Kehinde, 2025). In line with these views, scholars consistently rank the RP as the point of departure for scholarly inquiry. Charles et al. (2016) and Han-Jing (2023), for example, averred that the initial step in the research process is to identify and define the RP. Moreover, it is viewed as the main element that anchors successful decisions in a study, including the study’s focus and rationale (Han-Jing, 2023; Pardede, 2018), much as a building’s foundation supports structural stability (Rahman et al., 2022). Booth et al. (2016) added that the problem can be either practical or conceptual. In practice, the problem statement should identify a knowledge gap that is insufficiently addressed or remains inconclusive, necessitating further investigation (Creswell & Creswell, 2018; Stevens, 2024). Together, these assertions highlight how the RP shapes the direction and relevance of the research process.

1.2.2. From Problem Definition to Research Design

Since research problems underpin scholarly research, a clearly articulated problem should delineate the specific issue from its broader context to ensure focus and prevent deviation from the central theme (Bhagyamma & Ramesh, 2023; Haddaq et al., 2024). Correspondingly, Pardede (2018) argued that the RP also serves as a coherent framework (Figure 2) for the entire research project, guiding the selection of appropriate literature and research methodology, and aligning with the research objectives and questions (Younas et al., 2023). On this point, Haddaq et al. (2024) also suggested that a thorough understanding of the RP facilitates easier interpretation and analysis, yielding more accurate results. Conversely, vague and ambiguous RPs impede effective study management, leading to confusion and a loss of focus (Han-Jing, 2023; Pardede, 2018). In short, well-executed research establishes clear parameters for a thorough investigation.

Figure 2 Research problem serving as a coherent framework (Ellis & Levy, 2008, p. 20)



1.2.3. Strategies for Identifying and Narrowing Research Problems

Research shows that research problems can originate from various sources. For instance, the sections on “future research” suggestions indicate numerous opportunities for further investigation (Ravindra, 2022; Terrell, 2022). Replicating existing studies in new contexts can also yield different findings. For example, a study on the leadership skills of secondary school principals may yield different insights when replicated with primary school principals (Terrell, 2022). Therefore, staying up to date with the latest literature enables researchers to identify gaps or areas of insufficient knowledge (Haddaq et al., 2024; Ravindra, 2022). As Abdallah (2024, p. 1) explained: “The ability to pinpoint a relevant, researchable problem reflects a deep understanding of the field, as well as an awareness of the current gaps in knowledge that require exploration”. Also, exchanges with colleagues, experience from own practice, and media reports can generate viable research ideas (Wolhuter in Okeke & Van Wyk, 2015).

1.2.4. Components and Quality Criteria for Effective Problem Statements

Younas et al. (2024) identified three key components that structure an effective RP: context, significance, and purpose. Context situates the phenomenon within a larger subject area, providing the information needed to define and address the problem efficiently (Reffner & Kammrath, 2023). Furthermore, as Stevens (2024) noted, context provides essential information, ensuring that scientific investigations are well directed towards the effective addressing of complex issues. Concerning significance, social scientists established that the problem should be interesting to both the researcher and the reader (Bhagyamma & Ramesh, 2023; Ravindra, 2022). In this regard, Terrell (2022) explained that a lack of interest often leads to failure or incomplete work due to diminished energy and enthusiasm. This point is supported by Bhagyamma and Ramesh (2023), who mentioned that genuine interest improves motivation, creativity, and engagement. Regarding the purpose of the RPs, Terrell (2022) emphasised the importance of adhering to ethical considerations. Likewise, scholarly enquiries should be feasible and practical (Bhagyamma & Ramesh, 2023), address a manageable knowledge gap within the given time frames, possess both theoretical and practical significance, and include sufficient RPs (Ravindra, 2022). Together, these studies confirm that understanding these key components will ensure clearly delineated and articulated research problems. Yet, as Haddaq et al. (2024) pointed out, establishing clear criteria for RPs is essential but challenging. They should display sharp focus, avoid excessive multiple titles, and be researchable and measurable (Ravindra, 2022; Younas et al., 2023). Additionally, researchers need to adhere to the principles of scientific formulation and reasoning (Terrell, 2022).

1.2.5. Defining and Understanding the Research Question

The RQ is widely regarded as the other anchor of a study. Shaheen et al. (2023, p. 2) reminded us that “a research question is the first cornerstone for building an interesting research project.” Barrios et al. (2024) believed that the RQ is what the researcher and the study aim to answer. Similarly, Kross and Giust (2019, p. 24) are among those who described it as “... an unambiguous statement that clearly articulates the phenomenon you plan to investigate.” In line with this need for precision, the RQ should be aligned with and correspond to the study’s problem (Han-Jing, 2023). Nonetheless, some RPs are complex and may necessitate multiple research questions (Kross & Giust, 2019).

1.2.6. Deriving Research Questions from Research Problems

The RQ(s) stem from the research problem (Han-Jing, 2023). Accordingly, Jansen (2019) commented that the research problem is typically stated before the research question. In fact, Parathasarathy et al. (2023) emphasised that the success of research depends largely on the researcher’s ability to transform the RP into an RQ. To illustrate this process, a problem such as “postgraduate students

struggle to write a clear problem statement” may lead to a question such as “How do postgraduate students experience problem statement writing during the academic writing process?” On top of that, as research projects are often complex, multiple research questions are formulated, referred to as sub- or secondary questions (Mahesh, 2024). Amidst the quest for conciseness, Fandino (2019) cautioned that careful consideration is vital when preparing multiple RQs, as too many questions may require different research designs and disperse the study’s focus. In conclusion, Barroga and Matanguihan (2022, p. 1) observed: “Excellent research questions are focused and require a comprehensive literature search and in-depth understanding of the problem being investigated”.

1.2.7. The Centrality of Research Questions in Achieving Research Success

As underscored by Jansen (in Maree, 2019) and later Parathasarathy et al. (2023), the success of any research project hinges fundamentally on the quality of the RQ. As Cohen et al. (2018, p. 167) declared: “Research questions should enable the researcher to make a significant and innovative contribution to the field of study, say something new and interesting, and contribute to the concerns and current topics in the academic community”. While the RP sets the general direction, the RQ provides a focused, specific line of inquiry (Hosseini et al., 2024; Kross & Giust, 2019). Jansen (in Maree, 2019) also asserted that an RQ plays a critical role in confirming and clarifying what genuinely intrigues the researcher and in providing a focus for the study. In addition, Hosseini et al. (2024) argued that a well-posed research question facilitates the identification of pertinent factors, relevant literature, and appropriate research methodologies. This includes the study design. As Maxwell (2013, p. 73) confirmed: “Your research questions—what you specifically want to understand by doing your study—are at the heart of your research design”. Structuring them necessitates careful planning, which is crucial to prevent unethical research approaches, weak outcomes, engagement with irrelevant literature, uncertain research approaches, and the reliance on false or low-quality evidence (Barroga & Matanguihan, 2022; Covvey et al., 2024; Ganesha & Aithal, 2022; Hosseini et al., 2024).

1.2.8. Frameworks and Considerations for Developing Research Questions

Frameworks provide researchers with guidance for crafting appropriate RQs across quantitative, qualitative, and mixed-methods studies. As the formulation of sound RQs demands thoughtful consideration (Hosseini et al., 2024; Jansen, 2019), Covvey et al. (2024) proposed a structured approach to address all its complexities. Frameworks can provide structure and support researchers in formulating clear, focused, researchable, and scientifically justified questions. Considering this idea, Kabir et al. (2023, p. 3500) reported that “it is a common practice to use an established framework to assist in this process”. Also, van der Walddt (2025) supported the idea that using frameworks helps address complex problems and ensures specific, focused research. Thus, using “some tools,” such as frameworks, can greatly help achieve this objective (Shaheen et al., 2023, p. 2).

1.2.9. Quantitative and Interventional Frameworks

The widely used PICO(T) framework provides valuable guidelines to structure RQs in quantitative and interventional studies (Covvey et al., 2024; Fandino, 2019; Hosseini et al., 2024; Parathasarathy et al., 2023). It comprises five elements that work collectively to guide question formulation:

- Patient/Population/Problem (P): Specifies the subject of the study and inclusion and exclusion criteria.
- Intervention (I): Specifies the action (related to the outline of the methodology).
- Comparison (C): Outlines the alternative intervention.

- Outcome (O): Outlines the desired results.
- Time (T): Refers to the duration of the investigation (Covvey et al., 2024; Fandino, 2019; Hosseini et al., 2024).

The PECODR (Population, Exposure, Comparison, Outcome, Design, and Result) framework is considered an extension of the PICO model (Dawes et al., 2007). Apart from assisting researchers in formulating appropriate RQs, it is often used in systematic reviews and evidence-based practice (Covvey et al., 2024).

1.2.10. Qualitative and Mixed Methods Framework

Hosseini et al. (2024) noted that the type of study determines the choice of framework. In this regard, Covvey et al. (2024) noted the usefulness of the SPIDER framework (Sample, Phenomenon of Interest, Design, Evaluation, Research type) for qualitative and mixed-methods research. Moreover, this framework encourages scholars to address the “who”, “what”, and “how” questions in their research projects (Covvey et al., 2024). Additional frameworks used in qualitative research in educational contexts include:

PCC, PEO, and PFO. The PCC framework (P: Population, C: Concept, C: Context) refers to the study participants, the main concept being studied, and the context in which the phenomenon occurs. This framework is particularly applicable to scoping reviews and exploratory studies (Hosseini et al., 2024).

The PEO framework (Population to be studied, E-Exposure/Environment that influences the population, and the outcome (O), which points to the outcome of the study) is useful for exploring relationships between experiences and outcomes in non-interventional contexts (Kabit et al., 2023). Munn et al. (2018:3) indicated that this framework can be used to “determine the association between a particular risk and outcomes”.

The last framework is the PFO framework, which stands for P-Population, F-Factors (the key variables, influences, or phenomena of interest), and O-Outcomes. This framework is mostly used in observational or exploratory studies. Besides, Munn et al. (2018:3) acknowledged that the purpose of a PFO framework is to “determine the overall prognosis, the link between specific prognostic factors and an outcome”. According to Hirose and Creswell (2023), quantitative and mixed-methods studies include questions and hypotheses, whereas qualitative studies state questions or aims rather than hypotheses.

1.2.11. Frameworks for Service Evaluation, Policy, and Applied Settings

In applied, policy, or service evaluation contexts, frameworks such as ECLIPSE and SPICE provide a structure for questions related to service design, delivery, and impact.

ECLIPSE (Expectation, which helps researchers articulate the intended outcomes), C (Client group, focusing on the target population), L (Location, the geographic area where the service is provided), I (Impact, the effect of the actions), P (Professionals, those who are involved), and S (Service: evaluation of services). This framework is mostly suitable for assessments and for researchers focusing on projects, services, or policies (Covvey et al., 2024, p. 67). Hosseini (2024:2) advocated for its use, stating that it is used for “policy and management”.

The SPICE framework comprises the Setting, Perspective, Intervention, Comparison, and Evaluation. This framework is useful for evaluations within specific organisational, social, or educational settings (Covvey et al., 2024).

1.2.12. Evaluation of Research Questions Using the FINER Framework

To ensure that RQs are concise, though robust and meaningful, they should be evaluated. For this reason, researchers apply evaluative frameworks to test the quality of a question against established criteria. The FINER framework, with its dimensions of feasible, interesting, novel, ethical, and relevant, is the appropriate framework for assessing RQs and refining them to enhance clarity and practicality (Covey et al., 2024; Fandino, 2019; Goldschmidt & Matthews, 2022; Han-Jing, 2023). According to Han-Jing (2023) and Covey et al. (2024), the term “feasible” implies that the RQ is practical within the researchers’ capabilities and resources, whereas the term “interesting” suggests that the question should be captivating. Goldschmidt and Matthews (2022) averred that the term “novel” guarantees that the question addresses an unexplored issue. What’s more, the concept “Ethical” ensures the research will not cause harm or ethical conflicts, while the word “relevant” implies that the question is significant to the scientific community and society (Covey et al., 2024; Han-Jing, 2023). To maintain relevance, frameworks should be reviewed and revised iteratively throughout the research process (Mahesh, 2024).

Checklists and templates can also be used to ensure that research problems and questions meet the required standards.

1.2.13. Research Problem Development Checklist

Gap identified: Does the problem clearly identify a conceptual, empirical, or practical gap in educational research? (Barroga & Matanguihan, 2022; Busetto et al., 2020; Creswell & Creswell, 2017; Han-Jing, 2023; Nassaji, 2023; Purvis et al., 2024; Srinivas et al., 2023).

Context and multidisciplinary considerations specified: Is the educational setting clearly described (e.g., schooling level, discipline, geographical or institutional context)? (Nishiyama & Leleito, 2018).

Significance and relevance justified: Does the problem answer the “So what?” question for theory, practice, or policy? Does it address gaps in existing literature or practical issues (Supino & Epstein, 2012)?

Population and context identified: Are the learners, educators, institutions, or stakeholders affected by the problem explicitly indicated? (Reffner & Kammrat, 2023).

Scope manageable: Is the problem narrow and feasible enough to be investigated within time, ethical, and resource constraints? (Aityan, 2022; Terrell, 2022).

Integration with purpose, literature, methods, and results: Does the problem logically motivate the study’s aim or purpose statement? (Ochoa-Pachas, 2024; Younas et al., 2024).

Kehinde (2025) proposed a structured, yet flexible three-stage method for developing problem statements, dividing each statement into the ideal situation, the problem with challenges, and the problem’s consequences.

1.2.14. Formulation Template for Problem Statements

Despite growing emphasis on [educational practice/policy/approach], there is limited empirical evidence regarding [specific issue or gap] among [population] in [educational context]. Existing studies have largely focused on [what is known], leaving insufficient understanding of [what is unknown or contested]. This gap limits [educational outcomes, decision-making, or theory development], underscoring the need for a systematic investigation.

1.2.15. Research Question Quality Checklist

- Is the research question directly derived from the problem? (Han-Jing, 2023).
- Is the research question interrogative and precise? (Hosseini et al., 2024).

- Can the question be answered using identifiable qualitative, quantitative, or mixed methods? (Hosseini et al., 2024).
- Does the question acknowledge educational context (setting, participants, system)? (Covey et al., 2024).
- Does the question clearly guide sampling, data collection, and analysis? (Covey et al., 2024).
- Is the question Feasible, Interesting, Novel, Ethical, and Relevant? (Covey et al., 2024; Fandino, 2019; Goldschmidt & Matthews, 2022; Han-Jing, 2023).
- If multiple questions are used, do they complement rather than duplicate one another? (Fandino, 2019; Jansen, 2019).

1.2.16. *Template for Research Question Set (Derived from the Problem)*

Central Research Question

- How does [key phenomenon] influence [outcome/experience/process] among [population] in [educational context]?

Sub-questions (if applicable)

- What are the perceptions or experiences of [participants] regarding [phenomenon]?
- What contextual factors shape [phenomenon] in [setting]?
- What outcomes or implications emerge from [phenomenon] for [practice/policy/theory]?

2. Method

This study employed a qualitative research approach within a systematic review framework, aligning with the views of Aten and Denney (2023), who argued that the main aim of qualitative research is to gain a deep understanding of a particular phenomenon.

Table 1 *Eligibility criteria*

Focus areas	Inclusion criteria	Exclusion criteria
Study type	Peer-reviewed articles, conference papers, theses and dissertations.	Editorials, opinion pieces, book reviews, and non-peer-reviewed articles.
Language	Studies published in English.	Studies published in languages other than English.
Publication date	Studies published from 2000 onwards.	Studies published before 2000.
Focus	Studies explicitly discuss the differences between problem statements and research questions.	Studies that do not specifically address the distinctions between problem statements and research questions.
Methodology	Qualitative, quantitative and mixed-methods.	Studies with unclear or poorly defined methodologies.
Discipline	Studies from various disciplines, including social sciences, education and health sciences.	Unrelated fields or topics.
Accessibility	Full-text articles available.	Requesting payment to access articles.

The SLR applied a language restriction to English only because most scholarship on the topic is conducted in English. By establishing clear criteria, we aimed to improve the study's reproducibility. This process was also essential for verifying results, building on previous research, and managing the study. The reference list provided evidence of all the databases, registers, websites, organisations, reference lists, and other sources consulted to identify studies. To minimise bias, we employed a rigorous and transparent approach during the search (Gusenbauer & Haddaway, 2020). For this purpose, we used the Risk of Bias in Systematic Reviews (ROBIS) instrument to evaluate the overall trustworthiness of the reviews' conclusions (Shaheen et al., 2023). Our focus was on multiple major bibliographic databases to conduct a comprehensive search encompassing diverse perspectives and disciplines relevant to the study (Gusenbauer, 2022).

- ERIC (Education Resources Information Centre)
- EBSCOhost (EBSCOhost Research Platform)
- Directory of Open Access Journals (DOAJ)
- PubMed
- SciSpace

Search engines such as Google Scholar and Google were also used to widen coverage (Pillay, 2024; Tawfik et al., 2019). Filters were applied to keywords, titles, and abstracts to ensure that the topic was thoroughly examined. These filters included phrases such as “problem statements”, “research questions”, “differences between problem statements and research questions”, “formulating research questions”, and “developing problem statements”. Starting with a pilot search strategy, the search was monitored and periodically updated to incorporate newly published studies. Boolean operators, such as AND, OR, and NOT, were used to refine the search, and we adapted the word order for different databases (Skinner, 2023).

2.1. Screening and Study Selection Process

The screening process involved multiple steps to ensure only relevant, high-quality studies were included. Initially, titles and abstracts were assessed by two independent reviewers for relevance using predefined criteria. Studies that did not meet the qualification criteria were excluded. Next, a detailed full-text review was conducted to determine final inclusion. The reviewers conducted their work independently but met weekly to discuss the process and resolve uncertainties. Reasons for exclusions were documented to support transparency and reproducibility, and then data extraction followed. A Standardised form was used during this process (Table 2). To evaluate consistency among reviewers during the screening process of the title, abstract, and full-text screening, Cohen's Kappa (k) model of Inter-Rater Reliability (IRR) was employed. This established how the reviewers evaluated, scored, and classified the research topic. Cohen's method provides a strong statistical measure of inter-rater agreement (Li et al., 2023). Kappa values were interpreted using standard benchmarks (e.g., $\kappa < 0.40$ = fair agreement; $0.41-0.60$ = moderate; $0.61-0.80$ = substantial; >0.80 = almost perfect). The use of Cohen's Kappa strengthened the credibility, reproducibility, and reliability of the selection process by identifying areas requiring adjustment (Almehrizi, 2025).

2.2. Role of the Researchers

The researchers designed a clear review protocol, a process supported by Gough and Newman (in Zawacki-Richter et al., 2020). This process included defining the purpose, eligibility criteria, search strategy, and appraisal methods. A comprehensive literature search was conducted across multiple databases using structured keywords. This was followed by an independent screening of studies.

Inter-rater reliability was verified using Cohen’s Kappa. Data were extracted using a standardised form (Table 2), and the quality of the study was appraised using the CASP checklists with dual-reviewer consensus (CASP, 2023). The researchers synthesised findings through thematic analysis. Objectivity was maintained through language-neutrality checks and sensitivity analyses.

Table 2 Summary of Data Extraction Plan

Step	Description	Actions
Identify data sources	Determine relevant literature sources.	Search databases, journals and repositories
Pilot testing	Tested extraction form	Conducted a trial run on a subset of studies
Extract data	Extract from selected studies.	Use the standardised form
Data cleaning	Reviewed and cleaned for completeness	Checked for inconsistencies, missing data, and errors.
Data synthesis	Analyse the extracted data.	Used qualitative methods to synthesise the data and draw conclusions.
Monitoring	Maintain quality	Ensured ongoing accuracy and consistency in data extraction.

2.3. Characteristics of the Study

To ensure trustworthy reporting, we adhered to the highest quality standards (Page et al., 2021). Documenting the search process is essential, as it enhances replicability and provides a basis for future updates (Gusenbauer & Haddaway, 2020). In terms of quality, we followed the advice offered by Gough and Newman (in Zawacki-Richter et al., 2020): the study design should be suitable for the RQ, the study methods should be executed with rigour, and the relevance of the review questions to the study should be assessed. To ensure methodological strength, a Critical Appraisal Skills Programme (CASP) was used (Carroll & Booth, 2014). Using a CASP checklist (Appendix B), the two reviewers structured their prompts to evaluate the validity, results, and relevance of the included studies. The two reviewers completed the checklist independently, discussed the discrepancies, and reached consensus. To promote comprehensive and transparent reporting and minimise discrepancies between protocols and completed reviews, we adhered to the PRISMA-P checklist (Shaheen et al., 2023; Shamseer et al., 2015). This rigorous approach strengthened the trustworthiness and applicability of the findings (Page et al., 2021). Additionally, we conducted an extensive literature search to enhance the reproducibility, reliability, and overall quality of the review (Iqbal et al., 2022). An emphasis on study quality, objectivity, and bias was operationalised using measurable criteria. For this reason, specifically, we employed a language-neutrality checklist (Appendix C) to avoid leading or value-laden phrasing in data extraction and synthesis. This checklist is supported in:

- Avoiding adjectives that imply judgment (e.g., “significant,” “important”) unless statistically supported.
- Using consistent terminology across studies.
- Ensuring interpretations are grounded in evidence rather than the researcher’s assumptions.

To further ensure transparency and accountability, we registered the review protocol on OSF (<https://doi.org/10.17605/OSF.IO/M9K2T>), in which we clarified the intent, methods, and inclusion criteria prior to data collection. This process reduced bias (Frewen et al., 2023).

2.4. Sensitivity Analysis

A sensitivity analysis was conducted to assess the quality of the review's findings (Marušić et al., 2020). The synthesis was rerun after excluding studies rated as low quality. The idea was to determine whether such studies overly influenced the overall conditions of this study. Themes were then derived from the full dataset and compared with those from subsets. Lastly, the reviewers re-evaluate the agreements after removing borderline cases that did not meet the study's criteria (Carroll & Booth, 2014). The sensitivity analysis supported the trustworthiness and transferability of the results.

2.5. Data Synthesis Process

We conducted a reflexive thematic analysis comprising familiarisation with the data, inductive coding, theme development, review, and definition and reporting (Braun & Clarke, 2021). A detailed codebook containing all codes, definitions, and inclusion/exclusion boundaries is provided in Appendix A. The reviewers double-coded an initial 20% of the sub-categories and reconciled discrepancies through discussion. Discrepancies were addressed with follow-up discussions. Decisions were documented in reflective journals, with audit trails that trace the process of translating the codes into themes. The execution stage comprised implementing the search strategy, screening titles and abstracts, and retrieving full-text articles. Extracted data were synthesised through thematic analysis and interpreted accordingly. In line with PRISMA requirements, results were compiled into a structured report with periodic updates. To reduce publication bias, grey literature sources—including conference proceedings, theses, and dissertations—were incorporated (Gusenbauer & Haddaway, 2020). The search, conducted between March 2024 and February 2026, targeted studies published from 2014 to 2026 to ensure relevance. Initially, 569 records were identified; after removing duplicates, 480 remained. Title and abstract screening excluded 188 records, leaving 292 for full-text review. Of these, 237 were excluded for the following reasons:

- 164 were irrelevant
- 45 lacked full text
- 11 were not in English
- 7 were not peer-reviewed
- 7 were duplicates
- 3 employed questionable methodologies.

Ultimately, 55 articles were included in the final analysis. Figure 3 illustrates the PRISMA flow diagram summarising the screening and selection process.

Figure 3 PRISMA flow diagram of studies screening and selection

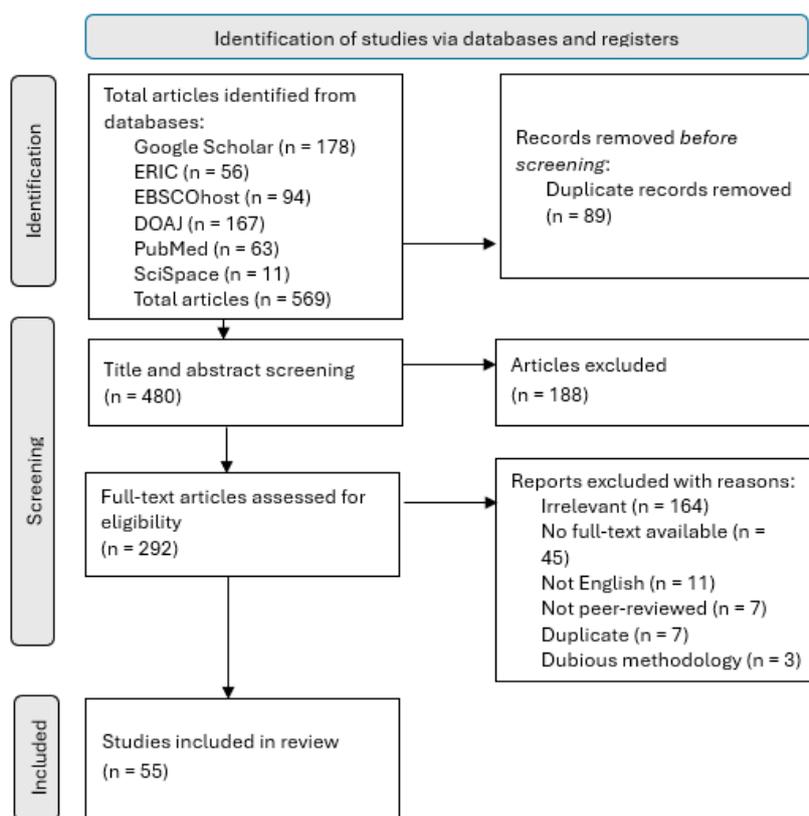


Figure source: Adapted from Page et al. (2021)

3. Results

The data were coded, and similar segments were categorised and clustered according to themes (Miles et al., 2024). This systematic coding procedure is used to ensure rigorous, transparent findings. Each included study was read repeatedly to ensure familiarity with its content before meaningful segments of text were identified and assigned initial descriptive codes. These codes captured core ideas related to the study's aims, including distinctions between research problems and research questions, their functions, origins, formulation criteria, and associated frameworks. This was an iterative and recursive process in which the codes were refined, merged, and expanded as new insights emerged. The following four themes were developed:

- The Significance and Purpose of Defining Research Problems and Questions
- Origins and Sources of Research Problems and Research Questions
- Criteria for Formulating Effective and Rigorous Research Problems and Questions
- The Role of Conceptual and Theoretical Frameworks in Developing Research Problems and Questions

3.1. The Significance and Purpose of Research Problems and Research Questions

Table 3 summarises the significance and purpose of RPs and RQs, differentiating among their primary functions, scope, roles in design and formulation, and typical formats. It also incorporates relevant studies to illustrate variations in how these constructs are conceptualised.

Table 3 The Significance and Purpose of Research Problems and Research Questions

Aspect	Research Problem	Research Question	Representative Sources
Primary function	Establishes significance and need by identifying a practical or conceptual gap; justifies the inquiry.	Operationalises the inquiry into specific, answerable prompts that guide methods and analysis.	(Barroga & Matanguihan, 2022; Busetto et al., 2020; Creswell & Creswell, 2017; Han-Jing, 2023; Nassaji, 2023; Purvis et al., 2024; Srinivas et al., 2023)
Scope	Broad, contextual, justificatory (the "so what?").	Narrow, focused, method-directing (the "what/how/why?").	(Barroga & Matanguihan, 2022).
Role in design	Frames aim/purpose and motivates relevance; identifies knowledge gaps.	Shapes sampling, instruments, procedures, and analytic strategy.	(Creswell, 2017; Han-Jing, 2023; Maxwell, 2013; Purvis et al., 2024)
Formulation	Often articulated early to justify contribution.	In flexible designs, refined iteratively as understanding deepens.	(Maxwell, 2013).
Typical format	Declarative statement describing an issue/gap.	Interrogative statements (central + subquestions) or hypotheses (quantitative).	(Creswell & Creswell, 2017).

This data highlighted meaningful differences between RPs and RQs, particularly in terms of their significance and purpose. Moreover, RPs are central to addressing pressing issues, whereas research questions guide the investigations required to address those gaps. The study also revealed that although both RPs and RQs establish the boundaries for the research enquiry, they do so in distinctive ways. While the problem sets a broad context and provides a justification for the research, the questions narrow the scope by setting focused boundaries. These boundaries guide the literature search, research approach, design, and data collection methods. This, in turn, directs the process of evidence finding and analysis. To address these mixed demands, educational researchers often employ multiple RQs, especially in larger studies or when addressing complex research problems.

3.2. The Origins and Sources of Research Problems and Questions

Table 4 below summarises typical sources of research problems and the routes through which they develop into RQs. It includes examples from relevant studies to show how researchers identify problems rooted in conceptual, social, or contextual origins, and then refine these into coherent questions that guide methodological decisions.

Table 4 Route of Development for Research Problem into Research Questions

Source of the problem	Examples	How a Research Problem Is Transformed into Research Questions	Representative sources
Conceptual/theoretical debates	Competing explanations; unresolved constructs	Pose questions that test/compare frameworks or specify relationships	(Booth et al., 2016; Creswell & Creswell, 2017; Han Jing, 2023; Pardede, 2018; Purvis et al., 2024; Srinivas et al., 2023).
Social/cultural contexts	Local practices; cultural constraints	Frame questions around context, meaning, and process	(Akhidime, 2017; Bryman et al., 2021; Madhu et al., 2024)

Source of the problem	Examples	How a Research Problem Is Transformed into Research Questions	Representative sources
Technological/policy change	New tools, reforms, and regulations	Ask evaluative or explanatory questions about impacts and adaptation	(Madhu et al., 2024).

The key result demonstrated that RPs rarely arise from a single source. They can arise from a network of intellectual discourse and practice. These include the “suggestions for further research” sections in completed studies and a need to replicate completed research. Replicating studies validate or challenge prior findings, refine theories, and enhance methodological precision. In a field such as education, where reproducibility is often a concern, replication is critical. Researchers need to keep abreast of the current literature by understanding current debates, contradictory findings, and emerging trends. Collaboration and scholarly exchange through conferences and interactions with other scholars also enable the sharing of research ideas and the critical feedback on them. In the field of education, RPs also arise from conceptual, contextual, and policy dynamics. Ambiguities in these fields create opportunities for further research, including comparative or clarifying investigations. Lastly, RPs also stem from evaluative and explanatory investigations, including implementation, impact, and institutional adaptation.

3.3. The Criteria for Formulating Effective Research Problems and Questions

Table 5 outlines the key criteria for scholarly standards that ensure clarity and coherence in research problems and questions. It also illustrates how each applies differently to RPs and RQs, drawing on guidance from the established methodological literature.

Table 5 Key criteria to ensure clarity and coherence in research problems and questions

Criterion	Research Problem	Research Question	Key sources
Significance	Addresses a meaningful gap (practical or conceptual); passes the "So what?" test.	Targets a specific facet of the problem that can be answered empirically.	(Booth et al., 2016, 2018; He et al., 2023)
Clarity & focus	Clear statement of the issue and boundaries (phenomenon, population, context).	Interrogative, specific, bounded ("what/how/why") — serves as a design signpost.	(Creswell & Creswell, 2022; Maxwell, 2013)
Feasibility & ethics	Achievable with available time, data access, expertise; ethically approvable.	Answerable with feasible methods/measures and acceptable participant burden.	(Covey et al., 2024; Fandino, 2019; Goldschmidt & Matthews, 2022; Han-Jing, 2023)
Relevance & novelty	Contributes to knowledge, policy, or practice. Advances debate.	Produces interpretable, decision-useful evidence (outcomes, experiences, mechanisms).	(Covey et al., 2024; Fandino, 2019; Goldschmidt & Matthews, 2022; Han-Jing, 2023)
Context sensitivity	Locates the issue in the setting, stakeholders, and systems.	Incorporates setting/perspective/context where appropriate.	(Booth et al., 2018; Covey et al., 2024; Fandino, 2019; Goldschmidt & Matthews, 2022; Han-Jing, 2023)

Criterion	Research Problem	Research Question	Key sources
Alignment	Coherent with aims/purpose; motivates the study.	Aligns aims → methods → analysis; prevents fragmentation.	(Heitner, 2014; Newman & Covrig, 2013)

The review made clear the foundational role of RPs, which hinge on several probing questions that collectively ensure depth, direction, and intellectual resolution in their formulation. In addition, RPs identify a significant gap in a field. Conversely, RQs target specific components of that problem to guide the inquiry. Both require correct formulation, feasibility within constraints, and clear theoretical or practical relevance. The review emphasises that researchers should continually revisit and refine both elements. This recursive process is important for maintaining focus and upholding ethical objectivity. Furthermore, the data revealed that context sensitivity should be reviewed to enhance the accuracy and applicability. For this reason, the problem should be situated within appropriate settings, stakeholders, and systems. The review also showed that the availability and feasibility of literature remain shared requirements. While RPs are presented in paragraph form and provide the broader contextual structure, RQs address the identified gaps and are typically presented separately in interrogative form.

3.4. Guiding Frameworks for the Construction of Research Problems and Questions

Table 6 below illustrates frameworks that could be utilised to structure RPs and RQs.

Table 6 Frameworks to be utilised to structure RPs and RQs

Dimension	Problem Statement	Research Questions
Frameworks Commonly Used	No formal frameworks or practical tools are included; FINER and Faryadi's guiding questions are used.	Multiple established frameworks (e.g., PICO, PICo, SPIDER, SPICE) for structuring questions.
Iteration	May require refinement as context and literature evolve.	Often revised iteratively to maintain relevance and rigour throughout the research process.
Checklists & Templates	Enhance conceptual clarity, analytical precision, and identification of conceptual, empirical, or practical gaps. They support contextualisation. Explore, define, differentiate, contextualise, and justify research gaps.	Improve correctness, methodological appropriateness, contextual alignment, and accountability across qualitative, quantitative, and mixed-method studies. Provide transparency in organising primary and secondary questions to strengthen the research design and structure.

The findings indicated that frameworks are highly valuable for formulating clear and insightful research questions. Established models such as PICO(T) and SPIDER help researchers structure comprehensive and focused questions by addressing all essential components of the research design. Using the FINER framework is another highly beneficial strategy when formulating RQs, improving clarity and practicality. However, it appears that the framework's feasibility depends primarily on resource availability and engagement. Interestingly, the review identified limited literature on frameworks for developing research problems. That said, a systematic approach could be useful in this case as well, starting with problem identification, reviewing relevant literature, and labelling key concepts and variables. Understanding these constructs and their interdependencies could be enhanced by appropriate visual representations. This is an evolving process that necessitates ongoing refinement. In summary, while frameworks for research questions are well-established and demonstrably useful, their limitations and context-specific applicability must be

acknowledged. In the same way, the scarcity of formal frameworks for problem formulation underscores the need for systematic strategies to ensure clarity, feasibility, and congruency with research objectives.

The SLR demonstrated that checklists and templates are effective strategies for developing RPs and RQs in educational research. For example, the Research Problem Development Checklist can enhance conceptual clarity and analytical precision by identifying conceptual, empirical, or practical gaps in studies. Checklists encourage contextualisation of educational settings and strengthen the significance and relevance of statements. Plus, they clearly identify the target population in studies, thereby sharpening their focus. The data revealed that studies that used checklists were more manageable, focused, feasible, and aligned with the study's purpose, literature focus, methodology, and analysis. By comparison, a Problem Statement Template enables researchers to explore, define, differentiate, contextualise, and justify research gaps. Beyond this, the template enhances clarity across studies and provides structured guidance to evaluators of research projects.

Research Question Quality Checklists improve correctness, methodological appropriateness, and accountability through a range of research methods. Even more, checklists encourage the situating of questions within specific educational contexts, thereby improving interpretive clarity, sampling processes, data collection, data analysis, and redundancy. The Research Question Template provides a transparent way to organise research questions, including primary and secondary ones. It helps to improve research design and align investigations with meaningful educational phenomena and contextual factors. The template supports consistency and uniformity in structure.

4. Discussion

The results of the SLR found that, despite substantial scholarly work on RPs and RQs, the literature appears largely fragmented. It also showed signs of uneven theorisation and inconsistent terminology. On the contrary, several key patterns emerged, including greater clarity on definitions, quality criteria, strategy formulation, and the applicability of existing frameworks.

Regarding RQ 1, there was evidence that inexperienced researchers struggle to identify and articulate concise RPs and RQs. This finding aligns with Ellis and Levy's (2008) longstanding claim that this step is the most demanding in the research endeavour, a view reinforced by Kehinde (2025), who underlined that mastering the writing of an effective problem statement is essential for structuring impactful studies that attract academic or funding support. The reviewed literature confirmed that RPs and RQs work in tandem; their relationship is interdependent, a view supported by Maxwell (2013) and Ochoa-Pachas (2024), who described the two constructs as joint, interactive anchors for methodological coherence. The findings also exposed significant differences between the RP and the RQ: the research problem establishes the core issue and the need for the study (Srinivas et al., 2023), whereas the research question converts the study's motivation into specific questions (Nassaji, 2023). Furthermore, several scholars further noticed that the RP provides the bedrock for the entire study, while the RQ serves as the instrument of delimitation (Creswell & Creswell, 2018; Kross & Giust, 2019; Younas et al., 2024). That said, a noteworthy contradiction surfaced regarding the inclusion of research questions in different types of academic research. One group of scholars (Grant & Osanloo, 2014; Ravitch & Riggan, 2016; Taherdoost, 2022) averred that RQs are not always required, especially in conceptual and theoretical studies. In contrast, Aguinis (2025) and Bahishti (2022) contended that RQs are indispensable for empirical research and ensuring methodological soundness. This disagreement amongst researchers highlights an unresolved issue in the field: RQs are sometimes viewed as necessary for all types of studies and sometimes not. Despite these

conflicting views, the insights under this theme suggest that aspects of the research process generally operate and evolve iteratively. Hence, they underscore the importance of strong integration between RPs and RQs, especially in enhancing feasibility, conceptual clarity, and interpretive validity in qualitative and mixed-methods studies (Busetto et al., 2020; Purvis et al., 2024).

The evidence from the SLR indicates that dealing with complex phenomena requires multiple, interconnected questions (Han-Jing, 2023; Purvis et al., 2024), though researchers also need to be mindful of narrowing the scope to ensure a clear literature and analytic focus (Bryman et al., 2021). In line with the view that RPs and RQs are critical components of research, formulation is vital. Therefore, Stevens (2024) emphasised the use of clear, precise, unambiguous language, while Kehinde (2025) warned that a poorly defined problem risks an unfocused, overly broad, or irrelevant study that becomes a quagmire. Overall, these findings converge on a key insight: thoughtfully crafted RPs and RQs serve as conceptual anchors that strengthen coherence across studies.

Regarding RQ 2, the SLR findings confirmed that educational research problems arise from multidimensional factors, including prior studies, study replication, educational debates, policy dynamics, and real-world educational and societal challenges (Akhidime, 2017; Madhu et al., 2024; Machimbizofa, 2025). Complimenting this standpoint, Barrios et al. (2024, p. 377) argued that scholars should: “Begin a diagnosis of the current situation. That is, identify the facts or situations that are observed when analysing the object of the research (these are the symptoms of the problem)”. The data also highlighted the distinction between practical and conceptual problems, as noted by Creswell and Creswell (2017) and Booth et al. (2016). These perspectives imply the need for deeper engagement with the literature—a point reinforced by Creswell and Creswell (2018), confirming further the need to stay abreast of current scholarship. Also, Hart (2018) and Machi and McEvoy (2016) stressed the importance of identifying knowledge gaps and immersing oneself in the existing literature. Although these perspectives predominantly emphasise systematic, literature-driven approaches, other researchers have alluded to the value of informal, practice-based approaches, such as professional experiences and media reports (Wolhuter in Okeke & Van Wyk, 2015). This indicates that the process is not always systematic but sometimes depends on context.

In addressing RQ 3, the SLR underscored the foundational role of RPs and RQs. Creswell and Creswell (2018) acknowledged that RPs identify significant gaps, while RQs target specific components to guide investigation. Regarding the nature of knowledge gaps, Abdallah (2024, p. 2) observed: “It is not merely a lack of information but a situation where existing knowledge is insufficient or inconclusive to address a particular issue”. Barrios et al. (2024) coined the term “research problem question,” which they regard as the guiding pillar of any scientific study (Barrios et al., 2024). These views underline the critical importance of strong RP and RQ development. Kehinde (2025), for instance, cautioned that a weak RP jeopardises the entire study. In support of this view, Creswell (2015, p. 4) stressed: “Identifying a research problem consists of specifying an issue to study, developing a justification for studying it, and suggesting the importance of the study for select audiences”.

The SLR also identified interesting similarities between RPs and RQs. For example, both constructs require precise formulation, feasibility, and clear theoretical or practical relevance. Moreover, refinement seems critical to maintaining focus and upholding ethical objectivity. Another key finding is the vital role of contextual sensitivity; Abdallah (2024), for example, explained that situating RPs within relevant settings and the literature enhances accuracy and applicability. As Kehinde (2025, p. 95) noted: “Tailor the problem to one’s specific field, region, or sector”. Stevens (2024) contextualised inclusion and justification, while Abdallah (2024) emphasised the need for contextualised educational environments. However, it should be noted that while the RP is positioned by many

scholars as the bedrock for conducting research (Charles et al., 2016; Han-Jing, 2023; Pardede, 2018; Rahman et al., 2022; Stevens, 2024), others contradict the idea and prioritise RQs or aims as the main drivers of scholarly enquiry (Jansen in Maree, 2019; Parathasarathy et al., 2023). These opposing views revealed a contradiction in the literature over what really constitutes the foundation of research design. This uncertainty emphasises the need for a framework that positions each element, RP, RQ and aims more clearly in research studies. Collectively, these findings also underscore the necessity for systematic, context-responsive strategies to promote scientific rigour when crafting problems and questions.

RQ 4 of the SLR explored the use of frameworks and checklists in developing and evaluating RPs and RQs. Frameworks seem highly beneficial for strengthening accord among research questions, literature selection, and methods. This view is confirmed by Munn et al. (2018, p. 3), claiming that frameworks may assist in “investigating the experience or meaningfulness of a particular phenomenon”. The SLR identified various frameworks for various study types and purposes: PICOT/PICO/PECODR for quantitative or interventional studies; SPIDER/PCC/PEO for qualitative or mixed-methods research (Covey et al., 2024); and SPICE/ECLIPSE for policy, service, or contextual inquiries. It should be noted, though, that while frameworks such as the PICO(T) and PECODR are promoted as invaluable for quantitative research, their components may not be suitable for all quantitative studies. In addition, with their emphasis on context, the SPICE and ECLIPSE may be unsuitable for other academic inquiries. The FINER framework proved useful as an evaluation tool (Han-Jing, 2023; Covey et al., 2024), but the requirement for iterative revision during research question development (Mahesh, 2024) may pose challenges given the framework’s fixed nature.

There is a paucity of literature on frameworks for problem formulation, though Faryadi’s (2012) questions are among the few structured options. In this regard, researchers also hold conflicting views on the criteria for structuring PSs. The one suggested by Kehinde (2025) focuses on the ideal state and its related consequences, which may create a misalignment between a theoretically sound problem statement and a practically fragmented one. Unlike Kehinde’s aspirational orientation, Faryadi’s framework foregrounds contextual specificity and targeted questioning, thereby offering a more grounded mechanism for transforming an observed gap into a coherent, researchable statement. This contrast highlights the broader disagreements in the literature: whether PSs should be constructed from an idealised vision of what should be, or from a rigorous unpacking of what currently is. Additionally, the RP is generally viewed as a construct that should address a clear gap within a well-defined context (Akdime, 2017; Creswell & Creswell, 2018; Stevens, 2024). This framing is broad and may contradict the idea of manageability. Another point of disagreement among scholars is the criteria used in the structured approach. The SPIDER, PCC, PEO, and PFO frameworks are beneficial for question formulation (Covey et al., 2024; Hosseini et al., 2024), contradicting the literature, which claims that qualitative studies prioritise flexibility in research.

Complementing the value of these frameworks, checklists, and templates emerged as powerful aids that enhance clarity, focus, and coherence in studies. The SLR findings revealed several other benefits. Studies using checklists produced more manageable, feasible, and ethically grounded problem statements (Aityan, 2022; Terrell, 2022). These tools reduce conceptual drift and promote coordination, a notion echoed by Ochoa Pachas (2024) and Younat et al. (2024). In addition, they also help identify theoretical, conceptual, empirical, or practical gaps (Institute of Education Sciences et al., 2013; Barroga & Matanguihan, 2022; Creswell & Creswell, 2017; Purvis et al., 2024). Furthermore, Abdallah (2024) highlighted their role in clarifying knowledge gaps and addressing insufficient or

inconclusive knowledge. Checklists also clarify target populations and intended audiences, as emphasised by Stevens (2024).

Despite these advantages, the SLR also reflects contradictory views on the value of checklists and templates. Besides the advantages described elsewhere, some scholars, such as Supino & Epstein (2012), view them as mechanisms that enhance the relevance of problem statements at the theoretical, practical, and policy levels. Other proponents, such as Charles et al. (2016), highlighted their value for aligning problems, purposes, questions, and the study's methods, while Stevens (2024) emphasised their value for contextualisation. In contrast, critics caution that adherence to templates may hamper originality and oversimplify complex educational problems. This prescriptive nature, in turn, may risk sound intellectual engagement in favour of compliance. It may also hamper critical reasoning and creativity, a prerequisite for quality educational research.

4.1. Limitations and Sensitivity of Findings

Although this review provides a comprehensive synthesis of the distinctions between research problems and research questions, several limitations should be acknowledged. These include issues related to the sensitivity of the findings, the methods, and the disciplinary and conceptual contexts. For instance, research questions are generally stronger within structured research designs, whereas in other approaches, they may evolve during data collection. Therefore, research problems and research questions differ in ordering and degree of formalisation. Besides, this point indicates that the applicability of the findings is methodologically sensitive. This, in turn, requires careful interpretation across different paradigms. Second, although the review focused predominantly on education, very little literature on formal research frameworks in education was found. This forced the researchers to draw on work from the social sciences and the health professions. Although this approach enhances transferability across research contexts, disciplinary differences may influence how problems and questions are formulated, operationalised, and applied in practice. Also, the scarcity of formal frameworks is sensitive to the breadth of their definitions. Consequently, there is a need for standardisation and explicit guidance for problem-formulation tools. Third, the review's sensitivity analysis revealed that poor formulation has the greatest impact on novice researchers. Challenges with formulation often lead to inconsistency, which subsequently may result in disorganisation, methodological irregularity, or even diminished rigour. Lastly, the conclusions regarding the risks of pursuing multiple problems or questions may also present challenges. While large-scale studies may require multiple questions, small studies have a narrower focus. This difference in focus necessitates that researchers apply findings with consideration of the study's scale, complexity, and purpose.

4.2. Directions for Future Research

Future research could examine the most common sources of research problems in education and investigate the impact of well-defined research problems on research outcomes. It would also be valuable to explore how the context in which research problems are situated influences their formulation and outcomes. Furthermore, future studies could focus on designing frameworks for research problems and investigating the benefits and limitations of using structured frameworks for developing research problems and questions. Finally, comparing the outcomes of studies that focus on practical research problems with those that address theoretical ones would contribute significantly to the existing body of knowledge in this field.

4.3. Implications for Practice

Supervisors and postgraduate researchers can use an alignment matrix during the research process

to ensure focus and coherence, following the sequence of problem, purpose, questions, methods, and analysis. In addition, supervisors should apply a neutrality checklist to reduce bias in studies, which may include avoiding value-laden adjectives, ensuring terminological consistency, and supporting the accurate interpretation of evidence. It is also recommended that researchers utilize frameworks appropriately, such as PICO(T)/PECODR for interventional and quantitative contexts, and SPIDER/PEO/PCC/SPICE for qualitative, mixed, and evaluation contexts. Finally, using problem and question guidance templates and checklists, along with rubric-based assessment of research questions and problems, can further enhance the quality and rigor of the research process.

4.4. Conclusion

This systematic review, drawing on two decades of research, aimed to clarify the distinction between the problem statement and the research question in education. The review revealed that these two constructs are often approached interchangeably in practice. Yet, they serve different purposes. The findings confirmed that they mutually reinforce the research design's purposes. It was found that the research problem establishes the significance, context, and rationale for the study. The research question, by contrast, draws from the problem to guide the research into a focused line of investigation. Poorly formulated problems and questions lead to conceptual and methodological vagueness and drift, resulting in shallow analyses. Also, the SLR revealed that research problems stem from several conceptual, contextual, and policy-driven sources. Hence, it requires thoughtful, intentional justification and delimitation. Research questions, by comparison, operationalise these problems. They, in turn, demand precision and feasibility. Scholars emphasised the need for clear criteria as a prerequisite for developing and formulating strong research questions. The criteria that emerged were clarity, relevance, feasibility, context sensitivity, ethical appropriateness, and synergy. It was also recorded that several frameworks exist for question development. In contrast, the literature on formal tools to guide the formulation of research problems appears scarce. This paucity indicates a significant gap in this area of scholarship, underscoring the need for greater attention to problem formulation. The study also revealed practical tools that offer support for research problem and question writing. These include checklists and templates that scaffold the writing process. On a methodological level, the review underlined the importance of iterative refinement, emphasising the pursuit of stringent congruence among the title, problem, questions, methods, and findings. In conclusion, this review reaffirms that conceptual clarity and rigour are critical in producing meaningful, coherent, and impactful research. Through explicit criteria, synergy strategies, and relevant frameworks, scholarly practice can be improved, and novice researchers empowered. Therefore, ongoing research is required to develop formal tools for problem formulation to promote high-quality educational inquiry.

5. Declarations

5.1. Author Contributions (CRediT)

The authors confirm contribution to the paper as follows: Study conception and design: BP, AP; conceptual framework, method, findings, and discussion: BP; introduction, literature review, and review of the method section: AP; draft manuscript preparation: BP, AP. The authors reviewed the results and approved the final version of the article. Both authors have agreed to be accountable for all aspects of the work, ensuring its accuracy and integrity in accordance with their respective author contributions.

5.2. Conflict of Interest

The authors declare no conflicts of interest.

5.3. Funding Statement

The authors declare they have not received specific financial support for the research.

5.4. Data Availability Statement

Data are available from the corresponding author upon reasonable request.

5.5. Ethics Approval

N/A

5.6. Use of Artificial Intelligence (AI) Tools

The authors wish to acknowledge that they utilised the assistance of a Generative AI tool – CoPilot, during the writing process for prompting, refining, and complementing the editorial process. The data was assessed and validated rigorously to maintain academic integrity and rigour. Potential biases inherent in AI-generated content were assessed and addressed. All intellectual content, interpretations, and the final version of the manuscript are, however, the sole responsibility of the authors.

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The authors declare that this study has not been presented, pre-printed, or published as an abstract or as a thesis.

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