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Improving Methodological Coherence in Thesis Proposal Design: Development and Preliminary Validation of Research Coherence Alignment Framework

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Abstract. Methodological coherence is a central requirement in thesis proposal design because valid inquiry depends on the logical alignment of the research questions, constructs, evidence sources, instruments, and analytical procedures. Although the research methodology literature consistently emphasizes alignment, student researchers often lack the operational tools for translating research questions into coherent empirical structures. This study developed and preliminarily validated the Research Coherence Alignment Framework (RCAF), a methodological support system designed to guide, evaluate, and diagnose coherence in thesis proposal design. The framework consists of four integrated components: the SOP-Instrument Alignment Matrix, the Methodological Coherence Evaluation Rubric, the Taxonomy of Research Alignment Errors, and the Methodological Coherence Index. A DBR-informed developmental design was employed, involving expert validation and classroom-based implementation with 60 thesis-writing students assigned to control and experimental intact groups. Expert evaluation yielded a Content Validity Index of .90, indicating strong agreement for the framework's clarity, relevance, and usefulness. The results also show that students who used the RCAF obtained significantly higher methodological coherence scores than those who followed the usual thesis-writing condition, $t(58) = 10.31$, $p < .001$, Cohen's $d = 2.65$. Given the quasi-experimental design, the findings should be interpreted as preliminary evidence of the framework's pedagogical usefulness rather than definitive proof of causal effectiveness. Overall, the study suggests that RCAF can support thesis instruction, proposal evaluation, and research supervision by making methodological alignment more explicit, teachable, and assessable.

Keywords: research design; methodological coherence; thesis writing; research alignment; preliminary validation

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1. Introduction

Research design depends on the systematic alignment of its core components: research questions, conceptual constructs, evidence sources, data collection instruments, and analytical procedures. When these elements are logically connected, the evidence generated by a study is more likely to address the research problem with validity, coherence, and interpretive precision. Conversely, when these elements are fragmented or mismatched, a study may produce data that only partially answer, or even fail to answer, the questions it seeks to investigate. For this reason, methodological coherence is not a peripheral concern in educational research; it is a foundational condition for producing credible, defensible, and interpretable findings (Creswell & Creswell, 2018; Maxwell, 2013).

From a validity perspective, alignment is also essential because empirical indicators and instruments must adequately represent the constructs they are intended to measure. Construct validity theory emphasizes that evidence is meaningful only when the measures, indicators, and interpretations used in a study correspond to the underlying conceptual domain (American Educational Research Association [AERA], American Psychological Association [APA], & National Council on Measurement in Education [NCME], 2014; Sireci & Faulkner-Bond, 2014). Similarly, the instrument-development literature stresses that rigorous inquiry requires clear construct specification, careful domain representation, and explicit links between the constructs and observable indicators (Boateng et al., 2018; DeVellis & Thorpe, 2021). Taken together, these perspectives suggest that methodological coherence should be understood not merely as procedural organization, but as a theoretically grounded form of congruence linking conceptualization, evidence generation, and analytical inference.

Despite this long-standing emphasis on alignment, thesis-writing students frequently struggle to translate conceptual research questions into coherent empirical designs. Studies on thesis writing, research supervision, and research-skills development show that novice researchers often experience difficulty when formulating researchable problems, specifying constructs, selecting appropriate evidence sources, developing instruments, and aligning methods with intended claims (Grohnert et al., 2024; Ipanaqué-Zapata et al., 2023; Vigh, 2024). These difficulties are especially visible in thesis proposal writing, where students are expected to make complex methodological decisions while still developing their research competence. In practice, proposals may contain clearly written research questions but weakly defined constructs, relevant objectives but inappropriate instruments, or promising topics but analytical procedures that do not match the data to be collected.

A particularly persistent form of misalignment occurs between the Statement of the Problem and the data collection instrument. Student researchers may formulate questions about performance, perception, discourse, or experience, yet use questionnaires, interview protocols, observation tools, or document analysis matrices that do not adequately capture the evidence required by those questions.

In other cases, instruments may only partially represent the construct domain, thereby weakening the interpretive value of the resulting data. Such forms of misalignment are not merely technical flaws; they compromise the methodological integrity of the study because the relationship among the questions, constructs, indicators, instruments, and analysis determines whether the evidence can validly support the intended conclusions.

Existing research design textbooks, instrument-development models, and thesis supervision frameworks provide important guidance, but each address only part of the alignment problem. Research design texts explain the importance of coherence among the questions, methods, and claims, but they often provide broad principles rather than a step-by-step mechanism for mapping research questions to constructs, evidence sources, instruments, and analysis. Instrument-development models offer rigorous procedures for construct definition, item generation, and validation, but they focus mainly on the quality of the instrument rather than on the coherence of the entire proposal architecture. Thesis supervision frameworks clarify the role of feedback, scaffolding, and adviser-student interaction, but they do not necessarily provide a concrete diagnostic tool for locating specific points of methodological mismatch within a proposal.

This distinction is important because the problem addressed in this study is not simply the absence of methodological advice. Rather, the problem lies in the absence of an integrated thesis-oriented system that can simultaneously guide the construction of alignment, evaluate the quality of coherence, diagnose specific alignment errors, and summarize coherence in a usable index. Curriculum alignment frameworks, for example, are useful when linking learning outcomes, teaching activities, and assessment tasks, but they were not designed to map the internal logic of a research proposal. Similarly, instrument-development models can improve item quality, but a technically sound instrument may still be misaligned with the research question, evidence source, or analytical procedure. This study therefore responds to a specific gap: the need for a methodological framework that operationalizes coherence across the full structure of thesis proposal design.

It is within this gap that the present study introduces the Research Coherence Alignment Framework (RCAF). The RCAF is a methodological support system designed to make thesis proposal alignment explicit, teachable, evaluable, and diagnosable. It integrates four operational components: the SOP-Instrument Alignment Matrix (SIAM), which maps the relationship among research questions, constructs, evidence sources, instruments, and analysis; the Methodological Coherence Evaluation Rubric (MCER), which evaluates the quality of alignment; the Taxonomy of Research Alignment Errors (TRAEE), which identifies recurring forms of methodological mismatch; and the Methodological Coherence Index (MCI), which provides a composite indication of overall proposal coherence. Unlike general research design guidance, the RCAF is intended to function as a practical alignment mechanism for thesis proposal development, supervision, and evaluation.

Accordingly, this study aims to develop and preliminarily validate the Research Coherence Alignment Framework as a methodological tool for improving the coherence of research proposals among thesis-writing students in higher education. This study does not claim to provide final or universal validation of the framework. Instead, it offers preliminary evidence of the framework's conceptual clarity, expert-rated usefulness, and potential pedagogical value as part of supporting more coherent thesis proposal design.

1.1 Research Questions

This study addresses the following research questions:

1. How can the Research Coherence Alignment Framework be conceptualized as a methodological system for thesis proposal design?
2. How do research methodology experts evaluate the clarity, usefulness, and rigor of the Research Coherence Alignment Framework?
3. Does the application of the Research Coherence Alignment Framework improve the methodological coherence of the research proposals developed by thesis-writing students?

2. Literature Review

The literature relevant to this study converges on one central concern: research design quality depends not only on the presence of standard proposal components but also on the logical alignment of those components. For thesis-writing students, this alignment is often difficult to achieve because research questions, constructs, evidence sources, instruments, and analytical procedures are frequently developed as separate parts rather than as an integrated methodological system. This section reviews five interconnected areas of scholarship: research design alignment, construct representation, instrument development, thesis-writing and supervision difficulties, and alignment frameworks. Together, these areas establish the need for a thesis-oriented framework that can operate methodological coherence in proposal design.

2.1 Research Design Alignment and Methodological Coherence

The research design literature consistently emphasizes that a study becomes methodologically defensible when its questions, methods, evidence, and claims operate within a coherent relationship. Creswell and Creswell (2018) explain that research questions guide the selection of the design, data collection, and analysis, while Maxwell (2013) conceptualizes a research design as an interactive system in which the goals, conceptual framework, methods, validity, and research questions must be logically connected. From this perspective, methodological coherence is not simply a matter of format or organization; it is a validity condition that determines whether the data generated by a study can meaningfully answer its research questions.

This principle is particularly important in thesis proposal writing because novice researchers often learn research components separately. They may be taught how to write a Statement of the Problem, prepare instruments, identify respondents, and select statistical tools, yet they still struggle to connect these parts into one defensible design logic. The problem, therefore, is not merely that students lack

knowledge of research terminology. Rather, they often lack a procedural mechanism for checking whether each methodological decision follows on from the research problem and supports the intended analysis.

Recent scholarship on alignment in higher education also supports this concern. Kickert et al. (2022) and Zhao et al. (2023) show that alignment frameworks are useful because they make the relationships among the goals, activities, and assessment mechanisms more visible. However, their work is primarily situated in curriculum, learning, and assessment contexts, not in the internal architecture of thesis proposal design. Thus, while alignment scholarship provides an important conceptual foundation, it does not fully address how thesis writers may systematically align their research questions, constructs, evidence sources, instruments, and analytical procedures.

2.2 Construct Representation, Instrument Development, and Evidence Alignment

A second body of literature comes from construct validity and instrument development, where validity is understood as the defensibility of the interpretations and inferences drawn from evidence (Messick, 1995). The *Standards for Educational and Psychological Testing* emphasize that validity depends on the extent to which evidence and theory support the intended interpretation of the scores (American Educational Research Association [AERA], American Psychological Association [APA], & National Council on Measurement in Education [NCME], 2014). Similarly, Sireci and Faulkner-Bond (2014) stress that content-based validity evidence requires an adequate representation of the construct domain.

This means that a research instrument cannot be considered appropriate simply because it is well written or formally validated. It must also correspond to the construct or phenomenon identified in the research question. For example, if a study asks about teaching performance, then the instrument must generate evidence of performance rather than just perceptions of performance. If a study asks about discourse practices, then the evidence source and analytical tool must be capable of capturing discourse data. Misalignment occurs when the instrument produces data that is only indirectly related to the actual question being asked.

Instrument-development literature provides valuable guidance for improving tool quality. Boateng et al. (2018) and DeVellis and Thorpe (2021) emphasize construct definition, domain specification, item generation, expert review, and empirical testing as essential stages in developing valid instruments. However, these models focus mainly on the adequacy of the instrument itself. They do not fully solve the broader proposal-level problem of whether the instrument is aligned with the Statement of the Problem, evidence source, and analysis. A technically sound questionnaire may still be methodologically inappropriate if the research question requires observation, performance assessment, textual analysis, or qualitative evidence. This gap supports the need for a framework that evaluates instrument quality as part of a larger chain of methodological coherence.

2.3 Thesis-Writing Difficulties and Supervision as Alignment Problems

Research on thesis writing and research supervision shows that students frequently encounter difficulties when moving from general research ideas to coherent methodological decisions. Recent work also highlights the value of workshop-based, hybrid, and mediated learning spaces in supporting bachelor's and master's thesis writing (Jusslin & Hilli, 2024). Bakhou and Bouhania (2020), in an Algerian EFL context, found that thesis-writing difficulties are not limited to language problems but also involve conceptual, methodological, and supervisory challenges. Similarly, Quinto (2022), in a Philippine undergraduate thesis-writing context, identified student-related, adviser-related, and institutional challenges that affect thesis development. These studies are significant because they show that thesis-writing difficulties occur across different educational contexts and are often connected to the students' ability to organize research decisions coherently.

Recent studies on research competence reinforce this point. Ipanaqué-Zapata et al. (2023) reported that thesis-related research skills among university students require systematic development, especially planning and executing research tasks. Vigh (2024) likewise showed that research competence among preservice teachers develops unevenly, suggesting that students need scaffolded opportunities to connect research formulation, evidence generation, and interpretation. Consistent with these findings, recent work on bachelor's thesis development emphasizes the need for structured support at specific points where methodological decisions are made, including staged guidance for developing and completing bachelor's thesis work (Praestegaard Larsen, 2025).

The supervision literature also helps explain why alignment remains difficult, as degree-project supervision requires a gradual movement from structured guidance toward student responsibility and autonomy (Jordal et al., 2021). Grohnert et al. (2024) further conceptualize supervision as a complex interaction among student characteristics, supervisor actions, supervisory relationships, and learning outcomes. Their review highlights the importance of structured guidance, but it does not offer proposal-level diagnostic tool for identifying whether a student's research questions, constructs, instruments, and analysis are aligned. In this respect, supervision frameworks clarify the conditions that support thesis development, but they do not by themselves provide a concrete mechanism for diagnosing methodological misalignment within the thesis proposal.

2.4 Existing Alignment Frameworks and Their Limits for Thesis Proposal Design

Alignment frameworks are well established in curriculum, instruction, and assessment, particularly through constructive alignment, which emphasizes the correspondence among the intended learning outcomes, teaching-learning activities, and assessment tasks (Biggs, 1996). Recent applications show that alignment frameworks can improve transparency and reveal inconsistencies across the educational design components (Kickert et al., 2022; Zhao et al., 2023). These contributions are relevant because they demonstrate that coherence can be modeled, visualized, and evaluated.

However, curriculum and assessment alignment frameworks cannot simply be transferred to thesis proposal design without modification. Their primary concern is the relationships among the learning outcomes, pedagogy, and assessment, whereas thesis proposal design requires alignment between the research questions, constructs, evidence sources, instruments, and analytical procedures. These are related but distinct. Curriculum alignment asks whether teaching and assessment correspond to the learning goals. Methodological alignment asks whether the evidence-generation system of a study can validly answer its research questions.

This distinction clarifies the originality of the Research Coherence Alignment Framework. The RCAF does not merely repeat the general principle that alignment is important. Instead, it translates alignment into a thesis-specific methodological system. Unlike curriculum alignment frameworks, the RCAF focuses on the internal logic of the research design. Unlike instrument-development models, it does not stop at the quality of the instrument but examines whether the instrument fits the construct, evidence source, and analysis. Unlike thesis supervision frameworks, it provides a concrete diagnostic structure that advisers and students can use to identify specific forms of methodological mismatch.

2.5 Synthesis and Research Gap

Taken together, the reviewed literature points to three major conclusions. First, research design theory establishes that methodological coherence is essential for producing valid and interpretable findings. However, it often explains coherence as a principle rather than as an operational procedure that thesis-writing students can apply during proposal development.

Second, the construct validity and instrument-development literature provide strong guidance on construct representation and tool development. However, these traditions focus mainly on whether instruments adequately represent constructs, not on whether the entire proposal architecture is coherent from research question through to the analysis.

Third, thesis-writing and supervision studies show that students need structured methodological support, particularly when connecting conceptual intent to empirical design. However, existing supervision frameworks tend to focus on feedback, relationships, and learning conditions rather than on a diagnostic mechanism able to locate alignment errors within the proposal itself.

The gap is not simply the absence of literature on alignment. The gap is the absence of a thesis-oriented methodological system that integrates four functions into one framework: constructing alignment, evaluating coherence, diagnosing alignment errors, and summarizing coherence through a usable index. The Research Coherence Alignment Framework responds to this gap by combining the SOP-Instrument Alignment Matrix, Methodological Coherence Evaluation Rubric, Taxonomy of Research Alignment Errors, and Methodological Coherence Index into one integrated system for thesis proposal design. Its intended

contribution is methodological, pedagogical, and evaluative: it helps students construct coherent proposals, helps supervisors provide more specific feedback, and helps proposal evaluators assess the internal logic of the research design more systematically.

3. Conceptual Framework

The present study is anchored on the Research Coherence Alignment Framework (RCAF), a methodological and pedagogical system designed to operationalize coherence in thesis proposal design. The framework is based on the premise that a research proposal becomes methodologically defensible when its major components—research questions, constructs, evidence sources, instruments or analytical tools, and analytical procedures—are logically connected. In this study, methodological coherence refers to the degree to which these components correspond to one another in ways that allow the research questions to be answered through appropriate and valid evidence.

The RCAF is informed by three complementary theoretical perspectives. First, research design theory emphasizes that research questions, conceptual framing, methods, and validity considerations must function as an integrated system rather than as isolated parts of a study (Creswell & Creswell, 2018; Maxwell, 2013). Second, construct validity and measurement theory stress that the instruments and indicators must adequately represent the constructs they are intended to measure (American Educational Research Association [AERA], American Psychological Association [APA], & National Council on Measurement in Education [NCME], 2014; Sireci & Faulkner-Bond, 2014). Third, instructional scaffolding supports the need for structured guidance to help novice researchers move from abstract research ideas to concrete methodological decisions. Taking together, these perspectives justify the development of a framework that does not only describe alignment but also guides, evaluates, and diagnoses it.

The framework conceptualizes thesis proposal design as a sequence of alignment decisions. A research question first identifies the focus of inquiry. This question is then translated into a construct, variable, phenomenon, category, or analytical unit. The construct determines the appropriate evidence source, while the evidence source guides the selection of the instrument or analytical tool. Finally, the analytical procedure must correspond to the type of data or evidence generated. Coherence is achieved when each decision logically follows from the previous one and supports the next. Misalignment occurs when any component does not correspond to the others, such as when a question about performance is answered only through perception-based survey data, or when a qualitative research question is paired with an unsuitable quantitative analysis.

3.1 Operational Components of the Framework

The RCAF is operationalized through four integrated components: the SOP-Instrument Alignment Matrix, the Methodological Coherence Evaluation Rubric, the Taxonomy of Research Alignment Errors, and the Methodological Coherence Index. These components work together to support the construction, evaluation, diagnosis, and quantification of methodological coherence.

Table 1: Operational components of the Research Coherence Alignment Framework

Component	Function in the Framework
SOP-Instrument Alignment Matrix (SIAM)	Guides the mapping of the research questions, constructs, evidence sources, instruments, or analytical tools, and analysis.
Methodological Coherence Evaluation Rubric (MCER)	Evaluates the quality of alignment across the major proposal components.
Taxonomy of Research Alignment Errors (TRAE)	Diagnoses specific forms of mismatch, such as problem-to-construct, construct-to-evidence, evidence-to-instrument, and instrument-to-analysis misalignment.
Methodological Coherence Index (MCI)	Provides a composite score representing the overall level of methodological coherence in the proposal.

The SIAM functions as the construction tool of the framework because it helps students and supervisors make the internal logic of the proposal visible. The MCER functions as an evaluative tool because it assesses whether the mapped components are clear, appropriate, and logically connected. The TRAE serves as the diagnostic tool because it identifies where coherence breaks down. The MCI serves as the quantitative summary of the rubric-based evaluation, allowing proposal coherence to be described in a more systematic way.

3.2 Conceptual Logic of the Framework

The conceptual logic of the RCAF can be represented as follows:

Research Question → Construct/Variable/Phenomenon → Evidence Source → Instrument or Analytical Tool → Analytical Procedure → Coherence Evaluation

This sequence reflects the central claim of the framework: methodological coherence is achieved when each part of the proposal is explicitly aligned with the others. For example, if a study asks about the level of student engagement in asynchronous English learning modules, the construct must be clearly defined as student engagement, the evidence source must be students who experienced the modules, the instrument must contain indicators that validly represent engagement, and the analysis must match the kind of data produced. In this way, the framework helps prevent superficial alignment, where the proposal components appear complete but do not actually generate evidence capable of answering the research questions.

3.3 Practical Implications of the Framework

The practical value of the RCAF lies in its use as a thesis-writing, supervision, and proposal-evaluation tool. For students, it provides a step-by-step structure for translating research questions into appropriate methodological decisions. For supervisors, it offers a shared language for giving more precise feedback, especially when identifying whether a proposal has a construct problem, an evidence-source problem, an instrument problem, or an analysis problem. For proposal evaluators, it provides a more systematic basis for judging whether a study is methodologically coherent before data collection begins. Thus, the RCAF is not intended to replace existing research design principles, instrument-development procedures, or thesis supervision practices. Rather, it integrates

these concerns into one thesis-oriented alignment system. Its contribution lies in making methodological coherence visible, teachable, diagnosable, and assessable within the process of thesis proposal design.

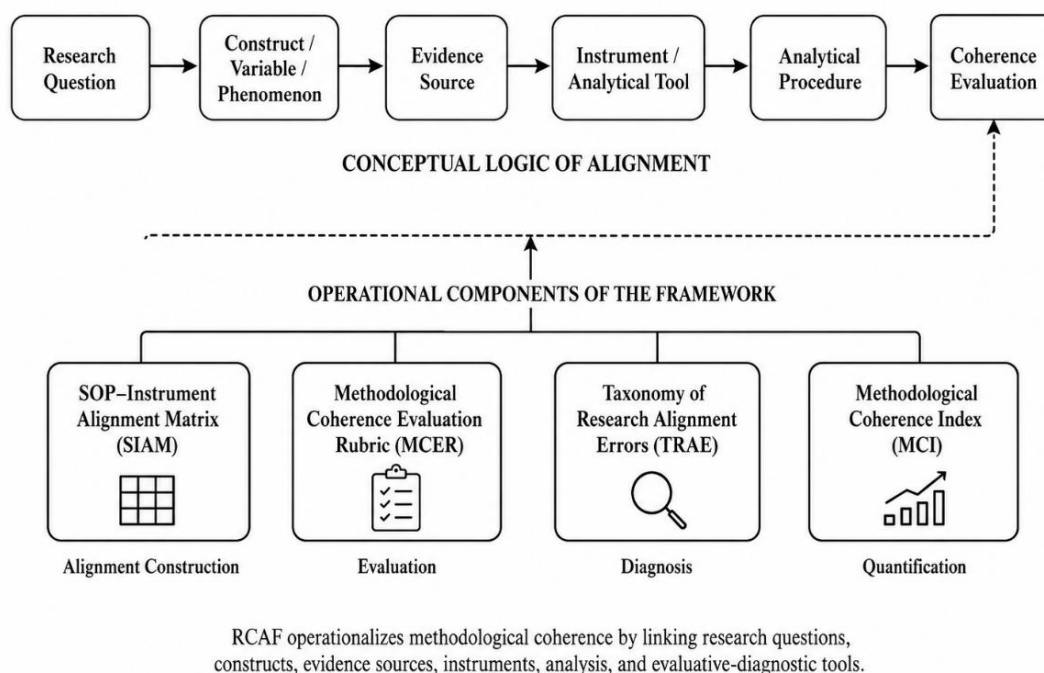


Figure 1: Conceptual and operational structure of the Research Coherence Alignment Framework

4. Methodology

4.1 Research Design

This study employed a DBR-informed developmental and quasi-experimental design to develop, refine, and preliminarily validate the Research Coherence Alignment Framework (RCAF) in an authentic thesis-writing context. The developmental component was used to construct the framework and its four operational tools, while the quasi-experimental component was used to examine whether students who used the framework demonstrated higher methodological coherence in their thesis proposals than students who followed the usual thesis-writing condition.

The study was described as DBR-informed rather than as a full design-based research project because it involved the development, expert review, pilot testing, implementation, and refinement of an educational intervention, but did not involve multiple full cycles of redesign and reimplementation (Reeves, 2006; The Design-Based Research Collective, 2003; Wang & Hannafin, 2005). The framework was developed through four stages: analysis, design, implementation, and refinement. During the analysis stage, common methodological alignment problems in student thesis proposals were identified through a review of the literature, instructor observations, and the examination of previous proposal-writing difficulties. During the design stage, the RCAF and its operational tools

were constructed. During the implementation stage, the framework was subjected to expert validation, pilot scoring, and classroom-based application. During the refinement stage, expert comments, pilot results, and implementation observations were used to improve the clarity and usability of the framework.

The quasi-experimental component used intact class groups because random individual assignment was not possible in the instructional setting, a common condition in educational intervention research where causal inference must be treated with caution (Shadish et al., 2002). One intact group served as the control group, while another intact group served as the experimental group. This design allowed for a comparison between the usual thesis-writing condition and the RCAF-supported condition, while recognizing that baseline equivalence and full randomization were not established.

4.2 Research Context, Participants, and Sampling Procedure

The study was conducted in a public higher education institution in the Philippines, where undergraduate students were enrolled in thesis-writing or research courses requiring the preparation of formal research proposals. This context was appropriate because the participants were actively engaged in the type of methodological decision-making that the RCAF was designed to support. A total of 60 thesis-writing students participated in the classroom implementation phase. They were selected through purposive sampling based on three inclusion criteria: enrollment on an undergraduate thesis or research course, active engagement in developing a research proposal, and participation during the implementation period of the study. The students were distributed into two intact groups: a control group composed of 30 students and an experimental group composed of 30 students.

The control group developed their thesis proposals under the usual thesis-writing conditions. This included standard research-methods instruction, the use of the institutional thesis proposal format, ordinary classroom supervision, and regular consultations with the course instructor or their research adviser. The experimental group completed the same proposal-writing requirement but received additional structured support using the RCAF. This support included orientation on the framework, guided use of the SOP-Instrument Alignment Matrix, rubric-informed feedback, and an alignment-based consultation during proposal development.

For the expert validation phase, 10 research methodology experts were invited through criterion-based purposive sampling. The experts were selected based on having at least one of the following qualifications: experience in teaching research methodology, experience as a thesis adviser or panel member, experience in instrument development or validation, or publication experience in education, research methodology, applied linguistics, or related fields. Their role was to evaluate the clarity, usefulness, rigor, and practical applicability of the RCAF and its operational tools.

4.3 Research Instruments and Framework Tools

The study used the following instruments and framework tools:

First, the Research Coherence Alignment Framework served as the main intervention and methodological support system. It was designed to guide the alignment of research questions, constructs, evidence sources, instruments, analytical tools, and analytical procedures.

Second, the SOP-Instrument Alignment Matrix was used by students in the experimental group to map the logical connections among the Statement of the Problem, constructs or variables, evidence sources, instruments or analytical tools, and proposed analysis. This matrix functioned as the main alignment-construction tool.

Third, the Methodological Coherence Evaluation Rubric was used to evaluate the quality of alignment in the students' completed thesis proposals. The rubric assessed six dimensions: the clarity of the Statement of the Problem, construct specification, domain or indicator representation, evidence source appropriateness, instrument alignment, and analysis congruence. Each dimension was rated on a 4-point scale, where 1 indicated weak alignment, 2 indicated limited alignment, 3 indicated adequate alignment, and 4 indicated strong alignment.

Fourth, the Taxonomy of Research Alignment Errors was used to identify specific forms of methodological mismatch, including problem-to-construct mismatch, construct-to-evidence mismatch, evidence-to-instrument mismatch, and instrument-to-analysis mismatch.

Fifth, the Methodological Coherence Index was computed as the summed score across the six rubric dimensions. Possible scores ranged from 6 to 24, with higher scores indicating stronger methodological coherence.

Sixth, the Expert Evaluation Form was used to obtain expert ratings on the framework's conceptual clarity, alignment structure, usefulness for thesis proposal design, practical applicability in thesis supervision, and diagnostic capability. The experts rated each component using a 4-point relevance scale consisting of content validity procedures.

4.4 Instrument Development, Validation, and Reliability

The RCAF and its instruments were developed based on literature on research design alignment, construct validity, instrument development, and thesis supervision. The initial version of the framework consisted of four operational tools: the SOP-Instrument Alignment Matrix, the Methodological Coherence Evaluation Rubric, the Taxonomy of Research Alignment Errors, and the Methodological Coherence Index.

The preliminary framework and its tools were submitted to 10 research methodology experts for content validation. Experts evaluated the framework using the Expert Evaluation Form, and their ratings were used to compute the Content Validity Index, a commonly used indicator of expert agreement in

content validation studies (Polit & Beck, 2006; Polit et al., 2007). An average scale-level CVI of .80 or higher was considered acceptable. The framework obtained an overall CVI of .90, indicating strong expert agreement regarding its clarity, usefulness, and methodological relevance.

After expert validation, the Methodological Coherence Evaluation Rubric was pilot tested using 12 thesis proposals that were not included in the main study sample. The pilot testing examined whether the rubric descriptors were clear, consistently interpretable, and appropriate for evaluating undergraduate thesis proposals. Based on the pilot observations, minor revisions were made to improve descriptor clarity and reduce scoring ambiguity.

Internal consistency was examined using Cronbach's alpha based on the pilot scoring results, with the alpha interpreted as an estimate of score consistency across the related rubric dimensions (Tavakol & Dennick, 2011). The rubric obtained an alpha coefficient of .89, indicating good score consistency across the six rubric dimensions. Since the rubric measured related but distinct aspects of methodological coherence, Cronbach's alpha was interpreted as evidence of consistency across dimensions rather than proof that the rubric was unidimensional.

For the main proposal evaluation, three independent raters scored the completed thesis proposals using the Methodological Coherence Evaluation Rubric. The raters were selected based on their experience with research methodology and thesis evaluation. Before formal scoring, they participated in a calibration session in which they reviewed the rubric dimensions, discussed the scoring anchors, and examined sample proposals to ensure a shared understanding of the rating procedure. Inter-rater reliability was computed using the intraclass correlation coefficient, which is appropriate for estimating agreement among multiple raters in reliability studies (Koo & Li, 2016). The obtained ICC was .91, indicating excellent agreement among the raters.

4.5 Data Collection Procedure

The data was collected in four phases.

In the first phase, developmental data was gathered to inform the construction of the framework. This included insights from the review of methodological literature, instructor observations, and recurring alignment problems observed in the student thesis proposal development. These inputs were used to identify common areas of misalignment involving research questions, constructs, evidence sources, instruments, and analysis.

In the second phase, expert validation data was collected. The preliminary RCAF and its operational tools were given to 10 research methodology experts. The experts completed the Expert Evaluation Form and provided ratings on the clarity, usefulness, rigor, and practical applicability of the framework. Their ratings were used to compute the Content Validity Index, while their comments guided the refinement of the framework.

In the third phase, the pilot data was collected from 12 thesis proposals not included in the main implementation sample. The proposals were scored using the Methodological Coherence Evaluation Rubric to test the clarity and usability of the rubric. The pilot scoring results were used to compute the internal consistency and revise any unclear rubric descriptors.

In the fourth phase, classroom implementation data was collected from 60 thesis-writing students. The control group developed proposals using the usual thesis-writing condition, while the experimental group developed proposals with structured RCAF support. The experimental group received orientation on the framework, completed the SOP-Instrument Alignment Matrix, and received a rubric-informed consultation during the proposal development. After proposal completion, all proposals from both groups were evaluated by three independent raters using the Methodological Coherence Evaluation Rubric. The resulting scores were used to compute the Methodological Coherence Index for each proposal.

4.6 Data Analysis

The study used descriptive and inferential statistical procedures.

For the expert validation phase, the Content Validity Index was computed to determine the extent of expert agreement on the relevance and adequacy of the framework components. An average scale-level CVI of .80 or higher was considered acceptable.

For the pilot phase, Cronbach's alpha was computed to estimate the internal consistency of the Methodological Coherence Evaluation Rubric. For the main proposal-rating phase, the intraclass correlation coefficient was computed to determine the level of agreement among the three raters.

For the classroom implementation phase, descriptive statistics, including mean and standard deviation, were computed for the Methodological Coherence Index scores of the control and experimental groups. Before conducting the group comparison, the assumptions of normality and homogeneity of variance were examined using the Shapiro-Wilk test and Levene's test, respectively. An independent samples *t*-test was then used to determine whether there was a statistically significant difference between the control and experimental groups. The level of significance was set at .05. Cohen's *d* was computed to determine the magnitude of the group difference, and 95% confidence intervals were reported to provide a more precise interpretation of the mean difference (Cohen, 1988).

4.7 Measures to Minimize Bias and Confounding Variables

Several steps were taken to reduce bias and improve the credibility of the findings. First, both groups completed the same general thesis proposal requirement within the same academic period. Second, both groups followed the same institutional proposal format and were evaluated using the same rubric. Third, the proposals were rated by three independent raters rather than by a single evaluator. Fourth, the raters were oriented and calibrated before formal scoring to promote consistency in the application of the rubric. Fifth, inter-rater reliability was computed to determine the dependability of the proposal ratings.

Despite these measures, the study recognizes that the use of intact groups limits causal inference. Because the students were not randomly assigned individually and baseline equivalence data was not available, differences between the groups may have been influenced by pre-existing class characteristics, instructional dynamics, or student-level differences. Therefore, the findings are interpreted as preliminary evidence of the usefulness of the RCAF rather than definitive proof of its effectiveness.

4.8 Ethical Considerations

Ethical principles were observed throughout the study. The participation of both students and experts was voluntary. The participants were informed about the purpose of the study, the nature of their participation, and the use of the data for research purposes. Student proposal scores and expert responses were treated confidentially and reported only in aggregate form. No identifying information was disclosed in the presentation of the results. The study also ensured that either participation or non-participation did not affect the students' academic standing beyond the normal requirements of their thesis-writing course.

5. Results and Findings

This section presents the findings of the study according to the sequence of the three research questions. The first part presents the conceptualization of the Research Coherence Alignment Framework (RCAF) as a methodological system for thesis proposal design. The second part reports the expert evaluation of the framework in terms of clarity, usefulness, and rigor. The third part presents the results of the classroom-based implementation, examining whether the application of the framework improved the methodological coherence of the students' thesis proposals.

5.1 Conceptualization of the Research Coherence Alignment Framework

The first research question was 'How can the Research Coherence Alignment Framework be conceptualized as a methodological system for thesis proposal design?

The findings from the developmental phase show that the RCAF may be conceptualized as a thesis-oriented methodological system that guides the alignment of research questions, constructs, evidence sources, instruments, or analytical tools, and analytical procedures. The framework was developed in response to recurring proposal-writing problems observed among thesis-writing students, particularly weak correspondence between the Statement of the Problem and the instruments or analytical procedures used to answer it.

The framework consists of four operational components: the SOP-Instrument Alignment Matrix (SIAM), the Methodological Coherence Evaluation Rubric (MCER), the Taxonomy of Research Alignment Errors (TRAЕ), and the Methodological Coherence Index (MCI). Each component performs a distinct but related function within the framework. The SIAM supports alignment construction, the MCER supports evaluative judgment, the TRAЕ supports

diagnosis of alignment errors, and the MCI provides a quantitative summary of proposal coherence.

Table 2: Operational structure of the Research Coherence Alignment Framework

RCAF Component	Primary Function	Role in Thesis Proposal Design
SOP-Instrument Alignment Matrix (SIAM)	Alignment construction	Maps the relationship among the research questions, constructs, evidence sources, instruments or analytical tools, and analysis.
Methodological Coherence Evaluation Rubric (MCER)	Evaluation	Assesses the quality of alignment across the major proposal components.
Taxonomy of Research Alignment Errors (TRAЕ)	Diagnosis	Identifies specific forms of misalignment, such as problem-to-construct, construct-to-evidence, evidence-to-instrument, and instrument-to-analysis mismatch.
Methodological Coherence Index (MCI)	Quantification	Summarizes the overall coherence of a proposal through a composite rubric-based score.

The conceptual logic of the framework follows a sequential alignment pathway: research question, construct or variable, evidence source, instrument or analytical tool, analytical procedure, and coherence evaluation. This sequence shows that methodological coherence is achieved when each component of the proposal logically corresponds to the others.

For instance, a research question about performance should be supported by evidence sources and instruments capable of capturing performance, rather than only perceptions. Similarly, a qualitative question should be paired with an analytical procedure appropriate for qualitative evidence. Thus, the RCAF is not merely a checklist of thesis proposal parts. It functions as a structured reasoning system for ensuring that each methodological decision is connected to the research problem and to the type of evidence needed to answer it.

5.2 Expert Evaluation of the Clarity, Usefulness, and Rigor of the Framework

The second research question was ‘How do research methodology experts evaluate the clarity, usefulness, and rigor of the Research Coherence Alignment Framework?’

Ten research methodology experts evaluated the RCAF using the Expert Evaluation Form. The evaluation focused on five areas: conceptual clarity, alignment structure, usefulness in thesis proposal design, practical applicability in thesis supervision, and diagnostic capability. The Content Validity Index (CVI) was computed to determine the level of expert agreement regarding the relevance and adequacy of the framework components.

Table 3: Content validity index of the Research Coherence Alignment Framework

Framework Component	Number of Experts Rating as Relevant	CVI
Conceptual clarity of the framework	9	.90
Alignment structure of the research components	10	1.00
Usefulness for thesis proposal design	9	.90
Practical applicability in thesis supervision	9	.90
Diagnostic capability of alignment errors	8	.80
Overall average CVI		.90

Note. CVI = Content Validity Index. Ratings were based on expert evaluations of the framework components in terms of relevance.

The results show that the RCAF obtained an overall average CVI of .90, indicating strong expert agreement on the relevance and adequacy of the framework. The highest rating was obtained for the alignment structure of the research components, which received a CVI of 1.00. This suggests that all experts regarded the framework's alignment logic as relevant to thesis proposal design.

Conceptual clarity, usefulness in thesis proposal design, and practical applicability in thesis supervision each obtained a CVI of .90, indicating strong agreement in these areas. The diagnostic capability of the alignment errors obtained a CVI of .80. Although this was the lowest among the evaluated components, it still met the acceptable threshold for content validity. This result suggests that the experts considered the diagnostic function of the framework relevant, although it may require further refinement and testing in future applications.

The qualitative comments of the experts support the quantitative ratings. Three recurring observations were noted. First, the experts observed that the framework made the internal logic of the thesis proposal design more visible by explicitly linking the Statement of the Problem, constructs, evidence sources, instruments, and analysis. Second, they noted that the SIAM could help students and advisers identify inconsistencies between what a proposal seeks to answer and the type of evidence generated by its instruments. Third, the experts viewed TRAE as useful for making methodological feedback more specific by identifying whether the problem lies in construct specification, evidence-source selection, instrument alignment, or analysis congruence.

Taken together, the expert evaluation indicates that the RCAF demonstrated strong preliminary content validity. However, the findings should be interpreted as evidence of expert-rated relevance and usefulness rather than as full validation of the framework across all thesis-writing contexts.

5.3 Effect of RCAF Application on Students' Methodological Coherence

The third research question was 'Does the application of the Research Coherence Alignment Framework improve the methodological coherence of research proposals developed by thesis-writing students?'

To answer this question, the completed thesis proposals of students in the control and experimental groups were evaluated using the Methodological Coherence Evaluation Rubric. The resulting scores were used to compute each proposal's Methodological Coherence Index. The control group followed the usual thesis-writing condition, while the experimental group used the RCAF as a structured support tool during proposal development.

5.3.1 Descriptive Statistics of the Methodological Coherence Scores

Table 4: Descriptive statistics of the methodological coherence index scores by group

Group	n	M	SD
Control group	30	15.27	2.31
Experimental group	30	20.83	1.87

Note. *n* = sample size; *M* = mean; *SD* = standard deviation.

The descriptive results show that the experimental group obtained a higher mean Methodological Coherence Index score than the control group. The experimental group achieved a mean score of 20.83, while the control group obtained a mean score of 15.27. This indicates that students who used the RCAF produced proposals with stronger overall methodological coherence than those who followed the usual thesis-writing condition.

5.3.2 Assumption Testing for the Independent-Samples *t*-Test

Before conducting the independent-samples *t*-test, the assumptions of normality and homogeneity of variance were examined. The Shapiro-Wilk test showed that the scores did not significantly deviate from normality in either the control group, $W(30) = .97, p = .52$, or the experimental group, $W(30) = .96, p = .34$. These results indicate that the assumption of normality was met.

Levene's test for equality of variances was also not statistically significant, $F(1, 58) = 1.42, p = .24$, indicating that the assumption of homogeneity of variance was satisfied. Therefore, the pooled-variance form of the independent-samples *t*-test was interpreted.

5.3.3 Group Comparison of the Methodological Coherence Scores

Table 5: Independent-samples *t*-test comparing the methodological coherence index scores by group

Group	n	M	SD	Mean Difference	95% CI	t	df	p	Cohen's d
Control group	30	15.27	2.31						
Experimental group	30	20.83	1.87	5.56	[4.48, 6.64]	10.31	58	< .001	2.65

Note. *CI* = confidence interval for the mean difference. The mean difference is computed as experimental minus control.

The independent-samples *t*-test showed a statistically significant difference in the Methodological Coherence Index scores between the control and experimental groups, $t(58) = 10.31, p < .001$. The experimental group obtained significantly

higher scores than the control group. The mean difference between the groups was 5.56 points, with a 95% confidence interval of [4.48, 6.64]. Cohen's d was 2.65, indicating a very large effect size.

These findings suggest that the use of the RCAF was associated with substantially higher methodological coherence in the students' thesis proposals. However, because the study used intact groups and did not employ random individual assignment or baseline equivalence testing, this result should be interpreted cautiously. The findings provide preliminary evidence that the RCAF may support improved proposal coherence, but they do not establish definitive causal effectiveness.

5.3.4 Rubric-Based Observations on Proposal Coherence

In addition to the overall MCI scores, the rubric-based observations suggested that proposals in the experimental group tended to demonstrate stronger alignment across several key dimensions of methodological coherence. These improvements were most evident in construct specification, evidence-source appropriateness, instrument alignment, and analysis congruence.

Proposals developed with the RCAF more frequently showed clear correspondence between the research questions and the evidence needed to answer them. They also more often defined the constructs explicitly and reflected these constructs in the indicators, domains, or analytical categories of the instrument. In contrast, proposals in the control group more commonly showed misalignment between the Statement of the Problem and the selected instrument. For example, some proposals asked questions about student performance but relied mainly on perception-based survey items. Others identified broad constructs without specifying measurable indicators or appropriate analytical procedures.

These observations support the diagnostic value of RCAF. The framework appeared to help students recognize that a research proposal is not coherent simply because it contains all the required sections. Rather, coherence depends on whether the sections function together as an integrated evidence-generating system. Since no separate inferential tests were conducted for each rubric dimension, these observations should be interpreted as descriptive scoring patterns rather than independent statistical findings.

5.4 Summary of the Findings

The results provide preliminary evidence that the Research Coherence Alignment Framework is conceptually clear, expert rated as useful and rigorous, and associated with stronger methodological coherence in thesis proposal design. For Research Question 1, the findings show that the RCAF may be conceptualized as a methodological system composed of alignment construction, evaluation, diagnosis, and quantification tools. For Research Question 2, the expert evaluation yielded an overall CVI of .90, indicating strong agreement regarding the relevance and adequacy of the framework. For Research Question 3, students who used the RCAF obtained significantly higher Methodological Coherence Index scores than those in the usual thesis-writing condition, with a very large effect size.

Overall, the findings suggest that the RCAF can support students with thesis-writing by making methodological alignment more explicit, systematic, and assessable. At the same time, because the study used a quasi-experimental intact-group design, these findings should be viewed as preliminary and context-bound rather than fully generalizable across all thesis-writing settings.

6. Discussion

This study developed and preliminarily validated the Research Coherence Alignment Framework (RCAF) as a methodological support system for thesis proposal design. The findings showed that the framework could be conceptualized as an integrated system for alignment construction, coherence evaluation, error diagnosis, and quantitative indexing. Expert evaluation provided the preliminary content validity evidence for the framework, while the classroom implementation showed that students who used the RCAF obtained significantly higher methodological coherence scores than those who followed the usual thesis-writing condition. This discussion follows the sequence of the research questions and addresses the conceptualization of the framework, expert-rated clarity and usefulness, the application of the framework in thesis writing, and its implications, limitations, and recommendations.

6.1 Conceptualization of the Research Coherence Alignment Framework

The first finding shows that the RCAF may be conceptualized as a thesis-oriented methodological system that links research questions, constructs, evidence sources, instruments or analytical tools, and analytical procedures. This finding supports the theoretical assumption that research design coherence depends on the internal relationship among the major components of a study rather than on the mere presence of the required proposal sections.

This finding is consistent with research design theory, which emphasizes that research questions, conceptual framing, methods, and validity considerations should operate as an integrated system (Creswell & Creswell, 2018; Maxwell, 2013). In the context of thesis proposal writing, this means that a proposal cannot be judged as methodologically sound simply because it contains a Statement of the Problem, methodology, instrument, and analysis plan. These parts must work together as an evidence-generating structure. The RCAF responds to this need by making the alignment process explicit through the SOP-Instrument Alignment Matrix, the Methodological Coherence Evaluation Rubric, the Taxonomy of Research Alignment Errors, and the Methodological Coherence Index.

The framework is also consistent with the construct validity and measurement theory, which emphasize that the instruments, indicators, and interpretations must correspond to the construct domain being investigated (American Educational Research Association [AERA], American Psychological Association [APA], & National Council on Measurement in Education [NCME], 2014; Sireci & Faulkner-Bond, 2014). This is important because many proposal weaknesses occur when students move too quickly from a research question to the instrument without clearly defining the construct or identifying the appropriate evidence

source. In such cases, the instrument may appear acceptable in form but still fail to generate evidence that can validly answer the research question.

The conceptual contribution of the RCAF lies in its integration of four functions that are often treated separately in research training. SIAM guides students in constructing alignments, the MCER evaluates the quality of coherence, the TRAE diagnoses specific forms of misalignment, and the MCI summarizes coherence through a composite score. This structure differentiates the RCAF from general research design guidelines, curriculum alignment frameworks, and instrument-development models.

Curriculum alignment frameworks typically focus on the relationship among the learning outcomes, teaching activities, and assessment tasks. Instrument-development models focus primarily on construct representation and item quality. Thesis supervision frameworks focus on feedback processes, adviser-student relationships, and research support. The RCAF, by contrast, focuses specifically on the internal methodological logic of the thesis proposal design.

This conceptual contribution should be interpreted cautiously. The present study provides an initial operational structure for the RCAF, but it does not yet establish that the framework is universally applicable across all research disciplines, institutions, or thesis-writing contexts. The framework was developed and tested in a specific undergraduate thesis-writing setting; therefore, its conceptual usefulness should be examined further in graduate research, qualitative inquiry, mixed-methods research, action research, and discipline-specific proposal writing.

6.2 Expert-Rated Clarity, Usefulness, and Rigor of the Framework

The second finding showed that experts rated the RCAF positively, with an overall Content Validity Index of .90. This indicates strong expert agreement that the framework was relevant, clear, and useful for thesis proposal design. The highest rating was given to the alignment structure of the framework, suggesting that the experts found the relationships among the research questions, constructs, evidence sources, instruments, and analysis to be methodologically meaningful.

This result suggests that methodological coherence can be evaluated more systematically when proposal components are made visible and assessable. In many thesis-writing contexts, methodological feedback is often expressed in broad terms, such as “align the instrument with the problem” or “revise the methodology.” While such comments are valid, they may not always help students identify the exact source of misalignment. The RCAF responds to this limitation by providing a more precise language for identifying whether the problem lies in construct specification, evidence-source selection, instrument alignment, or analysis congruence.

The expert-rated usefulness of the framework also supports the pedagogical value of structured scaffolding in research training. Novice researchers often need guided procedures to move from abstract research ideas to concrete

methodological decisions, especially in thesis writing, where conceptual, methodological, and supervisory challenges frequently intersect (Bakhou & Bouhania, 2020; Grohnert et al., 2024; Quinto, 2022). By requiring students to map each research question to its corresponding construct, evidence source, instrument, and analysis, the framework may reduce the tendency to treat proposal components as separate and disconnected tasks.

At the same time, the expert evaluation results should not be overstated. Content validity based on expert judgment is an important early form of validation, but it is not sufficient to establish full validity. The CVI indicates that experts judged the framework as relevant and appropriate, but this does not prove that the framework will work equally well across different student populations, research traditions, institutional contexts, or adviser practices. In addition, the diagnostic capability of alignment errors received the lowest CVI among the evaluated components, although it still met the acceptable threshold. This suggests that the Taxonomy of Research Alignment Errors may require further refinement, expansion, and empirical testing.

6.3 RCAF Application and the Students' Methodological Coherence

The third finding showed that students who used the RCAF obtained significantly higher methodological coherence scores than students in the usual thesis-writing condition. The experimental group had a higher mean Methodological Coherence Index score, and the independent-samples *t*-test showed a statistically significant difference between the two groups. The reported Cohen's *d* indicated a very large group difference, although this magnitude should be interpreted cautiously because the study used intact groups and did not establish baseline equivalence.

The framework appears to have supported more coherent thesis proposal development by guiding students through a structured alignment process. Instead of moving directly from a research question to an instrument, students were required to identify the construct or phenomenon being investigated, to determine the appropriate evidence source, to select a suitable instrument or analytical tool, and to match the data with an appropriate analytical procedure. This process likely encouraged more deliberate methodological decision-making.

This interpretation is consistent with alignment scholarship, which suggests that coherence improves when the relationships among the goals, processes, evidence, and evaluation are made visible rather than left implicit (Kickert et al., 2022; Zhao et al., 2023). It is also consistent with recent studies showing that the students' research competence develops unevenly and requires structured support in research planning, execution, and interpretation (Ipanaqué-Zapata et al., 2023; Vigh, 2024). In this sense, the higher coherence scores of the experimental group may be understood not merely as an effect due to using a template, but as a result of engaging in a more explicit process of methodological reasoning.

Another plausible explanation is that the framework provided students and advisers with a shared language for feedback. Because the framework identifies specific forms of misalignment, the feedback could become more targeted. For

example, instead of simply telling students that the methodology was weak, an adviser could identify whether the weakness involved a problem-to-construct mismatch, construct-to-evidence mismatch, evidence-to-instrument mismatch, or instrument-to-analysis mismatch. This type of feedback may be more useful for novice researchers because it shows not only what is wrong but also where the problem occurs.

The rubric-based observations also suggest that the RCAF was particularly helpful in improving construct specification, evidence-source appropriateness, instrument alignment, and analysis congruence. These are common areas of difficulty in thesis proposal writing because students often struggle to translate broad research ideas into observable indicators, appropriate instruments, and defensible analytical procedures. The framework appears to have addressed these difficulties by requiring students to check the logical fit among the proposal components before finalizing their methodology.

Nevertheless, alternative explanations must be acknowledged. Since the study used intact groups rather than random individual assignment, the observed difference may have been influenced by pre-existing group characteristics. Students in the experimental group may have had stronger research skills, greater motivation, better class dynamics, or more favorable learning conditions before the intervention. The difference may also have been influenced by instructional factors, such as the way the framework was introduced, the amount of consultation received, and the level of engagement during proposal development. The findings should be interpreted as preliminary evidence that the RCAF was associated with improved methodological coherence, not as definitive proof that the framework alone caused the improvement.

6.4 Implications for Thesis Pedagogy, Supervision, and Proposal Evaluation

The findings have several implications for research methodology instruction. First, thesis-writing courses may benefit from teaching methodological coherence as an explicit design skill rather than assuming that students will naturally connect research questions, instruments, and analysis on their own. The RCAF provides a practical structure that can help students see how methodological decisions are connected. Since thesis-writing difficulties often involve conceptual and methodological challenges rather than writing problems alone, structured tools such as the RCAF may help students identify where their research design logic breaks down (Bakhou & Bouhania, 2020; Quinto, 2022).

Second, the framework may support thesis supervision by improving the specificity of adviser feedback, since effective undergraduate dissertation supervision depends on clear guidance, student support, and the development of student independence (Roberts & Seaman, 2018). This implication aligns with the thesis supervision literature, which emphasizes the importance of structured guidance, clear expectations, and formative feedback in supporting research development (Grohnert et al., 2024; Strebel et al., 2021). Instead of relying only on general comments, advisers may use SIAM and TRAE to identify precise points of misalignment. This can make consultations more diagnostic, efficient, and

developmental. For example, a supervisor may ask the student to revise the construct definition, reconsider the evidence source, modify the instrument, or adjust the analytical procedure depending on where the mismatch occurs.

Third, institutions may use the RCAF as a proposal-evaluation tool. Research committees, thesis panels, and methodology instructors may adapt the MCER to evaluate whether proposals meet the minimum standards of methodological coherence before the data collection. This can help prevent students from proceeding with studies whose research questions, instruments, and analyses are not properly aligned.

Fourth, the framework may contribute to quality assurance in research education. By providing a common language for alignment, the RCAF can help standardize how methodological coherence is discussed, taught, and evaluated across thesis-writing classes. Institutional adoption would require orientation, faculty training, and possible contextual adaptation to different disciplines and research traditions. Without sufficient training, the framework may be treated as a mechanical checklist rather than as a scaffold for methodological reasoning. Thus, successful implementation would require both technical orientation and sustained faculty engagement.

6.5 Limitations and Recommendations

Several limitations should be considered when interpreting the findings. First, the study was conducted in one institutional context, which limits the generalizability of the results. Future studies should test the RCAF across different universities, academic disciplines, degree levels, and research traditions.

Second, the study used intact class groups rather than random individual assignments. This limits causal inference because the observed differences may have been influenced by pre-existing differences between groups. Future research could use randomized controlled designs, matched-group designs, or pretest-posttest designs to provide stronger evidence of effectiveness.

Third, the study relied mainly on rubric-based proposal scores. Although the rubric demonstrated strong internal consistency and inter-rater reliability, the evaluation would be enriched by qualitative data from students, thesis advisers, and panel members. Future studies should include interviews, focus groups, reflective journals, and supervisor feedback to examine how students actually experience the framework and how it affects their research decision-making.

Fourth, the study evaluated short-term proposal outputs rather than long-term research outcomes. It remains unclear whether improved methodological coherence at the proposal stage leads to stronger final theses, better data collection, more valid analysis, and higher completion rates. Future research should examine the longitudinal impact of RCAF use from proposal development to final thesis completion.

Finally, the RCAF itself may require further refinement. The Taxonomy of Research Alignment Errors may be expanded to include more discipline-specific forms of misalignment, such as sampling-to-inference mismatch, research-design-to-claim mismatch, or theoretical-framework-to-analysis mismatch. Continued application and validation can help refine the framework into a more robust tool for research education.

Despite these limitations, the findings remain useful because the study was conducted in an authentic thesis-writing context and used expert review, rubric-based scoring, rater calibration, and inter-rater reliability procedures to strengthen the credibility of the evidence. Thus, while the results should not be generalized uncritically, they provide a reasonable basis for further testing and refinement of the RCAF.

6.6 Synthesis of the Discussion

Overall, the findings suggest that the Research Coherence Alignment Framework has promise as a methodological and pedagogical tool for thesis proposal design. Its value lies in making methodological coherence visible, teachable, diagnosable, and assessable. The expert evaluation provides preliminary content validity evidence for the framework, while the classroom implementation suggests that its use is associated with higher methodological coherence scores among thesis-writing students.

The study's contribution should be understood as preliminary rather than conclusive. The RCAF offers a structured response to a real and recurring problem in thesis education, but further testing is needed before broad claims of effectiveness can be made. The framework may be most useful when treated not as a rigid checklist but as a scaffold for methodological reasoning, supervisor feedback, and proposal evaluation, consistent with the need to balance structure and student independence in undergraduate dissertation supervision (Wisker, 2018). In this sense, the RCAF contributes to research methodology education by helping students and supervisors move from general calls for alignment toward a more systematic process for constructing and evaluating coherent research proposals.

7. Conclusion

This study addressed the need for a more explicit and operational approach to methodological coherence in thesis proposal design. Although the research methodology literature consistently emphasizes the importance of alignment, thesis-writing students often struggle to connect their research questions, constructs, evidence sources, instruments, and analytical procedures into a coherent evidence-generating structure. In response to this problem, this study developed the Research Coherence Alignment Framework (RCAF) and provided preliminary evidence of its validity and usefulness as a methodological support system for thesis proposal development, supervision, and evaluation.

The findings indicate that the RCAF may be conceptualized as an integrated framework composed of four operational tools: the SOP-Instrument Alignment Matrix, the Methodological Coherence Evaluation Rubric, the Taxonomy of Research Alignment Errors, and the Methodological Coherence Index. Together, these tools support alignment construction, coherence evaluation, error diagnosis, and quantitative indexing. Expert evaluation provided preliminary content validity evidence for the framework, with an overall Content Validity Index of .90, suggesting that the experts regarded the framework as clear, relevant, useful, and methodologically appropriate. Classroom implementation further showed that students who used the RCAF obtained significantly higher methodological coherence scores than those who followed the usual thesis-writing condition.

The main takeaway of the study is that methodological coherence can be strengthened when proposal writing is treated not merely as the completion of required parts of a thesis but as a systematic process of aligning the research questions, constructs, evidence sources, instruments, and analysis. The RCAF offers a practical structure for making this alignment visible, teachable, diagnosable, and assessable. For students, it provides a guide for constructing more coherent proposals. For supervisors, it offers a shared language for giving more precise methodological feedback. For institutions, it may serve as a proposal-evaluation tool for improving quality assurance in thesis preparation.

The findings should be interpreted cautiously. The study was conducted in one institutional context, used intact groups, and did not establish a baseline equivalence between the control and experimental groups. The results should be viewed as preliminary and context-bound rather than as definitive evidence of universal effectiveness. Future studies should test the RCAF across different institutions, academic disciplines, research designs, and degree levels. Further research may also incorporate qualitative evidence from students, advisers, and panel members to examine how the framework is experienced and applied in actual thesis supervision.

Overall, the RCAF contributes to research methodology education by translating the general principle of alignment into a concrete thesis-oriented system. Its value lies in helping novice researchers move from fragmented proposal writing toward more coherent, defensible, and methodologically aligned research design.

Conflict of Interest

The author declares that there are no conflicts of interest regarding the publication of this paper.

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