

The Reflective Sandwich Method: A Cognitive-Dialogic Framework for Enhancing Research Competence among Pre-service Teachers in Negros Oriental State University (2023–2025)

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ABSTRACT

This capstone critically examines the **Reflective Sandwich Method**, a pedagogical innovation conceptualized by **Dr. Regidor T. Carale**, designed as a **Cognitive-Dialogic framework** to cultivate research competence, reflective thinking, and scholarly autonomy among pre-service teachers at **Negros Oriental State University**. Implemented from 2023 to 2025, the study systematically investigates the method's conceptual underpinnings, operational techniques, pedagogical strengths, and implementation challenges. Grounded in principles of **reflective practice** and **dialogic cognition**, the Reflective Sandwich Method integrates structured stages of research instruction with reflective discourse and feedback loops, allowing learners to critically engage with both process and content. This iterative structure fosters deeper understanding, promotes intellectual resilience, and enhances the learner's capacity for independent scholarly inquiry. Findings reveal that the framework bridges the gap between **theoretical knowledge** and **practical research skills**, reinforcing metacognitive awareness and collaborative reflection as vital components of teacher education. Moreover, the Cognitive-Dialogic dimension underscores the importance of dialogical feedback—where teacher and student co-construct meaning through guided reflection and evaluative dialogue. As a result, pre-service teachers demonstrate improved competence in research design, analytical reasoning, and critical interpretation. Ultimately, the Reflective Sandwich Method emerges as a dynamic and contextually responsive model for advancing research pedagogy within teacher education programs, offering a replicable framework for cultivating reflective scholarship and academic rigor in higher education.

Keywords: Reflective Sandwich Method, Cognitive-Dialogic Framework, Research Competence, Reflective Practice, Pre-service Teacher Education, Negros Oriental State University

INTRODUCTION

Background of the Study

The rapidly evolving landscape of higher education necessitates pedagogical innovations that bridge the gap between structured academic instruction and reflective inquiry. In the field of research education, there is a growing recognition that effective learning requires not only methodological competence but also the cultivation of reflective and critical thinking skills. As educational paradigms shift toward inquiry-based and learner-centered frameworks, the challenge for teacher educators is to develop instructional approaches that integrate structure, cognition, and reflection into a cohesive model of learning.

One such pedagogical innovation is the Sandwich Method, conceptualized by Carale (2018). Rooted in principles of reflective and dialogic pedagogy, this method provides a balanced approach to research instruction by combining structured inquiry with reflective feedback and self-assessment. The method metaphorically “sandwiches” empirical realities between ideals and reflective processes—allowing learners to navigate between

what is known, what is experienced, and what is critically understood. It promotes a systematic yet flexible learning environment in which feedback and reflection are not peripheral but integral to the research process.

Despite its growing application in undergraduate research settings, the Sandwich Method has received limited scholarly examination regarding its epistemic, cognitive, and reflective foundations, particularly within teacher education. Existing literature focuses primarily on its procedural functions rather than its theoretical implications for developing metacognition, dialogic reasoning, and scholarly autonomy. This gap underscores the need to investigate the method as a Cognitive-Dialogic framework—a model that situates learning within dialogical interaction and reflective cognition, where understanding is co-constructed between teacher and student through guided discourse and iterative feedback.

In teacher education, pre-service teachers represent a distinct group of learners who must master not only research competencies but also the intellectual and reflective dispositions essential for professional practice. Their role as future educators demands a higher level of analytical thinking, self-awareness, and responsiveness to feedback. However, traditional modes of research instruction often emphasize technical procedures at the expense of reflective engagement, leading to surface-level understanding rather than deep learning. The Reflective Sandwich Method addresses this gap by embedding reflective dialogue at every stage of the research process—from conceptualization and literature synthesis to analysis and interpretation. Through this recursive and dialogic process, pre-service teachers learn to integrate theory with practice, critique their assumptions, and develop a sustained reflective habit of mind.

Within the institutional context of Negros Oriental State University, this pedagogical approach gains particular significance. As a higher education institution committed to advancing quality teacher preparation, the university recognizes the importance of research as both a professional competency and a transformative practice. The implementation of the Reflective Sandwich Method in research instruction seeks to strengthen the intellectual and reflective capacities of pre-service teachers, enabling them to become critical thinkers, effective researchers, and transformative educators.

Hence, this study examines the Reflective Sandwich Method as a Cognitive-Dialogic pedagogical model for enhancing research competence among pre-service teachers at Negros Oriental State University. Conducted over two academic years (2023–2025), the investigation explores the method's features, pedagogical mechanisms, strengths, and challenges. By situating the framework within a reflective and dialogic paradigm, the study aims to contribute to the discourse on research-based teacher education and reflective pedagogy. Ultimately, it aspires to establish the Reflective Sandwich Method as a transformative and sustainable model that not only enhances research proficiency but also nurtures critical reflection, intellectual autonomy, and scholarly engagement among future educators.

Statement of the Problem

While the Sandwich Method has been recognized for its strengths in balancing qualitative and quantitative research approaches, providing constructive feedback, and structuring research outputs, limited studies have examined its features, techniques, and strengths as experienced by BTE students in higher education. There is a need to explore how this method influences students' research practices, academic writing, feedback mechanisms, and overall learning development. Specifically, it answers the following question:

1. What are the features of the Sandwich Method as experienced by the Pre-service Teachers students?
2. What techniques do Pre-service Teachers follow when using the Sandwich Method in the formulation and identification of research problem?
3. What are the strengths and benefits of the Sandwich Method in the development of skills and techniques in conducting research by Pre-service Teachers?
4. How does the Sandwich Method enhance feedback delivery and research formulation?
5. What challenges and limitations do Pre-service Teachers encounter in applying the Sandwich Method?

Theoretical and Conceptual Framework

The Reflective Sandwich Method is grounded in the principles of **Constructivist Learning Theory** (Piaget, 1973; Vygotsky, 1978) and **Reflective Practice Theory** (Schön, 1983), both of which emphasize learning as an active, dialogic, and meaning-making process. Constructivism posits that knowledge is not transmitted but constructed through interaction between the learner and the environment. In this view, learning occurs as individuals reconcile new experiences with existing cognitive schemas, resulting in deeper conceptual understanding and transformation. Within research pedagogy, this means that pre-service teachers develop competence not merely through procedural instruction but through engagement in authentic inquiry, reflection, and feedback.

Vygotsky's (1978) sociocultural theory further reinforces this foundation by situating learning within the **Zone of Proximal Development (ZPD)**, where cognitive growth is facilitated through social interaction and guided dialogue. The dialogic nature of the Reflective Sandwich Method mirrors this process, as the teacher–researcher relationship becomes a collaborative partnership in constructing meaning. Through structured feedback and reflective exchange, learners progress from dependent engagement to independent scholarly inquiry.

Complementing this constructivist foundation, Schön's (1983) **Reflective Practice** model highlights the cyclical process of “reflection-in-action” and “reflection-on-action.” These reflective dimensions are integral to the Sandwich Method's design, enabling learners to continuously evaluate their research assumptions, methods, and interpretations while receiving targeted guidance. Reflection thus becomes both a cognitive and affective process that deepens understanding and promotes intellectual autonomy.

Building upon these theoretical underpinnings, the **Enhanced Sandwich Framework** conceptualizes research learning as a triadic interaction among three interdependent dimensions:

Cognitive Structuring, Reflective Praxis, and Dialogic Engagement.

Cognitive Structuring refers to the systematic organization of ideas, processes, and concepts that scaffold research development. It ensures that inquiry follows coherent, evidence-based logic while maintaining intellectual rigor.

Reflective Praxis involves the integration of self-assessment and critical reflection into each stage of the research process. It allows learners to internalize their learning experiences, interrogate biases, and construct new meanings from empirical evidence.

Dialogic Engagement emphasizes the reciprocal exchange of insights between mentor and learner through constructive feedback and collaborative dialogue. This interaction transforms feedback from evaluative commentary into co-constructed knowledge.

Together, these dimensions form a **Cognitive-Dialogic system** in which reflection, structure, and dialogue converge to enhance research competence. The framework thus positions the Reflective Sandwich Method not only as a pedagogical tool but as a **transformative epistemological model**—one that cultivates reflective scholarship, critical thinking, and autonomous inquiry among pre-service teachers. By integrating constructivist and reflective theories into a cohesive pedagogical design, the model advances a more holistic understanding of how research competence is developed within higher education contexts.

Building upon the foundations of **Constructivist Learning Theory** and **Reflective Practice**, the **Enhanced Sandwich Framework** conceptualizes research learning as a **triadic and interactive system** composed of three interdependent dimensions: **Cognitive Structuring, Reflective Praxis, and Dialogic Engagement**. Together, these dimensions establish the **Cognitive-Dialogic system** at the heart of the Reflective Sandwich Method—where knowledge is constructed through structured inquiry, reflective self-assessment, and collaborative meaning-making.

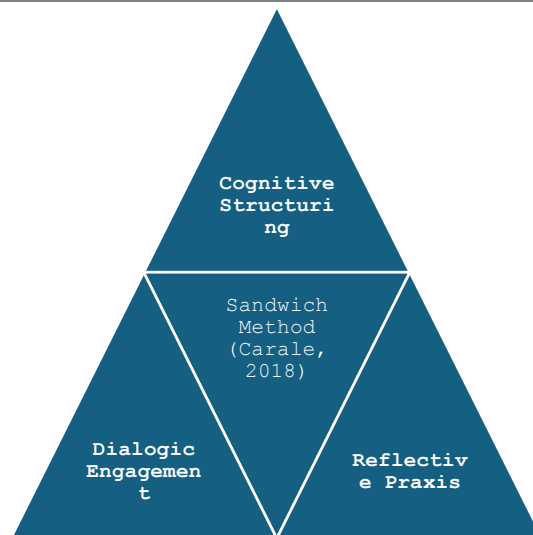


Figure 1. The Sandwich Method Theoretical and Conceptual Framework

Cognitive Structuring

Cognitive Structuring constitutes the foundational dimension of the framework, serving as the intellectual architecture that supports systematic inquiry and disciplined thought. It involves the deliberate organization of knowledge, the formulation of research questions, and the alignment of methodological choices with theoretical foundations. Within this dimension, pre-service teachers are guided to think critically and logically, ensuring that their research processes are grounded in coherent, evidence-based reasoning.

This structuring process promotes **epistemic discipline**—the learner’s ability to navigate between descriptive and analytical levels of thought, to distinguish between observation and interpretation, and to synthesize theoretical and empirical insights. It fosters intellectual rigor by situating inquiry within a systematic sequence of conceptualization, investigation, and validation. As a cognitive scaffold, it provides the structure within which reflection and dialogue can meaningfully occur.

Reflective Praxis

Reflective Praxis represents the transformative core of the Enhanced Sandwich Framework. Drawing from Schön’s (1983) reflective practice theory, this dimension emphasizes the integration of **reflection-in-action** (real-time critical thinking during the research process) and **reflection-on-action** (post-analysis of learning experiences and outcomes). Within research learning, this means that pre-service teachers are not passive recipients of methods but active participants in reconstructing their own understanding.

Through reflective praxis, learners interrogate their assumptions, confront cognitive dissonance, and reconstruct meaning from both success and error. Reflection becomes an act of **metacognitive regulation**—the ability to think about one’s thinking and to strategically adjust one’s cognitive approaches to research challenges. This continuous reflexivity deepens comprehension, nurtures self-directed learning, and cultivates a scholarly disposition oriented toward critical inquiry.

Moreover, reflective praxis situates the learner’s personal and professional growth within the research process itself. By engaging in systematic self-assessment, learners connect empirical observation with personal insight, thereby developing a richer, more authentic engagement with knowledge construction.

Dialogic Engagement

Dialogic Engagement serves as the social and relational dimension of the framework, embodying Vygotsky’s (1978) sociocultural principle that learning is mediated through dialogue and interaction. It involves the reciprocal exchange of perspectives between teacher and learner, where feedback is not unidirectional but co-constructed through reflective conversation.

In this dialogic space, mentors function as **cognitive partners** who guide learners through the **Zone of Proximal Development (ZPD)**—the space between what learners can do independently and what they can achieve with expert guidance. Feedback thus transcends evaluation; it becomes a collaborative process of **joint meaning-making**, enabling the learner to articulate, defend, and refine ideas within a supportive intellectual community.

Dialogic engagement also nurtures affective and interpersonal dimensions of learning. It validates the learner's voice, fosters academic confidence, and models the ethical and communicative aspects of scholarly discourse. By engaging in sustained dialogue, learners develop the discursive competence required to articulate arguments, negotiate meanings, and engage critically with peers and mentors.

Integrative Dynamics of the Framework

When synthesized, **Cognitive Structuring**, **Reflective Praxis**, and **Dialogic Engagement** form a **recursive and self-reinforcing system** that continuously refines both knowledge and cognition. Cognitive structuring provides the intellectual framework for inquiry; reflective praxis deepens personal and epistemic insight; and dialogic engagement ensures that these insights are tested, refined, and co-constructed through interaction.

This triadic system aligns with the **Cognitive-Dialogic Model of Learning**, where understanding emerges from the dynamic interplay of internal reflection and external dialogue. It embodies the constructivist principle that knowledge is actively built through contextualized experience and guided mediation. Within this system, the Reflective Sandwich Method operates not simply as a teaching technique but as a **transformative epistemological model**—one that redefines research learning as an integrative process of cognition, reflection, and communication.

Ultimately, the Enhanced Sandwich Framework provides a holistic lens through which **research competence** can be developed in teacher education. It cultivates pre-service teachers who are not only methodologically skilled but also reflective, dialogic, and critically engaged scholars—capable of bridging theory and practice, reason and reflection, and learning and teaching.

REVIEW OF RELATED LITERATURE

The evolving landscape of higher education increasingly demands pedagogical frameworks that integrate structure, reflection, and interaction to enhance research competence among pre-service teachers. In the context of teacher education, these competencies encompass not only methodological skills but also critical reasoning, reflective judgment, and dialogic engagement. The Sandwich Method, conceptualized by Carale (2018), aligns with the global movement toward reflective and scaffolded learning approaches. By bridging empirical observation with reflective inquiry, it “sandwiches” realities and ideals through structured feedback cycles and systematic research formulation.

Existing models—such as Kolb's (1984) Experiential Learning Cycle, Gibbs' (1988) Reflective Cycle, and Schön's (1983) Reflective Practice Framework—share the same epistemic stance: that learners construct knowledge through iterative cycles of experience, reflection, and re-application. However, few studies have investigated how these cycles may be formalized into a structured yet dialogic research pedagogy in teacher education contexts, particularly in the Philippines. Hence, this chapter reviews empirical and theoretical literature surrounding three core dimensions of the Enhanced Sandwich Framework—Cognitive Structuring, Reflective Praxis, and Dialogic Engagement—which collectively form a cognitive-dialogic model for developing research competence.

Cognitive Structuring and Scaffolding in Research Learning Cognitive Structuring refers to the systematic organization of ideas and processes that enable learners to build coherent, evidence-based research frameworks. Foundational theorists such as Piaget (1973) and Bruner (1960) assert that learning occurs through the progressive internalization of cognitive schemas, guided by active discovery and scaffolded instruction. In this light, Vygotsky's (1978) concept of the *Zone of Proximal Development* provides a sociocognitive rationale for scaffolding: learners perform more complex cognitive tasks through guided support until mastery is achieved.

Kirschner, Sweller, and Clark (2006) reinforced this idea through *Cognitive Load Theory*, demonstrating that novices benefit from explicit instructional guidance rather than unguided discovery. Similarly, Hmelo-Silver (2004) emphasized that structured inquiry, rather than open-ended problem solving, promotes higher-order understanding in professional education. Biggs and Tang (2011) further established that constructive alignment—linking learning objectives, activities, and assessments—optimizes the cognitive structure of academic inquiry.

In research learning, cognitive structuring manifests through frameworks that help learners define research problems, formulate hypotheses, and align theoretical and methodological perspectives. Renner and Muis (2014) provided empirical evidence that cognitive scaffolds improve problem-solving skills and analytical rigor by prompting students to make explicit their reasoning processes. Perkins (1992) and Ramsden (2003) likewise argued that intellectual rigor emerges from structured opportunities to connect abstract theories with practical contexts, an essential goal of the Sandwich Method.

Local studies echo these findings. Salazar-Clemeña (2019) and Santos and Gonzales (2016) observed that Filipino pre-service teachers often struggle with conceptual framing and methodological consistency in research writing. These difficulties point to the need for explicit cognitive scaffolds such as those embedded in Carale's (2018) Sandwich Method, which guides learners from topic formulation to argument synthesis through structured feedback.

Reflective Praxis and the Development of Research Competence

Reflection lies at the heart of scholarly inquiry. Schön (1983) defined *Reflective Praxis* as the process by which professionals think critically about their actions to improve future practice. Dewey (1916/1997) earlier described reflection as the “active, persistent, and careful consideration” of beliefs in light of supporting evidence. Extending this perspective, Brookfield (1995) and Mezirow (1991) emphasized reflection's transformative function, where learners interrogate assumptions, reframe experiences, and derive new meaning from empirical observation.

Empirical studies in teacher education confirm that reflective practice enhances analytical and methodological awareness. Loughran (2002) demonstrated that modelled reflection helps pre-service teachers internalize research reasoning, while Korthagen (2010) proposed a realistic teacher education model that links reflective thinking directly to classroom action. Similarly, Zeichner and Liston (2014) and Darling-Hammond and Bransford (2005) identified reflective inquiry as a central competency of effective teacher education.

Reflection also functions as a metacognitive regulation process. Flavell (1979) introduced *metacognition* as awareness and control of one's thinking processes, and Zimmerman (2002) and Hadwin, Järvelä, and Miller (2011) extended this into self-regulated and co-regulated learning frameworks. These studies show that metacognitive reflection enables learners to monitor understanding, set goals, and self-correct—outcomes essential for independent research competence.

In the Sandwich Method, *Reflective Praxis* is intentionally embedded at each research phase: topic selection, data analysis, and interpretation. Carale (2018) observed that structured reflection prompts allow learners to question assumptions, validate findings, and transform feedback into actionable insights. This mirrors Kolb's (1984) experiential cycle, where reflective observation mediates between concrete experience and abstract conceptualization.

Collectively, these studies suggest that embedding systematic reflection within a scaffolded research framework enhances not only procedural competence but also epistemic awareness—an understanding of how knowledge is produced and justified. This theoretical synergy forms the reflective backbone of the Enhanced Sandwich Framework.

Dialogic Engagement and Feedback as Co-construction

Dialogic Engagement operationalizes Vygotskian and Bakhtinian principles of social learning. Bakhtin (1981) introduced the concept of dialogism to describe how meaning emerges through interaction and exchange of perspectives. Mercer (2000) and Alexander (2008) later extended this concept into education, demonstrating that dialogic teaching fosters reasoning, collaboration, and shared knowledge construction.

In feedback research, dialogic engagement transforms assessment from a one-way transmission to a reciprocal conversation. Nicol and Macfarlane-Dick (2006) identified seven principles of good feedback practice that enhance self-regulation, emphasizing dialogue and feedforward strategies. Carless (2015) and Nicol (2010) further argued that feedback becomes meaningful only when learners actively interpret and negotiate it through dialogue. Hattie and Timperley (2007) confirmed through meta-analysis that feedback is most powerful when it addresses three questions—*Where am I going? How am I going? Where to next?*—which correspond to goal-setting, monitoring, and improvement.

Empirical studies reinforce these findings. Winstone, Nash, Parker, and Rowntree (2017) revealed that students' engagement with feedback depends on their beliefs about its value and the presence of structured opportunities for discussion. Kaye and McEntee (2020) and Kogan and Shea (2007) explored variations of the “feedback sandwich,” showing that when dialogic interaction accompanies the traditional praise–critique–praise sequence, learner motivation and uptake increase significantly.

From a sociocultural perspective, Hadwin et al. (2011) and Lave and Wenger (1991) argue that learning occurs through *legitimate peripheral participation*, where dialogue mediates the transition from novice to expert. In research supervision contexts, McAlpine and Harris (2019) found that doctoral students who received dialogic mentorship developed greater conceptual clarity and scholarly independence.

The Enhanced Sandwich Framework thus situates dialogic engagement as an interactive system that links structure and reflection. By transforming feedback into dialogue, mentors and learners co-construct knowledge, leading to more meaningful revisions and deeper cognitive investment.

Integrative Cognitive-Dialogic Perspective

Synthesizing the above strands, the Enhanced Sandwich Framework integrates Cognitive Structuring (logical scaffolding of research inquiry), Reflective Praxis (critical self-assessment and meaning-making), and Dialogic Engagement (interactive feedback and co-construction). This triadic system echoes Nicol and Macfarlane-Dick's (2006) feedback model, Vygotsky's (1978) sociocultural theory, and Kolb's (1984) experiential cycle—each emphasizing cyclical learning, reflection, and transformation.

Empirical and theoretical evidence collectively affirm that integrating structure, reflection, and dialogue enhances learners' research competence, critical thinking, and self-regulation (Hattie & Timperley, 2007; Loughran, 2002; Nicol, 2010). However, current literature remains limited in examining how these dynamics unfold in Philippine teacher education. Studies by Salazar-Clemeña (2019) and Santos and Gonzales (2016) highlight ongoing challenges in feedback culture, research supervision, and reflective learning, thereby underscoring the need for contextualized frameworks such as Carale's Reflective Sandwich Method.

Ultimately, the reviewed literature supports the notion that the Cognitive-Dialogic Framework serves not only as a pedagogical model but also as an epistemological stance—one that redefines research learning as a dynamic interplay of structure, reflection, and dialogue. This synthesis provides the theoretical foundation for the present study, which aims to empirically validate the Sandwich Method as a transformative tool for cultivating research competence among pre-service teachers in the Philippine higher education context.

METHODOLOGY

Research Design

This study employs a Qualitative Phenomenological–Comparative Design across multiple academic cohorts (2023–2026) at Negros Oriental State University. The choice of phenomenology is grounded in the intent to explore the *lived experiences* and *meaning-making processes* of pre-service teachers as they engage with the Reflective Sandwich Method in research instruction. Phenomenology allows the researcher to uncover how participants interpret their cognitive, reflective, and dialogic encounters within the structured framework developed by Carale (2018).

Simultaneously, the comparative component permits examination of evolving experiences across cohorts who have undergone varying phases of the Sandwich Method’s implementation. This design makes it possible to identify patterns, transformations, and persistent challenges in how reflective learning and feedback processes are internalized.

The study is interpretive in nature and anchored in Constructivist–Interpretivist epistemology (Lincoln & Guba, 1985; Creswell & Poth, 2018). It assumes that knowledge and meaning are co-constructed between researcher and participants through dialogue and reflection—mirroring the Cognitive-Dialogic principles underpinning the Enhanced Sandwich Framework. Therefore, qualitative inquiry becomes both method and metaphor: the research process itself reflects the iterative cycles of structure, reflection, and dialogue that characterize the pedagogical model under study.

Research Locale

The study is conducted at Negros Oriental State University (NORSU), College of Teacher Education, Dumaguete City, Philippines. NORSU serves as an ideal research setting due to its strong commitment to inquiry-based teacher education and its institutional integration of research pedagogy in undergraduate curricula. The College of Teacher Education (CTE) has implemented Carale’s Sandwich Method as part of its research instruction from 2023 onward, making it an authentic environment for observing the framework’s effects on reflective learning and research competence.

Participants and Sampling

Participants will be purposively selected from pre-service teacher cohorts enrolled in Bachelor of Elementary Education (BEED) and Bachelor of Technology Education (BTE) programs between academic years 2023–2025. The selection criteria include:

1. Completion of at least one research course using the Sandwich Method framework.
2. Active engagement in the reflective and feedback components (journals, consultations, or peer dialogues).
3. Willingness to participate in focus group discussions and reflective interviews.

Approximately 5–7 participants (per academic year) will be selected, ensuring representation across cohorts to capture longitudinal insights. This sample size is consistent with phenomenological saturation standards (Creswell & Poth, 2018), where depth of description rather than numerical breadth defines rigor.

Demographic data (e.g., major, year level, gender, prior research experience) will be documented to enable comparative analysis between subgroups. Ethical considerations—such as informed consent, confidentiality, and voluntary participation—will be strictly observed following CHED and university research ethics protocols.

Data Collection Instruments

1. Focus Group Discussion (FGD) Guide

The FGD guide is designed to elicit collective reflections on how participants experienced the Sandwich Method's structured feedback and reflective cycles. Open-ended prompts will explore:

- Perceptions of clarity, sequence, and intellectual challenge in the Sandwich steps.
- Experiences of reflection, feedback, and self-assessment.
- Dialogic interactions with mentors and peers.
- Perceived impact on research competence, confidence, and scholarly independence.

FGDs will be conducted per cohort to facilitate peer-supported reflection and shared meaning-making. Each session (60–90 minutes) will be audio-recorded and transcribed verbatim.

2. Reflective Journals

Participants' written journals—maintained throughout their research coursework—will serve as primary introspective data sources. These journals document evolving thoughts, affective responses, and conceptual shifts during research formulation, data analysis, and presentation. Reflective prompts are based on Carale's (2018) original Sandwich Steps, adapted to highlight *Cognitive Structuring* (organization of research ideas), *Reflective Praxis* (insight and metacognition), and *Dialogic Engagement* (response to feedback). The journals thus provide longitudinal evidence of how pre-service teachers internalize research processes.

3. Semi-Structured Reflective Interview Protocol

To complement the FGDs, individual interviews (30–45 minutes each) will be conducted to deepen understanding of participants' personal narratives. The interview protocol will follow van Manen's (1990) phenomenological method—eliciting concrete stories rather than abstract opinions. Interview questions will probe how participants constructed meaning from the Sandwich experience, integrated feedback, and transformed their approach to research.

4. Thematic Coding Framework

The Thematic Coding Framework will be developed from Carale's (2018) Comprehensive Sandwich Steps and aligned with the Enhanced Sandwich Framework's three interlocking dimensions:

- Cognitive Structuring: Identifying how learners organize research problems, literature, and methodology.
- Reflective Praxis: Recognizing expressions of insight, realization, and shifts in understanding.
- Dialogic Engagement: Tracing feedback interactions and the co-construction of knowledge.

This framework serves both as an analytic lens and as a validation mechanism, ensuring internal consistency between theory, pedagogy, and data interpretation.

Comprehensive Steps in the Sandwich Method

(Adapted from Carale, 2018)

The **Sandwich Method** by Regidor T. Carale, Ed.D., Ph.D.-CDDS provides a sequenced yet reflective structure for research instruction. It is called “sandwich” because it interleaves three essential pedagogical phases—positive reinforcement, constructive critique, and reflective synthesis—within every instructional encounter. The comprehensive steps include:

Presentation of Research Idea (Base Layer): Learners articulate initial research concepts and identify real-world educational issues. Mentors provide guiding questions to ensure alignment with curricular goals.

Reflective Framing (Filling 1): Students critically examine existing literature, connecting theoretical frameworks to contextual realities. Reflection focuses on identifying “what is” versus “what should be,” anchoring inquiry in authentic problems.

Constructive Feedback and Dialogic Review (Core Filling): Teachers and peers provide targeted feedback. Dialogue replaces monologue, transforming critique into collaborative problem-solving. This aligns with Vygotsky’s (1978) notion of socially mediated learning.

Revision and Synthesis (Upper Layer): Students integrate feedback and reframe their understanding, applying reflective insights to improve their research designs. This phase embodies Kolb’s (1984) abstract conceptualization stage.

Presentation and Reflection (Meta-Slice): Learners present their revised work, followed by guided reflection sessions. Reflection journals and FGDs capture metacognitive awareness—how the learners’ thinking evolved throughout the process.

These steps operationalize the Cognitive-Dialogic Model—each phase alternating between structure (cognitive scaffold), reflection (self-assessment), and dialogue (interactive learning). As such, the Sandwich Method functions simultaneously as a *teaching model* and *data structure* for analysis.

Data Collection Procedure

Data will be gathered in three iterative stages corresponding to the Sandwich Method’s pedagogical cycles:

Initial Reflection Phase: Baseline reflective journals and initial FGDs will document participants’ preconceptions about research learning and feedback practices.

Mid-Process Dialogue Phase: Midterm FGDs and reflective interviews will focus on the dialogic exchange between students and mentors. This stage captures real-time negotiation of meaning during research revisions.

Post-Sandwich Integration Phase: End-of-course FGDs and final journals will assess participants’ overall transformation—changes in research confidence, conceptual understanding, and reflective depth.

Throughout these stages, the researcher assumes a participant-observer role, maintaining reflexive field notes and memos to triangulate findings and preserve contextual authenticity.

Data Analysis Procedure

Data will be analyzed using Thematic Phenomenological Analysis (TPA) following Moustakas (1994) and Braun & Clarke (2006). Steps include:

1. Bracketing (Epoché): Setting aside researcher biases to focus on participants’ authentic meanings.
2. Horizontalization: Extracting significant statements from transcripts and journals.
3. Clustering of Meaning Units: Grouping statements into thematic categories corresponding to cognitive structuring, reflective praxis, and dialogic engagement.

4. Textural Description: Describing *what* participants experienced during the Sandwich Method.
5. Structural Description: Describing *how* these experiences occurred (interactions, reflections, processes).
6. Composite Essence: Synthesizing individual experiences into a unified narrative that defines the lived meaning of the Sandwich Method in research learning.

The Thematic Coding Framework will guide interpretation, ensuring fidelity to Carale's pedagogical sequence and the theoretical constructs established in Chapter II.

Trustworthiness and Rigor

To ensure credibility and dependability, the study will employ Lincoln and Guba's (1985) criteria of trustworthiness:

- Credibility: Member checking and peer debriefing will verify interpretive accuracy.
- Transferability: Rich, thick descriptions of context and participants will allow comparison across cohorts.
- Dependability: Audit trails will document decision-making processes during coding.
- Confirmability: Reflexive journaling will safeguard against researcher bias.

Triangulation among FGDs, interviews, and journals will enhance validity by cross-verifying themes emerging from multiple sources.

Ethical Considerations

All research procedures will adhere to the ethical standards set by the Negros Oriental State University Research Ethics Committee. Participants will be informed of the study's objectives, voluntary nature, and confidentiality protocols. Written consent will be obtained before data collection. Pseudonyms will be used to ensure anonymity, and all data will be securely stored following institutional guidelines. The study will avoid any coercive academic influence, ensuring that participation (or non-participation) does not affect students' grades or standing.

SUMMARY

Chapter III operationalizes the Enhanced Sandwich Framework into a qualitative methodological structure that mirrors its theoretical underpinnings. The Phenomenological–Comparative Design allows exploration of pre-service teachers' evolving cognitive, reflective, and dialogic experiences over time. By aligning the data collection instruments with Carale's Sandwich Steps, the research ensures that its method of inquiry is congruent with its epistemological stance. This approach positions the study not only as an evaluation of a pedagogical model but also as a lived demonstration of the Cognitive-Dialogic process that the Sandwich Method seeks to cultivate.

Sandwich Method Matrix by Regidor T. Carale, Ed.D., Ph.D.-CDDS

Sandwich Method In Identifying Research Problem
(Carale, 2018)

Observed Problem	Reality of the Observed Problem	Ideals of the Observed Problems	Translated Specific Question with the Realities	Translated Specific Question with the Ideals	Possible Independent Variables that may affect the perceptions of the respondents on the questions on the Reality and the Ideals.	Translated Specific Questions based on the Independent Variables and the Dependent variables based on the Reality and Ideals.	Identification on the formulated specific questions into Quantitative or Qualitative Questions	Formulation of the Statement of the Problem based on the identified specific questions.	Proposed or Draft Title based on the Statement of the Problem and Specific Questions.

Comprehensive Steps in the Sandwich Method for Identifying a Research Problem (Carale, 2018)

Step 1. Observe and Identify the Problem. Begin by examining your environment, field, or area of practice to identify a *specific, observable issue* that needs to be addressed.

- Purpose: To recognize the existence of a research-worthy concern grounded in real-life context.
- Output: *Observed Problem* (e.g., declining student engagement in online learning).

Step 2. Determine the Reality of the Observed Problem. Analyze the *current condition or factual situation* related to the observed problem. This involves collecting initial descriptive data, reviewing literature, or conducting informal interviews to describe “what is actually happening.”

- Purpose: To establish the current reality—the factual and objective state of the phenomenon.
- Output: *Reality of the Observed Problem* (e.g., Students report lack of motivation and interaction in virtual classes).

Step 3. Articulate the Ideals of the Observed Problem. Define the *ideal or desired condition*—what should be happening if the situation were functioning effectively.

- Purpose: To create a contrast between *reality* and *ideal*, which frames the research gap.
- Output: *Ideals of the Observed Problem* (e.g., Students should demonstrate high engagement and meaningful participation in online classes).

Step 4. Translate the Realities into Specific Research Questions. Formulate specific research questions that address the existing realities or deficiencies.

- Purpose: To translate factual observations into actionable, research-oriented inquiries.
- Output: *Translated Specific Questions with the Realities*

Example: “What factors contribute to students’ low motivation in online learning?”

Step 5. Translate the Ideals into Specific Research Questions. Formulate another set of questions that reflect the *ideal state*—the aspirational goal or desired condition.

- Purpose: To explore conditions or practices that could lead to improvement.
- Output: *Translated Specific Questions with the Ideals*

Example: “What strategies can enhance students’ engagement in online learning?”

Step 6. Identify Possible Independent Variables. Identify *possible independent variables (IVs)* that may influence or affect the perceptions of respondents regarding both the realities and ideals.

- Purpose: To conceptualize the variables that shape the observed phenomenon.
- Output: *List of Independent Variables*

Example: Demographic, Psychographic, Behavioral, and Geographic profile of the prospect respondents, etc.

Step 7. Translate the Independent and Dependent Variables into Specific Questions. Formulate new specific research questions that integrate both the independent variables (causes or predictors) and dependent variables (effects or outcomes) drawn from the realities and ideals.

- Purpose: To connect the theoretical variables with measurable research questions.
- Output: *Translated Specific Questions based on IVs and DVs*

Example:

- What is the Profile of the respondents in terms of the following:
 - age
 - sex
 - educational attainment, etc

How does the instructor's feedback influence students' motivation in online learning?

Step 8. Classify Each Specific Question as Quantitative or Qualitative. Determine the nature of each formulated question—whether it requires quantitative analysis (measurement, correlation, comparison) or qualitative analysis (exploration, understanding, interpretation).

- Purpose: To align the research questions with appropriate methodology.
- Output: *Identification of Questions as Quantitative or Qualitative*

Example:

- Quantitative: “What is the relationship between instructor feedback and student motivation?”
- Qualitative: “How do students describe the role of feedback in maintaining motivation?”

Step 9. Formulate the Statement of the Problem. Synthesize the specific questions into a coherent Statement of the Problem (SOP). This section should include both the *general problem* and the *specific sub-questions* that emerged from the previous steps.

- Purpose: To formally articulate the central focus of the study.
- Output: *Statement of the Problem* (e.g., “This study aims to determine the relationship between instructor feedback and student motivation in online learning environments.”)

Step 10. Propose or Draft the Research Title

Derive a clear, concise, and descriptive research title based on the Statement of the Problem and the identified specific questions.

- Purpose: To summarize the research focus in a manner that reflects both the variables and context.
- Output: *Proposed Title*

Example: “Instructor Feedback and Student Motivation in Online Learning: A Correlational Study.”

Synthesis of the Process

The Sandwich Method in identifying a research problem functions as a structured yet reflective framework that bridges empirical observation with conceptual abstraction. It begins with the concrete (the observed problem) and progressively integrates theoretical constructs (ideals, variables, and methodologies), culminating in a coherent research statement and title. The process mirrors a “sandwich” structure—anchoring between reality and ideal, while integrating conceptual “fillings” of variable analysis, question formulation, and methodological classification.

Data Analysis

Using Thematic Analysis (Braun & Clarke, 2006), data will be coded, categorized, and abstracted into emerging themes per academic year (2023–2024, 2024–2025, and 2025–2026), followed by a longitudinal comparative synthesis.

Presentation, Analysis, And Interpretation of Data

Presentation

This chapter presents the findings from the Focus Group Discussion (FGD) with Pre-service Teachers regarding their experiences with the Sandwich Method, focusing on its features, techniques, strengths, feedback mechanisms, and challenges. The data were analyzed thematically through coding and categorization.

Summary Participants 1-5

S.Y. 2023-2024

Research Question	Answers (Condensed per Participant)	Primary Codes	Secondary Codes	Themes
1. What are the features of the Sandwich Method as experienced by BEED students?	P1: A mixed-methods technique (qual + quant), holistic, iterative. P2: Step-by-step tool, statement of problem → ideals vs. reality → title. P3: Starts/ends with positive feedback, fosters trust. P4: Writing/paragraph structuring, clarity, unity, inclusivity. P5: Balanced positive-negative-positive feedback, supportive.	Mixed-methods; step-by-step; trust-building; clarity; balanced feedback	Research structure; supportive framework	Comprehensive and structured method
2. What techniques do BEED students follow when using the Sandwich Method in the formulation and	P1: Qualitative exploration → quantitative validation; triangulation. P2: Problem statement → translate reality/ideals → qualitative data → title. P3: Praise → critique → encouragement.	Triangulation; title formulation; feedback layering; inclusivity testing;	Stepwise formulation; balanced delivery	Systematic and step-by-step techniques

identification of the research problem?	P4: Gathering sources, testing title relevance, inclusivity check. P5: Positive start → specific actionable critique → encouragement.	actionable critique		
3. What are the strengths and benefits of the Sandwich Method in the development of skills and techniques in conducting research by BEED students?	P1: Validity, reliability, deeper analysis, critical thinking. P2: Easier title creation, systematic process. P3: Builds communication, trust, collaboration. P4: Enhances writing, inclusivity, thoroughness. P5: Improves communication, confidence, motivation.	Critical thinking; systematic ease; collaboration; inclusivity; motivation	Research competence; communication skills	Skill development and researcher growth
4. How does the Sandwich Method enhance feedback delivery and research formulation?	P1: Triangulation validates findings, reliability, nuanced analysis. P2: Step-by-step makes study creation easier. P3: Clear, respectful critique fosters reflection and growth. P4: Sandwiching feedback softens criticism, makes it constructive. P5: Balanced actionable feedback, trust, motivation.	Triangulation; respectful critique; constructive feedback; actionable suggestions	Feedback receptivity; improved research formulation	Enhanced constructive feedback and formulation
5. What challenges and limitations do BEED students encounter in applying the Sandwich Method?	P1: Complexity, time-consuming, balancing depth vs. generalizability. P2: Not directly stated, but implied reliance on independent variables. P3: Risk of diluted critique, insincere praise, time-consuming. P4: Risk of focusing on form vs. content, time challenges. P5: Diluted critique, balancing issues, time demands.	Complexity; diluted critique; focus on form; time-consuming	Methodological and practical constraints	Challenges of balance, clarity, and efficiency

Emerging Themes Across Participants

Comprehensive and Structured Method. The Sandwich Method was consistently described as a systematic and supportive process. For example, **Participant 1** emphasized its value as a mixed-methods design that integrates qualitative depth and quantitative validation, while **Participant 2** highlighted its structured step-by-step approach from problem statement to title formulation.

Systematic and Step-by-Step Techniques. Pre-service teachers applied sequential techniques such as translating ideals and realities into questions (**Participant 2**), layering feedback as praise–critique–

encouragement (**Participants 3 and 5**), and gathering sources to test title relevance and inclusivity (**Participant 4**).

Skill Development and Researcher Growth. The method was seen as an effective tool for improving academic and professional competence. **Participant 1** noted gains in validity, reliability, and critical thinking; **Participant 3** and **Participant 5** highlighted growth in communication, collaboration, and motivation; while **Participant 4** emphasized inclusivity and equity in research writing.

Enhanced Feedback and Research Formulation. Across participants, the Sandwich Method enhanced constructive feedback delivery. **Participant 3** stressed how balanced phrasing fosters reflection and growth, while **Participant 5** valued specific, actionable suggestions for improvement. **Participant 4** added that layering feedback softens criticism, making it more palatable and effective.

Challenges of Balance and Efficiency. Limitations were also noted: **Participant 1** described the method as complex and time-consuming; **Participant 2** emphasized reliance on independent variables to derive outcomes; **Participant 3** cautioned that excessive positivity may *dilute the critique* and leave gaps in learning; **Participant 5** warned that vague or insincere praise can weaken the impact of feedback; and **Participant 4** pointed out that an overemphasis on structure may overshadow deeper content analysis.

Summary Participants 1-5

2024-2025 Participants

Specific Question	Answers (Summary from Participants)	Primary Codes	Final Codes	Themes
1. What are the features of the Sandwich Method as experienced by BTE students?	Students describe the Sandwich Method as a structured and reflective process that continues from the research analysis stage, promotes deeper understanding, and provides clarity and organization in research formulation. It acts as a guide that simplifies complex ideas, promotes critical reflection, and structures presentation (introduction–core–conclusion).	Structured approach; Reflective process; Continuation of research; Clarity and organization; Step-by-step guidance; Simplifies complexity	Structured reflective framework	Systematic and reflective research structuring
2. What techniques do BTE students follow when using the Sandwich Method in the formulation and identification of	Techniques include brainstorming, mind mapping, clustering ideas, identifying keywords, and connecting concepts. Students also follow a step-by-step organization method, using the introduction–	Brainstorming; Mind mapping; Clustering; Idea organization; Keyword identification; Step-by-step sequencing	Concept integration and idea refinement	Techniques for idea generation and problem formulation

the research problem?	body–conclusion format to refine research questions and focus.			
3. What are the strengths and benefits of the Sandwich Method in the development of skills and techniques in conducting research by BTE students?	The method enhances reflection, analytical skills, and the ability to synthesize ideas. It builds confidence, improves clarity in writing and thinking, and leads to more meaningful and impactful outcomes. Students find it valuable for deepening understanding, structuring thoughts, and producing cohesive research.	Deeper reflection; Skill enhancement; Critical thinking; Cohesion; Clarity; Meaningful outcomes	Development of reflective and analytical competence	Enhanced research competence and reflective learning
4. How does the Sandwich Method enhance feedback delivery and research formulation?	The method improves communication and feedback by balancing constructive criticism with positive reinforcement. It fosters a growth-oriented and collaborative environment where feedback becomes motivating and productive. It also clarifies how research ideas are refined through guided feedback loops.	Constructive feedback; Positive reinforcement; Open communication; Guided refinement; Collaborative improvement	Effective feedback integration and communication	Constructive and supportive feedback process
5. What challenges and limitations do BTE students encounter in applying the Sandwich Method?	Students report time consumption, initial confusion, and difficulty in grasping abstract concepts or literature review. The method can be challenging at first due to lack of exposure and practice. Locating relevant literature and interpreting findings	Time-consuming; Lack of prior knowledge; Initial confusion; Difficulty finding literature; Abstract comprehension	Learning curve and resource limitations	Cognitive and procedural challenges in application

	were also noted as stress-inducing.			
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Summary of Emergent Themes

1. **Systematic and Reflective Research Structuring** – The Sandwich Method provides a clear framework that guides research development.
2. **Techniques for Idea Generation and Problem Formulation** – Students use visual and organizational techniques to clarify research focus.
3. **Enhanced Research Competence and Reflective Learning** – The method develops deeper understanding and research skills.
4. **Constructive and Supportive Feedback Process** – It strengthens feedback delivery and academic communication.
5. **Cognitive and Procedural Challenges in Application** – Initial struggles stem from complexity, time demands, and lack of familiarity.

Analysis

School Year 2023-2024

RQ1: What are the features of the Sandwich Method as experienced by Pre-service Teachers?

Participants described the Sandwich Method as a comprehensive and structured approach. For Participant 1, the method was viewed as a powerful mixed-methods research design, integrating both qualitative and quantitative strategies to provide a holistic and iterative analysis of phenomena. Participant 2 emphasized its step-by-step structure, beginning with the statement of the problem, then identifying ideals and realities, and finally deriving a research title. Meanwhile, Participants 3, 4, and 5 highlighted the feedback function of the method—starting and ending with positive reinforcement while embedding constructive critique in between. Participant 4 also stressed its utility in structuring paragraphs and organizing research papers.

Theme: The Sandwich Method is characterized by its comprehensive, structured, and supportive nature, combining research rigor with feedback mechanisms and organizational clarity.

RQ2: What techniques do Pre-service Teachers follow when using the Sandwich Method in the formulation and identification of the research problem?

Participants followed systematic and step-by-step techniques when applying the Sandwich Method. Participant 1 described using qualitative exploration followed by quantitative validation, emphasizing triangulation. Participant 2 focused on the process of translating reality and ideals into questions, supported by qualitative data, which ultimately leads to a formulated title. Participants 3 and 5 applied the feedback layering technique—praise, critique, encouragement—to enhance research formulation. Participant 4 added that the method is also used to gather sources, test the relevance of research titles, and check inclusivity in academic work.

Theme: Pre-service Teachers employ systematic sequencing, feedback layering, and inclusivity testing as central techniques in research formulation under the Sandwich Method.

RQ3: What are the strengths and benefits of the Sandwich Method in the development of skills and techniques in conducting research by Pre-service Teachers?

Across participants, the Sandwich Method was identified as an effective tool for developing research competence and communication skills. Participant 1 emphasized its role in improving validity, reliability, and critical thinking, while Participant 2 appreciated its ability to make title formulation easier and systematic. Participants

3 and 5 highlighted its contribution to trust-building, collaboration, and motivation, while Participant 4 noted its role in enhancing academic writing and promoting inclusivity.

Theme: The method strengthens research competence, communication, inclusivity, and motivation, thereby contributing to overall researcher growth and development.

RQ4: How does the Sandwich Method enhance feedback delivery and research formulation?

Participants agreed that the method improves the delivery of constructive feedback and strengthens research formulation. For Participant 1, triangulation ensures reliability and validity, while Participant 2 emphasized the clarity brought by its stepwise approach. Participant 3 underlined that clear, respectful critique fosters reflection and growth, whereas Participant 4 stressed how feedback softens criticism through balanced phrasing. Participant 5 added that specific, actionable feedback boosts receptivity and motivation.

Theme: The Sandwich Method enhances feedback by promoting constructiveness, clarity, and receptivity, thus supporting robust research formulation.

RQ5: What challenges and limitations do Pre-service Teachers encounter in applying the Sandwich Method?

Despite its strengths, participants acknowledged methodological and practical constraints in applying the Sandwich Method. Participant 1 pointed to its complexity and time-consuming nature, noting that the iterative process of integrating both qualitative and quantitative approaches can be overwhelming for beginners. Participant 2 implied dependence on independent variables when deriving outcomes, which may limit flexibility in certain research contexts.

Participant 3 emphasized the risk of *diluted critique*—explaining that “excessive positivity might water down the core message of the feedback,” leaving the researcher uncertain about what exactly needs improvement. Similarly, Participant 5 observed that vague or insincere praise could make feedback feel hollow, reducing its value for actual growth. Participant 4 raised concerns about the overemphasis on form rather than content, where researchers might focus too much on following the structure of the method rather than deeply analyzing the substance of their research.

Theme: The challenges revolve around maintaining balance, clarity, and efficiency, with time constraints, dependence on variables, diluted critique, and risks of prioritizing form over substance being recurring concerns.

Emerging Themes Across Participants

Comprehensive and Structured Method. The Sandwich Method was consistently described as a systematic and supportive process. For example, **Participant 1** emphasized its value as a mixed-methods design that integrates qualitative depth and quantitative validation, while **Participant 2** highlighted its structured step-by-step approach from problem statement to title formulation.

Systematic and Step-by-Step Techniques. Pre-service teachers applied sequential techniques such as translating ideals and realities into questions (**Participant 2**), layering feedback as praise–critique–encouragement (**Participants 3 and 5**), and gathering sources to test title relevance and inclusivity (**Participant 4**).

Skill Development and Researcher Growth. The method was seen as an effective tool for improving academic and professional competence. **Participant 1** noted gains in validity, reliability, and critical thinking; **Participant 3** and **Participant 5** highlighted growth in communication, collaboration, and motivation; while **Participant 4** emphasized inclusivity and equity in research writing.

Enhanced Feedback and Research Formulation. Across participants, the Sandwich Method enhanced constructive feedback delivery. **Participant 3** stressed how balanced phrasing fosters reflection and growth,

while **Participant 5** valued specific, actionable suggestions for improvement. **Participant 4** added that layering feedback softens criticism, making it more palatable and effective.

Challenges of Balance and Efficiency. Limitations were also noted: **Participant 1** described the method as complex and time-consuming; **Participant 2** emphasized reliance on independent variables to derive outcomes; **Participant 3** cautioned that excessive positivity may *dilute the critique* and leave gaps in learning; **Participant 5** warned that vague or insincere praise can weaken the impact of feedback; and **Participant 4** pointed out that an overemphasis on structure may overshadow deeper content analysis.

Emergent Framework

(Participants 2023-2024)

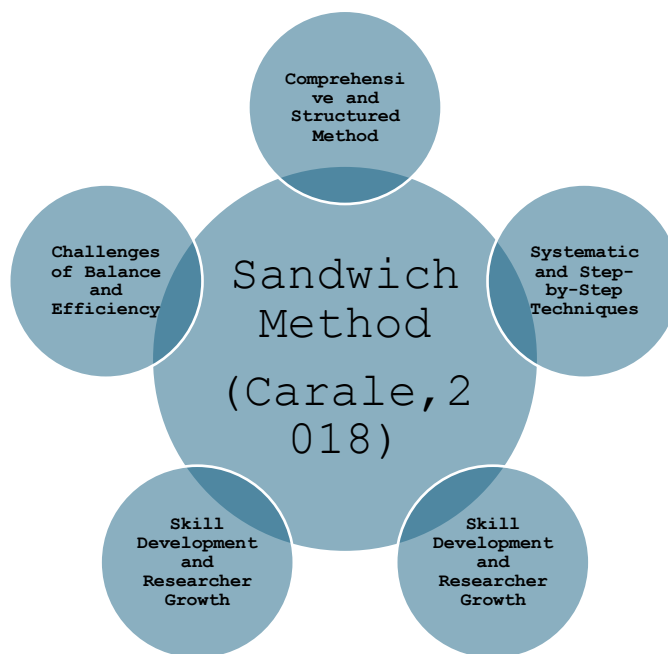


Figure: Emergent Framework on Sandwich Method

School Year 2024-2025

RQ1: What are the features of the Sandwich Method as experienced by BTE students?

The findings revealed that BTE students perceive the Sandwich Method as a structured, reflective, and systematic framework that guides the research process. Participants described it as a continuation of the research analysis, allowing for deeper reflection and understanding of findings (Participant 1). It offers a strategic and layered approach to presenting information, emphasizing clarity and logical sequencing (Participant 2). Others described it as a guiding framework that simplifies complex research components (Participant 4), while some emphasized its feedback-oriented structure (Participant 5). Overall, students experienced the Sandwich Method as a comprehensive and reflective process that enhances organization, clarity, and engagement throughout research development. This indicates that the Sandwich Method's core strength lies in its structured format and its capacity to bridge understanding between analysis and synthesis. Consistent with reflective learning theories, the method promotes critical engagement and systematic organization, helping students make sense of complex ideas.

RQ 2: What techniques do BTE students follow when using the Sandwich Method in the formulation and identification of the research problem?

Participants identified several techniques integrated into their use of the Sandwich Method, including brainstorming, mind mapping, clustering of ideas, and step-by-step sequencing of content. Participant 1

mentioned linking it with “brainstorming or mind mapping,” while Participant 2 emphasized the “introduction–body–conclusion” sequencing as a key procedural strategy. Participant 4 described the process as a step-by-step journey that turns “confusing pieces into clearer questions,” highlighting its role in problem identification and conceptual clarification. These findings suggest that the Sandwich Method not only provides a structure but also incorporates creative and analytical techniques that promote higher-order thinking. The combination of brainstorming and structured sequencing enhances students’ problem formulation skills, allowing them to transition from vague ideas to precise research questions. It also reflects constructivist principles, where learners actively organize and connect ideas to form coherent understanding.

RQ 3: What are the strengths and benefits of the Sandwich Method in the development of skills and techniques in conducting research by BTE students?

Across all participants, the Sandwich Method was described as a valuable tool for skill development. Students reported improvement in critical thinking, reflective analysis, synthesis, and communication. Participant 1 emphasized how it “clarifies and refines research questions,” while Participant 2 noted that it “enhances clarity of communication” and fosters “comprehensive understanding.” Participant 3 recognized its role in providing a “solid foundation” for research design, and Participant 5 highlighted its impact on “open communication and fostering growth.”

The Sandwich Method strengthens both cognitive and metacognitive skills, encouraging reflection, logical organization, and analytical reasoning. It supports skill development not only in research formulation but also in self-evaluation and feedback handling, which are essential for academic growth. These benefits align with existing pedagogical studies that emphasize structured reflection as a means of improving research competency.

RQ 4: How does the Sandwich Method enhance feedback delivery and research formulation?

Participants consistently observed that the method improves feedback dynamics and communication. According to Participant 5, the Sandwich Method “preserves self-esteem” by layering constructive criticism between positive remarks. Participant 1 described it as fostering a “nuanced and sophisticated interpretation” of findings, while Participant 2 explained how the “concluding layer reinforces the significance of findings,” ensuring clear and memorable communication. This reveals that the Sandwich Method not only aids in research organization but also enhances feedback delivery through positive reinforcement and constructive critique. It aligns with feedback theory, which emphasizes the balance between affirmation and improvement. As students apply it in academic research, the method nurtures a more collaborative and supportive learning environment, encouraging openness to revision and reflection.

R Q 5: What challenges and limitations do BTE students encounter in applying the Sandwich Method?

While students acknowledged the method’s benefits, they also reported several challenges. Common issues include the time-consuming nature of the process (Participant 1 and 3), initial confusion and lack of prior exposure (Participant 1 and 4), and difficulty locating and analyzing literature (Participant 3). Participant 5 also noted that poorly structured feedback can “dilute the main point,” indicating challenges in maintaining clarity and precision. These findings indicate that the Sandwich Method has a learning curve, requiring practice and familiarity for effective implementation. The difficulties encountered are primarily procedural and cognitive, rooted in limited exposure to structured methodologies. Nonetheless, once mastered, the method promotes long-term academic benefits. Addressing these limitations through scaffolding and guided instruction could further enhance its accessibility and application.

Emerging Themes Across Participants 2024-2025

Structured and Reflective Learning Process

Across participants, the Sandwich Method was consistently described as a structured and reflective framework that promotes deeper understanding and systematic organization of research ideas. Participant 1 viewed it as a “*continuation of the research analysis*” that allows for “*deeper reflection on findings*,” while Participant 2 characterized it as a “*strategic and effective approach to presenting information*.” Participant 4 emphasized its

ability to “*turn a confusing task into a well-organized adventure.*” Collectively, these accounts show that students perceive the Sandwich Method as more than a procedural tool—it functions as a cognitive framework that supports reflective engagement with data. The structured nature of the method helps learners make sense of complex concepts, build connections between stages of research, and strengthen the logical flow of their studies. This theme reflects the principles of reflective learning and scaffolding, where structured processes enhance comprehension and critical reflection. The Sandwich Method provides an ordered pathway from idea generation to synthesis, aligning with experiential learning theory (Kolb, 1984) that emphasizes reflection as a foundation for knowledge construction.

Techniques for Idea Generation and Problem Formulation

Participants identified a range of techniques embedded within the Sandwich Method—such as brainstorming, mind mapping, idea clustering, and keyword identification—that facilitate the formation of research problems and questions. Participant 1 related the method to “*brainstorming or mind mapping,*” while Participant 4 noted that it “*turned our research problem into clear questions and helped us plan how to get the info we needed.*” Participant 2 described the method’s structure as “*introduction–filling–conclusion,*” a technique that mirrors analytical thinking and logical organization. The Sandwich Method encourages both divergent and convergent thinking — helping students generate multiple ideas and later refine them into focused research questions. This supports the notion that effective research formulation requires both creativity and structure. By combining visual and sequential techniques, the Sandwich Method strengthens conceptual development and helps students bridge the gap between abstract ideas and practical inquiry.

Enhanced Research Competence and Reflective Learning

A strong consensus emerged across participants that the Sandwich Method contributes to the development of analytical, reflective, and communication skills. Participant 1 mentioned that it “*clarifies and refines the research question,*” while Participant 3 highlighted that it “*provided valuable insights and a solid foundation.*” Participant 2 emphasized that it “*enhances the clarity of communication and fosters comprehensive understanding.*” Through its reflective and layered structure, students learn to think critically about their findings, evaluate data with depth, and communicate their insights more coherently. This theme points to the transformative potential of the Sandwich Method in cultivating research competencies. It aligns with the constructivist view of learning, which posits that knowledge is actively built through reflection, synthesis, and iterative understanding. The method scaffolds learning experiences that lead to increased confidence, analytical precision, and academic rigor.

Constructive and Supportive Feedback Process

Participants—particularly Participant 5—highlighted how the Sandwich Method enhances feedback delivery through a balance of positive reinforcement and constructive criticism. The method’s layered feedback structure promotes emotional safety, making students more receptive to critique. Participant 5 observed that this approach “*preserves self-esteem and lessens the negative effects of feedback,*” while Participant 1 and Participant 2 similarly indicated that the method encourages nuanced and meaningful communication in interpreting results. This theme underscores the Sandwich Method’s application not only as a research framework but also as a pedagogical feedback strategy. It builds an environment of trust and collaboration, which aligns with theories of formative assessment and dialogic feedback (Carless, 2006). Such an approach supports the development of a growth-oriented learning culture, where feedback becomes a shared, constructive process rather than a corrective one.

Cognitive and Procedural Challenges in Application

Despite its benefits, participants acknowledged encountering several challenges in applying the Sandwich Method. The most common difficulties included the time-consuming nature of the process, initial confusion about how to apply it, and difficulty in sourcing and organizing literature. Participant 1 described the method as “*requiring a significant amount of time,*” while Participant 3 found “*locating and evaluating literature challenging and time-consuming.*” Participant 4 admitted that understanding concepts such as “research

paradigm” was “*a bit tough.*” These experiences highlight a learning curve associated with mastering the Sandwich Method. The challenges are both cognitive (related to comprehension) and procedural (related to implementation). Such difficulties suggest the need for guided instruction, scaffolding, and practice-based exposure to ensure that students fully internalize and effectively apply the method in future research endeavors.

Emergent Framework

School Year 2024-2025



Figure No. 2: Emergent Framework for S.Y. 2024-2025

Summary of Presentations and Discussions

Comparative Analysis for the Emergent Themes for

S.Y. 2023-2024 and S.Y. 2024-2025

Sandwich Method

Regidor T. Carale, Ed.D., Ph.D.-CDDS

Emergent Themes 2023-2024	Emergent Themes 2024-2025
Comprehensive and Structured Method	Systematic and Reflective Research Structuring
Systematic and Step-by-Step Techniques	Techniques for Idea Generation and Problem Formulation

Skill Development and Researcher Growth	Enhanced Research Competence and Reflective Learning
Enhanced Feedback and Research Formulation	Constructive and Supportive Feedback Process
Challenges of Balance and Efficiency	Cognitive and Procedural Challenges in Application

The comparative analysis of the emergent themes for academic years 2023–2024 and 2024–2025 reveals a distinct evolution in the pedagogical and epistemological understanding of the Sandwich Method as applied by Bachelor of Technology Education (BTE) students. Across both cohorts, the Sandwich Method has consistently demonstrated its efficacy as a scaffolded framework for critical thinking, research structuring, and reflective inquiry. However, nuanced variations between the two academic years suggest a deepening cognitive engagement and methodological sophistication among learners.

In **S.Y. 2023–2024**, the emergent themes—*Comprehensive and Structured Method*, *Systematic and Step-by-Step Techniques*, *Skill Development and Researcher Growth*, *Enhanced Feedback and Research Formulation*, and *Challenges of Balance and Efficiency*—highlighted the method’s foundational role as a procedural guide. Students predominantly perceived the Sandwich Method as a structured and systematic process that facilitated the linear progression of research formulation. The emphasis was on mastering procedural fluency, adhering to sequential stages, and developing initial research competence. Feedback was recognized as a component of the process that contributed to conceptual refinement but was often seen through the lens of formality and compliance rather than reflective transformation.

By contrast, the **S.Y. 2024–2025** themes—*Systematic and Reflective Research Structuring*, *Techniques for Idea Generation and Problem Formulation*, *Enhanced Research Competence and Reflective Learning*, *Constructive and Supportive Feedback Process*, and *Cognitive and Procedural Challenges in Application*—illustrate a transition from procedural mastery to reflective praxis. The 2024–2025 participants demonstrated an increased metacognitive awareness of the method’s reflective dimension, perceiving it as a cognitive tool that fosters both critical synthesis and self-regulated learning. Here, the Sandwich Method was no longer viewed merely as a sequence of stages but as a dynamic and iterative framework for generating, connecting, and articulating ideas.

The shift from *skill development* to *enhanced research competence* indicates a deepened scholarly maturity among participants, aligning with higher-order research capacities such as analytical reasoning, conceptual abstraction, and methodological independence. Moreover, the evolution of the theme from *enhanced feedback and research formulation* to *constructive and supportive feedback process* reflects a pedagogical transformation—from feedback as evaluative correction to feedback as dialogic engagement. This suggests that the Sandwich Method now functions as a relational pedagogical space where feedback becomes collaborative, fostering mutual learning between mentors and students.

Notably, both cohorts reported *challenges*—initially characterized as *balance and efficiency* and later as *cognitive and procedural difficulties*. This shift underscores that while procedural clarity has improved, the complexity of reflective integration demands higher cognitive engagement. The 2024–2025 participants confronted challenges associated with abstract reasoning, synthesis of data, and maintaining coherence amidst iterative reflection. Such findings point to the Sandwich Method’s increasing cognitive rigor, which, while beneficial for research depth, requires deliberate scaffolding and time management strategies.

Overall, the comparative data affirm that the Sandwich Method has evolved from being a **structured instructional strategy** to a **reflective and cognitive pedagogical model**. It facilitates not only research organization but also epistemic growth, transforming student researchers into reflective practitioners capable of synthesizing knowledge, evaluating processes, and articulating nuanced interpretations.

Enhanced Sandwich Method Matrix (Reflective–Metacognitive Version)

Based on the Findings and Conclusions

Revised and Expanded from Carale (2018; 2025 CDDS Edition)

Step	Enhanced Description (Integrating Cognitive, Reflective, and Dialogic Elements)	Purpose / Theoretical Anchor	Outputs / Evidence of Learning	Analytical and Reflective Focus (Scaffolding & Feedback Integration)
1. Contextual Observation and Problem Identification	Learners engage in systematic observation of authentic classroom, institutional, or social contexts to identify an educational issue grounded in lived experience. Guided reflection sessions and peer sharing are used to refine observations.	Constructivism (Piaget, 1973; Dewey, 1938): Knowledge begins with experience. Cognitive Structuring Dimension.	Initial Problem Log; Observation Notes; Reflective Journal Entry 1.	Cognitive scaffolding through guided prompts (“What do I notice?” / “Why is this significant?”). Encourages critical noticing and contextual framing.
2. Validation of the Reality of the Problem	Students explore “what is actually happening” through informal interviews, literature scans, or classroom data, contrasting perceived issues with empirical reality.	Experiential Learning (Kolb, 1984): Active exploration of lived reality. Reflective Praxis Dimension.	Descriptive Profile of Reality; FGD Summary; Mentor Validation Notes.	Reflective dialogue with peers and mentors validates observed problems and strengthens empirical grounding.
3. Articulation of the Ideal Condition	Learners define “what should be,” envisioning optimal performance or learning states. This contrast clarifies the research gap.	Transformative Learning (Mezirow, 1991): Challenging assumptions to generate ideals. Cognitive–Reflective Integration.	Reflective Matrix (Reality vs. Ideal); Journal Entry 2.	Scaffolded comparison of ideal vs. real conditions stimulates abstract conceptualization and critical reasoning.
4. Translation of Realities into Research Questions	Concrete realities are converted into problem-driven research questions focusing on deficiencies and causes.	Cognitive Structuring (Bruner, 1996): Organizing experience into conceptual form.	Set A Research Questions (Reality-based).	Feedback from mentor used to refine focus and ensure conceptual clarity.
5. Translation of Ideals into Research Questions	Ideals are reformulated into aspirational questions that explore	Metacognitive Reflection (Schön, 1983): “Reflection-on-action” to	Set B Research Questions (Ideal-based).	Guided journaling and mentor dialogue bridge empirical and aspirational inquiry.

Step	Enhanced Description (Integrating Cognitive, Reflective, and Dialogic Elements)	Purpose / Theoretical Anchor	Outputs / Evidence of Learning	Analytical and Reflective Focus (Scaffolding & Feedback Integration)
	improvement, best practices, or innovation.	conceptualize solutions.		
6. Identification of Variables (IVs and DVs)	Learners determine independent and dependent variables influencing both realities and ideals.	Sociocultural Theory (Vygotsky, 1978): Co- construction of meaning through guided interaction.	Variable Map; Causal Diagram; Mentor Review Notes.	Collaborative variable mapping sessions scaffold abstract reasoning and promote analytic accuracy.
7. Integration of Variables into Specific Questions	Variables are integrated into measurable or interpretive questions, connecting cause and effect relationships.	Cognitive-Dialogic Alignment: Transforming data into interrelated questions through dialogue and reflection.	Comprehensive Set of Research Questions.	Mentors provide formative feedback loops; students engage in peer coding of variables.
8. Methodological Classification (Quantitative vs. Qualitative)	Learners classify questions by methodological nature— measurement or meaning. This step develops methodological literacy.	Methodological Cognition (Lincoln & Guba, 1985): Choosing approaches consistent with epistemic stance.	Method Classification Table; Journal Entry 3.	Reflection prompts: “How does my method reveal what I want to know?” enhances methodological awareness.
9. Formulation of the Statement of the Problem (SOP)	Synthesis of all preceding steps into a structured and reflective SOP integrating cognitive rigor and contextual insight.	Dialogic Synthesis (Bakhtin, 1981): Harmonizing multiple perspectives into a coherent research voice.	General Problem Statement and Sub-questions; Mentor Feedback Sheet.	Peer and mentor validation ensures coherence, logical progression, and reflective depth.
10. Development of the Research Title	Creation of a concise, descriptive, and conceptually rich title summarizing the variables, focus, and intent of the study.	Academic Communication Competence: Expressing conceptual relationships succinctly.	Proposed Research Title; Title Justification Log.	Feedback used to refine clarity, accuracy, and scholarly tone.
11. Reflective Integration and Feedback Loop (Expanded)	Continuous reflection and feedback integration across all stages. Learners revisit previous steps, refining	Reflective–Dialogic Cycle: Knowledge construction through	Final Reflective Portfolio; Mentor- Learner Dialogue Transcript;	Triangulated reflection integrating cognitive progress, feedback uptake, and self-regulated

Step	Enhanced Description (Integrating Cognitive, Reflective, and Dialogic Elements)	Purpose / Theoretical Anchor	Outputs / Evidence of Learning	Analytical and Reflective Focus (Scaffolding & Feedback Integration)
	conceptualizations and self-assessing metacognitive growth.	iteration, feedback, and transformation.	Concept Map of Learning Journey.	learning; demonstrates transformation from compliance to autonomy.

Analytical Enhancements Based on Recommendations

Recommendation Theme	Matrix Integration	Practical Application
1. Pedagogical Integration and Training	Step 1–3 emphasize guided workshops and explicit instruction on reflective inquiry.	Faculty embed demonstration sessions and exemplars for observing, documenting, and reflecting on problems.
2. Feedback as Dialogic Engagement	Steps 6–11 include structured feedback loops and mentor–student dialogues.	Feedback sessions restructured as reflective consultations rather than evaluations.
3. Cognitive Scaffolding for Reflective Thinking	Steps 2–7 utilize mind mapping, concept charts, and reflective journaling.	Students use scaffolds like thematic matrices and cognitive maps to visualize reasoning.
4. Research Competence Development	The iterative design (Step 11) institutionalizes continuity across semesters.	Integration of Sandwich Method into all research phases ensures longitudinal competence.
5. Further Research Pathways	The matrix can guide future mixed- method or longitudinal studies examining reflective transformation.	Universities may adopt the matrix as a model for cross-disciplinary research pedagogy.

Step-by-step Procedure in Performing the Sandwich Method Based on the Recommendations

Enhanced Sandwich Method in Identifying a Research Problem

(Revised and Expanded Based on Carale, 2018; Integrating Reflective, Cognitive, and Dialogic Dimensions)

Step 1. Observation and Contextual Reflection

Begin by engaging in reflective observation of real-world conditions within your academic or professional context. Identify gaps, inefficiencies, or challenges that provoke inquiry.

- Purpose: To cultivate awareness of phenomena that warrant scholarly investigation.

- Reflective Integration: Document not just *what is observed*, but *why* it matters and *how* it connects to prior knowledge or theory.
- Output: A clearly articulated *Observed Problem* framed within a contextual reflection.

Step 2. Analysis of the Current Reality (Empirical Grounding)

Examine the current state or factual reality of the identified problem through initial data collection, literature scanning, or field experience.

- Purpose: To empirically ground the observation by defining *what currently exists* and *how it manifests*.
- Reflective Integration: Engage in self-questioning—"What assumptions am I bringing to this observation?"
- Output: *Reality of the Observed Problem* supported by preliminary evidence or factual data.

Step 3. Defining the Ideal State (Conceptual Visioning)

Construct the ideal or desired condition that represents effective practice or optimal functioning of the observed context.

- Purpose: To establish the *ideal benchmark* or aspirational outcome for comparison.
- Reflective Integration: Integrate insights from theoretical models, best practices, or standards in the field.
- Output: *Ideals of the Observed Problem* that clarify the gap between "what is" and "what should be."

Step 4. Formulation of Guiding Questions from Reality and Ideals

Translate the realities and ideals into specific guiding research questions.

- Purpose: To transform contextual insights into scholarly inquiries that reveal relationships or discrepancies between the actual and ideal.
- Reflective Integration: Recognize cognitive biases and ensure each question aligns with the study's intended scope.
- Output:
 - *Questions from Reality*: Explore existing conditions or deficiencies.
 - *Questions from Ideals*: Explore aspirational possibilities or improvement strategies.

Step 5. Identification and Reflection on Key Variables

Determine the independent and dependent variables influencing or affected by the observed realities and ideals.

- Purpose: To conceptualize measurable elements of the research problem and to prepare for methodological design.
- Reflective Integration: Link variables to theoretical constructs, frameworks, or prior studies.
- Output:
 - *Independent Variables* (factors or causes)

-
- *Dependent Variables* (outcomes or effects)

Step 6. Dialogic Refinement of Questions through Feedback

Engage mentors, peers, or advisors in dialogic feedback sessions to refine your questions and variable relationships.

- Purpose: To enhance conceptual precision and ensure academic rigor.
- Reflective Integration: Treat feedback as *collaborative meaning-making*, not correction—iteratively adjust questions to align with theoretical and methodological clarity.
- Output: Polished and conceptually grounded *Research Questions* integrating both IVs and DVs.

Step 7. Classification of Research Questions by Methodological Orientation

Differentiate questions as quantitative, qualitative, or mixed-methods, depending on their purpose and data requirements.

- Purpose: To align research questions with the most appropriate methodological approach.
- Reflective Integration: Evaluate how each question contributes to understanding both *the measurable patterns* and *the lived meanings* of the phenomenon.
- Output: Categorized list of *Quantitative* and *Qualitative* questions ready for design development.

Step 8. Integration and Formulation of the Statement of the Problem (SOP)

Synthesize the refined questions into a coherent Statement of the Problem that logically connects the observed reality, the ideal state, and the identified variables.

- Purpose: To formalize the central research focus and guide the direction of inquiry.
- Reflective Integration: Ensure the SOP reflects both *empirical clarity* and *theoretical depth*.
- Output: Comprehensive *Statement of the Problem* framed within a reflective and evidence-based context.

Step 9. Development of a Reflective and Conceptually Grounded Research Title

Formulate a research title that encapsulates the core problem, key variables, and methodological orientation.

- Purpose: To produce a precise and scholarly title that communicates both focus and scope.
- Reflective Integration: Evaluate if the title communicates the study's theoretical orientation, relevance, and contribution.
- Output: *Proposed Title* (e.g., “Reflective Learning and Research Competence among BTE Students: An Application of the Sandwich Method”).

Step 10. Continuous Reflective Feedback and Revision Cycle

Implement a cyclical feedback process throughout research planning, incorporating mentor and peer insights to strengthen conceptual coherence.

- Purpose: To internalize feedback as an ongoing developmental process, not a terminal evaluation.

- Reflective Integration: Maintain a *reflective journal* to track intellectual growth, conceptual shifts, and methodological adjustments.
- Output: An evolved, rigorously refined research framework demonstrating both methodological precision and reflective maturity.

Synthesis: The Reflective Sandwich Framework

This revised model transforms the Sandwich Method from a linear procedural tool into a reflective, dialogic, and metacognitive research framework. It integrates three key dimensions:

1. Cognitive Structuring – grounding inquiry in logic, clarity, and variable analysis.
2. Reflective Praxis – cultivating awareness of assumptions, meaning, and learning through reflection.
3. Dialogic Engagement – embracing collaborative feedback to enhance conceptual and methodological depth.

In this enhanced form, the Sandwich Method not only aids in identifying research problems but also serves as a *transformative learning process* that nurtures autonomy, scholarly identity, and lifelong inquiry competence.

SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

Summary of Findings

The comparative analysis of the emergent themes for Academic Years 2023–2024 and 2024–2025 reveals a progressive evolution in the understanding and application of the Sandwich Method among Bachelor of Technology Education (BTE) and College of Teacher Education (CTE) pre-service teachers. Across both cohorts, the Sandwich Method demonstrated its effectiveness as a scaffolded framework for fostering critical thinking, research organization, and reflective inquiry.

In S.Y. 2023–2024, themes such as *Comprehensive and Structured Method*, *Systematic and Step-by-Step Techniques*, *Skill Development and Researcher Growth*, *Enhanced Feedback and Research Formulation*, and *Challenges of Balance and Efficiency* reflected the method's procedural emphasis. Students primarily viewed it as a sequential process that guided the step-by-step completion of research tasks, highlighting procedural mastery and the early development of research competence.

By contrast, in S.Y. 2024–2025, emergent themes such as *Systematic and Reflective Research Structuring*, *Techniques for Idea Generation and Problem Formulation*, *Enhanced Research Competence and Reflective Learning*, *Constructive and Supportive Feedback Process*, and *Cognitive and Procedural Challenges in Application* indicated a significant pedagogical shift. Participants began to perceive the Sandwich Method as a reflective and iterative learning model that supports both cognitive development and metacognitive awareness.

This transition signifies a move from procedural compliance to reflective autonomy, where pre-service teachers demonstrated higher levels of conceptual reasoning, methodological independence, and adaptive reflection. The evolution from feedback as correction to feedback as dialogue also reveals a transformation toward collaborative and supportive learning relationships.

Both cohorts acknowledged ongoing challenges—from maintaining balance and efficiency to addressing cognitive and procedural difficulties—highlighting the growing complexity of reflective engagement as research understanding deepens. Overall, the findings affirm that the Sandwich Method has evolved from a structured instructional guide into a reflective pedagogical framework that strengthens both research competence and professional growth among pre-service teachers.

Conclusion

The results of this comparative study underscore the enduring value of the Sandwich Method as both a methodological and metacognitive tool in research education. Initially serving as a procedural guide, it has matured into a comprehensive framework that integrates critical reflection, conceptual synthesis, and scholarly communication.

For pre-service teachers, this evolution reflects the shift from learning research as a set of steps toward engaging in it as a reflective, inquiry-driven process. The Sandwich Method thus functions as a bridge between knowledge construction and transformation—empowering students to internalize feedback, think critically, and apply reflective reasoning not only in research but also in future classroom contexts.

Mastery of the Sandwich Method among the 2024–2025 cohort corresponds with greater analytical rigor, conceptual clarity, and research independence—traits that align closely with the competencies required of 21st-century educators and lifelong learners.

Recommendations

(Contextualized for the College of Teacher Education Pre-Service Teachers)

Pedagogical Integration and Reflective Training. Research instructors in the College of Teacher Education should embed the Sandwich Method as both a research framework and a model for reflective pedagogy. Structured workshops, simulations, and guided exercises can help pre-service teachers internalize reflection as a habit of mind—translating research reflection into classroom reflective practice. Integrating reflection across all research courses can cultivate metacognitive awareness essential for professional teaching.

Feedback as Collaborative Learning Dialogue. Faculty mentors are encouraged to adopt a dialogic and formative feedback approach that mirrors effective classroom feedback strategies. This promotes a culture of collaboration where feedback becomes a shared learning process rather than a corrective mechanism. For pre-service teachers, this experience serves as a model for delivering constructive feedback to their future learners.

Cognitive Scaffolding for Research and Teaching Reflection. To address the cognitive and procedural challenges observed, the curriculum should include structured scaffolding techniques—such as concept mapping, reflective journaling, thematic clustering, and guided inquiry sessions. These strategies enhance higher-order reasoning in research and simultaneously equip pre-service teachers with classroom techniques to cultivate critical thinking and reflection in their pupils.

Progressive Development of Research Competence. The College of Teacher Education may consider institutionalizing the Sandwich Method across multiple levels of research instruction—from introductory courses to action research. This continuity ensures consistent reinforcement of analytical and interpretive skills, enabling pre-service teachers to develop evidence-based reasoning that can be applied in teaching practice and professional development.

Application to Practice Teaching and Action Research. Pre-service teachers should be encouraged to apply the principles of the Sandwich Method in their practice teaching and classroom-based action research. Through reflective lesson planning, structured observation, and post-lesson analysis, they can integrate the same systematic-reflective approach used in research to enhance classroom practice, self-evaluation, and pedagogical innovation.

Further Research and Longitudinal Study. Future research may investigate the long-term impact of the Sandwich Method on teacher education students' academic performance, teaching efficacy, and professional growth. A longitudinal or mixed-methods study could reveal how sustained engagement with the method influences reflective thinking, research productivity, and classroom competence over time.

Synthesis

The comparative findings across the two academic years highlight the Sandwich Method's evolution from a procedural technique to a reflective, metacognitive, and pedagogically transformative framework. For pre-service teachers, this development parallels their journey from *learning to teach* toward *teaching to learn*.

The method not only equips them with technical research competence but also nurtures dispositions of reflective inquiry, adaptive cognition, and professional autonomy—key hallmarks of effective and transformative educators. By embedding the Sandwich Method into both research and practice, the College of Teacher Education can continue to cultivate teacher-researchers who embody critical reflection, collaborative learning, and evidence-informed teaching practice.

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