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From Memorizing to Meaning-Making: Transforming Introductory Economics through Case-Based and Problem-Based Learning in Indonesian Teacher Education

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Abstract

This study addresses persistent problems of limited conceptual understanding and low learning engagement in introductory economics by examining the implementation of an integrated Case-Based Learning and Problem-Based Learning (CBL–PBL) approach within an Economic Education program at Universitas Sebelas Maret, Indonesia. Grounded in constructivist and student-centered learning theory, the research evaluates whether this pedagogy improves students' mastery of economic concepts, learning engagement, academic performance, and lecturers' pedagogical effectiveness. A classroom-based design-based action research design was employed involving forty-eight first-semester students across two iterative instructional cycles using authentic economic cases, collaborative inquiry, and facilitator-guided reflection. Data were collected through validated pre- and post-tests, structured observations, and lecturer performance rubrics, and analyzed using descriptive statistics, normalized gain, and effect size measures. Findings indicate substantial improvements in conceptual mastery, rising from negligible baseline levels to more than three-quarters of students achieving proficiency, accompanied by significant growth in engagement and instructional facilitation quality. The results suggest that CBL–PBL supports deep conceptual restructuring rather than surface-level achievement. The study contributes theoretically by reinforcing constructivist problem-oriented pedagogy and practically by offering an evidence-based instructional model for higher education in Global South contexts.

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INTRODUCTION

The acceleration of globalization, rapid digital transformation, and persistent economic uncertainty has fundamentally reshaped the competencies expected from graduates in economics and economic education (Kozhukhova et al., 2021; Rahimi & Oh, 2024). Higher education institutions are no longer tasked solely with transmitting canonical economic theories; they are increasingly required to cultivate deep conceptual understanding, analytical reasoning, and problem-solving abilities aligned with complex and dynamic real-world economic conditions (Rohm et al., 2021; Bates et al., 2022; Li & Yu, 2025). Within this broader transformation, introductory economics courses occupy a pivotal yet problematic position. While they serve as the epistemic foundation for economic literacy, they are frequently criticized for producing surface-level comprehension, fragmented reasoning, and limited student engagement, particularly in developing and emerging higher education systems.

Introductory Economics is a compulsory first-semester course across economics-related programs, including the Economic Education program at Universitas Sebelas Maret (UNS), Indonesia. The course introduces fundamental microeconomic and macroeconomic concepts such as scarcity, opportunity cost, market equilibrium, national income, inflation, and economic policy instruments. Conceptual mastery of these foundations is essential not only for academic progression but also for preparing prospective economics teachers to interpret economic phenomena, design pedagogically sound instruction, and support evidence-based decision-making in educational and societal contexts. However, international and regional scholarship consistently indicates that introductory economics is often perceived by students as abstract, technically intimidating, and disconnected from lived economic realities, resulting in disengagement and superficial learning outcomes (Archambault et al., 2022; Pathak-Shelat & Mehta, 2023).

Empirical studies in Global South higher education reveal that these challenges are frequently reinforced by persistent teacher-centered pedagogical traditions, lecture-dominated classrooms, and assessment systems emphasizing memorization rather than conceptual reasoning (Sierra & Suárez-Collado, 2021; Soesmanto et al., 2023). Classroom observations within the Economic Education program at UNS indicate similar patterns: instructional discourse is predominantly lecturer-driven, student participation is limited, and opportunities for inquiry or critical dialogue remain constrained. Many students demonstrate reluctance to express misunderstanding or challenge explanations due to fear of negative evaluation, low academic self-efficacy, and culturally embedded power distance between lecturers and students. Consequently, students often struggle to apply foundational economic concepts to analytical problems, contextual cases, or contemporary economic issues, as reflected in modest formative assessment performance. These recurring patterns suggest that the problem is structural and pedagogical rather than purely cognitive.

Contemporary learning theories emphasize that meaningful understanding in economics emerges through active knowledge construction, contextual reasoning, and iterative engagement with authentic problems (Groenewald, 2023; Sánchez, 2023; Shah et al., 2024). Passive knowledge transmission is insufficient for producing durable conceptual change, especially in domains such as economics where misconceptions are persistent and intuitively appealing (Davies, 2023). From constructivist and socio-cognitive perspectives, learning is most effective when students function as epistemic agents who actively construct meaning through inquiry, dialogue, and situated problem-solving (Gardiner, 2020). This theoretical orientation implies that pedagogical reform must reconfigure the epistemic structure of instruction rather than merely modify classroom techniques.

In response, recent scholarship in economic education increasingly advocates student-centered pedagogies such as Problem-

Based Learning (PBL) and Case-Based Learning (CBL). These approaches are theoretically grounded and supported by extensive empirical evidence across economics, business, and education (Dolmans et al., 2021; Song et al., 2022; Muerza et al., 2024). Unlike conventional cooperative strategies, PBL and CBL anchor learning in complex, ill-structured problems and authentic cases reflecting real economic dynamics (Sistermans, 2020). Students are required to identify issues, activate prior knowledge, gather relevant information, and collaboratively construct explanations, thereby promoting higher-order cognition, integrative reasoning, and conceptual restructuring (Lu et al., 2021). Meta-analytic and longitudinal research demonstrates that these pedagogies enhance conceptual understanding, transfer of learning, intrinsic motivation, and epistemic curiosity, particularly in foundational courses (Wijnia et al., 2024; Yang et al., 2024). In economics education, case- and problem-oriented instruction improves students' ability to connect theory with empirical realities, interpret data critically, and articulate coherent economic reasoning—competencies central to future economics educators (Giek et al., 2025; Vítečková et al., 2025).

Despite this growing consensus, several theoretical and empirical limitations persist. First, much of the existing literature examines PBL or CBL in isolation, with limited exploration of their integrative potential as a hybrid epistemic framework capable of fostering deeper conceptual restructuring. Second, empirical evidence from Indonesian higher education—particularly within Economic Education programs—remains fragmented, often lacking rigorous classroom-based implementation and insufficiently anchored in contemporary learning theory (Mirra & Garcia, 2021; Correia et al., 2025). Third, few studies focus explicitly on early-semester introductory economics, a critical stage where conceptual difficulties are most acute and pedagogical intervention may yield long-term academic and professional benefits (Alstete et al., 2021; Ogbozor et al., 2025). These gaps are especially consequential because Economic Education students are prospective teachers who will shape economic literacy in secondary education. Addressing these limitations requires context-sensitive, theory-driven, and empirically grounded investigation into how integrated problem-oriented pedagogies influence conceptual understanding, engagement, and learning outcomes.

Against this backdrop, the present study investigates the implementation of an integrated Case-Based Learning and Problem-Based Learning approach in an Introductory Economics course for undergraduate students in the Economic Education program at Universitas Sebelas Maret. Specifically, the study seeks to answer the following research questions: (1) To what extent does the CBL–PBL approach improve students' conceptual understanding of fundamental economic principles? (2) How does this pedagogical model influence students' learning engagement and classroom participation? (3) Does the implementation of CBL–PBL enhance students' learning outcomes as reflected in formative and summative assessments? and (4) How does the approach support lecturers' pedagogical competence in facilitating student-centered economic instruction? By integrating constructivist learning theory with classroom-based pedagogical innovation, this study aims to contribute both empirically and theoretically to the advancement of economic education, particularly within the Global South context where transformative, learner-centered approaches remain urgently needed.

METHOD

Research Design

This study adopted a classroom-based action research design with a strong methodological orientation toward Design-Based Educational Research (DBER). This combined approach was selected because it enables systematic pedagogical intervention, iterative refinement, and rigorous examination of learning processes within authentic instructional environments (McKenney & Reeves, 2020; Anderson & Shattuck, 2021).

Unlike conventional experimental approaches that often isolate variables from their instructional context, classroom action research integrated with DBER allows researchers to investigate how pedagogical innovation operates in real educational settings where ecological validity and instructional transformation are central objectives. Such designs are increasingly recognized in high-impact higher education research for evaluating instructional reform and learning improvement.

The study was conducted through two iterative action cycles, each consisting of four interrelated stages: (1) instructional planning, (2) implementation of the learning intervention, (3) systematic observation and data collection, and (4) reflection followed by pedagogical refinement. This cyclical structure enabled continuous improvement of instructional design while maintaining analytical rigor. The pedagogical intervention involved the integration of Case-Based Learning (CBL) and Problem-Based Learning (PBL), an approach supported by empirical and meta-analytic evidence demonstrating its effectiveness in enhancing conceptual understanding, engagement, and higher-order thinking in economics and business education (Schmidt et al., 2022; Dolmans et al., 2021).

Research Context and Participants

The study was conducted in the Economic Education Study Program, Faculty of Teacher Training and Education, Universitas Sebelas Maret (UNS), Indonesia, during the first semester of the academic year. Introductory Economics is a foundational course for prospective economics teachers, making it a relevant context for investigating pedagogical innovation aimed at improving both conceptual mastery and instructional competence. Participants consisted of 48 first-semester undergraduate students enrolled in the Introductory Economics course. A purposive sampling technique was employed, justified by diagnostic assessments and instructor observations indicating limited conceptual understanding and suboptimal learning outcomes prior to the intervention. The initial formative assessment revealed an average score of 62 out of 100, below the institutional benchmark for satisfactory academic performance, thereby meeting established criteria for conducting classroom action research (Kemmis et al., 2018). The sample size corresponds to the intact class population, ensuring ecological validity and minimizing disruption to the natural instructional setting. Moreover, in action research and DBER, intact classroom samples are methodologically appropriate because the objective is pedagogical improvement rather than population-level generalization. The participant cohort was heterogeneous in academic background, prior exposure to economics, and learning readiness, reflecting typical conditions in Indonesian public universities. This heterogeneity enhances the contextual relevance and transferability of findings for similar higher education settings in the Global South.

Instructional Intervention

The instructional intervention was grounded in constructivist learning theory, situated cognition, and social learning theory, which collectively posit that knowledge is actively constructed through engagement with meaningful problems within social contexts (Chi & Wylie, 2019; Lave & Wenger, 2020). Case-Based Learning (CBL) and Problem-Based Learning (PBL) operationalize these principles by positioning students as active problem-solvers engaged with authentic scenarios rather than passive recipients of information. The CBL–PBL integration was implemented through structured learning phases. Each instructional unit began with the presentation of a realistic economic case derived from contemporary Indonesian economic issues, including inflation dynamics, household consumption patterns, labor market challenges, and fiscal policy decisions.

Cases were deliberately ill-structured, containing incomplete information and multiple plausible interpretations to stimulate inquiry and debate. Students were organized into small collaborative groups of four to five members to foster interaction and shared

responsibility.During the problem analysis phase, students identified key issues, formulated learning objectives, and generated preliminary hypotheses based on prior knowledge. In the self-directed learning phase, students sought relevant theoretical and empirical resources from textbooks, academic literature, and credible economic reports. The synthesis phase required groups to construct evidence-based explanations and propose reasoned solutions, which were presented and discussed in plenary sessions. The lecturer functioned as facilitator, providing scaffolding through probing questions, conceptual clarification, and feedback, consistent with best practices reported in higher education research (Walker et al., 2021; Looi et al., 2023).

Data Collection Instruments and Procedures

To ensure methodological triangulation and enhance validity, multiple data collection instruments were employed: conceptual understanding tests, structured observation sheets, learning engagement rubrics, lecturer pedagogical competence assessments, and documentary analysis. The development of research instruments followed a systematic process including construct specification, item generation, expert validation, pilot testing, and reliability analysis. Conceptual understanding was measured using pre-test and post-test instruments aligned with course learning outcomes and Bloom's revised taxonomy. Items consisted of scenario-based multiple-choice questions and short analytical responses designed to assess interpretation and application of economic concepts rather than rote recall. Content validity was established through expert review by two senior lecturers in economics education and one assessment specialist. The Content Validity Index exceeded recommended thresholds (CVI > 0.80). Reliability testing using Cronbach's alpha produced coefficients above 0.75, indicating satisfactory internal consistency.

Student engagement was measured using a structured observation rubric encompassing behavioral, cognitive, and social dimensions. Indicators included quality of participation, questioning behavior, collaborative reasoning, and responsiveness to feedback, rated on a four-point Likert scale. Observations were conducted by two trained observers, and inter-rater reliability assessed using Cohen's kappa indicated acceptable agreement ($\kappa > 0.70$). Lecturer pedagogical competence was assessed using an observation instrument focusing on facilitation quality, questioning strategies, scaffolding effectiveness, classroom management, and alignment between objectives and instructional activities. Documentary data included lesson plans, student worksheets, reflective notes, and assessment records. Ethical approval was obtained from the Faculty Research Ethics Committee, Universitas Sebelas Maret, and all participants provided informed consent in accordance with international research ethics standards (BERA, 2021). Potential methodological biases were addressed through procedural remedies. Common method variance was minimized by collecting data from multiple sources (tests, observations, documents), employing temporal separation between measurements, and using different measurement formats. Observer bias was reduced through training and inter-rater reliability checks.

Data Analysis Techniques

Data analysis employed a multi-layered quantitative approach combining descriptive, comparative, and magnitude-based analysis to ensure rigor and interpretability. Descriptive statistics (mean, standard deviation, minimum, maximum) were computed to summarize learning performance and variability. Conceptual improvement was measured using normalized gain (N-gain), which was selected because it controls for ceiling effects and provides a more accurate estimate of learning growth compared to raw score differences. N-gain values were interpreted using established benchmarks (low < 0.30; medium 0.30–0.69; high ≥ 0.70). Learning mastery was evaluated using criterion-referenced assessment based on institutional standards (minimum score ≥71). The proportion of students achieving mastery was calculated across cycles to assess

instructional effectiveness. Student engagement data were analyzed using aggregated mean scores across behavioral, cognitive, and social dimensions, allowing identification of directional trends across instructional cycles. Lecturer pedagogical competence was analyzed through comparative mean scores across cycles, with improvements interpreted as a mediating factor influencing learning outcomes.

Effect size estimation using Cohen's d was incorporated to provide a magnitude-based interpretation of instructional impact and enhance comparability with international empirical research. This approach was selected over inferential hypothesis testing because classroom action research prioritizes pedagogical improvement rather than statistical generalization. Nevertheless, effect size provides a robust indicator of practical significance. To strengthen internal validity, triangulation was conducted across conceptual test results, engagement observations, and pedagogical competence measures. Convergent findings were interpreted as evidence of instructional effectiveness, while discrepancies informed reflective refinement in subsequent cycles. This integrative analytical strategy ensured methodological robustness while maintaining alignment with the pedagogical objectives of classroom-based action research.

RESULTS AND DISCUSSION

Results

This section presents and interprets the empirical findings of the classroom-based intervention implementing Case-Based Learning integrated with Problem-Based Learning (CBL–PBL) in the Introductory Economics course for undergraduate students of Economic Education, Universitas Sebelas Maret (UNS). The results are organized to address the research objectives concerning (1) students' conceptual understanding, (2) learning mastery progression, (3) student engagement dynamics, and (4) lecturer pedagogical competence. The discussion focuses explicitly on why and how the observed changes occurred and the extent to which the findings may be transferable to comparable higher education contexts.

Table 1 presents a comprehensive overview of students' learning performance across the baseline assessment, three instructional intervention cycles, and the final post-test. Rather than indicating a simple linear progression, the data reveal a progressive yet non-linear trajectory of learning development, suggesting that students' conceptual understanding of introductory economics evolved through iterative cognitive engagement with Case-Based Learning integrated with Problem-Based Learning (CBL–PBL), rather than through immediate or uniform gains.

Table 1. Descriptive Statistics of Students' Learning Outcomes Across Cycles

Indicator	Pre-test	Cycle 1	Cycle 2	Cycle 3	Final Test
Minimum score	30	60	60	60	60
Maximum score	51	78	80	85	90
Mean score	37.07	68.27	69.70	73.83	77.03
Students achieving mastery (%)	0.00	43.33	46.67	56.67	76.67

Source: Processed Primary Data

The baseline performance demonstrates a critically low level of conceptual mastery, with a mean score of 37.07 and no students meeting the institutional mastery threshold. This result provides strong empirical confirmation of a structural learning problem at the entry level of economic education. Such a low baseline cannot be plausibly attributed to individual ability alone but instead reflects well-documented systemic issues in introductory economics, including abstract content presentation, insufficient contextualization, and the persistence of naïve economic reasoning formed prior to university entry. The narrow score range at baseline further suggests that learning difficulties were widespread across the cohort rather than concentrated among a small subgroup of low-performing students.

Following the first implementation cycle, the mean score increased sharply to 68.27, representing a substantial absolute gain. This immediate improvement indicates that the

introduction of authentic economic cases and ill-structured problems successfully disrupted passive learning routines and activated students' prior knowledge. However, despite this notable rise in average performance, only 43.33% of students achieved mastery, revealing a critical distinction between performance improvement and conceptual mastery. The data suggest that early gains were primarily procedural and surface-level, driven by increased engagement and familiarity with problem-solving formats rather than by fully internalized economic concepts.

This pattern is pedagogically significant. The divergence between mean score improvement and mastery attainment in Cycle 1 reflects a phenomenon widely discussed in learning sciences: initial exposure to problem-oriented instruction often produces cognitive dissonance, as students confront inconsistencies between their intuitive understandings and formal economic reasoning. During this phase, learners may demonstrate improved task performance without yet achieving stable conceptual restructuring. Thus, the Cycle 1 results should not be interpreted as partial failure but rather as evidence of a productive transitional phase in conceptual change.

In Cycles 2 and 3, learning gains became more incremental yet more epistemically meaningful. Mean scores increased from 69.70 to 73.83, while mastery rates rose from 46.67% to 56.67%, indicating a gradual consolidation of understanding. Unlike the sharp initial increase observed in Cycle 1, these later gains reflect deepening conceptual coherence, as students repeatedly engaged in analyzing economic cases, articulating arguments, negotiating meaning within groups, and receiving structured facilitation from the lecturer. The stabilization of minimum scores at 60 across cycles further suggests a reduction in extreme underperformance, pointing to the inclusive instructional potential of CBL–PBL in supporting lower-achieving students.

The final post-test results provide the strongest evidence of instructional effectiveness. The mean score reached 77.03, with 76.67% of students achieving mastery, indicating that sustained engagement with the intervention ultimately translated into robust conceptual understanding for the majority of the cohort. Importantly, the widening gap between minimum and maximum scores at this stage reflects increased differentiation in conceptual sophistication, a hallmark of higher-order learning environments where students move beyond uniform surface responses toward more nuanced reasoning.

Learning Mastery Progression and Threshold Achievement

Learning mastery in this study was evaluated using a criterion-referenced assessment framework, in which students were classified as achieving mastery if they attained a minimum score of ≥71 (Grade B) in accordance with the academic standards of Universitas Sebelas Maret. This approach was intentionally adopted to move beyond relative performance indicators and to assess whether instructional gains translated into substantively acceptable levels of conceptual competence, which is a key concern in higher education economics.

The mastery progression data, summarized in Table 2, reveal a delayed yet substantial mastery effect across instructional cycles. At baseline, no students met the mastery criterion, confirming that low average performance was accompanied by a complete absence of threshold-level understanding. This finding reinforces the interpretation that initial learning difficulties were structural rather than marginal and justifies the need for sustained pedagogical intervention rather than incremental instructional adjustment.

Table 2. Learning Mastery Progression Across Instructional Cycles

Assessment Phase	Students Achieving Mastery (n)	Mastery Rate (%)	Incremental Gain (%)
Pre-test	0	0.00	–
Cycle 1	21	43.33	+43.33
Cycle 2	22	46.67	+3.34
Cycle 3	27	56.67	+10.00
Final Test	37	76.67	+20.00

Source: Processed Primary Data

As shown in Table 2, the largest absolute increase in mastery occurred during the first cycle, when nearly half of the cohort reached the minimum threshold. This initial surge suggests that exposure to case-based economic problems rapidly enabled a substantial proportion of students to transition from non-functional understanding to minimally acceptable conceptual performance. However, the relatively modest incremental gains observed between Cycle 1 and Cycle 2 (+3.34%) indicate that early mastery attainment was fragile and unevenly distributed across the cohort.

More critically, the data demonstrate that the most pedagogically meaningful mastery gains emerged at later stages of the intervention, particularly between Cycle 3 and the final assessment (+20.00%). This delayed acceleration in mastery suggests that conceptual consolidation in introductory economics is not an immediate outcome of problem exposure, but rather the result of repeated cycles of cognitive conflict, guided inquiry, and reflective abstraction. Students required sustained engagement with multiple economic cases to stabilize their understanding and apply concepts consistently across varying contexts. From a learning theory perspective, this pattern aligns with conceptual change and productive failure frameworks, which posit that initial problem-solving attempts often generate incomplete or unstable knowledge structures. Over time, iterative engagement allows learners to reorganize misconceptions, integrate formal economic principles, and achieve threshold-level understanding. In this sense, the delayed mastery effect observed in this study should be interpreted as evidence of deep learning, rather than as a limitation of the instructional approach.

Pedagogically, these findings challenge linear and short-term models of instructional effectiveness, which assume that learning gains should manifest immediately following intervention. If evaluation had been limited to early cycles, the effectiveness of CBL–PBL might have been underestimated, particularly for students who require longer periods of epistemic adjustment. The results therefore underscore the importance of instructional persistence and longitudinal assessment when implementing constructivist pedagogies in foundational economics courses. Furthermore, the steady increase in mastery rates without regression across cycles suggests that CBL–PBL did not merely benefit high-achieving students but progressively supported a broader segment of the cohort. This inclusive mastery trajectory is particularly relevant in economic education programs, where student preparedness is heterogeneous and early failure can have cascading effects on academic progression.

Magnitude of Learning Improvement: Gain and Effect Size Analysis

Beyond documenting descriptive improvements and mastery progression, this study examined the magnitude and substantive significance of learning gains to determine whether the observed changes reflect meaningful conceptual development rather than superficial score inflation. To this end, two complementary indicators were employed: normalized gain (N-gain) and effect size (Cohen's d). The combined use of these metrics is increasingly recommended in high-impact educational research, as it enables researchers to distinguish between relative improvement, absolute improvement, and practical significance.

Normalized gain (N-gain) was used to assess the proportion of potential learning actually achieved by students, controlling for differences in baseline performance. This is particularly important in introductory economics, where extremely low pre-test scores can artificially inflate raw gain measures. By accounting for the maximum possible improvement, N-gain provides a more conservative and conceptually meaningful indicator of learning effectiveness. The N-gain results, summarized in Table 3, indicate that learning improvement occurred in distinct phases, rather than uniformly across the intervention.

Table 3. Learning Gain and Effect Size Indicators

Comparison	Mean Gain	N-gain Category	Cohen's d	Practical Interpretation
Pre-test → Cycle 1	+31.20	Medium	0.91	Large
Cycle 1 → Cycle 3	+5.56	Low–Medium	0.43	Moderate
Pre-test → Final Test	+39.96	Medium–High	1.27	Very Large

Source: Processed Primary Data

The medium N-gain (0.51) observed between the pre-test and Cycle 1 reflects a substantial early improvement, largely attributable to increased engagement and exposure to authentic economic problems. However, this initial gain should be interpreted cautiously. At this stage, students were still adapting to the epistemic demands of CBL–PBL, and learning gains likely reflected procedural familiarity and surface-level understanding, rather than fully consolidated conceptual structures.

In contrast, the medium–high N-gain (0.65) between the pre-test and final test provides stronger evidence of genuine conceptual advancement. This level of N-gain suggests that students achieved nearly two-thirds of the maximum possible improvement, a result that compares favorably with benchmarks reported in international meta-analyses of problem-based and case-based learning in higher education. While N-gain captures relative learning efficiency, effect size (Cohen's d) was calculated to assess the practical significance of the intervention in absolute terms. The effect size of d = 1.27 between the pre-test and final assessment far exceeds the conventional threshold for a large effect (d ≥ 0.80), indicating that the intervention produced learning improvements of a magnitude that is educationally substantial and not merely statistically detectable.

Importantly, the effect size observed in this study is notably higher than those commonly reported for traditional lecture-based reforms in economics education, which often yield small to moderate effects. This suggests that the integration of case-based reasoning with problem-based inquiry fundamentally altered the learning dynamics of the course, rather than incrementally improving existing instructional routines. The moderate effect size (d = 0.43) observed between Cycle 1 and Cycle 3 further reinforces the interpretation that later learning gains were more incremental but also more epistemically meaningful. Rather than indicating diminishing returns, this pattern reflects a shift from rapid initial adjustment to deeper conceptual consolidation, consistent with models of threshold concept learning in economics.

Student Engagement and Learning Participation Dynamics

Student engagement was examined as a multidimensional construct encompassing cognitive, behavioral, and social participation, consistent with contemporary engagement frameworks in higher education research. Engagement data were collected using structured observation instruments designed to capture not only the frequency of participation but also the quality of students' involvement in learning activities during the implementation of Case-Based Learning integrated with Problem-Based Learning (CBL–PBL). Table 4 summarizes engagement scores across the three instructional cycles. Rather than reflecting a uniform or linear increase, the data reveal a phased engagement trajectory, suggesting that students' participatory behaviors evolved as they adapted to the epistemic and social demands of problem-oriented learning.

Table 3. Student Engagement Scores Across Cycles

Engagement Dimension	Cycle 1	Cycle 2	Cycle 3	Mean
Learning interest	3.00	3.50	4.00	3.50
Active participation	3.00	3.00	4.00	3.33
Collaborative interaction	3.00	3.50	3.50	3.33
Overall engagement	3.00	3.33	3.83	3.39

Source: Processed Primary Data

During Cycle 1, engagement levels across all dimensions were uniformly moderate, reflecting students' initial adjustment to the instructional shift from lecture-dominated

learning to case-based problem solving. At this stage, participation was largely reactive and compliance-driven, with students engaging in activities primarily in response to explicit instructional prompts rather than intrinsic epistemic curiosity. In Cycle 2, engagement patterns began to differentiate across dimensions. Learning interest increased noticeably (M = 3.50), suggesting that repeated exposure to authentic economic cases enhanced students' perceived relevance of course content. However, active participation remained stable, indicating that while students were cognitively invested, they had not yet fully internalized the norms of proactive contribution and critical dialogue characteristic of problem-based learning environments.

The most substantial engagement shift occurred in Cycle 3, where both learning interest and active participation reached the upper end of the scale (M = 4.00). This transition marks a qualitative change from surface-level involvement to authentic cognitive engagement, characterized by spontaneous questioning, argumentation, and sustained attention to problem-solving tasks. Such a pattern suggests that students required multiple cycles to develop epistemic confidence and participatory competence within the CBL–PBL framework. Notably, collaborative interaction scores stabilized rather than increased sharply between Cycles 2 and 3. This stabilization should not be interpreted as stagnation. Instead, it reflects a refinement of collaborative quality, where group interactions became more focused, efficient, and goal-oriented. Pedagogically, this pattern is desirable, as excessive interaction does not necessarily translate into productive collaboration. Mature collaboration is often marked by selective participation, shared cognitive responsibility, and reduced off-task communication.

Engagement as a Mechanism of Learning Improvement

Beyond describing engagement trends, this study conceptualized engagement as a mechanism through which learning improvement occurred, rather than as a secondary outcome. The parallel upward trajectories observed between engagement indicators and learning outcomes suggest a mediating relationship, wherein increased engagement facilitated deeper conceptual processing and sustained knowledge construction. Specifically, heightened learning interest appeared to function as a motivational gateway, increasing students' willingness to invest cognitive effort in grappling with complex economic problems. Active participation, in turn, provided opportunities for elaborative processing, as students articulated reasoning, confronted misconceptions, and refined arguments through discourse.

Collaborative interaction supported distributed cognition, allowing students to externalize thinking and co-construct understanding within their groups. This interpretation aligns with contemporary engagement theory, which emphasizes that engagement operates at the intersection of motivation, cognition, and social interaction. In problem-oriented learning environments, engagement is not an incidental byproduct but a necessary condition for conceptual change. Without sustained engagement, the epistemic demands of CBL–PBL would likely overwhelm students, resulting in frustration rather than learning. Importantly, the temporal alignment between engagement growth and delayed mastery attainment reinforces the argument that engagement precedes and enables learning consolidation. Students did not achieve mastery immediately after becoming engaged; rather, engagement provided the cognitive and motivational infrastructure necessary for conceptual stabilization over time. This finding further explains why mastery gains accelerated at later stages of the intervention, as documented in previous sections.

In sum, the engagement analysis demonstrates that CBL–PBL restructures not only what students learn, but how they participate in learning. By fostering sustained cognitive, behavioral, and social engagement, the instructional approach created conditions conducive to deep understanding in introductory economics. These results

underscore the importance of treating engagement as a central analytic construct in pedagogical research, particularly when evaluating instructional innovations aimed at conceptual change.

Lecturer Pedagogical Competence Development

Lecturer pedagogical competence was systematically examined to determine whether improvements in student learning outcomes were accompanied—and potentially enabled—by progressive refinement of instructional practice. This analysis responds to a recurring critique in higher education pedagogical research, namely that classroom-based interventions often focus disproportionately on student outcomes while under-theorizing the lecturer's adaptive role in mediating instructional effectiveness. In this study, pedagogical competence was conceptualized as a multidimensional construct encompassing instructional clarity, learning climate management, resource and media utilization, methodological alignment, responsiveness to students, and assessment accuracy. These dimensions reflect contemporary models of effective teaching in problem-oriented learning environments, where lecturers must balance structure with flexibility and guidance with learner autonomy. Table 5 presents the observed pedagogical competence scores across the three instructional cycles.

Table 5. Lecturer Pedagogical Skill Scores Across Cycles

Pedagogical Dimension	Cycle 1	Cycle 2	Cycle 3	Mean
Instructional clarity	3.00	3.00	3.50	3.17
Learning climate	3.00	3.50	4.00	3.50
Learning resources utilization	3.00	3.50	3.50	3.33
Media appropriateness	3.00	3.00	3.50	3.17
Methodological alignment	3.50	3.50	4.00	3.67
Student responsiveness	3.50	3.50	4.00	3.67
Evaluation accuracy	3.00	3.00	3.50	3.17
Overall pedagogical competence	3.14	3.29	3.79	3.38

Source: Processed Primary Data

The results reveal a progressive and non-linear trajectory of pedagogical development, with the most pronounced improvements emerging between Cycle 2 and Cycle 3. During Cycle 1, pedagogical competence across most dimensions was categorized as adequate, reflecting the lecturer's early-stage adjustment to the epistemic and procedural demands of the CBL–PBL approach. At this stage, although methodological alignment and student responsiveness were relatively strong, instructional clarity and evaluation accuracy remained cautious, indicating a facilitation style still anchored in conventional instructional habits. This pattern is consistent with research on instructional innovation, which shows that educators initially prioritize procedural control before developing adaptive pedagogical orchestration (Bates et al., 2022).

In Cycle 2, improvements were observed in dimensions associated with learning climate and resource utilization, suggesting that the lecturer began to regulate classroom interaction more effectively and integrate diverse learning materials to support inquiry. However, not all dimensions improved uniformly. Instructional clarity and evaluation accuracy remained stable, indicating selective rather than holistic pedagogical refinement. Such asymmetry challenges linear assumptions of instructional development and suggests that pedagogical transformation is contingent on iterative reflective practice rather than mechanical repetition. The most substantial development occurred in Cycle 3, where learning climate and student responsiveness reached the upper boundary of the scale. This shift indicates a transition from procedural facilitation to adaptive pedagogical orchestration, a defining characteristic of expertise in problem-based learning environments (Walker et al., 2021; Looi et al., 2023).

The primary objective of this study was to examine whether integrating Case-Based Learning with Problem-Based Learning in an Introductory Economics course could enhance

conceptual understanding, engagement, academic performance, and lecturer pedagogical effectiveness. The empirical findings demonstrate a coherent and theoretically meaningful pattern of improvement across all dimensions. The dramatic rise in mean achievement scores and the shift from zero mastery to more than three-quarters of students achieving proficiency indicate that the observed gains cannot be reduced to superficial procedural familiarity. Introductory economics is widely documented as a domain where students struggle to reconcile abstract theoretical constructs with real-world economic phenomena, leading to persistent misconceptions and fragmented reasoning (Davies, 2023). The baseline results observed in this study mirror this global pattern, suggesting that the subsequent improvements should be interpreted as evidence of conceptual restructuring rather than mere test familiarity.

However, a critical perspective requires consideration of alternative explanations. One possibility is that repeated exposure to assessment formats contributed to improved performance through test practice effects rather than genuine conceptual change. Although normalized gain and effect size analyses reduce this risk, the absence of a control group means that causal attribution must be interpreted cautiously. Another explanation could involve increased student familiarity with collaborative learning processes rather than the specific epistemic contribution of CBL–PBL. Additionally, motivational novelty associated with pedagogical change may temporarily enhance engagement, raising the possibility that observed gains reflect short-term enthusiasm rather than durable cognitive transformation. These alternative interpretations underscore the importance of methodological triangulation and iterative cycles in validating instructional impact.

Despite these considerations, the learning mechanism activated by CBL–PBL differs fundamentally from traditional cooperative or discussion-based instruction. Rather than structuring interaction around instructor-generated prompts, CBL–PBL embeds learning within authentic economic cases requiring diagnosis, hypothesis formation, and evaluation of competing explanations. This epistemic shift moves students from naïve economic conceptions toward theoretically coherent reasoning (Davies, 2023). The progressive improvement across cycles reflects cumulative conceptual restructuring, whereby early-stage engagement evolves into systematic analytical reasoning. During the initial cycle, students demonstrated partial engagement but lacked integrative analytical framing, explaining the rapid but unstable increase in mastery. As students became more accustomed to case-based inquiry, their capacity to synthesize multiple economic variables strengthened, producing higher-order understanding by the final cycle.

This interpretation aligns with contemporary learning theory emphasizing problem-based and case-based pedagogies as mechanisms for conceptual integration. Muerza et al. (2024) demonstrate that PBL promotes transfer and application by requiring learners to test theoretical understanding against empirical constraints. Similarly, Song et al. (2022) show that case-based learning enhances both engagement and performance by embedding reasoning within socially accountable environments. The UNS findings corroborate these insights but also extend them by illustrating how iterative pedagogical refinement mediates the effectiveness of problem-oriented instruction. The improvement observed was not instantaneous but emerged through cycles of adaptation, suggesting that the effectiveness of CBL–PBL depends on sustained pedagogical alignment rather than one-time implementation.

The transformation in student engagement further supports this interpretation. The consistent increase in participation, interest, and collaborative interaction indicates that students were not merely improving performance but were cognitively and emotionally invested in the learning process. Engagement functions as a mediating mechanism linking pedagogy to achievement (Archambault et al., 2022). When students shift

from passive reception to active knowledge construction, persistence and epistemic curiosity increase. The UNS results demonstrate that CBL–PBL fostered this shift by framing economic knowledge as an object of inquiry rather than authoritative transmission. However, engagement alone cannot fully explain the observed learning gains. Without structured conceptual scaffolding, high engagement may lead to productive struggle but not necessarily conceptual clarity. The convergence of engagement growth with improved mastery suggests that both motivational and cognitive processes were activated simultaneously.

The improvement in lecturer pedagogical competence constitutes a critical explanatory factor rather than a secondary outcome. Instructional clarity, facilitation quality, and alignment between objectives and activities improved across cycles, indicating that CBL–PBL effectiveness is contingent on facilitator expertise. Rahimi and Oh (2024) argue that contemporary educators must function as learning designers capable of orchestrating inquiry-based environments. The learning curve observed in this study reflects this transformation, suggesting that pedagogical innovation requires parallel development of instructor competence. This reciprocal relationship between pedagogy and learning outcomes aligns with the adaptive meta-competence framework proposed by Bates et al. (2022), which emphasizes reflective practice as a driver of effective education in complex domains.

The progression from partial to full conceptual mastery also offers insights into how economic understanding evolves in inquiry-based environments. In early stages, students identified problems but struggled with conceptual integration. Intermediate stages showed improved analytical capacity but fragmented reasoning. By the final cycle, students demonstrated coherent synthesis of multiple economic variables, consistent with Lu et al. (2021), who found that collaborative inquiry promotes higher-order thinking through deep learning processes. The UNS data suggest that once students reframed cases as opportunities for conceptual exploration rather than answer retrieval, learning acceleration occurred.

Equally important are the implications for equity in learning. The shift from zero to nearly eighty percent mastery indicates that CBL–PBL supported a broader range of learners, not only high-performing students. Sierra and Suárez-Collado (2021) emphasize that educational innovation in the Global South must reduce exclusion while improving average performance. The UNS findings suggest that problem-oriented pedagogy can enhance inclusivity by providing multiple entry points for conceptual engagement. However, it remains possible that some students benefited more than others, and future research should examine differential effects across ability levels.

The findings align with meta-analytic evidence showing that problem-based and case-based learning improve motivation and achievement across disciplines (Saputri et al., 2024; Wijnia et al., 2024). Nevertheless, this study contributes beyond confirmation by highlighting the role of iterative pedagogical adaptation, contextual relevance, and facilitator development. Unlike many prior studies focusing solely on student outcomes, this research demonstrates the co-evolution of teaching and learning processes. The evidence indicates that integrating Case-Based Learning with Problem-Based Learning can substantially transform introductory economics education by fostering conceptual restructuring, sustained engagement, improved academic performance, and enhanced pedagogical competence. However, these outcomes should be interpreted within methodological constraints, including the absence of a control group, limited sample size, and potential novelty effects. Future research should incorporate comparative designs, longitudinal measurement, and multi-institutional contexts to further validate and generalize these findings.

CONCLUSION

The findings demonstrate a progressive and non-linear trajectory of pedagogical

transformation following the implementation of Case-Based Learning integrated with Problem-Based Learning (CBL–PBL). Pedagogical competence evolved from procedural adjustment in Cycle 1 to adaptive facilitation by Cycle 3, marked by substantial improvements in learning climate, instructional clarity, and student responsiveness. These shifts indicate that effective problem-oriented pedagogy requires iterative refinement and reflective practice rather than immediate mastery (Bates et al., 2022; Walker et al., 2021; Looi et al., 2023). Concurrently, student outcomes improved consistently, with conceptual mastery rising from zero to more than three-quarters of the cohort, suggesting that learning gains reflected conceptual restructuring rather than superficial familiarity with assessment formats (Davies, 2023).

From a theoretical perspective, this study contributes to contemporary learning theory by demonstrating how the integration of case-based and problem-based pedagogies functions as a mechanism for conceptual integration in economics education. The findings extend prior research by showing that instructional effectiveness emerges through the co-evolution of student engagement and lecturer pedagogical competence, rather than through student-centered methods alone (Song et al., 2022; Muerza et al., 2024). This integrative perspective reinforces the view that meaningful learning in complex domains requires epistemic alignment between authentic problems, collaborative inquiry, and adaptive facilitation.

Practically, the results offer actionable implications for higher education, particularly in economic education programs. First, curriculum designers should embed structured case-problem sequences that connect abstract economic theory with real-world phenomena. Second, institutions should provide systematic professional development enabling lecturers to transition from content transmitters to facilitators of inquiry-based learning (Rahimi & Oh, 2024). Third, assessment practices should emphasize conceptual reasoning and applied analysis rather than memorization to support durable learning. Collectively, these measures can enhance both instructional quality and inclusivity by supporting diverse learners (Sierra & Suárez-Collado, 2021).

Future research should extend this work through comparative or quasi-experimental designs incorporating control groups to strengthen causal inference. Longitudinal studies are needed to examine whether conceptual gains persist beyond the intervention period and translate into professional pedagogical competence among future teachers. Multi-institutional and cross-cultural investigations would further test the generalizability of CBL–PBL across diverse higher education contexts. Additionally, future studies should explore differential effects across student ability levels and examine how variations in facilitator expertise mediate learning outcomes. Such directions will deepen understanding of how problem-oriented pedagogies can sustainably transform economics education.

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