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The Effect of Current Indonesian Economic Data-Based Learning on Students' Economic Analysis Skills

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ABSTRACT
This study aims to analyze the effect of current Indonesian economic data-based learning on university students' economic analysis skills. The learning approach integrates current macroeconomic data, including inflation, economic growth, exchange rates, international trade, and unemployment, into classroom activities to help students connect theoretical concepts with actual economic phenomena. The study employs a quantitative approach using a quasi-experimental design with a pretest–posttest comparison group. The participants are 60 Management students from the Faculty of Economics and Business at Universitas PGRI Mpu Sindok enrolled in the Indonesian Economy course. Data will be collected through case-based economic analysis tests, an assessment rubric, and learning documentation. Data analysis will involve descriptive statistics and analysis of covariance (ANCOVA), subject to the fulfillment of relevant statistical assumptions. Economic analysis skills will be assessed through students' abilities to interpret economic data, apply economic theories, explain relationships among economic indicators, and formulate evidence-based conclusions. The empirical findings will establish whether current economic data-based learning produces a statistically significant difference in students' economic analysis skills compared with the comparison group. The final report will present the observed results, effect size, and educational implications after data collection and statistical analysis have been completed. The findings are expected to inform the development of evidence-based learning practices in higher education, particularly in economics-related courses for Management students.

INTRODUCTION

Economics education in higher education should not only equip students with conceptual knowledge but also develop their ability to analyze economic phenomena, interpret quantitative information, and formulate evidence-based conclusions (Wahyudi et al., 2026). For Management students, these competencies are particularly important because business decisions are influenced by changes in inflation, economic growth, exchange rates, international trade, investment, and labor market conditions. Therefore, the Indonesian Economy course should provide opportunities for students to connect economic theories with current data reflecting national economic conditions. Wolfe, (2020) demonstrated that integrating data analysis activities and real-world applications into introductory macroeconomics can enrich students' learning experiences and support the development of analytical and quantitative skills . This evidence suggests that economic data can serve not merely as illustrative material but also as a learning resource for developing evidence-based economic reasoning.

The use of current data in teaching is also associated with the development of students' data literacy. Data literacy encompasses the ability to locate, understand, process, interpret, and communicate information derived from data appropriately. Marchant & Eliason, (2024), in their analysis of undergraduate economics curricula at 190 research universities in the United States, found that these programs provided foundations for finding, analyzing, communicating, and applying data, while explicit instruction in source evaluation, data types, and ethical data practices remained limited. Meanwhile, Mendez-Carbajo & Dellachiesa, (2023) examined data visualization tools in business and economics statistics courses involving 471 undergraduate

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students. Their findings indicated that the choice of visualization tool did not automatically ensure accurate graph construction or interpretation. These findings suggest that the effectiveness of data-based learning depends not only on data availability or digital tools but also on instructional activities that encourage students to interpret information critically and connect it with economic concepts (Mahendra & Novaliana, 2024).

Previous studies have highlighted the importance of economics learning experiences that integrate empirical analysis, authentic cases, and student-centered activities. Wolfe, (2020) incorporated publicly available data analysis into introductory macroeconomics instruction, while research published in the International Review of Economics Education demonstrated a case-based approach requiring students to formulate research questions, identify relevant data, conduct analyses, and communicate findings through professional recommendations (Depro & Rouse, 2022). Research on data-driven projects in economics courses has also reported potential improvements in analytical skills, critical thinking, and the application of knowledge to real-world problems (Bojinova & Kim, 2026). Furthermore, Dendir et al., (2019) found that students enrolled in economics courses experienced greater improvements in analytical skills than students in non-economics courses within their research context. Nevertheless, these findings were obtained from different instructional settings, research designs, and student populations and therefore cannot be directly generalized to the Indonesian Economy course in Indonesian higher education institutions (Wuthisatian & Thanetsunthorn, 2019).

Despite these developments, further investigation is warranted into the specific effect of learning based on current Indonesian economic data on Management students' economic analysis skills. Previous studies have examined data integration in macroeconomics, visualization tools, case-based instruction, and data literacy development (Cardak et al., 2025). The present study focuses on using current data representing the Indonesian economy as the foundation for learning activities and empirically assessing students' economic analysis skills in the Indonesian Economy course (Perdana & Tan, 2022). These skills include data interpretation, the application of economic concepts, the analysis of relationships among economic indicators, and the formulation of evidence-based conclusions. Accordingly, the proposed contribution lies in examining this instructional approach within a specific local context: Management students at the Faculty of Economics and Business, Universitas PGRI Mpu Sindok, Nganjuk, Indonesia. This proposed novelty must be further refined through a systematic review of closely related Indonesian and international studies.

Based on this rationale, the research question is formulated as follows: Does learning based on current Indonesian economic data have a statistically significant effect on students' economic analysis skills? The study hypothesizes that current Indonesian economic data-based learning has a significant effect on students' economic analysis skills. To test this hypothesis, the research employs a quantitative quasi-experimental approach involving pretest and posttest measurements and a comparison group, provided that the available classroom conditions permit such a design. This study aims to analyze the effect of current Indonesian economic data-based learning on the economic analysis skills of Management students at the Faculty of Economics and Business, Universitas PGRI Mpu Sindok, Nganjuk, Indonesia.

RESEARCH METHOD

1. Research Design

This study employs a quantitative approach using a quasi-experimental research method (Zhang & Ma, 2023). The design is a nonequivalent control group pretest–posttest design, which involves an experimental group and a comparison group that are not formed through individual

random assignment (Mega Farihatun et al., 2019). This design is appropriate for a classroom-based study in which existing class arrangements must be considered. Measurements before and after the intervention are used to identify changes in students' economic analysis skills and compare these changes between the two groups. Because nonequivalent groups may differ at baseline, the study will account for initial performance and relevant confounding factors when interpreting the effect of the instructional intervention (Suanto et al., 2026).

The experimental group will participate in learning activities based on current Indonesian economic data, whereas the comparison group will receive instruction consistent with the existing teaching practice, using equivalent course content and learning objectives (Supriyadi & Amalia, 2025). The data may include inflation, economic growth, the rupiah exchange rate, international trade, investment, and unemployment, obtained from official sources such as Statistics Indonesia (BPS) and Bank Indonesia (BI). Students will use these data to interpret economic phenomena, apply economic theories, analyze relationships among indicators, and formulate evidence-based conclusions. This instructional approach is consistent with the broader objective of developing data literacy and applying economic concepts to real-world issues (Perwita et al., 2026).

2. Research Procedure

The research procedure consists of interconnected stages, beginning with instrument preparation and ending with the interpretation of empirical findings.

3. Population, Sample, and Data Collection

The study population comprises Management students enrolled in the Indonesian Economy course at the Faculty of Economics and Business, Universitas PGRI Mpu Sindok, Nganjuk, Indonesia, during the research period. The sample (Sugiyono, 2019) will be selected from available classes that meet the study criteria is 60 students. If two comparable classes are available, one may serve as the experimental group and the other as the comparison group. Purposive sampling at the class level may be used when class selection follows predetermined criteria, subject to the actual academic arrangements (Bhardwaj, 2019).

The population size, sample size, semester, and research period will be reported based on verified administrative records. Baseline comparability will be examined using pretest scores and relevant available academic information. Potential influences arising from differences in instructors, schedules, prior learning experiences, and classroom characteristics will also be considered.

Data will be collected through three methods. First, an economic analysis test will be administered before and after the intervention. Second, instructional documents will be collected, including the Semester Learning Plan, teaching materials, worksheets, and sources of macroeconomic data. Third, relevant academic records will be examined to provide supporting information about students' initial academic conditions. Academic grades obtained from different assessment instruments will not be treated as equivalent to economic analysis test scores without evidence of measurement comparability.

4. Instrument Development and Data Analysis

The primary instrument will be a case-based economic analysis test developed around four indicators (Irvan & Wardan, 2025): (1) interpreting tables, graphs, and changes in economic indicators; (2) applying economic concepts and theories to explain phenomena; (3) analyzing relationships among economic indicators; and (4) drawing evidence-based conclusions and explaining their implications. Each indicator will be operationalized into test items and an analytical scoring rubric. The pretest and posttest will be designed to assess comparable competencies at similar levels of difficulty.

Content validity will be examined through expert review by specialists in economics and educational assessment (Gutiérrez-Castillo et al., 2023). The instrument will be reviewed for language clarity, item relevance, alignment with the intended indicators, and the accuracy of answer keys or scoring guidelines. Where feasible, pilot testing will be conducted with students who have similar characteristics but are not part of the main sample. Reliability will be evaluated using a method appropriate to the instrument format, while inter-rater agreement will be examined if open-ended responses require subjective scoring.

Data analysis will begin with descriptive statistics, including pretest and posttest scores, means, standard deviations, and score changes for each group. Analysis of covariance (ANCOVA) (Philippas, 2024) may then be used to compare adjusted posttest scores between the experimental and comparison groups while controlling for pretest scores, provided that the model assumptions, including homogeneity of regression slopes, are satisfied. Residual distributions, variance homogeneity, independence of observations, and potential clustering of students within classes will be assessed as appropriate.

The results will be reported using adjusted group differences, significance levels, confidence intervals, and an appropriate effect-size measure. If ANCOVA assumptions are not met, an alternative method will be selected based on the data characteristics and research design rather than on the likelihood of obtaining statistically significant results. The analysis will be conducted using appropriate statistical software, it's IBM SPSS Statistics or R, with the software version reported after actual use (Budi Darma, 2021).

RESULTS AND DISCUSSION

Descriptive results

This study examines the effect of current Indonesian economic data-based learning on the economic analysis skills of Management students at the Faculty of Economics and Business, Universitas PGRI Mpu Sindok. The outcome is assessed through four dimensions: data interpretation, application of economic theory, analysis of relationships among economic indicators, and evidence-based conclusions.

For demonstration purposes, that 60 students participate in the study, with 30 students in the experimental group and 30 in the comparison group. Both groups complete a pretest and a posttest scored on a 0–100 scale.

Table 1. Descriptive statistics of students' economic analysis skills

Group	N	Pretest mean (SD)	Posttest mean (SD)	Score change
Experimental	30	58.40 (8.20)	79.60 (7.10)	+21.20
Comparison	30	57.90 (7.80)	68.20 (8.00)	+10.30

Source: Processed by the researcher.

In this data, the experimental group shows a mean increase of 21.20 points, compared with 10.30 points in the comparison group. The difference in mean score gains is 10.90 points. If a similar pattern is observed in the actual data, it may indicate that current Indonesian economic data-based learning helps students develop stronger economic analysis skills than the comparison approach.

Conceptually, this pattern may arise because students do more than receive explanations of economic concepts. They practice interpreting current indicators, comparing changes in data, connecting theory with economic phenomena, and formulating evidence-based conclusions. Nevertheless, differences in descriptive means alone cannot establish an instructional effect. Inferential analysis must account for baseline performance, group characteristics, and the relevant statistical assumptions.

Statistical assumption testing

Before conducting analysis of covariance (ANCOVA), the researcher should examine the data characteristics and model assumptions. The following table demonstrates a possible reporting format; the values are simulated.

Table 2. statistical assumption checks

Test	Illustrative statistic	p-value	Example interpretation
Shapiro–Wilk: model residuals	W = 0.982	0.521	No statistically significant evidence of non-normality
Levene's test: posttest variance	F = 0.684	0.412	No statistically significant evidence of unequal variances
Group × pretest interaction	F = 0.742	0.393	No evidence of a violation of homogeneous regression slopes

Source: Processed by the researcher.

In the actual analysis, normality should be assessed for model residuals rather than solely for raw scores. Levene's test assesses variance homogeneity, while the homogeneity of regression slopes in ANCOVA is examined through the interaction between group membership and pretest scores. Independence of observations must also be evaluated in light of the research design, as students within the same class may not represent fully independent observations.

If important assumptions are not satisfied, the analytical model should be reconsidered and an alternative method selected based on the data structure. Statistical significance should not be the sole criterion for choosing an analytical procedure.

Comparison of score changes

Changes in students' performance can be examined by comparing pretest and posttest scores within each group.

Table 3. Illustrative analysis of score changes (simulated values)

Group	Mean change	SD of change*	Paired t-test	p-value
Experimental	21.20	8.50	13.67	< 0.001
Comparison	10.30	7.90	7.14	< 0.001

* Source: Processed by the researcher.

In this result, both groups improve. However, statistically significant paired tests in both groups do not demonstrate that the experimental intervention is more effective than the comparison approach. The difference between groups must be tested directly, for example by using ANCOVA to adjust for pretest scores.

Analysis of covariance and effect size

ANCOVA compares posttest scores while adjusting for students' baseline performance. This approach is relevant to quasi-experimental designs in which individual random assignment is not used. Baseline adjustment can improve the precision of an estimate, but it does not automatically eliminate all bias arising from differences between groups.

Table 4. ANCOVA results

Source of variation	df	F	p-value	Partial eta squared
Instructional group	1	35.80	< 0.001	0.386
Pretest score	1	42.10	< 0.001	0.425
Error	57	—	—	—

Source: Processed by the researcher.

In this results, a partial eta-squared value of 0.386 represents the proportion of variation associated with group membership after accounting for other model components, according to the definition of the effect-size measure. It must not be interpreted as empirical evidence that the intervention has an effect of this magnitude.

The final report should include the adjusted posttest mean difference, its 95% confidence interval, the p-value, and an appropriate effect-size estimate. Effect-size reporting for ANCOVA should follow a definition that is consistent with the design and statistical model.

DISCUSSION

The Effect of Current Indonesian Economic Data-Based Learning on Students' Economic Analysis Skills

The illustrative results presented in this study suggest that current Indonesian economic data-based learning may contribute to the development of students' economic analysis skills. The experimental group's mean score increased from 58.40 in the pretest to 79.60 in the posttest, representing an improvement of 21.20 points. In comparison, the comparison group's mean score increased from 57.90 to 68.20, representing an improvement of 10.30 points. Consequently, the difference in mean score gains between the two groups was 10.90 points. Although these descriptive results indicate a potentially meaningful difference in learning outcomes, the magnitude and statistical significance of the instructional effect must be established using the actual research data.

The observed pattern can be interpreted through the relationship between contextual learning, empirical reasoning, and the application of economic concepts. In conventional economics instruction, students may primarily encounter theoretical explanations, conceptual definitions, and established relationships among economic variables. Although these components provide an essential foundation for understanding economic principles, they may not always provide sufficient opportunities for students to develop the analytical skills required to interpret economic developments independently. By contrast, current-data-based learning places economic concepts within observable national economic conditions, allowing students to examine how theoretical relationships are reflected in actual economic indicators.

For example, students can examine changes in Indonesia's inflation rate alongside economic growth, interest rates, exchange rates, and household purchasing power. Rather than merely memorizing the definition of inflation, students are encouraged to identify changes over time, distinguish between price-level movements and inflation rates, formulate explanations, and evaluate the implications of inflation for consumption and business decisions. Similarly, fluctuations in the rupiah exchange rate can be analyzed in relation to import costs, export competitiveness, production costs, and the profitability of businesses that depend on imported inputs. Such activities require students to move beyond factual recall toward the interpretation and application of economic knowledge.

This interpretation is consistent with Wolfe's (2020) work on integrating data analysis into introductory macroeconomics. The use of publicly available economic data provides opportunities for students to connect abstract macroeconomic concepts with observable economic developments. Wuthisatian and Thanetsunthorn (2019) likewise demonstrated the relevance of data-based materials for enhancing quantitative skills in macroeconomics education. Together, these studies support the pedagogical rationale for integrating empirical evidence into economics instruction, although their findings do not independently establish the effectiveness of the intervention examined in the present study.

The potential contribution of this approach also lies in the structure of the learning activities. Access to economic statistics alone does not necessarily lead to stronger analytical performance. Students must be guided through a sequence of tasks that involves identifying relevant indicators, examining patterns, selecting appropriate theoretical explanations, evaluating competing interpretations, and formulating conclusions supported by evidence. Accordingly, the effectiveness of current-data-based learning depends on the extent to which instructional activities require students to engage in systematic economic reasoning rather than simply collect or reproduce statistical information.

The distinction between descriptive improvement and causal effectiveness is particularly important in this study. Because the proposed design uses nonequivalent experimental and comparison groups, differences in learning outcomes may be associated with both the instructional intervention and pre-existing differences between the groups. Therefore, the descriptive score gains should be interpreted alongside the adjusted posttest comparison, confidence intervals, effect-size estimates, and relevant statistical assumptions. If the illustrative pattern is reproduced in the actual dataset and remains statistically meaningful after appropriate adjustment, the evidence would support the conclusion that current Indonesian economic data-based learning is associated with better economic analysis performance within the study context.

The Development of Economic Data Literacy Through Contextual Learning

A second important dimension concerns the role of data literacy in economics education. Economic analysis requires more than familiarity with economic terminology. Students must be able to locate relevant information, understand how indicators are measured, interpret numerical and graphical representations, and assess whether the available evidence supports a particular explanation. These competencies are especially important for Management students, whose future professional responsibilities may involve interpreting market conditions, evaluating business risks, and making decisions under changing economic circumstances.

Marchant and Eliason (2024), in their examination of undergraduate economics curricula at research-intensive universities, identified opportunities for students to develop competencies in finding, analyzing, communicating, and applying data. Their analysis also highlighted limitations in the explicit treatment of source evaluation, data types, and ethical data practices. These findings suggest that data literacy should be addressed as a deliberate learning objective rather than treated as an automatic consequence of incorporating statistics into teaching materials.

In the context of the present study, students should therefore be encouraged to examine not only what an economic indicator shows but also how the indicator was produced and what conclusions can reasonably be drawn from it. For instance, when analyzing inflation data, students need to distinguish between monthly, year-on-year, and calendar-year inflation measures. When examining economic growth, they should recognize the difference between quarter-to-quarter and year-on-year growth rates and understand the implications of the comparison period. Failure to recognize these distinctions may result in misleading interpretations, even when the underlying data have been obtained from an official source.

The selection and evaluation of data sources are equally important. Students may use publications from Statistics Indonesia (Badan Pusat Statistik [BPS]) and Bank Indonesia (BI) to examine national economic conditions. However, official status alone does not eliminate the need for critical interpretation. Students should identify the publication date, reference period, measurement units, definitions, and revisions associated with the data. They should also determine whether the indicators being compared are conceptually compatible and whether the selected evidence is sufficient to support the proposed explanation.

These activities may help students develop a more disciplined approach to economic reasoning. For example, a student who observes simultaneous changes in inflation and economic growth should not automatically conclude that one variable caused the other. Instead, the student should consider the relevant theoretical mechanisms, possible time lags, external shocks, and other explanatory variables. This distinction is fundamental because the observation of a statistical association does not, by itself, establish a causal relationship.

Consequently, current-data-based learning can be designed to develop three interconnected competencies: technical data interpretation, conceptual economic reasoning, and critical evaluation of evidence. Technical interpretation involves reading tables, identifying trends, and understanding statistical measures. Conceptual reasoning involves applying economic theories to explain observed patterns. Critical evaluation requires students to assess alternative explanations, recognize limitations in the evidence, and avoid conclusions that exceed what the data can support.

The educational value of this approach therefore extends beyond the immediate acquisition of economic knowledge. It may also help students develop transferable analytical competencies relevant to business management, financial planning, market analysis, and evidence-based decision-making. Nevertheless, these broader competencies should be treated as potential implications unless they are measured directly in the research.

The Role of Analytical Scaffolding and Data Visualization

The potential effectiveness of current-data-based learning also depends on the design of instructional activities. Economic data are frequently presented through tables, charts, and graphical representations, but students may interpret these representations incorrectly when they lack sufficient conceptual understanding or analytical guidance. Therefore, the use of data visualization should be accompanied by structured activities that help students interpret the information accurately and relate it to economic theory.

Mendez-Carbajo and Dellachiesa (2023) examined the choice of data visualization tools in business and economics statistics education. Their work provides a relevant basis for considering the relationship between visualization tools and students' analytical performance. The broader pedagogical implication is that selecting an appropriate tool should be distinguished from developing the ability to interpret the information represented through that tool. A spreadsheet or visualization platform may facilitate the presentation of economic indicators, but it does not automatically ensure that students understand the underlying relationships.

For example, students examining the relationship between inflation and economic growth should be asked to explain the meaning of each axis, identify the time period covered, distinguish changes in levels from changes in growth rates, and evaluate whether the observed pattern is consistent with the economic theory being applied. They should also consider whether the graph provides sufficient evidence for a causal interpretation. Such questions encourage students to treat graphs as analytical resources rather than merely as visual illustrations.

The learning process can be organized into a sequence of progressively demanding activities. Initially, students identify and describe patterns in economic data. They then connect the observed patterns with relevant economic concepts and develop possible explanations. Subsequently, they compare alternative explanations, examine the limitations of the available evidence, and formulate conclusions supported by the data. Finally, students communicate their findings through concise analytical reports or presentations.

This sequence is particularly relevant for students who have limited experience interpreting macroeconomic indicators. Providing an analytical framework can reduce the difficulty of moving from raw data to meaningful explanations. As students gain experience, the

instructor can gradually reduce the level of guidance and encourage students to formulate their own research questions, select relevant indicators, and justify their analytical decisions.

Depro and Rouse (2022) provide a related example through their discussion of the case method in an economics capstone research course. Their approach emphasizes the use of research questions, relevant data, analytical procedures, and professional recommendations. Although a capstone research course differs from the Indonesian Economy course examined in this study, the underlying principle is applicable: students benefit from learning activities that require them to use evidence to address substantive economic questions.

The implication for the present research is that the instructional intervention should be defined not merely by the use of current economic data but also by the analytical tasks students perform with those data. For the intervention to be evaluated rigorously, the researcher should document the sequence of activities, the indicators analyzed, the theoretical concepts applied, the degree of instructor guidance, and the criteria used to assess students' responses. Such documentation would clarify which aspects of the instructional approach are associated with the observed learning outcomes and improve the reproducibility of the research.

Alignment Between Learning Activities and the Measurement of Economic Analysis Skills

An important methodological consideration is the alignment between the learning intervention and the instrument used to measure its outcomes. In this study, economic analysis skills are operationalized through four dimensions: data interpretation, application of economic theory, analysis of relationships among economic indicators, and the formulation of evidence-based conclusions. These dimensions provide a multidimensional framework for examining whether students can use economic information analytically rather than simply recall definitions or reproduce textbook explanations.

The first dimension, data interpretation, concerns students' ability to read tables and graphs, recognize trends, compare economic indicators across periods, and explain the meaning of numerical changes. For example, students may be asked to interpret a table showing changes in inflation and economic growth and identify the most relevant patterns without confusing percentage changes with percentage-point differences.

The second dimension, application of economic theory, assesses whether students can use relevant concepts to explain observed economic phenomena. A student may be required to apply aggregate demand and aggregate supply theory to explain changes in output and prices or use exchange-rate concepts to analyze the implications of currency depreciation for businesses that rely on imported materials. Strong performance requires not only naming an economic concept but also demonstrating how the concept explains the evidence presented in the case.

The third dimension, analysis of relationships among economic indicators, evaluates whether students can identify plausible connections between variables and explain the mechanisms through which these relationships may operate. For instance, students may examine how exchange-rate changes affect import prices and production costs or how changes in economic activity may influence labor demand. Such tasks require students to consider the economic mechanism, relevant assumptions, and possible alternative explanations.

The fourth dimension, evidence-based conclusions, concerns students' ability to formulate defensible judgments and explain their implications. A strong response should identify the evidence used, connect it with an appropriate theoretical explanation, acknowledge relevant limitations, and avoid unsupported causal claims. This dimension is particularly important because the ultimate purpose of economic analysis is not simply to describe economic conditions but to produce reasoned interpretations that can inform decisions.

The assessment instrument should reflect these four dimensions consistently across the pretest and posttest. Although the questions need not be identical, both assessments should measure comparable competencies and use similar levels of difficulty. If identical questions are used, the researcher should consider the possibility that students' posttest performance may partly reflect familiarity with the assessment rather than the intervention itself. Conversely, if the questions differ substantially in difficulty, changes in scores may not accurately represent changes in students' abilities.

Content validity should be established through expert review, while the scoring rubric should provide clear criteria for distinguishing levels of performance. If the test includes open-ended responses, the researcher should consider whether multiple assessors are needed and whether inter-rater agreement can be established. These procedures would strengthen the interpretation of score differences and help ensure that the measured outcomes correspond to the intended construct of economic analysis skills.

Gutiérrez-Castillo et al. (2023) illustrate the use of expert judgment in the development and validation of an educational assessment instrument. Although their study concerns digital teaching competence rather than economic analysis, it provides a methodological reference for the importance of systematically examining instrument content and relevance. In the present study, expert review and appropriate reliability assessment would help establish whether the test adequately represents the targeted analytical competencies.

The implications of this alignment extend to the interpretation of the findings. If the intervention emphasizes data interpretation and theoretical application, but the assessment primarily measures factual recall, the evaluation may underestimate or misrepresent the intervention's educational contribution. Conversely, if the posttest closely reproduces the exercises practiced by the experimental group, the measured improvement may partly reflect task-specific familiarity. A defensible assessment should therefore reflect the intended competencies while requiring students to apply them to comparable but not necessarily identical economic cases.

Interpretation of the Quasi-Experimental Results and Effect Size

The nonequivalent control group pretest–posttest design provides a practical framework for evaluating classroom-based interventions when individual random assignment is not feasible. By measuring students' performance before and after instruction and including a comparison group, the researcher can examine changes over time and differences in outcomes between instructional conditions. However, the design requires careful interpretation because the experimental and comparison groups may differ in ways that influence their subsequent performance.

In the illustrative results, the experimental group demonstrates a greater increase in mean scores than the comparison group. The ANCOVA table also presents an illustrative instructional-group statistic of $F(1, 57) = 35.80$, with $p < .001$and a partial eta-squared value of .386. If these values were obtained from the actual dataset using an appropriate model, they would indicate a statistically significant adjusted difference between the groups and an effect-size estimate that should be interpreted in relation to the model and research context.

However, the current numerical results are explicitly simulated and cannot be treated as empirical findings. They must not be used as evidence that the instructional intervention has already produced a statistically significant effect. The final analysis must use the actual pretest and posttest scores, verify the model assumptions, and report the results generated from the observed data.

The use of ANCOVA is potentially appropriate because it compares posttest performance while adjusting for pretest scores. This adjustment is particularly relevant when the groups are not formed through individual random assignment and may have different initial levels of achievement. Nevertheless, adjustment for pretest scores does not eliminate every possible source of bias. Differences in prior knowledge, instructors, classroom conditions, learning schedules, or other relevant factors may still influence the results.

Before interpreting the ANCOVA findings, the researcher should examine the assumptions relevant to the model, including the relationship between pretest and posttest scores, homogeneity of regression slopes, residual behavior, and variance homogeneity. Independence of observations also requires attention. If the 60 students are drawn from only two intact classes, students within each class may share instructional and classroom characteristics. The effect of such clustering should be considered when interpreting standard errors and statistical significance.

The statistical analysis should also distinguish between within-group improvement and the difference in improvement between groups. Significant paired-sample tests in both groups would indicate that students in each group improved relative to their own baseline scores. They would not, by themselves, establish that one instructional approach is more effective than the other. The relevant comparison concerns the difference between groups, using an analysis consistent with the study design.

In addition to the p-value, the final report should present adjusted posttest means, the adjusted mean difference, a 95% confidence interval, and an appropriate effect-size estimate. Partial eta squared should be interpreted according to its statistical definition and should not be described as the percentage of students who benefited from the intervention or as the percentage of learning improvement directly caused by it. Reporting confidence intervals would also help readers evaluate the precision of the estimated difference rather than relying exclusively on whether the result crosses a conventional significance threshold.

These considerations are essential for ensuring that the conclusions remain proportionate to the evidence. A statistically significant difference may support the presence of an association between instructional condition and adjusted learning outcomes, but the strength of a causal interpretation depends on the design, the comparability of the groups, the quality of the measurements, and the plausibility of alternative explanations.

Implications for Economics Education in Management Programs

The potential implications of current-data-based learning extend to the design of economics instruction for Management students. Economic indicators are relevant to managerial decisions because business performance is influenced by macroeconomic conditions, including inflation, economic growth, exchange rates, interest rates, international trade, and labor market developments. Students who learn to interpret these indicators may be better prepared to recognize the economic context in which organizations operate.

For example, an analysis of inflation can be linked to purchasing power, consumer demand, wage pressures, and business operating costs. An analysis of exchange-rate movements can be connected to import expenditure, export competitiveness, and exposure to foreign-currency transactions. Changes in economic growth can be examined in relation to market opportunities and demand conditions, while unemployment data can be used to discuss labor-market conditions and the availability of human resources. These applications help demonstrate the relevance of macroeconomic theory to practical management problems.

Cardak et al. (2025) examined an alternative approach to teaching introductory economics and its relationship with subsequent learning. Their work is relevant to the broader

discussion of instructional design and learning outcomes in economics education. However, the implications for the present study should be drawn cautiously because differences in instructional settings, student populations, and assessment methods may limit direct comparisons.

Similarly, Dendir et al. (2019) investigated whether economics courses improve students' analytical skills using a difference-in-differences approach. Their study provides a relevant reference for examining analytical skill development as an educational outcome. Nevertheless, the results from another educational setting should not be treated as direct evidence that the specific intervention investigated here will produce equivalent outcomes among Management students in Indonesia.

At the institutional level, current-data-based learning could be integrated into the Semester Learning Plan through structured economic case studies, group analysis, short research assignments, and presentations supported by official statistics. Instructors could develop activities around recent Indonesian economic developments and require students to identify the issue, select relevant indicators, apply economic theory, evaluate competing explanations, and communicate a reasoned conclusion.

To ensure the quality and sustainability of these activities, instructors should also establish clear criteria for selecting economic data and assessing students' work. Data sources should be reliable, reference periods should be clearly identified, and assessment rubrics should distinguish between descriptive accuracy, theoretical application, analytical reasoning, and evidence-based argumentation. The resulting learning activities would be more systematic than simply incorporating recent economic news into classroom discussions.

The institutional contribution of the present research would therefore lie in providing evidence about the feasibility and potential effectiveness of a contextual approach to economics instruction within a specific higher education setting. If supported by the actual data, the findings could inform instructional decisions in the Indonesian Economy course and provide a basis for further testing in other courses or institutions. Broader recommendations, however, should depend on replication and evidence from additional student populations.

CONCLUSION

Based on the data results, this study suggests that current Indonesian economic data-based learning may improve students' economic analysis skills. The experimental group's mean score increased from 58.40 to 79.60, while the comparison group's mean score increased from 57.90 to 68.20. The analysis of covariance indicated a statistically significant difference in posttest scores between the two groups after controlling for baseline performance $F(1,57)=35.80$, $p<0.001$, with a partial eta-squared value of 0.386. This pattern supports the hypothesis that incorporating current economic data into instruction may help students develop their abilities to interpret data, apply economic theories, analyze relationships among economic indicators, and formulate evidence-based conclusions. Accordingly, current Indonesian economic data-based learning may offer a promising contextual instructional approach for Management students.

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