



Empowering High School Students through Differentiated Learning in Economics Education: Evidence from Indonesia's Independent Curriculum

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ABSTRACT

Background. Economic education is expected not only to improve students' academic achievement but also to empower learners to become active, independent, and responsible decision-makers. Although differentiated learning has been widely recognized as a learner-centered instructional approach, empirical evidence regarding its contribution to student empowerment in economics education, particularly within Indonesia's Independent Curriculum, remains limited.

Purpose. This study aimed to examine the effect of differentiated learning on students' learning outcomes while demonstrating its role as an instructional approach for empowering high school students in economics education.

Method. This study employed a quantitative approach using a quasi-experimental design with a nonequivalent control group. The participants were tenth-grade students from a public senior high school in Indonesia. Data were collected through pre-test and post-test assessments and analyzed using descriptive and inferential statistical techniques.

Results. The findings revealed that students who participated in differentiated learning achieved significantly higher learning outcomes than those who received conventional instruction. The learning process also promoted greater student engagement, collaboration, and active participation, indicating that differentiated learning supports both academic achievement and student empowerment in economics education.

Conclusion. Differentiated learning is an effective instructional approach for improving students' learning outcomes while fostering empowerment-oriented learning environments. The findings contribute to the growing body of knowledge on differentiated instruction by providing empirical evidence from economics education within Indonesia's Independent Curriculum and offer practical implications for teachers seeking to implement more inclusive and student-centered learning practices

KEYWORDS

Differentiated Learning, Economics Education, Independent Curriculum, Learning Outcomes, Student Empowerment

INTRODUCTION

Education in the twenty-first century is increasingly expected to equip learners not only with disciplinary

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knowledge but also with the transferable competencies needed to navigate complex social, economic, and technological change. Research on 21st-century skills indicates that contemporary schooling must move beyond the transmission of content toward learning experiences that cultivate critical thinking, collaboration, communication, creativity, and self-regulation (Cattaneo, 2017; van Laar et al., 2017). In this shift, economics education has a particularly strategic function because it helps students interpret economic phenomena, evaluate alternatives, and make responsible decisions in everyday life and civic participation. Evidence from financial and economic literacy research shows that stronger economic understanding is associated with more informed decision-making and better downstream outcomes, underscoring the importance of meaningful economics instruction rather than rote memorization (Grohmann et al., 2015; Kaiser et al., 2022). Accordingly, economics classrooms should not merely deliver abstract concepts but should empower students as active participants who construct knowledge, exercise agency, and engage in authentic problem solving. Such an empowering orientation aligns with recent scholarship on student engagement and partnership, which emphasizes that learners are more likely to thrive when they are positioned as co-creators of learning rather than passive recipients of instruction (Bond et al., 2020; Bovill, 2019; Kahu & Nelson, 2018).

In economics education, student empowerment goes beyond improving academic achievement by enabling students to develop independence, autonomy, and confidence in making informed economic decisions. Empowerment-oriented learning encourages students to actively construct knowledge, reflect on authentic economic issues, and participate collaboratively in solving contextual problems rather than simply receiving information from teachers. Such an approach is crucial in economics education because students are expected to apply economic concepts in everyday decision-making, financial literacy, and responsible citizenship. Recent educational research increasingly emphasizes that empowering learning environments foster greater student engagement, self-regulation, and ownership of learning, all of which contribute to meaningful and sustainable learning outcomes (Bovill, 2019; Kahu & Nelson, 2018; Lee, 2024). Similarly, studies in economics and finance education indicate that students who actively engage with authentic economic contexts are more likely to develop sound economic reasoning and responsible decision-making competencies than those who experience teacher-dominated instruction (Kaiser et al., 2022; Kustiandi et al., 2024). Therefore, student empowerment should be seen as a fundamental educational goal in economic education, which provides a strong pedagogical foundation for implementing student-centered learning approaches such as differentiated learning.

In response to the growing diversity of students' learning readiness, interests, and learning profiles, differentiated learning has increasingly been recognized as one of the most prominent learner-centered pedagogical approaches in contemporary education. Rather than delivering uniform instruction, differentiated learning enables teachers to adapt learning objectives, instructional processes, learning resources, and assessment practices to accommodate students' diverse needs while maintaining equitable learning opportunities. Recent international reviews indicate that differentiated learning has evolved from a theoretical concept into an evidence-informed instructional approach that supports inclusive education, learner engagement, and personalized learning across diverse educational (D'Intino & Wang, 2021; Graham et al., 2021; Pozas & Letzel-Alt, 2023). Moreover, empirical studies have consistently reported that differentiated instruction contributes positively to students' academic achievement, motivation, and classroom participation when it is implemented through systematic instructional planning and ongoing formative assessment. A recent meta-analysis further confirmed that differentiated instruction produces a significant positive effect on students' learning outcomes across educational levels and subject areas, although its effectiveness depends on teachers' pedagogical competence and implementation (Asriadi et al., 2023; Gibbs &

McKay, 2021). These findings suggest that differentiated learning provides a strong pedagogical foundation for promoting learner-centered and empowerment-oriented practices, making it particularly relevant for economics education, where students are expected to actively construct knowledge and apply economic concepts to authentic situations.

To maximize the effectiveness of differentiated learning, teachers require instructional models that provide sufficient flexibility for students to demonstrate their diverse abilities while engaging in meaningful learning experiences. Among various learner-centered approaches, Project-Based Learning (PBL) has been widely recognized as a pedagogical model that complements differentiated learning by promoting authentic problem-solving, collaboration, inquiry, and student autonomy. Rather than requiring students to complete identical learning tasks, PBL enables teachers to differentiate project topics, learning processes, levels of complexity, and expected products according to students' readiness, interests, and learning profiles. Recent international evidence indicates that PBL not only improves students' academic achievement but also enhances critical thinking, creativity, collaboration, and self-directed learning, which are essential competencies for twenty-first-century education (Guo et al., 2020). Furthermore, systematic reviews have highlighted that the integration of PBL with personalized instructional approaches creates more inclusive learning environments by encouraging active participation, sustained engagement, and meaningful knowledge construction across diverse student populations (Asriadi et al., 2023; Gibbs & McKay, 2021). Therefore, integrating differentiated learning with Project-Based Learning provides a pedagogically sound approach for empowering students in economics education, where learners are expected not only to understand economic concepts but also to apply them collaboratively in solving authentic economic problems.

Previous international studies have consistently shown that differentiated learning can improve students' academic achievement, motivation, engagement, and participation, but the evidence is more nuanced than a simple positive-effect narrative. Systematic reviews suggest that differentiation is most effective when it is implemented as a responsive teaching practice rather than as a set of isolated task modifications, and its impact depends heavily on teacher expertise, classroom composition, and assessment design (Asriadi et al., 2023; Deunk et al., 2018a; Gibbs & McKay, 2021; Graham et al., 2021). Likewise, Project-Based Learning has been associated with gains in academic achievement, collaboration, and higher-order thinking, yet review and meta-analytic studies also note that these benefits are uneven and often contingent on task quality, scaffolding, and alignment between project demands and learning goals (Chen & Yang, 2019; Guo et al., 2020; Kokotsaki et al., 2016). From a broader learner-centered perspective, student engagement and autonomy are strengthened when instruction supports agency, relevance, and meaningful participation, although such outcomes are not automatic and require deliberate pedagogical design (Bond et al., 2020; Kahu & Nelson, 2018; Reeve et al., 2025). These findings indicate the need for empirical investigation to validate the practical implementation of differentiated learning beyond conceptual and review-based discussions. Taken together, these studies indicate that differentiated learning and Project-Based Learning share a common emphasis on responsiveness, autonomy, and active knowledge construction; however, most existing research has examined them separately, with limited empirical attention to their integration as a strategy for empowering students in economics education. Consequently, there remains a clear need to investigate how differentiated learning integrated with Project-Based Learning operates within the implementation of Indonesia's Independent Curriculum.

Despite the growing body of evidence supporting differentiated learning and Project-Based Learning, several important research gaps remain. First, existing studies have predominantly conceptualized differentiated learning as an instructional strategy for improving academic

achievement, whereas its potential to foster student empowerment, learner agency, and meaningful participation has received considerably less empirical attention (Reeve & Cheon, 2021; Stenalt & Lassesen, 2022). Second, although differentiated learning and Project-Based Learning share similar learner-centered principles, these pedagogical approaches have generally been investigated independently, leaving limited evidence regarding their integrated implementation and complementary effects on students' learning experiences (Ferrero et al., 2021; Guo et al., 2020). Third, systematic reviews consistently indicate that most empirical studies on differentiated instruction have been conducted in mathematics, science, language and primary education, while economics education remains substantially underrepresented despite its emphasis on contextual decision-making and problem solving (Deunk et al., 2018; Gibbs & McKay, 2021; Graham et al., 2021). Finally, the recent implementation of Indonesia's Independent Curriculum has generated increasing interest in learner-centered pedagogies; however, empirical studies examining differentiated learning within this policy context remain scarce, particularly those integrating Project-Based Learning to promote both academic achievement and student empowerment in economics education. Addressing these conceptual, pedagogical, disciplinary, and contextual gaps, the present study investigates differentiated learning integrated with Project-Based Learning as an empowerment-oriented pedagogical approach for improving students' learning outcomes in economics education under Indonesia's Independent Curriculum.

Building upon these identified gaps, this study offers several contributions to the existing literature. Conceptually, it extends previous research by positioning differentiated learning not merely as an instructional strategy for improving academic achievement, but as an empowerment-oriented pedagogical approach that promotes learner agency, active participation, and meaningful engagement (Graham et al., 2021; Reeve & Cheon, 2021; Stenalt & Lassesen, 2022). Pedagogically, this study integrates differentiated learning with Project-Based Learning to provide a coherent learner-centered instructional framework that accommodates students' diverse learning needs while encouraging collaborative problem-solving, consistent with evidence that both differentiation and PBL can support deeper engagement and improved learning outcomes (Chen & Yang, 2019; Ferrero et al., 2021; Guo et al., 2020). From a disciplinary perspective, the study enriches the limited body of empirical research on differentiated learning within economics education, an area that remains less examined than mathematics, science, and language education in the broader differentiation literature (Deunk et al., 2018; Gibbs & McKay, 2021; Graham et al., 2021). This research contributes empirical evidence from the implementation of Indonesia's Independent Curriculum, thereby broadening international understanding of how curriculum reform can support learner-centered and empowerment-oriented practices in secondary education (Kahu & Nelson, 2018; Reeve & Cheon, 2021). By connecting differentiated learning, student empowerment, and economics education within a single instructional framework, this study contributes to the ongoing discussion on responsive pedagogy and provides practical implications for teachers seeking to design more inclusive, meaningful, and contextually relevant learning experiences (Graham et al., 2021; Stenalt & Lassesen, 2022).

The present study contributes both theoretically and practically to the advancement of economics education. Theoretically, it extends the current discourse on differentiated learning by framing it as an empowerment-based pedagogical approach that integrates learner-centered instruction with Project-Based Learning to enhance students' learning experiences and academic achievement. This perspective broadens existing literature by linking differentiated learning, student empowerment, and economics education within a coherent conceptual framework. Practically, the findings are expected to provide evidence-based guidance for teachers, school leaders, and curriculum

developers in designing inclusive and responsive learning environments that accommodate students' diverse readiness, interests, and learning profiles while fostering meaningful participation and higher-order thinking skills. The study also offers practical insights into implementing learner-centered pedagogy within the context of Indonesia's Independent Curriculum, particularly in economics classrooms where contextual problem-solving and responsible decision-making are central learning objectives. Accordingly, this study aims to examine the effect of differentiated learning integrated with Project-Based Learning as an empowerment-based instructional approach on senior high school students' learning outcomes in economics education under Indonesia's Independent Curriculum.

RESEARCH METHODOLOGY

This study employed a quantitative research approach using a quasi-experimental design to examine the effect of differentiated learning integrated with Project-Based Learning as an empowerment-based instructional strategy on students' learning outcomes in economics education. A quantitative approach was considered appropriate because the study sought to measure the causal effect of an educational intervention through objective numerical data and statistical analysis. Specifically, the research adopted a nonequivalent control group design, one of the most frequently used quasi-experimental designs in educational research when random assignment of participants is not feasible in authentic school settings (Handley et al., 2018; Maciejewski, 2020). In this design, two intact classes were assigned as the experimental and control groups without random allocation. Both groups completed a pre-test before the intervention and a post-test after the intervention, enabling the researcher to examine changes in students' learning outcomes while controlling for initial differences between groups. The use of this design was considered appropriate because the existing classroom organization established by the school could not be altered for research purposes, thereby maintaining the natural learning environment while providing a rigorous framework for evaluating the effectiveness of the instructional intervention.

The participants of this study were tenth-grade students enrolled in a public senior high school in Lamongan, East Java, Indonesia, during the 2024/2025 academic year. The target population comprised all Grade X students taking economics courses under the implementation of Indonesia's Independent Curriculum. The research sample was selected using purposive sampling because the study required classes with comparable academic characteristics and similar learning conditions while accommodating the school's existing classroom organization. Based on recommendations from the economics teacher and preliminary observations of students' academic performance, two intact classes (Class X-1 and Class X-2) were selected because they demonstrated relatively similar academic abilities and had lower levels of learning achievement than the other Grade X classes, as reflected in their previous economics assessment results. One class was assigned as the experimental group receiving differentiated learning integrated with Project-Based Learning, while the other served as the control group receiving conventional instruction. The participants were generally 15–16 years of age and had comparable educational backgrounds, allowing the two groups to be considered sufficiently equivalent for comparative analysis.

The research was conducted over a two-week period consisting of four instructional meetings. Before the intervention, both the experimental and control groups completed a pre-test to measure students' initial understanding of the economics topics and to establish baseline equivalence between the two groups. Following the pre-test, the experimental group participated in differentiated learning integrated with Project-Based Learning, whereas the control group received conventional teacher-centered instruction covering the same learning objectives, instructional content, and duration. The instructional intervention focused on the topics of banking, payment systems, and payment

instruments, which were delivered according to the learning outcomes specified in Indonesia's Independent Curriculum. At the conclusion of the intervention, both groups completed an identical post-test to evaluate changes in students' learning outcomes following the instructional treatment. Maintaining equivalent instructional time and learning content across both groups ensured that differences in post-test performance could be more confidently attributed to the instructional approach rather than to variations in learning opportunities or curriculum coverage (Guo et al., 2020; Maciejewski, 2020).

The differentiated learning intervention was systematically implemented by integrating the principles of differentiated instruction with the stages of Project-Based Learning throughout the instructional process. Prior to the intervention, students' learning readiness was identified through the results of the pre-test, classroom observations, and teacher evaluations to obtain an initial understanding of students' academic preparedness. Based on this information, students were organized into heterogeneous collaborative groups to encourage peer interaction and mutual support during project activities. Differentiation was subsequently applied across three instructional dimensions. Content differentiation was achieved by providing learning resources of varying complexity and formats that enabled students to access economic concepts according to their readiness levels. Process differentiation was implemented by offering flexible learning activities, collaborative discussions, guided inquiry, and teacher facilitation tailored to students' learning needs. Product differentiation allowed students to demonstrate their understanding through various project outputs related to banking, payment systems, and payment instruments while maintaining the same learning objectives and assessment criteria. The instructional activities followed the general phases of Project-Based Learning, including project orientation, planning, investigation, project development, presentation, and reflection, thereby encouraging students to actively construct knowledge, solve contextual economic problems, and collaborate with their peers. This learner-centered implementation reflects the principles of differentiated instruction by providing equitable learning opportunities while empowering students to participate actively according to their individual readiness, interests, and learning profiles (Guo et al., 2020; Reeve & Cheon, 2021; Tomlinson, 2000).

Students' learning outcomes were measured using an achievement test administered as both a pre-test and a post-test. The instrument consisted of objective multiple-choice questions developed based on the economics learning outcomes specified in Indonesia's Independent Curriculum, particularly the topics of banking, payment systems, and payment instruments. The test was designed to assess students' conceptual understanding, application of economic principles, and ability to solve contextual economic problems aligned with the instructional objectives. To ensure consistency between the learning process and assessment, the test items were prepared according to a table of specifications that mapped each question to the intended learning outcomes and cognitive levels. The same instrument was administered before and after the intervention to evaluate students' learning progress and to enable comparisons between the experimental and control groups. Achievement tests are widely recognized as valid instruments for measuring students' cognitive learning outcomes in educational intervention research because they provide objective evidence of changes in knowledge and understanding following instructional treatment (Brookhart, 2018).

Prior to the implementation of the experiment, the achievement test was evaluated to ensure its validity and reliability. Content validity was established through expert judgment by economics education lecturers and experienced economics teachers, who examined the alignment between the test items, learning objectives, and curriculum content. Subsequently, empirical validity was assessed through item analysis using the product-moment correlation technique, and only items meeting the predetermined validity criteria were retained for the final instrument. The internal consistency of the

instrument was evaluated using Cronbach's alpha coefficient, indicating that the test possessed satisfactory reliability for measuring students' learning outcomes. In addition, item difficulty and discrimination indices were analyzed to ensure that each question appropriately differentiated students according to their level of achievement and represented an adequate range of difficulty. These procedures ensured that the instrument met accepted standards of educational measurement and produced valid and reliable data for subsequent statistical analysis (Boateng et al., 2018; Kyriazos & Kyriazos, 2018; Tavakol & Dennick, 2011).

This study has several methodological limitations that should be considered when interpreting the findings. First, the quasi-experimental design employed intact classrooms rather than random assignment of participants, which may limit the ability to establish full causal inference. However, the use of a nonequivalent control group design, combined with pre-test equivalence, identical instructional duration, and comparable learning content, helped strengthen the internal validity of the study. Second, the research was conducted in a single public senior high school with a relatively limited sample size, which may affect the generalizability of the findings to other educational contexts. Nevertheless, the study provides valuable empirical evidence regarding the implementation of differentiated learning integrated with Project-Based Learning in economics education under Indonesia's Independent Curriculum and offers a foundation for future studies involving broader populations, multiple schools, and longitudinal research designs (Handley et al., 2018; Maciejewski, 2020).

RESULT AND DISCUSSION

Validity and Reliability Test

This study uses the product moment correlation item validity test from Pearson with decision making if the value of $t_{count} > t_{table}$, then the item can be considered valid and whereas, if $t_{count} < t_{table}$. This test was conducted in class XI-5 SMAN 3 Lamongan which amounted to 30 students. The test consists of 34 questions with 5 answer choices. The analysis information can be found in the form of table 1.

Table 1. Pre-test and Post-test Validity Test Results

No	Description	Item number
1	Valid	2, 4, 5, 7, 8, 9, 10, 12, 14, 16, 17, 18, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 33
2	Invalid	1, 3, 6, 11, 13, 15, 19, 32, 34

Based on table 1, it is known that the validity test output of 34 pre-test and post-test questions, there are 25 questions that are declared valid. This is obtained after comparing the $t_{count} > t_{table}$ value that has been determined. However, there are 9 other questions that are declared invalid, because the value of $t_{count} < t_{table}$ determined. The t_{table} value used as a reference in the validity test is 0.361. So that invalid questions are eliminated and valid questions are tested for reliability.

Reliability is used to measure how far the data generated from measurements using the same object remains consistent and reliable. In this study, reliability uses the following Kuder Richardson 20 (K-R 20) method:

Table 2. Reliability Test

Statistics	Description
r11	0,889
Category	Very High Reliability

Based on table 2, the output of reliability testing on test questions that have been declared valid shows the value of r_{11} is 0.889. The reliability value obtained shows a very high level of reliability. Therefore, it is concluded that the test questions can be applied to the experimental and control classes. By using reliable test questions, the data obtained is accurate and reliable, thus enabling more valid and meaningful analysis in the research conducted.

Normality and Homogeneity Test

The normality test was conducted to determine whether the research data were normally distributed. The results of this test were used to decide the appropriate statistical analysis method for hypothesis testing. Parametric statistical analysis was applied when the data met the assumption of normal distribution, whereas nonparametric analysis would be considered if the data were not normally distributed. The normality test was performed using the pre-test and post-test scores from both the experimental and control groups. In this study, the significance value (Sig.) was used as the basis for determining data normally. Data were considered normally when the significance value was greater than 0.05, while a significance value lower than 0.05 indicated that the data were not normally distributed. The results of the normality test are presented below:

Table 3. Normality Test

Class	Kolmogorov-Smirnov ^a		
	Statistic	df	Sig.
Experimental Class Pre-test	.143	35	.067
Control Class Pre-test	.142	35	.071
Experimental Class Post-Test	.124	35	.189
Control Class Post-Test	.144	35	.065

Based on Table 3, the normality test results show that the pre-test scores of the experimental class obtained a significance value of 0.067, which is higher than 0.05. Likewise, the control class achieved a significance value of 0.071, also exceeding 0.05. For the post-test results, the experimental class produced a significance value of 0.189, while the control class obtained 0.065. Since all significance values are greater than 0.05, the data from both the experimental and control classes can be regarded as normally distributed and representative of the population.

The homogeneity test was conducted using the pre-test and post-test scores from both the experimental and control groups to determine whether the variance of students' economic learning outcomes was consistent before and after the treatment. The decision regarding data homogeneity was based on the significance (Sig.) value with a threshold of 0.05. Data are categorized as homogeneous when the significance value exceeds 0.05, whereas values below 0.05 indicate non-homogeneous data. The results of the data analysis are presented as follows:

Table 4. Homogeneity Test

Learning Outcomes Test	Levene Statistic	df1	df2	Sig.
Pre-Test Learning Outcomes	3.017	1	68	0.087
Post-Test Learning Outcomes	3.518	1	68	0.065

The results of the homogeneity test revealed that the significance value (Sig.) for the pre-test scores of both the control and experimental classes was 0.638, while the post-test scores obtained a significance value of 0.478. Since both values are higher than the significance level of 0.05, the data fulfill the homogeneity requirements. This indicates that there is no substantial difference in the variance of learning outcomes between the experimental and control groups, either prior to or following the implementation of the treatment.

Hypothesis Test

Based on the prerequisite analysis, the pre-test and post-test data were proven to satisfy the assumptions of normality and homogeneity. Consequently, the hypothesis testing procedure could be continued using the independent sample t-test.

Table 5. Hypothesis Test

Value Data	Average		t-count	t-table	Conclusion
	Experiment	control			
Pre-test	41,31	38,29.	1,481	1,970	H0 accept
Post-test	77,20	59,60	8,090	1,668	Ha accept

Based on the statistical output, the calculated t-value (t-count) for the pre-test data was 1.481, whereas the critical t-value (t-table) at a 5% significance level with degrees of freedom ($dk = n_1 + n_2 - 2$) was 1.970. Since the obtained t-count was lower than the t-table value ($1.481 < 1.970$), the result indicates that there was no statistically significant difference between the experimental and control groups before the treatment was implemented. Accordingly, the null hypothesis (H_0) was accepted, while the alternative hypothesis (H_a) was not supported. This finding suggests that students in both groups had relatively similar learning outcomes prior to the application of the treatment. The mean pre-test score of the experimental class was 41.31, while the control class obtained an average score of 38.21, confirming that the initial abilities of both groups were comparable.

Furthermore, the post-test analysis produced a t-count value of 8.090, while the t-table value at the 5% significance level with $dk = n_1 + n_2 - 2$ was 1.668. Since the t-count exceeded the t-table value ($8.090 > 1.668$), the null hypothesis (H_0) was rejected and the alternative hypothesis (H_a) was accepted. These findings indicate that the implementation of differentiated learning strategies combined with project-based learning significantly influenced students' economic learning outcomes. The experimental class achieved a higher mean post-test score of 77.20 compared to 59.60 in the control class. This result demonstrates that students in the experimental group experienced greater improvement in learning outcomes than those in the control group. Therefore, it can be concluded that differentiated learning strategies positively affect the economic learning outcomes of students in the independent curriculum.

Table 6. Statistical Description of Pre-test and Post-test Results

Variable	N	Min	Max	Mean	Std. Deviation
Pre-test Experiment	35	30	60	41.31	7.275
Post-test Experiment	35	60	92	77.20	7.764
Pre-test Control	35	20	60	38.29	9.667
Post-test Control	35	40	76	59.60	10.265
Valid N (listwise)	35				

The descriptive analysis in Table 6 shows a comparison of the pre-test results of the experimental class, which received differentiated learning strategies and project-based learning, and the control class, which used the direct instruction model. Based on the pre-test results, the experimental class, with 35 students, achieved a minimum score of 30, a maximum score of 60, an average score of 41.31, and a standard deviation of 7.275. Meanwhile, the control class, with 35 students, achieved a minimum score of 20, a maximum score of 60, an average score of 38.29, and a standard deviation of 9.667.

The descriptive analysis of the post-test revealed that the experimental class, which implemented differentiated learning strategies, with 35 students, achieved a minimum score of 60, a maximum score of 92, an average score of 77.20, and a standard deviation of 7.764. Meanwhile, the post-test in the control class that implemented the direct instruction model obtained a minimum score of 40, a maximum score of 76, an average score of 59.60, and a standard deviation of 10.265.

The present study demonstrated that students who participated in the integrated differentiated learning and Project-Based Learning (PBL) intervention achieved significantly better economics learning outcomes than those who received conventional instruction. Although both groups exhibited comparable prior knowledge before the intervention, as indicated by the absence of a statistically significant difference in the pre-test scores, the post-test results revealed a substantial improvement in the experimental group. Students in the experimental class achieved a higher mean post-test score ($M = 77.20$) than those in the control class ($M = 59.60$), and the independent-samples t -test confirmed that this difference was statistically significant ($t = 8.090, p < .05$). These findings indicate that the integrated instructional intervention was associated with meaningful improvements in students' cognitive achievement in economics. Rather than merely increasing academic performance, the intervention appeared to facilitate students' active engagement in learning by providing opportunities to learn according to their readiness, participate collaboratively in authentic problem-solving activities, and demonstrate their understanding through diverse learning products. This interpretation is consistent with international evidence showing that project-based learning can positively influence academic achievement when it is carefully structured and aligned with learning goals (Chen & Yang, 2019) and with systematic reviews indicating that differentiated instruction is more likely to support student achievement when teachers adapt instruction to learner readiness and classroom diversity within learner-centered environments (Deunk et al., 2018; Smale-Jacobse et al., 2019).

The positive learning outcomes observed in this study can be explained by the pedagogical mechanisms underlying the integrated differentiated learning and Project-Based Learning (PBL) intervention. Rather than exposing all students to identical learning experiences, the intervention accommodated differences in students' readiness by providing flexible learning pathways, collaborative activities and opportunities to demonstrate understanding through diverse project outputs. Such instructional practices likely enhanced students' cognitive engagement because learning activities were better aligned with their prior knowledge, learning needs and levels of competence. At the same time, collaborative project work encouraged students to actively construct economic knowledge through discussion, inquiry, and authentic problem-solving, instead of passively receiving information from the teacher. From a learner-centered perspective, these instructional conditions foster greater autonomy, meaningful participation and sustained engagement, all of which are recognized as important mediators of academic achievement. Recent empirical evidence also suggests that students' cognitive engagement is strengthened when instructional scaffolding supports autonomy, competence, and collaboration during Project-Based Learning activities (Tirado-Morueta et al., 2024), while learner-centered environments that respond to students' diverse needs create more meaningful learning experiences and promote deeper learning processes (Chiu, 2022; Reeve & Cheon, 2021). Consequently, the improved learning outcomes identified in this study may be interpreted as the result of an instructional environment that actively engaged students in constructing economic understanding through differentiated and collaborative learning experiences.

An important consideration in interpreting the findings of this study is that the observed improvement in students' learning outcomes should not be attributed solely to differentiated learning or Project-Based Learning (PBL) as independent instructional approaches. Rather, the findings reflect

the effectiveness of an integrated pedagogical intervention in which differentiated learning principles were embedded within the PBL framework. In this integrated approach, differentiated learning provided personalized learning pathways by adapting instructional content, learning processes, and expected products to students' readiness, interests, and learning profiles, whereas PBL created authentic learning contexts in which students collaboratively investigated real-world economic problems and constructed practical solutions. The interaction between these two pedagogical approaches appears to have created complementary learning conditions: differentiation ensured that all students could participate according to their individual capacities, while project-based activities promoted inquiry, collaboration, and the application of economic concepts in meaningful situations. Consequently, the instructional benefits observed in this study are more appropriately interpreted as the result of the structural synergy between differentiated learning and PBL rather than the isolated contribution of either approach alone. This interpretation is supported by recent international research showing that differentiated instruction is most effective when teachers adjust tasks and supports to students' diverse needs while maintaining active participation (Deunk et al., 2018) and that autonomy-supportive, learner-centered teaching fosters engagement when students are given meaningful choices and opportunities for self-directed work (Aelterman et al., 2019). Likewise, reviews of PBL indicate that its benefits emerge when students work on authentic problems with explicit scaffolding that helps them collaborate, regulate their learning, and connect new knowledge to prior understanding (Belland et al., 2010; Kokotsaki et al., 2016). Together, these studies suggest that the combination of differentiation and PBL is pedagogically coherent because it balances personalization with collaborative inquiry, thereby supporting both engagement and higher-order thinking.

The findings of the present study both support and extend previous international research on differentiated learning and Project-Based Learning (PBL). Consistent with earlier systematic reviews and meta-analyses, the integrated instructional intervention was associated with improved students' academic achievement, indicating that learner-centered pedagogies are generally more effective than conventional teacher-centered instruction in promoting meaningful learning (Chen & Yang, 2019; Deunk et al., 2018). Similarly, recent studies have demonstrated that differentiated instruction enhances students' engagement, motivation, and learning achievement when teachers adapt instructional strategies to learners' diverse readiness, interests, and learning profiles (Smale-Jacobse et al., 2019; Subban et al., 2024). Meanwhile, evidence from project-based learning research suggests that authentic learning tasks and collaborative inquiry create opportunities for students to develop deeper conceptual understanding and transferable problem-solving skills (Condliffe et al., 2017; Guo et al., 2020). However, unlike many previous studies that examined differentiated instruction or Project-Based Learning as separate pedagogical approaches, the present study investigated their integration within economics education under Indonesia's Independent Curriculum. This integrated design offers a broader perspective by demonstrating that personalized instructional support and authentic project experiences can function complementarily rather than independently in facilitating students' learning. Consequently, the present findings contribute to the growing body of evidence suggesting that the effectiveness of learner-centered instruction depends not only on the adoption of individual pedagogical models but also on how complementary instructional principles are strategically combined to address learner diversity and promote meaningful knowledge construction.

Beyond improving students' academic achievement, the findings suggest that the integrated differentiated learning and Project-Based Learning (PBL) intervention contributed to student empowerment in economics education. Student empowerment can be understood as the process through which learners develop knowledge, confidence, autonomy, and the capacity to make

informed decisions while participating actively in meaningful learning experiences. In economics education, this means that students are not only expected to understand economic concepts but also to analyze real economic issues, evaluate alternative solutions, collaborate with peers, and make responsible decisions in everyday life. The differentiated learning environment allowed students to engage according to their readiness, interests, and learning profiles, while PBL provided authentic opportunities to investigate economic problems and construct practical solutions collaboratively. As a result, students were positioned not merely as recipients of knowledge but as active agents who assumed responsibility for their own learning and contributed to collective knowledge construction. This interpretation aligns with international research showing that learner-centered pedagogies strengthen student agency, autonomy, and self-regulated learning, which are central dimensions of empowerment (Aelterman et al., 2019; Kahu & Nelson, 2018; Panadero, 2017; Reeve & Cheon, 2021). It is also consistent with evidence that differentiated instruction supports students' engagement and responsiveness to diverse learning needs (Deunk et al., 2018; Smale-Jacobse et al., 2019) while PBL promotes deeper understanding, critical thinking, and collaborative problem-solving through authentic inquiry (Chen & Yang, 2019; Guo et al., 2020; Witarsa & Muhammad, 2023). These findings are also consistent with previous evidence showing that students' academic achievement is influenced not only by instructional strategies but also by psychological resources such as motivation and academic buoyancy, which strengthen learners' capacity to persist and adapt in challenging learning environments (Rafsanjani et al., 2024). Therefore, the present study extends beyond demonstrating higher learning outcomes by providing empirical evidence that integrating differentiated learning with PBL can create an empowering learning environment that supports students in becoming independent, reflective, and socially responsible economic learners.

The findings of this study can also be interpreted through the lens of Humanistic Theory, which emphasizes that learning is most effective when educational experiences recognize learners as unique individuals with different needs, potentials, and capacities for self-development. Rather than treating students as passive recipients of information, the integrated differentiated learning and Project-Based Learning (PBL) intervention positioned students as active participants who were encouraged to make choices, collaborate with peers, and construct their own understanding of economic concepts. From a humanistic perspective, differentiating instructional content, learning processes, and products according to students' readiness and interests creates conditions that support autonomy, competence, and self-actualization. These conditions enable learners to experience greater ownership of learning, develop confidence in their abilities, and actively regulate their learning processes instead of merely complying with teacher-directed instruction. Recent educational research grounded in Self-Determination Theory further supports this interpretation by demonstrating that autonomy-supportive teaching enhances students' intrinsic motivation, engagement, psychological well-being, and academic achievement through the satisfaction of their basic psychological needs for autonomy, competence, and relatedness (Alrabai, 2021; Ma, 2021; Reeve & Cheon, 2021; Ryan & Deci, 2020). Likewise, studies have shown that learner-centered instructional environments promoting self-regulated learning and meaningful participation facilitate deeper conceptual understanding and sustained academic engagement (Aelterman et al., 2019; Kahu & Nelson, 2018; Panadero, 2017). Therefore, the present findings suggest that the effectiveness of the integrated instructional intervention lies not only in its instructional design but also in its ability to create a humanistic learning environment in which students are empowered to realize their learning potential through autonomy, meaningful participation, and authentic learning experiences.

The findings of this study may also be interpreted from the perspective of progressive education, which views learning as an active, experiential, and socially meaningful process through

which students construct knowledge by engaging with authentic problems. Within this perspective, knowledge is not transmitted directly from teacher to learner but is developed through inquiry, reflection, collaboration, and real-world experience. The integrated differentiated learning and Project-Based Learning (PBL) intervention reflected these progressive principles by positioning students as active investigators of contextual economic issues rather than passive recipients of theoretical concepts. Students were encouraged to identify economic problems, discuss alternative solutions, develop collaborative projects, and communicate their findings, thereby transforming economic concepts into meaningful learning experiences. Differentiated learning further strengthened this process by allowing students to approach the same economic concepts through learning pathways that reflected their readiness, interests, and preferred ways of demonstrating understanding. Consequently, learning became both personalized and experiential, enabling students to connect classroom knowledge with authentic economic situations encountered in everyday life. Recent international research has consistently shown that project-based, inquiry-based, and experiential learning environments can improve students' academic achievement, higher-order thinking, problem-solving ability, collaboration, and knowledge transfer because learners actively construct understanding through authentic tasks rather than passive instruction (Chen & Yang, 2019; Guo et al., 2020; Kokotsaki et al., 2016; Morris, 2020). From a progressive education perspective, therefore, the effectiveness of the integrated instructional intervention lies not merely in improving academic achievement but in cultivating students' capacity to become reflective, collaborative, and responsible decision-makers who are capable of applying economic knowledge to real-life situations.

The findings of this study have several practical implications for economics education. First, they suggest that teachers may improve students' learning outcomes by integrating differentiated learning principles with Project-Based Learning (PBL) to accommodate learner diversity while simultaneously promoting authentic problem-solving, collaboration, and active participation. This integrated approach is consistent with student-centered teaching that supports autonomy, competence, and self-regulation, which are important for meaningful learning in economics. Beyond improving academic achievement, the findings also indicate that such pedagogical integration can help develop students' autonomy, critical thinking, and decision-making skills, which are essential for economic literacy and lifelong learning. Nevertheless, several limitations should be acknowledged. First, the study employed a quasi-experimental design involving two classes from a single senior high school, which may limit the generalizability of the findings to other educational contexts. Second, differentiated learning and Project-Based Learning were implemented simultaneously; therefore, the present study cannot determine the independent contribution of each instructional approach to students' learning outcomes. Third, the study focused primarily on cognitive learning outcomes and did not examine other important dimensions such as learning motivation, self-regulated learning, critical thinking, or student empowerment using validated psychometric measures. Future studies are therefore encouraged to employ multi-group or factorial experimental designs involving larger and more diverse samples to examine the separate and interactive effects of differentiated learning and PBL. In addition, longitudinal and mixed-methods research is recommended to investigate how empowerment-oriented instructional practices influence students' academic achievement, learner agency, and economic competencies over time, thereby providing a more comprehensive understanding of sustainable learner development (Chen & Yang, 2019; Guo et al., 2020; Reeve & Cheon, 2021).

CONCLUSION

This study demonstrates that integrating differentiated learning with Project-Based Learning provides an effective learner-centered instructional approach for improving students' learning outcomes in economics education. Rather than functioning as separate pedagogical strategies, the integration of these approaches creates a learning environment that accommodates learner diversity while encouraging authentic inquiry, collaboration, and meaningful knowledge construction. These findings suggest that instructional effectiveness is enhanced when personalized learning experiences are combined with contextual project activities that actively engage students in the learning process.

Beyond its empirical contribution, this study extends the literature on economics education by demonstrating how the integration of differentiated learning and Project-Based Learning can support student empowerment through the development of learner autonomy, critical thinking, collaboration, and responsible economic decision-making. The findings also enrich the theoretical understanding of learner-centered pedagogy by illustrating how Humanistic Theory and Progressivism can be operationalized through instructional practices that recognize students' diverse learning needs and promote experiential learning. Practically, the study provides evidence that this integrated instructional approach may serve as a relevant pedagogical alternative for teachers implementing Indonesia's Independent Curriculum and other learner-centered educational contexts. Although the findings are context-specific, they provide a foundation for future research to further examine empowerment-oriented instructional models across different educational settings and disciplines.

DECLARATION OF AI AND AI ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

During the preparation of this work, the author(s) used ChatGPT by OpenAI to assist in support the improvement of English grammar, sentence structure and overall clarity of the manuscript. After using this tool, the author(s) reviewed and edited the content as needed and take full responsibility for the content of the publication.

AUTHORS' CONTRIBUTION

Author 1: Conceptualization; Validation; Writing - review and editing.

Author 2: Conceptualization; Data curation; Writing - original draft; Investigation.

Author 3: Data curation; Investigation.

Author 4: Formal analysis; Methodology.

Author 5: Visualization; Validation.

DECLARATION OF COMPETING INTEREST

The authors declare that there are no competing financial interests, personal relationships, or conflicts of interest that could have influenced the research, authorship, or publication of this article.

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