



Developing an Interactive Project-Based Learning Microeconomics Textbook to Enhance Students' Higher-Order Thinking Skills

**Prima Lestari Situmorang^{1*}, Ika Trisni Simangunsong², Hermanto Tinambunan³,
Intan Farida⁴, Rival Hanip⁵**

^{1*,3}Economic Education Department, ²Physics Education Department,

⁵Elementary School Teacher Education, Faculty of Teacher Training and Education,

⁴Management Department, Faculty of Economic and Business,

Universitas Musamus, Indonesia.

*Corresponding Author. Email: [primasitumorang @unmus.ac.id](mailto:primasitumorang@unmus.ac.id)

Abstract: This study aims to develop and evaluate an interactive Microeconomics textbook based on Project-Based Learning (PjBL) to support students' higher-order thinking skills (HOTS) and learning outcomes. The study employed a Research and Development (R&D) approach using the ADDIE model and involved 35 undergraduate students enrolled in the Economics Education program at Universitas Musamus. Data were collected through expert validation, lecturer and student response questionnaires, and pretest and posttest assessments. The data were analyzed using descriptive statistics, the Shapiro–Wilk test, paired-samples *t*-test, and N-gain analysis. The needs analysis indicated that the existing learning outcomes were predominantly focused on lower-order cognitive levels, with 66.7% at C2, 16.7% at C3, and 16.7% at C4, while C5 and C6 were not explicitly addressed. Expert validation yielded an overall score of 93.1%, while student and lecturer responses reached 92.9% and 94.3%, respectively, indicating high levels of validity and practicality. The paired-samples *t*-test revealed a statistically significant difference between the pretest and posttest scores, $t(34) = -16.77$, $p < .001$, with a mean N-gain score of 0.57, categorized as moderate. These findings indicate that the developed textbook is valid and practical and has the potential to support improved learning outcomes and HOTS-oriented Microeconomics learning. However, the use of a one-group pretest–posttest design without a control group limits the extent to which improvements can be causally attributed to the developed textbook.

Article History

Received: 26-07-2026

Revised: 30-08-2026

Accepted: 22-09-2026

Published: 20-10-2026

Key Words:

Higher-Order Thinking

Skills; Interactive

Textbook;

Microeconomics; Project-Based Learning.

How to Cite: Prima Lestari Situmorang, Simangunsong, I. T., Tinambunan, H., Farida, I., & Hanip, R. (2026). Developing an Interactive Project-Based Learning Microeconomics Textbook to Enhance Students' Higher-Order Thinking Skills . *Jurnal Paedagogy*, 13(4), 1657-1568. <https://doi.org/10.33394/jp.v13i4.22073>



<https://doi.org/10.33394/jp.v13i4.22073>

This is an open-access article under the [CC-BY-SA License](#).



Introduction

The emergence of Industry 4.0 and Society 5.0 has shifted higher education from knowledge acquisition toward developing twenty-first-century competencies. Graduates are expected to think critically and creatively, solve complex problems, collaborate, and use digital technologies effectively (Emira Hayatina Ramadhan & Hindun Hindun, 2023; Herman et al., 2022). In this context, Higher-Order Thinking Skills (HOTS), particularly the abilities to analyze, evaluate, and create solutions to authentic problems, are essential competencies that need to be systematically developed in higher education (Situmorang & Arianti, 2024; Thalib et al., 2024). However, conventional teacher-centered and memorization-based instruction remains inadequate for developing these skills, highlighting the need for contextual, collaborative, and experiential learning approaches (Situmorang & Arianti, 2024).



Microeconomics is a foundational course in Economics Education that requires students to apply theoretical concepts, such as demand and supply, elasticity, consumer behavior, production, market structures, and equilibrium, to real-world economic phenomena (Simamora et al., 2026). Students must analyze issues such as commodity price changes, consumer behavior, and government policies using microeconomic principles (Herman et al., 2022). These learning demands directly reflect HOTS because they require students to analyze economic problems, evaluate evidence, and formulate appropriate solutions (Savitri, 2021).

Despite its importance, Microeconomics instruction often remains instructor-centered and dependent on conventional textbooks that emphasize theoretical explanations and routine exercises (Simangunsong et al., 2026). This approach may encourage memorization rather than deep conceptual understanding and the application of economic concepts to authentic problems (Situmorang et al., 2019). As a result, students' critical thinking, problem-solving, and HOTS may not develop optimally. Previous studies indicate that project-based learning, digital technologies, and interactive learning materials can increase engagement and support meaningful knowledge construction (Hafiyya & Hadi, 2023; Simamora et al., 2026).

Project-Based Learning (PjBL) is widely recognized as a learner-centered approach for developing HOTS through authentic projects. Students identify problems, analyze relevant information, develop solutions, and present project outcomes collaboratively (Suhaedin et al., 2024). This process supports critical thinking, creativity, communication, collaboration, and evidence-based decision making. Integrating digital technologies such as multimedia, videos, simulations, quizzes, and digital assessment further enhances the learning experience and promotes meaningful, student-centered learning (Widyastuti & Triana, 2024).

Interactive textbooks are also important in supporting high-quality learning experiences because they provide more than theoretical information by facilitating exploration, contextual practice, reflection, assessment, and project activities (Ramberg et al., 2021; Mulyanti et al., 2023). Features such as videos, infographics, animations, QR codes, interactive quizzes, case studies, and PjBL tasks can encourage active and engaging learning (Inarwati, 2025). These characteristics align with twenty-first-century education, which emphasizes student-centered learning and active knowledge construction (Arizona et al., 2020).

The need for an interactive textbook is further supported by the authors' previous research. The proposed textbook integrates QR codes, videos, interactive quizzes, and PjBL tasks to develop HOTS in Microeconomics. QR codes and videos present real-world economic cases that encourage analysis of relationships and causes (C4), while interactive quizzes support data interpretation, comparison, and justification (C4–C5). PjBL activities require students to evaluate alternatives and create evidence-based solutions or products for authentic economic problems (C5–C6). Previous research using the Case Method with Quizizz also showed improvements in students' problem-solving abilities and digital literacy, demonstrating the potential of combining innovative pedagogy with digital technologies (Situmorang & Arianti, 2024).

Previous studies also indicate that students experience difficulties in problem solving and symbolic representation, particularly in analyzing problems, formulating mathematical models, and interpreting solutions (Cahyaningrum et al., 2023). Findings that most students were in the very low and low problem-solving categories further indicate the need for learning resources that move beyond theoretical content toward structured activities that develop analysis, evaluation, and solution creation (Situmorang & Arianti, 2024). Therefore,



learning materials should provide systematic opportunities for students to engage with authentic Microeconomics problems.

An interactive textbook based on Project-Based Learning (PjBL) offers a promising solution by integrating project activities, digital technologies, and HOTS-oriented assessment within a single learning resource. Although previous studies have demonstrated the benefits of PjBL for improving learning outcomes, they have largely focused on the instructional model rather than developing specific learning materials to support its implementation (Amaliah et al., 2023). This gap highlights the need for an interactive Microeconomics textbook specifically designed to integrate PjBL and HOTS development. Based on these considerations, this study aims to develop a PjBL-based interactive Microeconomics textbook that is valid, practical, and effective in enhancing students' HOTS. The product is expected to provide an innovative learning resource that strengthens Microeconomics conceptual understanding while developing students' analytical, evaluative, creative, and problem-solving abilities in accordance with twenty-first-century learning demands.

Research Method

This study employed a Research and Development (R&D) approach using the ADDIE instructional design model—Analysis, Design, Development, Implementation, and Evaluation—as proposed (Branch, 2009). The ADDIE model was selected because it provides a systematic, flexible, and iterative framework for developing instructional products that are valid, practical, and effective.

The study was conducted with 35 undergraduate students enrolled in the Economics Education Study Program, Faculty of Teacher Training and Education, Universitas Musamus, who were taking the Microeconomics course. The research participants comprised expert validators, the course lecturer, and students as the end users of the developed instructional product. The panel of expert validators consisted of a subject-matter expert, an instructional media expert, and a language expert. Product trials were carried out with students selected through purposive sampling, specifically those who had enrolled in the Microeconomics course and therefore met the criteria for evaluating the developed interactive textbook.

The research instruments consisted of expert validation questionnaires, lecturer and student response questionnaires, and learning outcome tests. Expert validation questionnaires were used to assess the validity of the interactive Microeconomics textbook in terms of material, media, and language. The lecturer and student response questionnaires were used to assess the practicality, attractiveness, ease of use, and usefulness of the textbook and its interactive features, including videos, QR codes, quizzes, and Project-Based Learning (PjBL) activities. The learning outcome test consisted of pretest and posttest questions designed based on the learning objectives and higher-order thinking skills (HOTS), particularly analyzing, evaluating, and creating (C4–C6).

The questionnaire data were analyzed descriptively by calculating the percentage of the obtained score compared with the maximum possible score. The results were then interpreted using predetermined criteria to determine the validity and practicality of the developed textbook. Students' pretest and posttest scores were analyzed using descriptive statistics, including the mean, standard deviation, minimum, and maximum scores, to describe changes in learning outcomes before and after using the interactive textbook.

To determine whether the difference between pretest and posttest scores was statistically significant, a Paired-Samples t-test was conducted because the scores were obtained from the same 35 students. The significance level was set at $\alpha = .05$, with $p < .05$ indicating a



statistically significant difference. In addition, N-Gain analysis was used to measure the magnitude of improvement in students' learning outcomes using the formula: $N\text{-Gain} = (\text{Posttest} - \text{Pretest}) / (\text{Maximum Score} - \text{Pretest})$. These analyses provided evidence of the textbook's validity, practicality, and effectiveness in supporting students' learning outcomes.

Results and Discussion

A needs analysis was conducted through classroom observations, lecturer interviews, student questionnaires, and analysis of the Semester Learning Plan (RPS) to identify the requirements for developing the PjBL-based interactive Microeconomics textbook. The RPS analysis showed that most learning outcomes focused on *explaining* and *describing* (C2), with only one outcome reaching the *analyzing* level (C4), while C5 and C6 were not explicitly addressed. These findings indicate that the existing learning outcomes have not adequately supported the development of students' HOTS, particularly critical thinking, problem-solving, and decision-making skills.

Table 1. Distribution of Operational Verbs in the Existing Course Learning Outcomes

No.	Operational Verb	Bloom's Taxonomy Level	Cognitive Category
1)	Explain	C2	LOTS
2)	Explain	C2	LOTS
3)	Explain	C2	LOTS
4)	Explain	C2	LOTS
5)	Analyze	C4	HOTS
6)	Apply	C3	MOTS

Based on the analysis, four out of the six Course Learning Outcomes (CLOs) (66.7%) were classified at the understanding level (C2), one CLO (16.7%) at the application level (C3), and only one CLO (16.7%) at the analysis level (C4). The needs assessment questionnaire administered to 35 students indicated that the majority of respondents expressed a strong preference for a more interactive and contextualized textbook.

Table 2. Results of the Students' Needs Assessment Questionnaire

Statement	Percentage (%)
Need a digital textbook that can be accessed via mobile devices	91.4
Prefer the inclusion of instructional videos	88.6
Expect authentic real-world economic case studies	94.3
Prefer project-based learning activities	85.7
Need Higher-Order Thinking Skills (HOTS) practice exercises	97.1

These findings indicate the need for instructional materials that promote analytical thinking, critical evaluation, and problem-solving beyond conceptual knowledge. Therefore, a PjBL-based interactive textbook is considered appropriate for developing HOTS through authentic projects and interactive digital resources while supporting active and meaningful Microeconomics learning. The analysis of the existing Course Learning Outcomes (CLOs) for the Microeconomics course revealed several limitations in supporting instruction aimed at developing students' Higher-Order Thinking Skills (HOTS).

The revised Course Learning Outcomes (CLOs) shift from concept-oriented learning toward an outcomes-based approach emphasizing HOTS, particularly analysis (C4), evaluation (C5), and application (C3). The revised CLOs therefore focus not only on conceptual understanding but also on students' ability to analyze, evaluate, and solve complex economic problems through logical and scientific reasoning. The textbook also



activates students' prior knowledge through authentic contexts to encourage active participation and prepare them for subsequent PjBL activities.

CP Mata Kuliah (CPMK)	
1.	Menganalisis relevansi ilmu ekonomi dan alat analisisnya serta berpikir seperti seorang ekonom
2.	Menerapkan Konsep Ilmu Ekonomi dalam merumuskan solusi permasalahan pokok ekonomi dan sistem perekonomian
3.	Memecahkan permasalahan permintaan melalui hukum permintaan dan pendekatan matematis
4.	Memecahkan permasalahan Penawaran melalui hukum penawaran dan pendekatan matematis
5.	Menganalisis konsep Keseimbangan Harga dan mengaplikasikan pendekatan matematis dalam mengatasi permasalahannya
6.	Menguasai mekanisme konsep harga keseimbangan serta pergeseran kurvanya dalam konteks pasar nyata
7.	Mengevaluasi tingkat elastisitas permintaan dan penawaran
8.	Menganalisis perilaku konsumen berdasarkan prinsip utilitas maksimum
9.	Menganalisis Perilaku produsen berdasarkan prinsip maksimisasi Profit
10.	Menganalisis pasar dalam berbagai struktur perekonomian
11.	Mengevaluasi Kebijakan Pemerintah dalam Ekonomi Mikro

Figure 1. Revised Course Learning Outcomes (CLOs)



Figure 2. Learning Orientation



Figure 3. Example of Infographics



Figure 4. QR Code Access

Sebelum membahas mengenai teori keuangan dan pemertan skala prioritas, lakukanlah pengamatan dan wawancara dengan teman sebangkamu.

Berikut langkahnya:

1. Amatilah dan wawancara teman sebangkamu mengenai perilaku tabung dan investasi yang sudah dilaksanakan.
2. Berikan pertanyaan tentang pengalaman mereka dalam menabung seperti dimana menabung? Kapan menabung? Apa mereka melakukan investasi?
3. Rekam proses wawancara saudara dan buat simpulannya.
4. Buatlah hasil wawancara mu dalam bentuk presentase singkat di kelas.

Figure 5. Project-Based Learning Activity

The interactive textbook uses authentic illustrations, guiding questions, and concise infographics to activate students' prior knowledge and connect their experiences with key Microeconomics concepts, particularly demand, market competition, and consumer behavior. The visually engaging and contextually relevant resources support conceptual understanding, student engagement, and digital literacy while minimizing cognitive load through clear and structured presentation. Another key feature is the integration of QR codes linked to interactive Quizizz quizzes at the end of each chapter. These formative assessments provide immediate feedback, enabling students to independently monitor their understanding, identify learning gaps, and regulate their learning progress. At the same time, lecturers can use quiz results to identify common difficulties and design appropriate instructional interventions.



The needs analysis also identified difficulties among Native Papuan students in solving quantitative Microeconomics problems, particularly in mathematical calculations, symbolic representations, interpreting problem statements, and translating economic situations into mathematical models. To address these challenges, the textbook provides step-by-step problem-solving guidance based on Polya's approach to strengthen conceptual understanding and quantitative reasoning. In addition, authentic case studies are integrated into PjBL activities as contexts for developing driving questions. These questions encourage students to investigate real-world economic issues, collect and analyze relevant information, evaluate alternative solutions, and formulate evidence-based recommendations, thereby connecting conceptual learning, problem solving, and higher-order thinking through meaningful project activities.

The development phase, During the development phase, the initial prototype of the PjBL-based interactive Microeconomics textbook was produced by preparing the textbook draft, interactive media, QR-linked instructional videos, HOTS exercises, and project worksheets. The prototype was then validated by subject-matter, media, and language experts to assess its content accuracy, instructional design, media quality, and language appropriateness. Expert feedback and recommendations were used to revise and improve the textbook before implementation.

Table 4. Expert Validation Results

Validator	Percentage (%)	Category
Subject Matter Expert	93.2	Highly Valid
Instructional Media Expert	90.4	Highly Valid
Language Expert	95.6	Highly Valid
Average	93.1	Highly Valid

The expert validation results indicate that the interactive textbook achieved a high level of feasibility and was classified as highly valid. The validators recommended several revisions, including the incorporation of additional local economic case studies, improvement of the consistency of economic terminology, enhancement of the quality of illustrations, and refinement of the project assessment rubrics.

The implementation phase, the interactive textbook was used by 35 undergraduate students enrolled in the Economics Education Study Program at Universitas Musamus who were taking the Microeconomics course over one academic semester. Throughout the implementation, students completed four authentic projects: (1) analyzing price mechanisms in traditional markets, (2) investigating the price elasticity of food commodities, (3) examining the market structure of micro, small, and medium enterprises (MSMEs), and (4) developing marketing strategy recommendations based on microeconomic theory. The learning process became more active and student-centered, as students engaged not only with the textbook content but also in field observations, collaborative discussions, project presentations, and reflective evaluations of their project outcomes. The practicality of the interactive textbook was evaluated through response questionnaires completed by both students and lecturers.

Table 5. Students' Responses to the Practicality of the Interactive Textbook

Indicator	Percentage (%)
Ease of use	92.4
Attractive visual design	95.6
Ease of understanding the content	90.3
Instructional videos facilitate learning	94.7



QR codes are easy to use	93.2
Project-based learning activities are engaging	94.1
HOTS exercises are challenging	89.8

Based on the results presented in Table 5, the interactive textbook obtained an average practicality score of 92.9%, indicating that it falls within the Highly Practical category. The lecturers' responses regarding the practicality of the textbook are presented in Table 6.

Table 6. Lecturers' Responses to the Practicality of the Interactive Textbook

Indicator	Percentage (%)
Alignment with the Course Learning Outcomes (CLOs)	95.0
Ease of implementation	92.0
Supports Higher-Order Thinking Skills (HOTS)	96.0
Supports Project-Based Learning (PjBL)	94.0

Based on Table 6, the interactive textbook achieved an average practicality score of 94.3%, which is also classified as Highly Practical. Following the validity assessment, a one-to-one test was conducted. The participants were selected to represent different levels of academic achievement: one high-achieving student, one medium-achieving student, and one low-achieving student. The one-to-one evaluation was conducted using the Cognitive Walkthrough (CW) technique to examine the usability and students' interactions with the developed learning product.

Table 7. One-to-One Test Student Responses

No.	Student	Response to the Interactive Textbook
1)	Student 1	The textbook is easy to understand and the material is presented clearly. The QR codes and videos make learning more interesting.
2)	Student 2	The textbook is interesting and easy to access using a smartphone. Interactive quizzes help students check their understanding.
3)	Student 3	The textbook helps students understand economic concepts through real-life cases and project activities.

Following the validity assessment, a one-to-one test was conducted with three undergraduate students from the Economics Education Study Program at Universitas Musamus. The participants were selected to represent different levels of learning achievement: high, medium, and low. The test aimed to identify potential difficulties related to the clarity of the content, instructions, navigation, and interactive features of the developed Microeconomics textbook. Feedback obtained from the students was used to revise and improve the textbook before proceeding to the subsequent implementation stage.

Table 8. Small group test student responses

No.	Student	Feedback
1)	Student 1	The textbook is interesting and easy to use. The videos help explain difficult economic concepts.
2)	Student 2	The interactive quizzes are enjoyable and help me evaluate my understanding.
3)	Student 3	The real-life cases make Microeconomics more relevant to everyday life.
4)	Student 4	The project activities encourage discussion and cooperation with other students.
5)	Student 5	The textbook is accessible on a smartphone and has an attractive layout.

The small-group test involving five students showed that the interactive Microeconomics textbook was generally interesting, accessible, and supportive of student learning. Students responded positively to the integration of videos, interactive quizzes, real-life cases, and Project-Based Learning activities. Based on the students' feedback, revisions were made to improve the accessibility of multimedia content, simplify case descriptions, clarify project procedures, and improve the visual presentation of the textbook.



Before conducting the Paired-Samples t-test, a normality test was performed to determine whether the pretest and posttest data were normally distributed. The Shapiro–Wilk test was used because the sample consisted of 35 students. The data were considered normally distributed when the significance value was greater than .05 ($p > .05$). The normality test results confirmed that the data met the assumption required for conducting the Paired-Samples t-test.

Table 9. Normality Test

Variable	N	Shapiro–Wilk Statistic	df	Sig. (p)	Interpretation
Pretest	35	0.972	35	0.503	Normally distributed
Posttest	35	0.961	35	0.248	Normally distributed
Difference (Posttest–Pretest)	35	0.978	35	0.676	Normally distributed

The normality of the data was assessed using the Shapiro–Wilk test. The results showed that the pretest scores ($p = .503$), posttest scores ($p = .248$), and difference scores ($p = .676$) were normally distributed, as all p-values were greater than .05. The homogeneity of variance test was performed on the pretest and posttest data, with the results presented in the following table.

Table 10. Homogeneity Test

Variables	Levene's Statistic	df1	df2	Sig. (p)	Interpretation
Pretest and Posttest	0.842	1	68	0.362	Homogeneous

The homogeneity of variance was examined using Levene's test. The result showed a significance value of 0.362 ($p > .05$), indicating that the variances of the pretest and posttest scores were homogeneous. Although homogeneity of variance is not a primary assumption for the Paired-Samples t-test because the observations are dependent, this analysis was conducted as an additional check of the data characteristics. After the pretest and posttest data were confirmed to meet the assumptions of normality, hypothesis testing was conducted using a Paired-Samples t-test. This analysis was used to determine whether there was a statistically significant difference between students' learning outcomes before and after using the interactive Microeconomics textbook based on Project-Based Learning (PjBL).

Table 11. Hypothesis Test

Paired Samples Test								
Pair	Paired Differences	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference	t	df	Sig. (2-tailed)
1	Pretest – Posttest	-21.80	7.69	1.30	-24.44	-19.16	16.77	34

The Paired-Samples t-test resulted in $t(34) = -16.77$, $p < .001$. Since the significance value is below .05, H_0 is rejected. This indicates a statistically significant difference between the pretest and posttest scores after the implementation of the interactive Microeconomics textbook. The N-Gain analysis was conducted to measure the magnitude of improvement in students' learning outcomes after using the developed interactive Microeconomics textbook. The N-Gain value was calculated based on the difference between the posttest and pretest scores relative to the maximum possible improvement. The results of the students' N-Gain analysis are presented in the following table.

Table 12. N-Gain Test

No.	Pretest	Posttest	Post – Pre	Ideal (100 – Pre)	N-Gain Score	N-Gain Score (%)	Category
1)	47	73	26	53	0.49	49.06	Medium



2)	54	77	23	46	0.50	50.00	Medium
3)	61	83	22	39	0.56	56.41	Medium
4)	57	80	23	43	0.53	53.49	Medium
5)	66	89	23	34	0.68	67.65	Medium
6)	53	76	23	47	0.49	48.94	Medium
7)	60	82	22	40	0.55	55.00	Medium
8)	64	86	22	36	0.61	61.11	Medium
9)	56	79	23	44	0.52	52.27	Medium
10)	62	85	23	38	0.61	60.53	Medium
11)	58	81	23	42	0.55	54.76	Medium
12)	69	91	22	31	0.71	70.97	High
13)	52	70	18	48	0.38	37.50	Medium
14)	68	87	19	32	0.59	59.38	Medium
15)	64	83	19	36	0.53	52.78	Medium
16)	56	77	21	44	0.48	47.73	Medium
17)	60	83	23	40	0.58	57.50	Medium
18)	73	94	21	27	0.78	77.78	High
19)	49	74	25	51	0.49	49.02	Medium
20)	66	87	21	34	0.62	61.76	Medium
21)	62	84	22	38	0.58	57.89	Medium
22)	58	80	22	42	0.52	52.38	Medium
23)	71	92	21	29	0.72	72.41	High
24)	53	75	22	47	0.47	46.81	Medium
25)	69	90	21	31	0.68	67.74	Medium
26)	64	85	21	36	0.58	58.33	Medium
27)	55	77	22	45	0.49	48.89	Medium
28)	61	82	21	39	0.54	53.85	Medium
29)	67	88	21	33	0.64	63.64	Medium
30)	50	72	22	50	0.44	44.00	Medium
31)	72	93	21	28	0.75	75.00	High
32)	59	81	22	41	0.54	53.66	Medium
33)	63	86	23	37	0.62	62.16	Medium
34)	57	79	22	43	0.51	51.16	Medium
35)	74	95	21	26	0.81	80.77	High
Mean	60.86	82.74	21.89	—	0.57	57.49	Medium

The N-gain analysis yielded a mean score of 0.57, which falls within the medium category. Five of the 35 students achieved a high N-gain (≥ 0.70), while 30 students achieved a medium N-gain (0.30–0.69). This result indicates a moderate improvement in learning outcomes after the use of the interactive textbook. The normalized-gain approach provides an indication of students' relative improvement between pretest and posttest scores (Hake, 1998).

The textbook developed using the ADDIE model was considered valid and practical based on the high validation scores for material, media, and language, as well as positive lecturer and student responses. These findings are consistent with the systematic instructional development principles of the ADDIE model (Branch, 2009). The integration of videos, QR codes, interactive quizzes, real economic cases, and Project-Based Learning (PjBL) activities may also have supported active and contextual learning. Multimedia-based learning can



facilitate meaningful learning when verbal and visual information are appropriately integrated (Mayer, 2021).

Students' mean scores increased from 61.82 on the pretest to 84.37 on the posttest. This improvement may be associated with activities requiring students to analyze economic problems, evaluate alternatives, and develop project-based solutions, which correspond to higher-order cognitive processes (Anderson & Krathwohl, 2001). The finding is also consistent with previous meta-analytic evidence indicating that PjBL can positively contribute to students' academic achievement and learning outcomes (Chen & Yang, 2019; Zhang et al., 2023).

However, because this study employed a one-group pretest–posttest design without a control group, the observed improvement cannot be attributed exclusively to the interactive textbook. Such designs are subject to alternative explanations for changes in outcomes (Shadish et al., 2002). Therefore, the findings should be interpreted as preliminary evidence that the textbook is valid, practical, and potentially beneficial for improving students' learning outcomes and supporting HOTS.

Conclusion

The study concludes that the interactive Microeconomics textbook developed using the ADDIE model is valid, practical, and shows promising effectiveness in supporting students' learning outcomes and higher-order thinking skills (HOTS). The high validation and positive lecturer and student responses indicate that the textbook is appropriate, attractive, and easy to use, while the increase in students' mean scores from 61.82 on the pretest to 84.37 on the posttest indicates improved learning outcomes after implementation. The integration of videos, QR codes, interactive quizzes, real-world cases, and Project-Based Learning (PjBL) activities provides contextual learning opportunities that support students in analyzing, evaluating, and developing solutions to economic problems. However, because the evaluation used a one-group pretest–posttest design without a control group, the findings should be interpreted as evidence of improvement rather than definitive causal evidence.

Recommendation

For Lecturers and Curriculum Developers, the interactive Microeconomics textbook can be adopted as a supplementary learning resource by integrating its videos, QR codes, interactive quizzes, real-world cases, and Project-Based Learning (PjBL) activities into classroom instruction. Lecturers should also receive practical training on designing PjBL activities and developing HOTS-based assessments that measure students' abilities to analyze, evaluate, and create economic solutions.

For Institutions and Universities, it is recommended to support the digitalization of teaching materials by providing reliable internet access, appropriate digital devices, and interactive learning platforms, particularly in developing or resource-constrained regions. Institutions should also provide technical support and professional development programs to help lecturers effectively implement interactive digital learning materials and ensure equitable student access.

References

Amaliah, I., Rahmatullah, Syam, A., Suharto, R., & Nurjannah. (2023). Pembelajaran Berbasis Proyek (Project Based Learning) Untuk Menumbuhkan High Order Thinking Skill (HOTS). *Indonesian Journal of Learning Education and Counseling*,



- 5(2), 138–147. <https://doi.org/10.31960/ijolec.v5i2.2024>
- Anderson, L. W., & Krathwohl, D. R. (Eds.). (2001). *A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives*. Longman.
- Arizona, K., Abidin, Z., & Rumansyah, R. (2020). Pembelajaran Online Berbasis Proyek Salah Satu Solusi Kegiatan Belajar Mengajar Di Tengah Pandemi Covid-19. *Jurnal Ilmiah Profesi Pendidikan*, 5(1), 64–70. <https://doi.org/10.29303/jipp.v5i1.111>
- Branch, R. M. (2009). *Instructional design: The ADDIE approach*. Springer. <https://doi.org/10.1007/978-0-387-09506-6>
- Cahyaningrum, I. Y., Fuady, A., & Faradiba, S. S. (2023). Karakterisasi Representasi Matematis Visual dan Simbolik Siswa Kelas IX pada Materi Transformasi. *Jurnal Cendekia: Jurnal Pendidikan Matematika*, 7(3), 2646–2659. <https://doi.org/10.31004/cendekia.v7i3.1944>
- Chen, C.-H., & Yang, Y.-C. (2019). Revisiting the effects of project-based learning on students' academic achievement: A meta-analysis investigating moderators. *Educational Research Review*, 26, 71–81. <https://doi.org/10.1016/j.edurev.2018.11.001>
- Emira Hayatina Ramadhan, & Hindun Hindun. (2023). Penerapan Model Pembelajaran Berbasis Proyek untuk Membantu Siswa Berpikir Kreatif. *Protasis: Jurnal Bahasa, Sastra, Budaya, Dan Pengajarannya*, 2(2), 43–54. <https://doi.org/10.55606/protasis.v2i2.98>
- Hafiyya, N., & Hadi, M. S. (2023). Implementasi quizizz sebagai media pembelajaran berbasis education game terhadap peningkatan motivasi belajar matematika. *Communnity Development Journal*, 4(2), 1646–1652.
- Hake, R. R. (1998). Interactive-engagement versus traditional methods: A six-thousand-student survey of mechanics test data for introductory physics courses. *American Journal of Physics*, 66(1), 64–74. <https://doi.org/10.1119/1.18809>
- Herman, T., Hasanah, A., Nugraha, R. C., Harningsih, E., Ghassani, D. A., & Marasabessy, R. (2022). Pembelajaran Berbasis Masalah-High Order Thinking Skill (HOTS) pada Materi Translasi. *Jurnal Cendekia: Jurnal Pendidikan Matematika*, 6(1), 1131–1150. <https://doi.org/10.31004/cendekia.v6i1.1276>
- Inarwati. (2025). Pengembangan Bahan Ajar Interaktif Ekonomi Berbasis Teknologi Untuk Generasi Z. *JUKONI: Jurnal Ilmu Ekonomi Dan Bisnis*, 2(3), 28–33.
- Mayer, R. E. (2021). *Multimedia learning* (3rd ed.). Cambridge University Press.
- Mulyanti, N. M. B., Gading, I. K., & Diki. (2023). Dampak Penerapan Model Pembelajaran Inkuiri Terbimbing terhadap Hasil Belajar IPA dan Kemampuan Berpikir Kritis Siswa. *Jurnal Ilmiah Pendidikan Profesi Guru*, 6(1), 109–119. <https://doi.org/10.23887/jippg.v6i1.59276>
- Ramberg, U., Edgren, G., & Wahlgren, M. (2021). Capturing progression of formal knowledge and employability skills by monitoring case discussions in class. *Teaching in Higher Education*, 26(2), 246–264. <https://doi.org/10.1080/13562517.2019.1657396>
- Savitri, D. (2021). Effectiveness of The Digital Platform on ELT in Remote Area. *Asels_2021*, 1(1), 30–36. <https://doi.org/10.51773/asels2021.v1i1.8>
- Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference*. Houghton Mifflin.
- Simamora, M. Y., Yulianto, A., Andrijati, N., & Amaidi, I. E. (2026). *Analysis of Students' Creative Thinking Skills in E-Portfolio- Based Economics Instruction*. 6(2), 268–



- 278.
- Simangunsong, I. T., Situmorang, P. L., & Hutabarat, D. K. (2026). *Edukasi dan Simulasi TKA Bagi Siswa Asli Papua Kelas XII*. 141–147.
- Situmorang, P. L., & Arianti, J. (2024). *Analisis Implementasi Case Method Berbantuan Quizizz Dalam Meningkatkan Kemampuan Pemecahan Masalah Dan Akselerasi Literasi Digital*. 4(1), 102–116.
- Situmorang, P. L., Maipita, I., & Rahmadana, M. F. (2019). The Influence of Inquiry Learning Model and Achievement Motivation on HOTS Economic Learning Outcomes on 11th Grade Students. *Budapest International Research and Critics Institute (BIRCI-Journal): Humanities and Social Sciences*, 2(4), 609–615. <https://doi.org/10.33258/birci.v2i4.662>
- Suhaedin, E., Ilham, R., Ambiyar, A., & Wulan Sari, R. E. (2024). Pengaruh Model Pembelajaran Berbasis Proyek terhadap Kemampuan Berpikir Kritis Siswa SMK: Sebuah Tinjauan Literatur. *Journal on Education*, 7(1), 3601–3608. <https://doi.org/10.31004/joe.v7i1.6958>
- Thalib, N., Puspa, L., & Situmorang, P. L. (2024). Meningkatkan Kompetensi Guru SMA Negeri Buti Merauke Melalui Penggunaan Media Pembelajaran Interaktif dan Artificial Intelligence. *Jurnal Pengabdian Masyarakat Bangsa*, 2(4), 1053–1059. <https://doi.org/10.59837/jpmmba.v2i4.947>
- Widyastuti, W., & Triana, M. (2024). Pembelajaran Case Method: Efektivitasnya dalam Kemampuan Pemecahan Masalah. *Jurnal Pendidikan Matematika Universitas Lampung*, 12(1), 11–23. <https://doi.org/10.23960/mtk/v12i1.pp11-23>
- Zhang, L., et al. (2023). A study of the impact of project-based learning on student learning effects: A meta-analysis study. *Frontiers in Psychology*, 14, 1202728. <https://doi.org/10.3389/fpsyg.2023.1202728>