Jurnal Teknologi Pendidikan, Desember 2025, 27 (3), 1154-1171
DOI: http://dx.doi.org/10.21009/JTP2001.6
p-ISSN: 1411-2744 e-ISSN: 2620-3081
Accredited by Directorate General of Strengthening for Research and Development
Available online at http://journal.unj.ac.id/unj/index.php/jtp

Enhancing Students' Anti-Corruption Awareness through a QR Code-Supported Problem-Based Learning Model

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Received : November 2, 2025
Revised : December 13, 2025
Accepted : December 29, 2025

Abstract

This study aimed to develop a problem-based learning model integrating anti-corruption values supported by QR Code-assisted teaching materials and to examine its feasibility and effectiveness. The study employed a research and development (R&D) approach based on the Dick and Carey model. The effectiveness of the developed model was evaluated using a one-group pretest–posttest design involving 50 students. The resulting learning model consists of five stages: (1) analysis of needs and student characteristics; (2) identification of real-world problems guided by educators; (3) selection of significant problems for solution exploration; (4) determination of the most feasible solution supported by scientific reasoning; and (5) presentation and dissemination of the selected solution. Expert validation involving material, language, and design experts indicated that the model was highly feasible, with an average score of 4.66, while small-group testing yielded a score of 4.74. The effectiveness analysis showed that the mean posttest score (M = 90.34, SD = 5.02) was substantially higher than the mean pretest score (M = 60.04, SD = 5.45). A paired sample t-test indicated a statistically significant difference, $t(49) = 124.765$, $p < .001$. The mean difference was 30.30 points (95% CI [29.81, 30.79]), with a very large effect size (Cohen's $d \approx 5.8$). These results indicate that the developed learning model is both feasible and highly effective in improving students' learning outcomes while supporting the development of problem-solving skills and collaborative learning.

Keywords: Anti-corruption value; learning model; problem-based learning; teaching material; QR Code

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How to Cite: Solihatin, E., Raharjo, R., Marsofiyati, M., Syarifain, R. I., Rasyid, R., & Rahman, R. (2025). Enhancing Students' Anti-Corruption Awareness through a QR Code-Supported Problem-Based Learning Model. *JTP - Jurnal Teknologi Pendidikan*, *27*(3), 1154–1171. https://doi.org/10.21009/jtp.v27i3.65387

INTRODUCTION

In an era where integrity and transparency are increasingly recognized as fundamental pillars of social development, education plays a crucial role in shaping individuals who uphold ethical values and reject corrupt practices. To effectively promote anti-corruption values, an appropriate educational model must incorporate elements of knowledge, ethics, and moral behavior (Lickona, 2022). Students must develop problem-solving skills related to anti- corruption, supported by diverse educational resources such as textbooks and multimedia tools (Bal-Gezegin, 2014). This approach aims to enhance learning outcomes and facilitate the practical application of anti-corruption values in daily life. Additionally, the learning model serves a preventative role by embedding ethical values in students and fostering a culture of integrity. Currently, this initiative targets Generation Z, who are poised

to assume leadership roles crucial to Indonesia's progress toward its envisioned Golden Indonesia 2045. This focus is supported by demographic data indicating that Generation Z constitutes 27.94% of Indonesia's population or approximately 74.93 million individuals, making them the largest generational cohort (Badan Pusat Statistik, 2021). Furthermore, Indonesia is experiencing a demographic bonus characterized by a high proportion of productive-age citizens reaching 70.72% of the total population, which provides strategic opportunities for national development toward 2045 (Badan Pusat Statistik, 2021; Ministry of Population and Family Development, 2025). During that period, members of Generation Z will be in their prime working years and hold key positions in the nation's advancement.

Indonesia's vision of the Golden Generation 2045 represents a strategic milestone in strengthening national independence and integrity. Therefore, efforts to eliminate factors that hinder national development, such as corruption, must be prioritized through education. However, in practice, anti-corruption education is often delivered using an expository learning approach in which students passively receive information through PowerPoint presentations and limited question-and-answer sessions. This teacher-centered approach tends to reduce student participation and engagement in the learning process. Furthermore, learning activities frequently rely on multiple-choice assessments that emphasize cognitive recall rather than critical reflection and value internalization. As a result, students may understand anti-corruption concepts theoretically but show limited ability to apply these values in real-life situations. Consequently, learning outcomes tend to remain concentrated in the cognitive domain, while the affective and psychomotor domains—both essential for character formation—are insufficiently developed. This condition highlights the need for more contextual and student-centered teaching materials that can promote meaningful learning and encourage the practical application of anti-corruption values in everyday life. Therefore, this research emphasizes the development of effective instructional materials designed to strengthen the outcomes of anti-corruption education.

The proposed learning model aims not only to deliver conceptual knowledge about anti-corruption but also to cultivate students' problem-solving abilities through real-life contexts, thereby supporting deeper understanding and long-term retention of values. Considering the learning characteristics of Generation Z, the model integrates problem-based learning with QR code-assisted materials to provide interactive, accessible, and technology-supported learning experiences. Furthermore, the assessment framework is designed to evaluate learning outcomes across the cognitive, affective, and psychomotor domains, as emphasized in Bloom's taxonomy of educational objectives (Bloom, 1956; Anderson & Krathwohl, 2001). In this study, greater emphasis is placed on the psychomotor domain to ensure that anti-corruption education extends beyond conceptual understanding and is reflected in observable behaviors and practical actions. Accordingly, the assessment proportion is structured to include cognitive (20%), affective (20%), and psychomotor (60%) components, prioritizing students' ability to internalize and implement anti-corruption values in real-life situations.

The research inquiries were articulated as follows:

1) In what manner can an anti-corruption values educational framework be

formulated utilizing problem-based learning alongside instructional resources integrated with quick response codes?
2) How viable was the proposed anti-corruption values educational framework that employs problem-based learning and instructional materials supplemented by quick response codes?
3) To what extent did the anti-corruption values educational framework, founded on problem-based learning and accompanied by teaching materials that utilize quick response codes, demonstrate effectiveness?

Therefore, this study aims to:

1. Develop an anti-corruption values learning model based on problem-based learning integrated with QR code-assisted instructional materials and examine its conceptual, procedural, and physical aspects.
2. Assess the feasibility of the proposed anti-corruption learning model through expert validation and instructional material evaluation.
3. Evaluate the effectiveness of the anti-corruption learning model in improving students' understanding and application of anti-corruption values.

Research Contributions. This study provides both theoretical and practical contributions. From a theoretical perspective, the study contributes to the field of educational technology by proposing an innovative instructional model that integrates problem-based learning with QR code-assisted teaching materials to support value-based learning in anti-corruption education. This integration expands existing approaches to technology-enhanced learning by emphasizing the development of cognitive, affective, and psychomotor learning outcomes. From a practical perspective, the findings of this study provide guidance for lecturers and educational institutions in designing and implementing more interactive and contextual anti-corruption learning models. The proposed model can serve as a reference for integrating digital technologies into value-based education to improve student engagement and encourage the practical application of anti-corruption values in everyday life.

Learning Model

A learning model serves as a framework for creating an environment that encourages and develops student interaction and learning through its various elements (Joyce & Calhoun, 2024). It represents a distinct approach to enhancing the learning process (Kaban et al., 2021). Four fundamental characteristics define a learning model: syntax, social system, reaction principle, and support system (Joyce & Calhoun, 2024). These characteristics include:

1) Syntax
   Each learning model features a unique syntax, which refers to its structural components and the systematic arrangement of these parts.
2) Social System
   Social system encompasses the interactive roles and relationships among educators and students, effectively treating each classroom as a small society.
3) Reaction Principle
   The reaction principle provides guidelines for educators on how to

appropriately respond to student activities, ensuring alignment with the selected model's characteristics.

4) Support System
   The support system outlines the necessary conditions for implementing a learning model, which includes requirements beyond the typical skills, capacities, and facilities available in standard classroom settings.

Problem Based Learning

Problem-Based Learning (PBL) is a student-centered instructional method focused on fostering knowledge related to authentic problem-solving (Doo et al., 2020; Kim et al., 2019). It enhances critical thinking, negotiation, and persuasion skills through collaborative efforts in addressing complex problems (Song et al., 2022). Researchers assert that challenges are inherent in both educational processes and students' lives, making PBL an effective framework for teaching anti-corruption values. This model requires students to identify and collaboratively solve problems with scientifically appropriate solutions, thereby promoting independent learning, lifelong skills, critical thinking, creativity, and collaboration.

PBL fosters interaction and higher-order thinking by engaging students with problems relevant to their field of study (Choden & Kijkuakul, 2020). It encourages the acquisition of new knowledge prior to problem resolution and immerses students in real-world issues they may encounter in the future (Batlolona & Souisa, 2020; Heuchemer et al., 2020). Furthermore, PBL emphasizes the application of prior knowledge, collaborative analysis, and active engagement among students (Seibert, 2021), leading to scientific solutions through a structured problem-solving approach (Y. I. Sari et al., 2021).

As a social constructivist strategy, PBL enhances critical and creative thinking through procedural problem-solving (Nantha et al., 2022; Susbiyanto et al., 2019). It initiates the learning process with real-life problems to meet educational objectives (Sebatana & Dudu, 2022). By positioning problems at the nn lesson's onset, PBL contextualizes and motivates student learning (Naveh et al., 2022). In conclusion, PBL is a learning approach that begins with real-world problems requiring group-based, scientific solutions. It enhances critical and creative thinking, equipping students with problem-solving skills that facilitate future challenges. Additionally, it underscores the necessity of acquiring knowledge—whether digital or otherwise—prior to addressing problems.

The advantages of problem-based learning include the following:

1) Enhancement of problem-solving abilities.
   Problem-based learning prioritizes the engagement of students in problem- solving activities, guiding them in the process of identifying and implementing solutions.
2) Development of collaborative competencies.
   This pedagogical approach fosters teamwork among students, allowing them to cultivate various skills essential for collaboration, including planning, organizing, negotiating, achieving consensus on tasks, delegating responsibilities, information gathering, and delivering presentations. The collaborative problem-solving skills acquired through

teamwork are transferable to both professional environments and community interactions.

3) Advancement of resource management capabilities.
   Problem-based learning equips students with the necessary experience in organizing projects and effectively allocating time and other resources to successfully complete tasks (Johnson et al., 1984).

Drawbacks of problem-based learning include the following:

1) This approach necessitates a more extended time commitment.
2) Collaborative tasks demand further allocation of time.
3) Learners must adapt to the problem-based learning methodology (Erwanto, 2020).

Teaching Material

Teaching materials encompass all resources that aid educators in facilitating learning activities (Nugrahani et al., 2024). They represent the knowledge and skills students must acquire to meet established competencies (Alfinalin et al., 2021). These materials are systematically designed in accordance with specific curricula and organized into manageable learning units, promoting independent study within designated timeframes (Nasrudidin, 2020).

The effectiveness of teaching materials significantly impacts the achievement of learning outcomes. They should be perceived as resources that both educators and learners can utilize to enhance the learning environment, comprising a structured array of both verbal and non-verbal materials that foster a supportive atmosphere for student engagement (Wibowo & Pratiwi, 2018).

QR Code

Quick Response (QR) Codes are advanced coding systems that enable rapid reading via image capture technology (Edinger et al., 2018). These matrix symbols consist of black squares on a contrasting background, typically white, and are framed by rounded rectangles. The pattern within distinguishes the QR Code (Liantoni et al., 2019). QR Codes offer the advantage of storing information both horizontally and vertically, allowing for greater data capacity compared to one-dimensional barcodes (Tjahyadi, 2021). They are prevalent in QR Code reader and generator applications, facilitating easy creation and retrieval of information through mobile phone scanning (Agustang et al., 2021).

Anti-Corruption

Corruption significantly impedes national development by obstructing social, economic, and political progress, particularly in countries like Indonesia. Therefore, anti-corruption education is vital for youth, especially Generation Z, who are tech-savvy and possess distinct social and ethical perspectives. This research emphasizes promoting anti-corruption values in the daily lives of Generation Z students. Anti-corruption education aims to cultivate moral and ethical standards that oppose corruption, and it should be an ongoing initiative beginning with the younger generations to develop resilient character (S. D. Sari, 2020). In the educational context, implementing anti-corruption teachings through

project-based learning, such as problem-based approaches, alongside supportive learning media, is essential (Prabowo, 2021).

METHODS

2.1 Research Type

This study employed a Research and Development (R&D) approach to develop and evaluate an anti-corruption learning model based on problem-based learning integrated with QR code-assisted teaching materials. The development process followed the Dick and Carey instructional design model, which consists of ten systematic steps for developing and evaluating instructional systems (Dick et al., 2015).

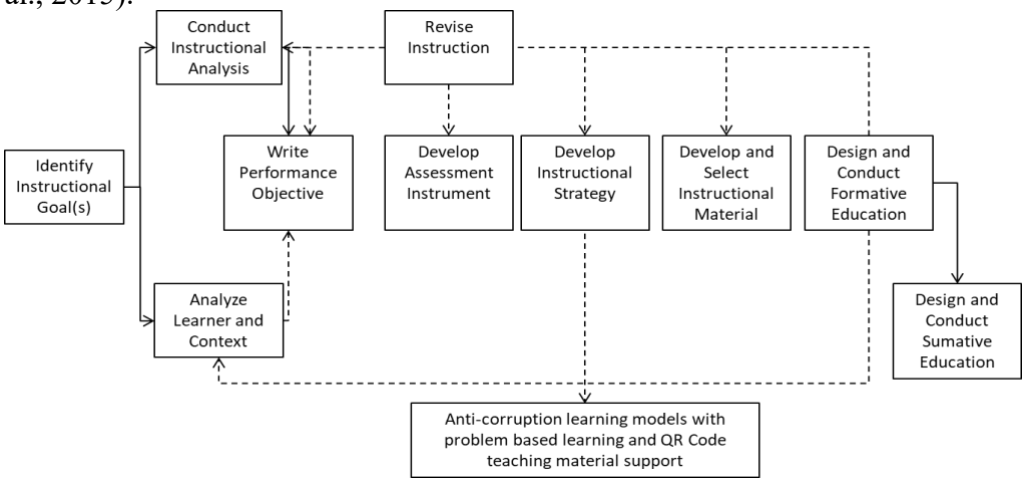

Figure 1. Ten Steps of System approach model of education research and development

This model was selected because it provides a structured framework for designing instructional materials, evaluating learning effectiveness, and revising the instructional system based on formative and summative evaluation results.

2.2 Research Subjects

The study was conducted at Universitas Negeri Jakarta and involved first-semester undergraduate students enrolled in the Pancasila Education course, which includes anti-corruption values as part of the curriculum. The participants were selected using a simple random sampling technique.

The sample consisted of 50 students from two classes. One class included students from the Faculty of Language and Arts, comprising English, Mandarin, and Arabic study programs. The second class consisted of students from the Mathematics Education study program. The first class was used for one-to-one evaluation and small-group trials, while the second class was utilized for field testing of the developed learning model.

2.3 Research Procedure

The research procedure followed the ten stages of the Dick and Carey instructional design model:

1. Identifying instructional goals, conducted through observations and interviews

with students to determine learning needs related to anti-corruption values.
2. Conducting instructional analysis, analyzing the knowledge, attitudes, and skills that students are expected to achieve.
3. Analyzing learners and learning context, focusing on the characteristics of Generation Z students in higher education.
4. Writing performance objectives, specifying the learning outcomes expected from the anti-corruption education program.
5. Developing assessment instruments, including test and non-test instruments to measure the achievement of learning objectives.
6. Developing instructional strategies, designing a problem-based learning model integrated with QR code-assisted teaching materials.
7. Developing and selecting instructional materials, producing anti-corruption teaching materials embedded with QR codes to support interactive learning.
8. Designing and conducting formative evaluation, including expert validation, one-to-one learner testing, and small-group trials to assess the feasibility of the learning model.
9. Revising the instructional design, improving the learning model and teaching materials based on the results of formative evaluation.
10. Conducting summative evaluation, evaluating the effectiveness of the developed learning model through field testing and analyzing its impact on learning outcomes.

2.4 Research Instruments

Several research instruments were used to collect data in this study:

1. Anti-corruption values questionnaire, used to measure students' attitudes and understanding of anti-corruption values.
2. Observation sheet, used to record student participation and learning activities during the implementation of the learning model.
3. Learning outcome test, used to assess students' cognitive understanding of anti-corruption concepts.
4. Expert validation sheet, used by instructional design and content experts to evaluate the feasibility of the learning model and teaching materials.
5. Prior to implementation, the instruments were tested for validity and reliability to ensure the accuracy and consistency of the collected data.

2.5 Data Analysis Techniques

Data analysis was conducted using both descriptive and inferential statistical techniques. Descriptive analysis was used to evaluate the results of expert validation and formative evaluation of the learning model and teaching materials. Quantitative data from student assessments were analyzed using normality tests with the Kolmogorov–Smirnov method to determine the distribution of the data. Since the study involved repeated measurements of the same group, a paired sample t-test was employed to examine differences in learning outcomes before and after the implementation of the developed learning model.

These analyses were conducted to determine the effectiveness of the problem-based learning model integrated with QR code-assisted teaching materials in improving students' anti-corruption learning outcomes.

RESULTS & DISCUSSION

Results

A total of 50 students participated in the study, including 37 females (74%) and 13 males (26%). Initially, all students completed a pretest to evaluate their baseline understanding prior to engaging with the Problem-Based Learning Model focused on Anti-Corruption Values and QR Code-assisted instructional materials. The pretest results, with an average score of 60.04, were analyzed to establish initial learning outcomes.

1) Research Instrument Validation and Reliability

The assessment tool employed consisted of 15 items evaluating the problem- based learning model and QR Code-assisted teaching materials. Following validation and reliability testing, the instrument was piloted with 10 students. A calculated r-count of 0.770 exceeded the critical r-table of 0.632 ($n = 10$, $\alpha = 0.05$), affirming the instrument's validity. The reliability coefficient, r11, was determined to be 0.940, indicating very high reliability, as it fell within the 0.800-1.00 range. Consequently, items 4 and 9 were eliminated, leaving a revised set of 13 valid items.

2) Feasibility Assessment of the Anti-Corruption Values Learning Model

The model's feasibility was evaluated by three experts: one in materials, one in language, and one in design/learning. They assigned scores of 4.67, 4.5, and 4.8, respectively, resulting in an average score of 4.66. This suggests that the model was deemed acceptable by the experts. Their feedback was instrumental in refining the QR Code-assisted teaching materials, which underwent subsequent one-on-one testing. Further details are provided in the accompanying table 1.

Table 1. Expert Assessment of the Anti-Corruption Values Learning Model

No.	Experts	Average Score
1.	Material Expert	4.67
2.	Design/ Learning Module Expert	4.80
3.	Language Expert	4.50

3) Individual Learner Assessment

An individual learner assessment was conducted with three students through interviews focusing on the anti-corruption educational framework, which utilizes problem-based learning and QR Code-enhanced instructional resources. The feedback from the individual assessments was predominantly positive, noting that the various stages were deemed practical, and the instructional materials were found to be easily comprehensible and current. These materials can be accessed for study at any location and at any time simply by scanning the QR Code.

4) Small Group Assessment

A small group assessment was carried out involving nine students, categorized into three groups based on academic performance: three high achievers, three average achievers, and three low achievers. This classification

aimed to capture the variability in student capabilities when evaluating the practicality of the developed model's syntax, as well as the comprehensibility and usability of the QR Code-based instructional materials (which facilitate learning from any location at any time). The results of the small group assessment produced an average score of 4.74. Further details are presented in the table 2.

Table 2. Small Group Assessment

No.	College Student Code	Scoring Scale														
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**Total Score**	**Average**
1	1.1	5	5	5	5	5	5	5	5	5	5	5	5	4	64	4.9
2	1.2	5	5	5	5	4	5	5	5	5	5	4	5	5	63	4.8
3	1.3	5	5	5	5	4	5	5	5	5	5	5	5	5	64	4.9
4	1.4	5	4	5	5	5	5	5	5	5	5	4	5	4	62	4.7
5	1.5	5	5	5	5	5	5	5	5	5	5	5	5	5	64	4.9
6	1.6	5	4	5	4	5	5	4	5	5	5	5	5	5	62	4.7
7	1.7	5	4	5	4	5	5	4	5	5	5	5	5	5	62	4.7
8	1.8	5	4	5	4	4	5	4	5	5	5	4	5	5	60	4.6
9	1.9	5	4	5	4	4	5	4	5	5	5	4	5	4	59	4.5

Highest score based on theory 13x5 = 65 Lowest score based on theory 13x1 = 13 Average score $(\bar{x}) = 4.74$

5) Field test

The field trial was conducted to evaluate the effectiveness of the developed learning media when implemented with college students. This stage aimed to measure the improvement in students' learning outcomes by comparing their scores before and after using the learning media. The assessment was carried out through a pretest and post-test administered to 21 students. The pretest was given prior to the implementation of the learning media to determine the students' initial understanding, while the post-test was conducted after the learning process to measure any improvement in their comprehension. The results of the field trial are presented in Table 3.

Table 3. Field Trial Data

No.	College Student Name	Gender (M/F)	Pretest	Post test
1	ARP	F	56	88
2	HLH	F	59	88
3	IA	F	65	96
4	AS	F	50	80
5	IFY	M	59	89
6	NGPA	F	56	86
7	MNH	M	63	93
8	MHH	F	59	86
9	MAA	F	65	95
10	FNH	F	57	90

11	FK	F	59	88
12	SKH	F	66	95
13	KTF	F	57	87
14	ANN	F	66	97
15	AA	F	67	96
16	NF	F	60	90
17	ADS	F	50	83
18	YQA	F	51	81
19	MDS	M	69	98
20	ADE	F	63	93
21	MAH	M	60	91
22	ABW	M	69	98
23	MRA	M	63	93
24	LAK	F	68	98
25	KSA	F	60	94
26	MYFP	M	51	82
27	RCH	F	64	94
28	EDC	F	62	94
29	MDF	M	57	87
30	Y	M	70	98
31	SAM	F	58	87
32	JBSD	M	70	98
33	MDS	F	62	92
34	SRD	F	53	84
35	MSA	M	52	83
36	EPM	F	53	85
37	YA	M	54	84
38	AAK	F	54	85
39	AKG	F	60	89
40	RAR	F	58	91
41	UA	F	61	91
42	ANA	F	67	97
43	ZA	F	55	91
44	QK	F	58	90
45	SNS	F	64	92
46	ANA	F	61	89
47	MS	F	55	85
48	NZS	F	64	97
49	DFM	M	61	90
50	KH	F	61	89

Pretest total score (∑)= 3,002 Pretest Average Score ($\bar{x}$) = 60.04 Posttest Total

Score (∑) = 4,527
Postest Average
Score ($\bar{x}$) = 90.54
Posttest – Pretest = 90.54-60.04 = 30.5

To assess the effectiveness of Problem Based Learning Model On Anti-Corruption Values, Utilizing QR Code-Assisted Teaching Materials, this learning model was used on a large sample of 50 students. Prior to the instruction using the problem-based learning model and QR code-assisted teaching materials, students took a pretest to assess their initial abilities. The average pretest score was 60.04.

After the instructor using Problem Based Learning Model On Anti- Corruption Values, Utilizing QR Code-Assisted Teaching Materials, student took a posttest. The average posttest score was 90.54. After data collection, a normality test using the Kolmogorov-Smirnov and Sphapiro Wilk was conducted on the pretest and posttest data. See the table 4. for the formality test for the pretest and posttest.

Table 4. Pretest dan Posttest Normality Assessment

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Class	Statistic	df	Sig.	Statistic	df	Sig.
Result	Pretest	.050	50	.200*	.977	50	.419
	Posttest	.070	50	.200*	.964	50	.132

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Based on the results of the normality analysis, it was found that the significance values of the pretest and posttest were greater than 0.05 so that all data had a normal category. Presented at figure 2.

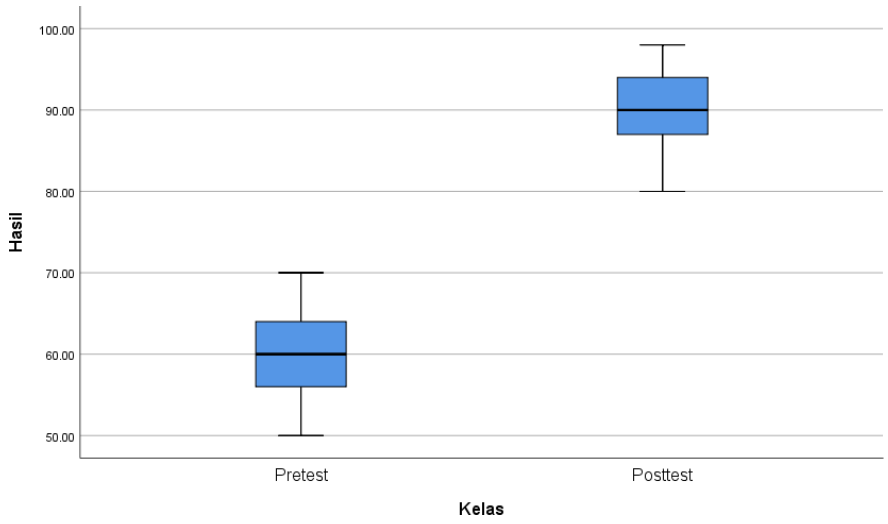

Figure 2. Pretest and Posttest Normality Analysis

Based on the Figure 2, it can be seen that the data is normally distributed. Therefore, a parametric t-test can be carried out with a paired sample t-test because the research subjects are the same class.

To determine whether there was a significant difference between students'

learning outcomes before and after the implementation of the learning media, a paired sample t-test was conducted. This statistical test was used to compare the mean scores of the pretest and posttest obtained from the same group of students. The analysis aimed to identify whether the improvement in scores after the learning intervention was statistically significant. The descriptive statistics of the paired samples, including the mean, number of participants, standard deviation, and standard error mean for both pretest and posttest scores, are presented in Table 5.

Table 5. Paired Sample t-test

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Posttest	90.3400	50	5.02081	.71005
	Pretest	60.0400	50	5.44719	.77035

In addition to comparing the mean scores, the relationship between the pretest and posttest scores was also analyzed using the paired samples correlation test. This analysis was conducted to determine the degree of correlation between students' scores before and after the implementation of the learning media. The correlation coefficient indicates how strongly the two sets of scores are related, while the significance value shows whether the relationship is statistically significant. The results of the paired samples correlation analysis are presented in Table 6.

Table 6. Paired sample t-test correlation

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Posttest & Pretest	50	.949	.000

Paired sample t-test showed significant corelatio (significant value <0.05) between pretest and Posttest.

Table 7. Paired sample t-test

Paired Samples Test

		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	Posttest - Pretest	30.30000	1.71726	.24286	29.81196	30.78804		49	.000

The findings from the paired sample t-test reveal a 2-tailed significance value of less than 0.05. The computed t-count of 124.765 exceeds the critical t- table of 2.009 at a degree of freedom of 49. Thus, it can be inferred that the implementation of a problem-based learning model, in conjunction with QR code- assisted teaching materials, significantly enhances learning outcomes concerning anti-corruption values.

The average difference between the posttest and pretest scores is calculated as follows: 90.54 - 60.04 = 30.5. As such, there exists 50.8% increase in learning outcomes related to anti-corruption values, attributable to the problem- based learning approach. This is corroborated by the t-test results, where the computed t-

count of 124.765 surpasses the critical t-table of 2.009, underscoring the efficacy of the learning model (Fidan & Tuncel, 2019)

Consequently, the problem-based learning model designed to impart anti-corruption values, alongside QR code-assisted teaching materials, is deemed effective, demonstrating a notable improvement in learning outcomes by 30.5 points. This supports existing literature that emphasizes the role of educators in the problem-based learning framework, where they serve as facilitators in helping students configure information rather than merely transmitting knowledge, a method characteristic of traditional teaching practices over the last five decades. Furthermore, this approach is associated with enhanced cognitive and skill development among students (Dolmans et al., 2016; Savery, 2015). The pretest and posttest data can be described in in figure 3-4.

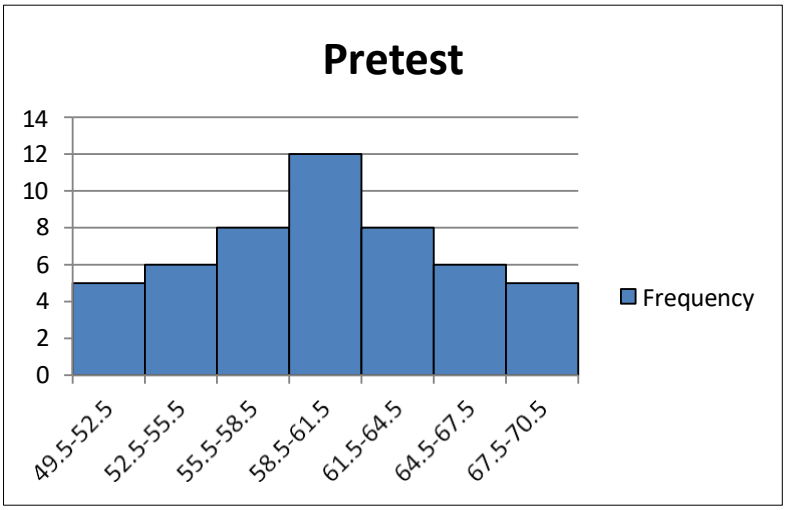

Figure 3. Interval class pretest

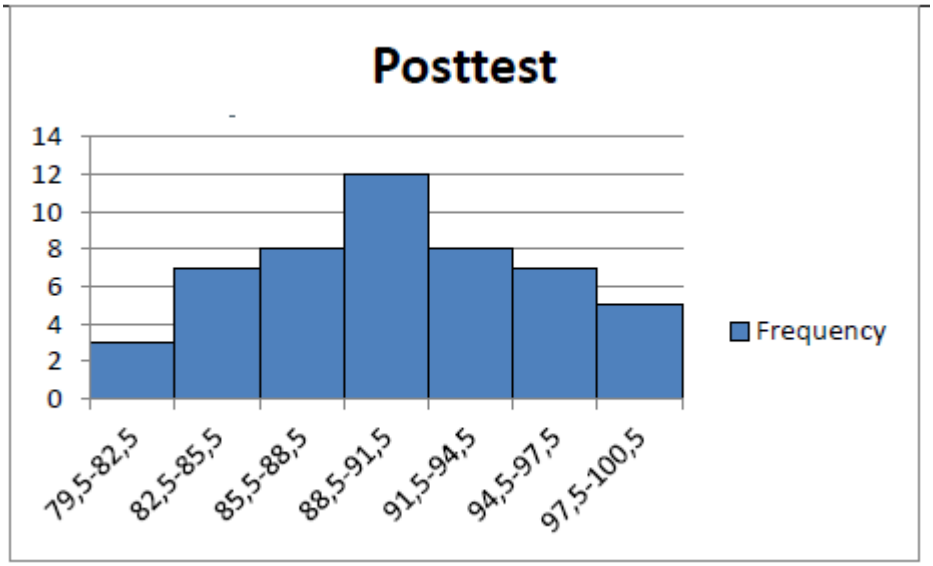

Figure 4. Interval class posttest

6) Syntax model problem-based learning model on anti-corruption values,

utilizing QR code-assisted teaching material using 5 steps syntax as follow.

- Conducting a needs assessment by examining student characteristics to align with educational goals and objectives.
- Identifying authentic challenges encountered by students concerning anti-corruption principles, with educators serving as facilitators during the learning experience, while students collaborate in small groups, utilizing teaching materials supplemented by QR codes.
- Selecting the primary real-world issue for which alternative solutions will be explored.
- Evaluating and determining the most effective solution, supported by scientifically valid arguments that can be substantiated.
- Presenting the outcomes of the proposed solution and remaining receptive to constructive feedback, with final results being disseminated as required.

Problem based learning model on anti-corruption values, utilizing QR code-assisted teaching material fiscal

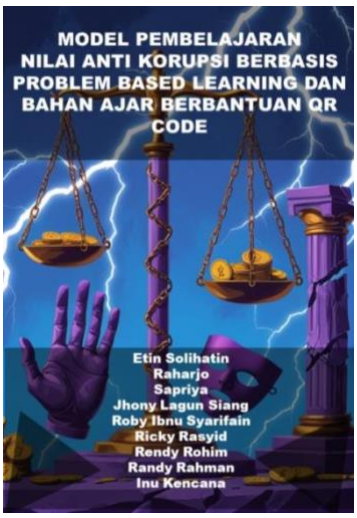

Figure 5. Problem based learning model on anti-corruption values, utilizing QR code-assisted teaching material

Discussion

The results of this study indicate that the developed problem-based learning (PBL) model integrating anti-corruption values and QR code-assisted teaching materials is both feasible and effective in improving students' learning outcomes. The significant difference between the pretest and posttest scores demonstrates that the learning model successfully enhanced students' understanding of anti-corruption concepts. This improvement can be attributed to the structured five-step learning syntax, which encourages students to actively engage in identifying real-world problems, analyzing possible solutions, and presenting evidence-based arguments. Through this process, students not only acquire conceptual knowledge but also develop critical thinking, problem-solving, and collaborative skills.

The findings of this study are consistent with previous research highlighting the effectiveness of problem-based learning in improving students' higher-order

thinking skills and learning outcomes. PBL encourages learners to construct knowledge through authentic problem-solving activities and collaborative learning environments. Previous studies have also shown that integrating real-life issues into the learning process can increase students' motivation and deepen their understanding of complex social values, including ethics and integrity. In the context of anti-corruption education, problem-based learning provides opportunities for students to critically analyze ethical dilemmas and propose responsible solutions.

Furthermore, the use of QR code-assisted teaching materials played a significant role in increasing student engagement during the learning process. QR codes allowed students to quickly access additional digital resources, such as supporting materials, case studies, and multimedia content related to anti-corruption issues. This integration of technology made the learning process more interactive and flexible, enabling students to explore learning resources independently while working collaboratively with their peers. As a result, the learning environment became more dynamic and student-centered.

From the perspective of educational technology, the integration of QR codes into the learning model demonstrates the potential of simple digital tools to enhance teaching and learning processes. QR codes can serve as effective bridges between printed teaching materials and digital learning resources, making it easier for students to access information instantly through mobile devices. This approach supports the implementation of technology-enhanced learning environments that promote accessibility, interactivity, and independent learning. Therefore, the integration of QR code-assisted materials in problem-based learning models can be considered a practical strategy for improving student engagement and learning outcomes in higher education contexts.

CONCLUSION

The anti-corruption educational model utilizing problem-based learning and QR Code-enhanced instructional materials comprises five structural components: (1) assessing student needs and characteristics to meet educational objectives; (2) identifying authentic real-world challenges under the guidance of educators; (3) selecting significant real-world issues for which to develop solutions; (4) determining the most effective solution, substantiated by scientific rationale; and (5) effectively communicating the proposed solution, which is disseminated as required.

The proposed model for instilling anti-corruption values, grounded in problem-based learning with QR Code-assisted instructional materials, has been deemed viable by subject matter experts. The ratings include a score of 4.67 from the subject matter expert, 4.5 from the language expert, and 4.8 from the learning model/design expert, culminating in an impressive average score of 4.66, which reflects a very high level of evaluation.

Furthermore, the model has been recognized for its effectiveness. Analysis of the average pretest score (0.04) and posttest score (90.54) reveals an improvement of 30.5 points. Statistical evaluation via the t-test indicates that t-count (124.765) surpasses t-table (2.009) at degrees of freedom 49, thereby confirming that this instructional approach effectively enhances students' learning outcomes and problem-solving skills.

ACKNOWLEDGEMENT

Thanks are extended to the Faculty of Social Sciences and Law, which has funded this research through the faculty collaborative research scheme, with contract number: 96/PENELITIAN/FISH/IV/2025 dated March 17, 2025.

REFERENCES

Agustang, A., Suardi, Agustang, A. D. P. M., & Oruh, S. (2021). Empowering Sociology Subject Teachers Through Quick Response Code-Based Digital Literacy in Bissappu District, Bantaeng Regency. *Jurnal Pengabdian Dan Pemberdayaan Masyarakat*, *3*(2), 175–188. https://doi.org/doi.org/10.24036/abdi.v3i2.120

Alfinalin, B. I., Sodiq, S., & Yuniseffendri. (2021). Development of Loaded Exposition Text Teaching Materials for Class VIII Using Learning Models. *Journal Education and Development*, *9*(1), 266–272.

Badan Pusat Statistik. (2021). *Hasil sensus penduduk 2020*. Jakarta, Indonesia: Badan Pusat Statistik. https://www.bps.go.id

Badan Pusat Statistik. (2021). *Berita resmi statistik: Profil penduduk Indonesia hasil sensus penduduk 2020*. Jakarta, Indonesia: Badan Pusat Statistik. https://www.bps.go.id

Bal-Gezegin, B. (2014). An Investigation of Using Video vs. Audio for Teaching Vocabulary. *Procedia - Social and Behavioral Sciences*, *143*, 450–457. https://doi.org/10.1016/j.sbspro.2014.07.516

Batlolona, J. R., & Souisa, H. F. (2020). Problem Based Learning: Students' Mental Models on Water Conductivity Concept. *International Journal of Evaluation and Research in Education*, *9*(2), 269–277.

Choden, T., & Kijkuakul, S. (2020). Blending Problem Based Learning with Scientific Argumentation to Enhance Students' Understanding of Basic Genetics. *International Journal of Instruction*, *13*(1), 445–462.

Dick, W., Carey, L., & Carey, J. O. (2015). *The Systematic Design of Instruction* (eight edit). New York: Pearson.

Dolmans, D. H. J. M., Loyens, S. M. M., Marcq, H., & Gijbels, D. (2016). Deep and surface learning in problem-based learning: a review of the literature. *Advances in Health Sciences Education*, *21*, 1087–1112.

Doo, M. Y., Bonk, C., & Heo, H. (2020). A Meta-Analysis of Scaffolding Effects in Online Learning in Higher Education. *International Review of Research in Open and Distributed Learning*, *21*(3), 60–80. https://doi.org/doi.org/10.19173/irrodl.v21i3.4638

Erwanto, E. (2020). Profile of students' critical thinking abilities on the concept of biodiversity through problem-based learning. *Jurnal Kependidikan: Jurnal Hasil Penelitian Dan Kajian Kepustakaan Di Bidang Pendidikan, Pengajaran Dan Pembelajaran*, *6*(3), 578–587.

Fidan, M., & Tuncel, M. (2019). Integrating augmented reality into problem based learning: The effects on learning achievement and attitude in physics education. *Computers and Education*, *142*(September 2018), 103635. https://doi.org/10.1016/j.compedu.2019.103635

Heuchemer, S., Martins, E., & Szczyrba, B. (2020). Problem-Based Learning at a Learning University: A View from the Field. *Interdisciplinary Journal of*

Problem-Based Learning, *14*(2).

Johnson, D. W., Johnson, R. T., & Smith, K. A. (1984). *Cooperative learning*. Interaction Book Company New Brighton.

Joyce, B., & Calhoun, E. (2024). *Models of Teaching: Tenth Edition*. https://doi.org/10.4324/9781003455370

Kaban, R. H., Anzelina, D., Sinaga, R., & Silaban, P. J. (2021). The Influence of the PAKEM Learning Model on Student Learning Outcomes in Elementary Schools. *Jurnal Basicedu*, *5*(1),102–109. https://doi.org/doi.org/10.31004/basicedu.v5i1.574

Kim, N. J., Belland, B. R., & Axelrod, D. (2019). Scaffolding for optimal challenge in K–12 problem-based learning. *Interdisciplinary Journal of Problem-Based Learning*, *13*(1), 3.

Kompas.com. (2021, January 22). *Mendominasi penduduk Indonesia, mari mengenal Generasi Z dan milenial*. https://www.kompas.com/tren/read/2021/01/22/190400965/mendominasi-penduduk-indonesia-mari-mengenal-generasi-z-dan-milenial

Lickona, T. (2022). *Educating for Character*. Bumi Aksara.

Ministry of Population and Family Development. (2025). *Indonesia to strengthen the productive-age population in aiming to be a developed country*. Jakarta, Indonesia: Ministry of Population and Family Development.

Nantha, C., Pimdee, P., & Sitthiworachart, J. (2022). A quasi-experimental evaluation of classes using traditional methods, problem-based learning, and flipped learning to enhance Thai student-teacher problem-solving skills and academic achievement. *International Journal of Emerging Technologies in Learning (IJET)*, *17*(14), 20–38.

Nasrudidin. (2020). Pengembangan Bahan Ajar Sejarah Daerah Bima Berbantu Quick Response Codes Kelas X Sma Negeri 1 Woha. *JISIP (Jurnal Ilmu Sosial Dan Pendidikan)*, *4*(3), 26–31. https://doi.org/10.36312/jisip.v4i3.1142

Naveh, G., Bakun-Mazor, D., Tavor, D., & Shelef, A. (2022). Problem-Based Learning in a Theoretical Course in Civil Engineering: Students' Perspectives. *Advances in Engineering Education*, *10*(3), 46–67.

Nugrahani, A. F., Saputri, D. S. D., Iffadah, A. D., Adi, S. N., Wijaya, & Andrian, F. (2024). Analisis Keterbacaan Bahan Ajar Bahasa Indonesia Pada Kelas I SD Berdasarkan Grafik Fry. *Jurnal Edukasi Madrasah Ibtidaiyah*, *6*(1), 46–51. https://doi.org/doi.org/10.30599/jemari.v6i1.3017

Prabowo, H. Y. (2021). Retooling our anti-corruption arsenals: exploring the potential use of CAQDAS in corruption investigation. *Journal of Money Laundering Control*, *24*(1), 111–136.

Sari, S. D. (2020). The Urgency of Anti Corruption Education For Colleges In Indonesia. *The 2nd Proceeding Â€ ŒIndonesia Clean of Corruption in 2020"*.

Sari, Y. I., Utomo, D. H., & Astina, I. K. (2021). The effect of problem based learning on problem solving and scientific writing skills. *International Journal of Instruction*, *14*(2), 11–26.

Savery, J. R. (2015). Overview of problem-based learning: Definitions and distinctions. *Essential Readings in Problem-Based Learning: Exploring and Extending the Legacy of Howard S. Barrows*, *9*(2), 5–15.

Sebatana, M. J., & Dudu, W. T. (2022). Reality or mirage: Enhancing 21st-century skills through problem-based learning while teaching particulate nature of matter. *International Journal of Science and Mathematics Education*, *20*(5), 963–980.

Seibert, S. A. (2021). Problem-based learning: A strategy to foster generation Z's critical thinking and perseverance. *Teaching and Learning in Nursing*, *16*(1), 85–88.

Song, B. L., Lee, K. L., Liew, C. Y., Ho, R. C., & Lin, W. L. (2022). Business students' perspectives on case method coaching for problem-based learning: impacts on student engagement and learning performance in higher education. *Education and Training*, *64*(3), 416–432. https://doi.org/10.1108/ET-03-2021-0106

Susbiyanto, S., Kurniawan, D. A., Perdana, R., & Riantoni, C. (2019). Identifying the Mastery of Research Statistical Concept by Using Problem-Based Learning. *International Journal of Evaluation and Research in Education*, *8*(3), 461–469.

Wibowo, E., & Pratiwi, D. D. (2018). Developing Teaching Materials Using the Kvisoft Flipbook Maker Application for Collection Materials. *Desimal: Jurnal Matematika*, *1*(2), 147. https://doi.org/10.24042/djm.v1i2.2279

World Bank. (2020). *Indonesia's demographic dividend: Leveraging the workforce for economic growth*. Washington, DC: World Bank.