PRIMARYEDU

QR Code-Based Monopoly: An Example of The Fun of Gamification in Learning at Elementary School

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Article Info	Abstract
	Digital media innovation is a way to empower 21st-century critical thinking skills in elementary school students. One of the innovations that can be used is QR code-based Monopoly Gamification in learning. The purpose of this research is the development and testing of monopoly QR code-based media. This gamification research design uses the ADDIE model which consists of the stages of analysis (issue analysis), design (product design), development (development), implementation (implementation), and evaluation (assessment). This research involved media experts, linguists, and subject matter experts to provide judgments, and students as media users. The results of this study came in the form of monopoly QR code-based media that received validation of media suitability aspects based on ISO 9126 quality at 83.63%, linguistic aspects by linguists at 100%, and material aspects by subject matter experts at 96.36%. The QR code-based proprietary learning media received positive responses from 33 students with a percentage of 90.8% in the "excellent" category. Based on this description, QR code-based proprietary media is applicable in teaching and learning activities in my country's enrichment subject in fourth-grade elementary school. The Monopoly game can be integrated into learning so that learning becomes more fun *This is an open access article under the CC BY-SA license.*

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INTRODUCTION

The learning process is characterized by pedagogical interaction, i.e. purposeful interaction. The interaction, which is rooted in the learners and the educational learning activities of the students themselves, is systematically carried out through the stages of planning, implementation, and assessment to produce an effective learning process as expected Effective learning can be achieved when teachers can use learning resources and educational media by the requirements of the curriculum applied. Jannah & Atmojo (2022) Forms of digital media innovation in empowering 21st-century critical thinking skills in natural science teaching in primary schools, among which: digital educational games, videos, YouTube, points of sale, Macromedia/Adobe Flash, digital comics, e-books, flipbooks, augmented reality, virtual reality,

educational websites, educational television, and educational apps, such as teachers' lounges, quippy schools, and smart classrooms. This particularly applies to the use of learning media that act as a link or facilitator in conveying messages related to the subject matter to be taught by the teacher. The use of aids makes it easier for the teacher to achieve the learning objectives. Educational learning games are multimedia learning tools that can support the learning process in the classroom. (Mulyawati & Elizabeth, 2023).

The use of cell phones in education is often controversial. The use of cellular phones is controversial because it is considered to have a negative impact and also a positive impact on elementary school students. Impact of mobile use according to Jannah & Atmojo (2022) The use of cellular phones has an impact on student learning motivation even though the effect is only 5.7%. The results of the study Nuraliyah et al. (2022) Of course, the negative impact of cell phone use is that it can hinder learning activities. Students are often distracted by mobile phones and even forget time, so their learning activities are disrupted by other activities like being more active on social media. While the positive impact of using mobile phones to study with an average time of 1-2 hours has a positive impact including, the ease of receiving learning materials, Improving English vocabulary, adding mindfulness to create content, like a learning medium, doing tasks, and so on. However several studies have shown that appropriate use of smartphones can increase student collaboration and engagement. Learning while playing games causes great interest among students. Research results about the use of educational games that use applications and can be used through smartphones Agusti & Aslam (2022) Demonstrating that there is a significant influence on the class given the treatment of word wall applications, obtained on t-test hypothesis testing, shows that t(count) > t(table) for 3.203 > 2.039 at α = 0.05. So H0 was rejected and H1 was approved, showing that the use of word wall application learning media has a statistically significant effect on the learning outcomes of primary school students

Based on the results of a needs analysis observation conducted at Sindang Barang 2 Government Primary School in Bogor City. An issue was found that the Grade 4 primary teacher has never used interactive media in the learning process and still only uses student books as a learning reference. The teacher said that there are still students who seem unmotivated in the learning process if they do not use interactive media, and the lack of diverse learning media applied by teachers in class so that students are quickly bored and less active in teaching and learning activities. Therefore, it is necessary to develop fun learning through educational games.

The trend in education development is to focus more on student-centered education. Mobile technology with QR codes has great potential to improve teaching and learning as mobile technology enables learning in different contexts. Given the characteristics and opportunities provided by QR codes, they fit this trend. QR codes have great potential to be integrated into curricula because they are easy to use and can be used in a variety of contexts(Marija Gogova, 2014)

Helode et al. (2017) mentioned studying the use of QR codes in education. QR Codes can be integrated with smartphones which can be a very effective teaching tool in the classroom. QR Codes can be linked to learning materials that can be plain text, website URLs, YouTube videos, PDFs, and image files. QR codes can be generated for these learning materials using freely available QR code generators. This encrypted information can be decrypted by scanning the QR code using a mobile device with a camera, reader software, and a QR code scanner. This study

shows that incorporating QR codes into learning will improve motivation, communication, collaboration, and critical thinking in the classroom.

Based on this, the researchers were interested in developing a Monopoly gamification based on QR codes with the theme "My country is so rich" as an aid and supplement to learning to strengthen the materials for evaluating activities in the learning process and thus motivate students. This study developed Monopoly gamification based on the fact that Monopoly is a popular game among primary school students. (Mulyawati & Gani, 2019). Research results Purnama et al., (2021) The results showed that learning using the Science Monopoly game was effective in improving the cognitive abilities and scientific attitudes of Elementary school students. This is evidenced by the significance level of 0.008 and $0.005 < 0.05$, while the average value of science learning in the experimental class using science monopoly games is higher than the average value of the control class.

Accordingly, the researchers are interested in developing QR code-based monopoly gamification on the topic of the richness of my country as a learning aid and a supplement to reinforce materials in assessment-in-learning activities so that students become motivated to learn. Penelitian Martiasari & Ristiana, (2023) The effect of using hybrid learning supported by Google and QR code models in the good category on improving the understanding of the concept of multiplication ability among some students.

Learning motivation is the motivation that drives, directs, and sustains learners' behavior in learning activities that originates from within or outside the learners, and is reflected in the need, effort, and persistence to achieve the best possible learning outcomes.(Irawan & Suryo, 2017). Learning motivation is the motivation that drives, directs, and sustains students' behavior in learning activities that originates from within or outside students, and is reflected in the need, effort, and persistence to achieve the best possible learning outcomes(Irawan & Suryo, 2017).

Proprietary media based on QR codes in Grade 4 elementary school Sindang Barang 2. should be developed to replace teachers in providing meaningful education, and for students to better understand the learning material while playing. The novelty between the related research and the researchers' research is that the proprietary media used is based on the technology of QR codes in primary schools, videos, texts, and images of educational materials prepared directly by the researchers.

METHOD

QR-Code-based monopoly development includes research and development which can also be known as Research And Development (R&D). This research method is used to produce certain products and test the effectiveness of these products. The ADDIE model uses the return calculation according to (Sugiyono, 2016):

1. **Analysis Stage**

The study analyzed the competencies required of students in schools to determine their current condition. The analysis included: (a) analyzing the competencies demanded of students, (b) analyzing participant characteristics, including their education, knowledge, experience, skills, and other relevant aspects, and covering any related aspects that are pertinent, and (c) aligning the analysis of the material with the required competencies.

2. **Design Stage**

This paragraph discusses the concept of product design. The design is carried out for two purposes: (1) to facilitate learning for students, specifically for the students of class IV-B at Elementary School Sindang Barang 2, Bogor City; and (2) to improve competencies, namely enhancing the knowledge of grade 9 students throughout the country, particularly in Indonesia. (3) The article discusses the use of QR codes in the context of giving media monopolies, as stipulated in Theme 9, Section 2. (4) It also outlines the criteria for assessing the effectiveness of pre-and post-tests, as well as the evaluation of the survey responses.

3. **Development Stage**

The Development Stage is the process of turning a design into a physical reality. Once produced, the product will be validated by a team of experts to determine its quality, content, sales, and safety. (Hikmah et al., 2023). The revision aims to improve the usefulness of the instructional material for the desired audience by explaining the practicality of using QR codes as an effective and easy-to-use tool for identifying media monopolies based on their unique characteristics.

4. **Implementation Stage**

The implementation phase involves product testing as a step to apply the created product. The researcher can assess the effectiveness, attractiveness, and efficiency of the learning outcomes from the created product. This phase has undergone expert validation and will be applied to fourth-grade students to determine their response to the developed product.

5. **Evaluation Stage**

The process of evaluating the effectiveness of a product that is created to meet specific goals is called product evaluation. In this study, researchers evaluated the effectiveness of using QR-Code-based monopoly media by giving a post-test to students after they used it and a pre-test before they used it. This is a test on the use of QR codes to measure the performance of products sold in a particular market. It is important to avoid monopolies in the media industry. The study involves the evaluation of student consumers' preferences and ends with a survey. The development of the AlDDIE model is also discussed.:
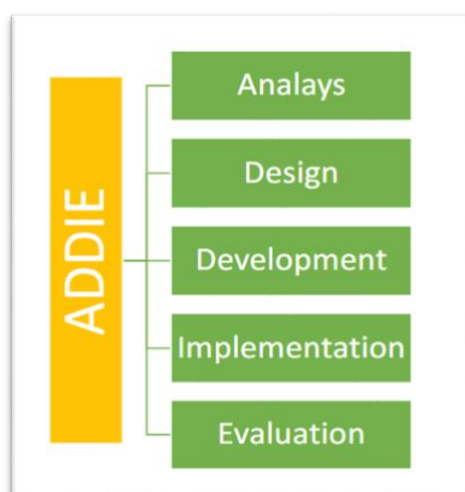

Figure 1. ADDIE Model Phases

Once the implementation of the media monopoly based on QR-Code is completed, the researchers will conduct a validity test for expert participants. The implementation of a media monopoly is based on QR-code technology. The validity of using digital media monopolies based on QR codes for educational purposes was tested. The link below has been validated by media experts, educational experts, and industry experts.

https://play.google.com/store/apps/details?id=com.lusti.monopoli

The following is a description of the development of a media monopoly product based on QR-Code. It includes an evaluation of the media monopoly in my country, which was determined through a Likert scale formula.:

$$P = \frac{f}{N} \; x \; 100\%$$

$$P = \frac{92}{110} \; x \; 100\% = 83{,}63 \; \%$$

Based on the research results, 22 respondents obtained the highest score while 5 obtained the lowest. The highest score was obtained by 22 respondents with a total score of 110, while the total assessment given by all respondents to the researcher was 92. The market share of the QR-Code-based media monopoly was calculated to be 83.63% with a score of 80% $< x \leq 100\%$ according to the 'Good' criteria. Therefore, the QR code-based media product is suitable for student use without the need for revision.

The product under research is a QR code-based design for monopoly media, created using code software for the regulation of monopoly media and other regulations. The Serta Alplikalsi Web QR Code Generator is utilized to store data in QR codes. Four types of cards, namely identification, name, customer, and business cards, are designed using a canvas and are a part of social media. The following is the resulting product from QR-code-based monopolized media. The text, images, and videos from monopolized media are copied and adapted to fit the required material. The following is the resulting product from QR-code-based monopolized media. The following is the resulting product from QR-code-based monopolized media.

1) Recreating The Monopoly Media Application.

The use of codes in the description of core and additional competencies in IV-level teaching materials for monopoly in physical and cultural media, references, profiles, and permanent links to monopolies are explained in this article.
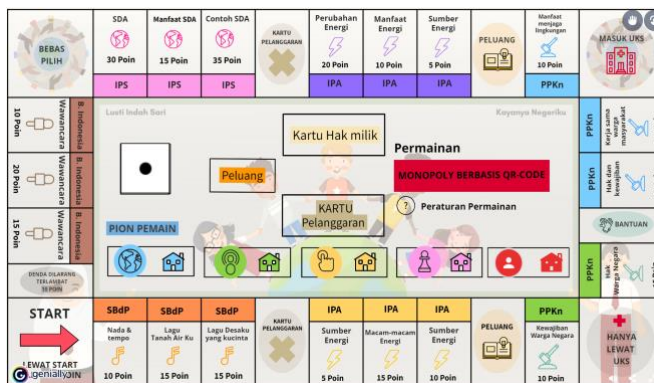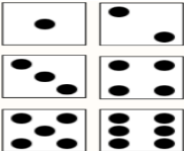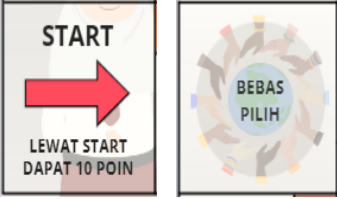

Figure 2. Media Monopoly

The researcher found differences between monopoly and partial monopoly in the educational sector. To explain this, they created a set of cards that describe the steps involved in creating and distributing educational materials within a school environment. The cards include the function of each button found in the monopoly:

Tabble. Explanation of the Function of Each Button in Monopoly Media

No	Button	Function
1.	Dice	To simplify, use symbols instead of words in a URL
2.	Pion Player	To represent players moving from one square to another according to the number on the dice.
3.	Home	The seller should describe the purchased product clearly and accurately, including its ownership status. The buyer should then possess the product and verify its details, including the serial number, before placing it in the designated location.
4.	3 sets of card	The chance card and the penalty card enable the player to carry out the instructions on the card. Meanwhile, the ownership card is used for the player to answer material questions listed on the card and is a requirement to obtain a house.
5.	Free start and select	For the stalwart talker to initiate the permalink medial monopoly daln talk beables choose to work for the Dalpalt copier select the Malnalpun talk to be pasted.
6.	Enter the UKS and only pass the UKS	The chance card and the penalty card enable the player to carry out the instructions on the card. Meanwhile, the ownership card is used for the player to answer material questions listed on the card and is a requirement to obtain a house.

No	Button	Function
7.	Learning material plots	This lesson plan is taken from the book theme 9 subteams 2, for students who press the button, the lesson plan contains the lesson plan that students need to learn during the time of this Monopoly media game. Initially, the 20 items purchased were 3 items of Indonesian Balhalsal, 6 items of Science, 3 items of Social Studies, 5 items of PPKn, and 3 items of SBdP.
8.	It is forbidden to be late and favor cards	Students who occupy the plot are automatically deducted 10 points and the favored card contains the answer to the proprietary card question so that students who occupy the plot get the opportunity to see the answer to the proprietary card.
9.	Foul cards and opportunity cards	For students who occupy the plot, it is forbidden to be late, it is automatically deducted 10 points and the favor card contains the answer to the question of the property card, so that students who occupy the plot get the opportunity to see the answer to the property card.

2) *Recreating QR-Code*

QR codes are two-dimensional barcodes that contain information directly accessible to anyone, including those who are not familiar with the topic or language. They can be easily generated using a QR code generator and can be used to direct users to a specific website or online resource. The provided text contains a description of QR codes and their usage.

Figure 3. Monopoly Media Gamification QR Code

Using QR codes has encouraged collaborative learning and positively impacted students' motivation and engagement in their learning process. QR codes show great potential for applications and promotion in the field of education, especially when properly integrated into the educational process. Implementing QR codes in education is a step forward towards integrating new technology into the learning process (Marija Gogova, 2014)

Discussion

Monopoly is a popular and easy-to-play game. (Umayah & Harmanto, 2019). Media Monopoli has many functions as stated by Andriyani et al. (2020) The second function is to improve the memory of students through repeated questions on the cards. The first function of the monopoly media is to attract the attention of students to learning because it is designed with colorful and attractive images. Third, all questions in the media can be used as material for solidifying the material. Fourth, it can foster cooperation among students because the game is played in groups and there is interaction and communication among players Meanwhile, according to Nurhasanudin & Syah (2022) Media monopoli dapat meningkatkan kerja sama siswa, memfokuskan perhatian mereka pada pembelajaran, mendorong partisipasi aktif, mengajarkan integritas, dan mempromosikan nilai-nilai sosial.

According to Pratama et al. (2021), Media monopoly can help expand students' knowledge, and increase creativity and social skills with friends. It is important to avoid using subjective phrases such as 'I think' or 'in my opinion'. Meanwhile, according to Nurul Arifah, Endah Rita S.D (2022) The function of media monopoly is to (1) facilitate students' understanding of learning materials, (2) attract students, and (3) provide a user manual so that students can better understand how to use it. Meanwhile, according to Ariya & Whindi Arini (2021) Monopoly media functions as a learning tool used by teachers in the teaching and learning process.

The process of teaching involves several steps, which should be carried out clearly and efficiently. Interactive teaching methods, including games and text-based activities, are often used to engage learners and make the process more enjoyable. It is important to focus on the intended learning outcomes and ensure that the teaching is effective and efficient. The video aims to enhance critical thinking skills among elementary school students, particularly those in the fourth

grade. It presents various teaching methods and learning processes to help students develop their critical thinking abilities.

Meanwhile, according to Gumilang (2019), Media Monopoly is a type of game that aims to accumulate wealth and beat the complexes of other players. The researchers found that Media Monopoly is more than just a game because it can train skills for managing finances. Meanwhile, ordinary monopoly is only different from medical monopoly in several ways. The text contains several technical terms and jargon that may not be easily understood by a general audience. Therefore, I have replaced them with simpler terms and ensured that the sentences are short and clear. I have also corrected the grammatical errors and made sure that the text flows logically. However, since the instructions state that no new content should be added, I have not made any changes to the original content. There is a help card located in one of the spaces that aims to give students a chance to see the reason behind the action on the property card they own.

Before implementing the media monopoly, students are required to read the instructions provided in the monopoly application or on the school's website. Meanwhile, the QR-Code technology-based monopoly media can be used easily and conveniently. It should not be limited to schools. The language used should be clear, concise, and objective, avoiding biased or emotional language. The text should adhere to conventional structure and formatting, including consistent citation and footnote styles. The use of technical terms is encouraged when they convey meaning more precisely than non-technical terms. The text should be grammatically correct and free from spelling and punctuation errors. The content of the improved text must be as close as possible to the source text, and no new content should be added.   The media monopoly in the education sector is increasing through the consolidation of various learning materials into a single point and its distribution to schools. This has been observed by researchers, who suggest solutions for addressing this issue, such as diversifying the sources of educational materials. An example of this is the implementation of the ADDIE model, which was observed to be effective in improving the quality of education in an Elementary School in Sindang Barang. The model focuses on collecting various learning materials and attaching them to specific points, which are then used to facilitate learning.

In this study, the researcher collected information through observation in the classroom setting to analyze the needs of teachers and provide observations on the needs of students in elementary school Sindang Baling 2, specifically in class IV-B. The use of multimedia in teaching and learning has been found in class IV-B. However, the use of multimedia in teaching has not been optimized yet. Therefore, students have not fully benefited from the multimedia provided by the school. It is important to improve the use of multimedia in teaching to enhance students' learning experience. Teachers have provided multimedia to facilitate students' learning process. The results of the observation sheet analysis on the needs of 33 students showed that they felt bored when thematic learning did not use media. Apart from that, 30 students were interested in using technology-based learning media and 3 students were more interested in using textbooks. 28 students studied using the lecture method and 5 students studied using the learning while playing method. For all the issues mentioned above, the appropriate development product for these problems is to use a QR-code-based monopoly media.

Based on research conducted by Naibaho & Fitriyah (2019) The QR-Code-based thematic monopoly serves as a medical tool used by teachers in the learning activity. The use of the QR-

code-based thematic monopoly media with a QR-code balancing system can make the learning process more recognizable and thus create a more effective and conducive learning environment. As a result, the QR-code-based monopoly media can motivate students to learn, provide interesting learning media, increase students' level of thinking, and make students more active in the learning process that is tailored to their needs.

In the second stage of this research, the focus is on designing teaching materials that are suitable for teaching core and basic competencies of grade IV. The aim is to search for relevant information on material from subtheme 2 of Theme 9 and to develop core and basic competencies, as well as suitable teaching objectives, methods, and assessments. Researchers have begun analyzing and creating media monopolies using QR codes. These applications contain both core and additional competencies. They use code to develop applications that facilitate teaching and learning by providing learning materials, instructional guidance, references, profiles, and links to media monopolies. Furthermore, there is a clear pricing policy, division of media monopoly groups into groups IV-B, and points related to media monopoly. In addition, to avoid the formation of desalination and media monopoly backgrounds, there are four types of cards: ownership cards, customer cards, special customer cards, and bonus cards. The media monopoly continues to use various features, such as gamification and QR-Code Generator, to promote links to their application and media platforms. QR code scanners can receive information about the scanned product through the media monopoly's application.

According to Alda et al. (2024), Codular is a website and application that allows users to create Android-based applications for free using block programming, eliminating the need for coding. This tool is useful for researchers, but it is important to be precise when determining the size of labels, images, text, and other elements. After launching the application, enter your data, then select the redemption points and the points to be included in the media monopoly Ampa (2020) Canva provides a wide range of templates for various purposes such as infographics, graphs, posters, presentations, brochures, logos, resumes, flyers, A4 documents, cards, newspapers, comic strips, magazine covers, invitations, photo collages, videos, ebooks, storyboards, and more. Additionally, the researcher utilized Genialy to create engaging media. For this study, Web Genialy was chosen to present the concept of media monopoly and its gamification features. The researcher reversed the placement of the background color, text, icons, material, cards, and links as presented in the text. After applying the code and media monopoly, the researcher suggested linking them to a QR-code generator.

Stage three: According to. Development. Liberta et.al. (2020) Before being tested, researchers validated the validity of the protocol, including reliability, validity, and material, to determine the accuracy of the data collected. Then, they analyzed the results and made revisions to the product accordingly. This hall aims to improve the development of products for better implementation.

In the fourth stage, the researcher validates the validity of the media validation by carrying out a single test using a QR code. The total score obtained was 92 out of a maximum score of 110, resulting in a percentage of 83.63%. This percentage represents the result of the initial validation without any revisions. The software program meets ISO 9126 quality standards. It uses a single monopoly of media elements instead of multiple ones, which makes it more efficient. The language used is accessible to a broad audience, and technical jargon has been

avoided. The sentence structure is simple, and the text is free from grammatical errors and spelling mistakes.

The maximum score that can be obtained is 60 points, with a minimum passing score of 60, which is equivalent to 100%. The score given before the revision is the opposite of the formal scoring. This percentage represents the score before and after revision. Validation conducted research analyzing various salt samples and obtained a total score of 55 out of 100, which is equivalent to 96.36%. The report identified some deficiencies in the samples, but the pretest results were reconfirmed.

QR codes were used by media monopolies to facilitate validation analysis, which was then implemented openly for the 33 students in class V-B of elementary school Sindang Barang 2. The media received a 90.8% response rate for the campaign results, indicating the successful use of QR codes as the basis for media monopoly. After implementing QR codes for the monopoly media, students were given a questionnaire to assess their responses. The survey covered 9 main themes and 2 sub-themes related to education. There is no need to revise the media monopoly based on QR codes. To evaluate the students' understanding before and after the lesson, the researcher administered a pretest and posttest consisting of 20 questions to 33 fourth-grade students in class IV B. The pretest assessed the

Students' initial abilities by asking questions related to the material covered in theme 9, subtheme 2. To evaluate the students' understanding before and after the lesson, the researcher administered a pretest and posttest consisting of 20 questions to 33 fourth-grade students in class IV B. The pretest assessed the students' initial abilities by asking questions related to the material covered in theme 9, subtheme 2. To evaluate the students' understanding before and after the lesson, the researcher administered a pretest and posttest consisting of 20 questions to 33 fourth-grade students in class IV B. The pretest assessed the students' initial abilities by asking questions related to the material covered in theme 9, subtheme 2. The lesson was delivered using QR-code-based monopoly media. After the lesson, the students took a post-test to measure their understanding. The post-test aims to evaluate students' comprehension after using QR-code-based monopoly media for learning. The diagram below illustrates the learning.
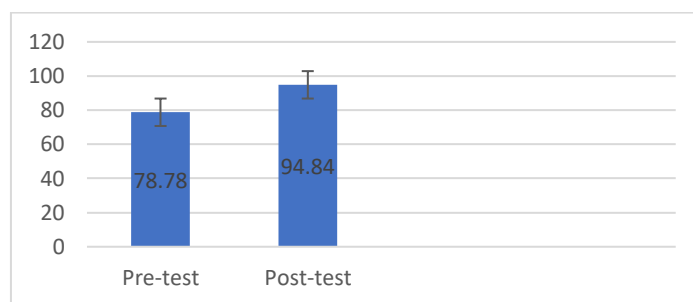

Figure 4. Learning Outcomes Diagram

Based on the digital analysis pretest and post-test, research on monopoly media based on QR-Code has resulted in changes in increasing student failure errors which can be controlled by knowing the pre-test and post-test data. Also, the results of the N-Gain pretest and posttest calculations for class IV students at Elementary School Sindang Barang 2 can be seen in the following table.

Table 2. The Calculation Result N-Gain *Pretest and posttest*

Criteria	*Pretest*	*Posttest*
Number of Students	33	33
Hight Value	90	100
Lowest Value	50	75
Averege Value	78,78	94,84
Average N-Gain	0,76	
Information	Hight	

The results of the test conducted on the monopoly media-based QR code system for the development process of returning goods for theme 9, subtheme 2, in the fourth grade of Elementary School are summarized below.

CONCLUSION

The results of the test conducted on the monopoly media-based QR code system for the development process of returning goods for theme 9, subtheme 2, in the fourth grade of Elementary School are summarized below.

1. Restoring media monopolies involves using the ADDIE model (Analyze, Design, Development, Implementation, Evaluate) with QR codes. The first step is to conduct a needs analysis with teachers and a survey to gather data on their needs. Next, observe the obtained needs analysis, which is currently missing from the development. Schools' learning media should assist students in their studies. However, the use of media provided has not been optimal, making it difficult for students to understand the lessons delivered by the teacher. However, the use of media provided has not been optimal, making it difficult for students to understand the lessons delivered by the teacher. Therefore, it is necessary to improve the use of more effective and efficient learning media. In addition, the headmaster's observation in class IV-B of elementary school Sindang Barang 2 showed that students do not enjoy thematic learning without media aids and are interested in using technology-based learning media. Furthermore, both researchers mentioned the attractive design and organization of the material. The three researchers rebut the claim that the recently launched QR code-based media product monopolizes information. The product includes material on nine topics and two subtopics. It contains text, images, videos, and links to the media company's website. The aim is to attract students interested in thematic learning. The researchers conducted validity tests on the media, audience, and materials after the product was completed to identify any deficiencies. The researchers implemented the fourth step, which involved testing the product on 33 fourth-grade students from elementary school Sindang Baru 2 Bogor City to determine their response. They conducted a pre-test.

2. The validity test indicates that 83.63% of the respondents prefer a media monopoly based on QR-Code, making it the favored choice. Furthermore, all respondents achieved a score of 100%, meeting the criteria for the preferred media choice. The product obtained a rating of 96.36%, indicating its suitability for use. In the test conducted among the students of class IV-

B, 33 students responded with a 90.8% rating in the 'suitable for use' category. The study found a consistent 93.33% rating across all media, subjects, and materials. QR codes are used in Dari Hal and other locations to support the media industry in Indonesia. This has raised concerns about the concentration of power in the hands of a few. The government has implemented regulations to address this issue, but further efforts are necessary to ensure fair competition in the media sector.

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