Development of monopoly media based on QR-Code on the theme of rich my country

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Article info	ABSTRACT
	This study aims to design and develop QR Code-based monopoly media on the subject matter of my rich country in Class IV SDN Sindang Barang 2 Bogor City. This research method is used to produce several products and to test the effectiveness of these products. The design of this study uses the ADDIE model which consists of the stages of Analysis (Problem Analysis), Design (Product Design), Development (Development), Implementation (Implementation), and Evaluation (Evaluation). This study involved media experts, linguists, and material experts to provide assessments as well as students as media users. The results of this study are that monopoly media based on QR Code has received eligibility validation on the aspect of media suitability based on ISO 9126 quality with a percentage of 83.63%, linguistic aspects by linguists with a percentage of 100%, and material aspects for the sake of material experts with a percentage of 96.36%.. Monopoly learning media based on the QR Code also received a positive response from 33 students with a percentage of 90.8% in the "Very Good" category. Based on this description, QR Code-based monopoly media is very feasible and can be implemented for teaching and learning activities with the theme Kaya Negeriku Class IV SD.

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INTRODUCTION _

Learning is a practical aspect of education. The learning process is a series of activities that include various components such as input, process, output and feedback that interact with each other, where educators need to use these components in the learning process to achieve the goals to be planned.

The learning process is marked by the existence of educative interactions that occur, namely interactions that are aware of the purpose. The interactions that are rooted in the trainer and the pedagogic learning activities for the students themselves take place systematically

through the planning, *implementation* and *evaluation* stages in order to produce an effective learning process as expected.

Effective learning can be achieved if educators are able to utilize learning resources and media in accordance with the demands of the applicable curriculum. Especially the use of learning media that functions as a connecting tool or intermediary in conveying messages related to the subject matter to be conveyed by educators. By using tools, it will make it easier for teachers to achieve learning goals (Komara et al., 2020; Iranti et al., 2023; Putra et al., 2022). In accordance the opinion expressed by Abi Hamid, et al (2020: 4) learning media is anything that conveys information through various channels that stimulate students' thoughts, feelings and desires, thereby encouraging them to obtain new information and achieve it in accordance with learning objectives . Another opinion was expressed by Nurfadhillah (2021: 8) that media in the learning process is defined as graphic, photographic, or electronic tools, to capture, process, and rearrange visual or verbal information .

Based on matter that , important for We to help students in the learning process especially on the aspect *development* of learning media . The problems that were obtained after the pre-research showed that teachers experienced problems in developing learning media in class . This happens because of limited media and tools help teach provided by the school , so the use of the given media not optimal . Based on these problems, one of the steps that can be taken by educators is to develop learning media to increase the enthusiasm for learning of students. *QR-Code* based monopoly media will make students more enthusiastic to carry out the learning process and become the right media in change innovation new in Elementary School. Meanwhile, based on the identification of the problem above, it can be formulated as follows:

1. How is the *development* of *QR-Code*-based monopoly media on the theme of my country's wealth?
2. What is the feasibility of *QR-Code*-based monopoly media on the theme of my country's wealth?

THEORETICAL FRAMEWORK

Monopoly media is included in two-dimensional or graphic learning media. Mulyawati & Resyi, (2019: 86) defines that Media Monopoly is a game that is familiar and liked by children to stimulate children's interest and motivation in learning. Meanwhile, according to Aslam et al., (2021: 38) argues that monopoly media is a learning medium that can be developed through play, subject matter that is linked to students' real lives and a learning process that is packaged in fun. While the opinion according to Ulfaeni & Januar, (2017: 145-146) states that monopoly media is a game that is played by more than two people and is a type of board game that aims to accumulate wealth and master the board game complexes and train students to manage finance.

According to Istiningsih et al., (2021: 917) the advantages of monopoly media are using attractive images so that students' attention becomes more focused, monopoly media is adapted to the characteristics of students in class. In line with that, according to Khasanah et al., (2018: 10) using monopoly media can provide a new color in the learning process in class, and can help students in the learning process conveyed through game media. The advantages of this *QR-Code* based monopoly media that distinguishes it from monopoly games in general are that it is included in general fund cards, opportunity cards and further developed proprietary cards, opportunities, foul cards and assistance cards contained in monopoly games. The pictures contained in the monopoly box are in accordance with the material to be taught and students can

scan the game via a barcode before using the media. The advantages of this monopoly media are also based on *QR-Code* technology in elementary schools, videos, texts and images of learning materials made directly by researchers.

According to Nurmalia et al., (2021: 6) Weaknesses in using monopoly media, namely games can only be used by 1 to 8 students resulting in a lack of effectiveness of the learning process used in groups. 1) Limited only to material determined by educators 2) Monopoly media is not suitable for students who have an auditive learning type 3) Presentation of material is only in the form of questions and orders 4) Monopoly games are used after students understand the concept of the material. The drawback of this monopoly media that distinguishes it from other monopoly media is that the media is played automatically using the dice listed in the grid, it's just that the calculation of the profits that students get using award points is done manually so that it requires accuracy in each group and vice versa medial monopoly is made using a programming language so that it can meet the perfect ISO 9126 quality.

In the theory put forward by the experts above, it can be synthesized that monopoly media is a game that children like to stimulate children's interest and motivation in learning, which is played by more than two people so that the game can be modified into a learning media that provides opportunities for students to learn. students to play while learning directly freely in order to achieve understanding and be able to create effective and fun learning. In addition, monopoly media is used by using a barcode to start the game. The barcode is created through the *QR-CODE* Generator which is a web application that stores data into the *QR-CODE* so that it becomes one of the technologies that is very practical and widely used in today's all-digital era, for this reason the *QR-CODE* is an important part of support the learning process.

METHOD

The type of research used is Research and Development (R&D), which is a research method used to develop or produce a particular product by testing the effectiveness of the product (Sugiyono, 2010). The development model used in this study is the ADDIE model which has five stages as the name implies, namely Analysis, Design, Development, Implementation, Evaluation. The research was conducted in the even semester of the 2022/2023 school year and was carried out at Sindang Barang 2 Elementary School on Jl. Lt. Gen. Ibrahim Adjie, RT.02/RW.05, Sindangbarang, Kec. West Bogor, Bogor City, West Java. With limited trial users, namely 33 students. The stages in developing a *QR-Code* based monopoly media consist of several stages such as:

a. Analysis

Needs analysis is carried out to see the learning problems in the material including learning methods, learning media and *evaluation* tools used. Researchers *Analyze*d the needs in learning at Sindang Barang 2 State Elementary School, Bogor City through observation and interviews. The analysis of the curriculum that the researcher developed is the material for theme 9, my rich country, sub-theme 2 for the use of natural resources in Indonesia.

b. Design

The *QR-Code* based monopoly *design* is like the usual monopoly games that use pawns and there are game procedures, what distinguishes the usual monopoly game is that there is no learning material from thematic books, but the *QR-Code* based monopoly has learning

material from thematic books for students. So that students can learn while playing and are able to increase the active participation of students to be enthusiastic in learning. The *QR-Code* based monopoly *design* is as follows:

1. Making an application that contains core competencies and basic competencies, learning objectives, learning materials, how to play monopoly or monopoly game rules, references, profiles and links to monopoly media games.
2. Making the rules for the monopoly media game listed in the application and monopoly media links.
3. Creating a monopoly deck *design* with 3 sets of cards in the middle of the playing field, namely opportunities, possession cards and violation cards.
4. Creating opportunity *design*s to explain the opportunity steps that students get during the game.
5. Making a proprietary card *design* in the form of material questions from theme 9 sub-theme 2 which students have the right to have if they are able to answer them.
6. Creating a foul card *design* is used when a player occupies the foul card square during the game.
7. Making help tiles, used by players to remember the answers to the questions listed on the property card.
8. Making an award points board to list the points earned by players.
9. Making a *QR-Code* to enter the game link and game guide application from monopoly media.

c. Development Stage

In the *Development* stage, the researcher collects various reference sources, arranges material according to the basic competencies, the learning objectives that students want to achieve. And images that match the needs and match the right colors on the *design* display in the *Development* of *QR-Code* based monopoly media. After the product is completed the researcher begins to validate the product. Validation to determine the feasibility of the product to be developed is in the form of monopoly media based on *QR-Code*. After the product has been completed, the researcher begins to validate the product, which includes the validation of media experts, linguists, and material experts.

d. Implementation

After the validation process by material, media, and language experts, it can be seen that the shortcomings of *QR-Code* based monopoly media are known, these deficiencies are then corrected so that the product becomes even more reliable. After the *QR-Code* based monopoly media product is completed, the product will be tested on students of class IV-B at Sindang Barang 2 Elementary School. After that students provide responses related to the use of *QR-Code* based monopoly media through an instrument given to students. The questionnaire instrument used is an instrument to measure the feasibility of monopoly media based on *QR-Code*.

e. Evaluation

At this stage students are given a response questionnaire to find out student responses to the feasibility of the *QR-Code* based monopoly media that has been used. In addition, there is a pretest before starting learning and a posttest after understanding learning to test the effectiveness of using monopoly media based on *QR-Code.*
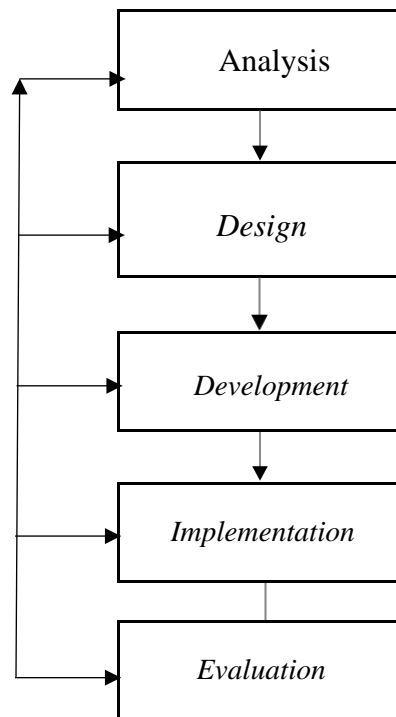

Figure 1. Stages of the ADDIE Model

(PGSD Lecturer Team, 2022: 84)

Data collection techniques using observation, interviews, questionnaires, and documentation. The questionnaire is used for expert validation assessment and student responses related to the product being developed. Data analysis techniques are useful for concluding the data that has been obtained by researchers recognizing monopoly media based on *QR-Code*. This study uses qualitative and quantitative analysis methods which explain as follows.

1. Qualitative Techniques

   Qualitative data analysis was obtained from the responses of class IV teachers at SDN Sindang Barang 2 Bogor City. Data from observations during the *implementation* of *QR-Code* based monopoly *Development* and input from media experts, linguists, and material experts were used to revise the *QR-Code* based monopoly *development* that had been made.

2. Quantitative Techniques

Quantitative data analysis was carried out to *Analyze* the results of the data that had been obtained from experts by distributing questionnaires. The assessment of data analysis in this study is as follows.

Table 1. Assessment of data analysis

Information	Score
Very Good (SB)	5
Good (B)	4
Enough (C)	3
Not Enough (K)	2
Very Less (SK)	1

Then *Analyze*d using the following formula:

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

Information:
P = Number of percentages of questionnaire data
f = Total score obtained
N = Maximum number of scores

Then the results of the percentages can be grouped into the score interpretation criteria according to the Likert scale so that a conclusion can be obtained about the feasibility of *QR-Code* based monopoly media. The score interpretation criteria based on the Likert scale are as follows:

Table 2. Eligibility Interpretation Criteria

Score	Criteria

Score	Criteria
80% < x ≤ 100%	Very Worth it
60% < x ≤ 80%	Worthy
40% < x ≤ 60%	Decent Enough
20% < x ≤ 40%	Not Feasible
0% ≤ x ≤ 20%	Very Unworthy

Determination N-Gain criteria are presented as following :

$$N - Gain = \frac{Posttest\ Score - Pretest\ Score}{Maximum\ Score - Pretest\ Score}\ x\ 100$$

Determination criteria N-Gain values are presented as following .

Table 3. Criteria for the N-Gain Value

N-Gain Value	Criteria Interpretation
> 0.7	Tall
0.3 – 0.7	Currently
< 0.3	Low

RESULTS AND DISCUSSION
Research and *Development* of learning media uses the ADDIE model (*Analyze*, *Design*, *Development*, *Implementation*, *Evaluation*).

The first stage of the ADDIE model is analysis, at this stage the researcher collects initial information or needs analysis through observation and interviews with teachers and provides observation sheets of needs analysis for students, in order to find out the problems that exist at SDN Sindang Barang 2 in class IV-B. The problems found in class IV-B are the lack of *Development* of learning media that are applied by teachers to students, especially in terms of technology due to limited media or teaching aids provided by schools, so that the use of the media provided is not optimal and makes students feel bored while learning going on. Furthermore, the second stage in the ADDIE model is *design* where at this stage the researcher sets learning objectives according to the core competencies and basic competencies of class IV. In the third stage of the ADDIE model, researchers go through the *Development* stage. According to Carolin (2020: 15) after the media was prepared before being tested on students, the researchers validated the experts, namely media experts, linguists, and material experts to determine the feasibility of the media that had been made.

The following is a link that has been validated by media experts, linguists and material experts: https://view.genial.ly/642916f4e538730018b2958e/interactive-content-monopoli & https://play.google.com/store/apps/details?id=com.lusti.monopoli

Media experts judge about monopoly media based on *QR-Code*. Data is obtained by giving a questionnaire. The aspects assessed include Functionality, Reliability, Usability, Efficiency, Maintainability, and Portability. Seeing the questionnaire prepared in the form of 22 statements with a description of the rating scale contained in the table above, namely 1 (very poor), 2 (poor), 3 (enough), 4 (good), and 5 (very good). So if the 22 statements are associated with the 5 highest scores and are associated with the number of media expert respondents, the score obtained is 110, but the total assessment given by media expert respondents to researchers is 92. So the calculation results above show that monopoly media is based on *QR-Code* developed has a percentage of 83.63% with a value between $80\% < x \leq 100\%$. If converted with the feasibility table previously described, this *development* product is in the 'Very Eligible' criteria. This means that monopoly media products based on *QR-Code* are considered appropriate for use by students without needing to be revised. However, in the absence of revisions, there are suggestions for improvements to be even better in terms of *development*. Suggestions for improvement from media experts are that monopoly media should be made using a programming language so that it can meet the perfect ISO 9126 quality.
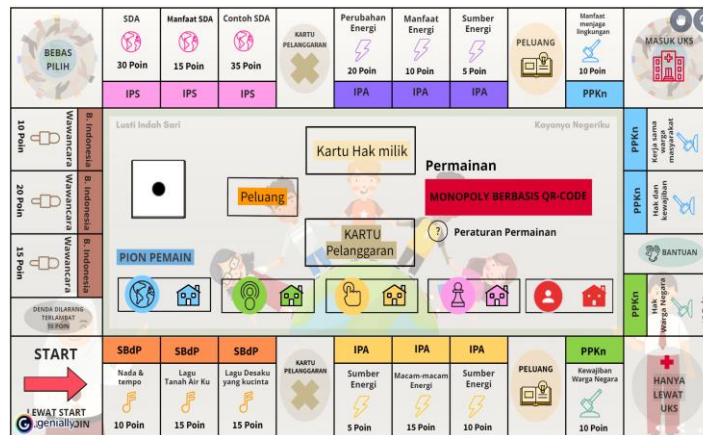

Figure 2. Media Monopoly

Figure 3. Monopoly media barcodes

Linguist seeing the questionnaire prepared in the form of 12 statements with the description of the rating scale contained in the table above, namely 1 (very poor), 2 (poor), 3 (enough), 4 (good), and 5 (very good). So if the 12 statements are associated with the 5 highest scores and associated with the number of media expert respondents, the score obtained is 60. So the calculation results above show that the *QR-Code*-based monopoly media developed has a percentage of 100% with a value between $80\% < x \leq 100\%$. If converted with the feasibility table previously described, this *Development* product is in the 'Very Eligible' criteria. This means that monopoly media products based on *QR-Code* are considered appropriate for use by students with revisions. However, there are suggestions for improvements to be better in terms of *development*. Suggestions for improvement from Linguists, namely the numbering is otherwise formal.

The material expert seeing the prepared questionnaire in the form of 11 statements with the description of the rating scale contained in the table above, namely 1 (Very Poor), 2 (Poor), 3 (Enough), 4 (Good), and 5 (Very Good). So if the 11 statements are associated with the 5 highest scores and are associated with the number of media expert respondents, the score obtained is 55, but the total assessment given by media expert respondents to researchers is 53. So the calculation results above show that monopoly media is based on *QR-Code* developed has a percentage of 96.36% with a value between $80\% < x \leq 100\%$. If converted with the feasibility table previously described, this *development* product is in the 'Very Eligible' criteria. This means that monopoly media products based on *QR-Code* are considered appropriate for use by students without needing to be revised. However, in the absence of revisions, there are suggestions for improvements to be even better in terms of *development*. Suggestions for improvement from material experts, namely pretest questions are further developed.

In the implementation phase, a limited product trial was carried out for class IV students at SDN Sindang Barang 2 with a total of 33 students which were carried out offline or face to face. Activities carried out during the learning process include preliminary activities, students are given directions first, then group division and award boards, points for each student, barcodes to each group. In this activity each group was asked to scan the barcode listed, starting from reading the material, playing games, answering the questions that have been provided. Furthermore, students who get the most points are given rewards directly which aims to motivate other

students. Then after students use the media, students can fill out a questionnaire sheet that is given through a piece of paper.

Furthermore, the trial was carried out to determine the response of students when using QR-Code-based monopoly media developed using a questionnaire containing 14 statements. Based on the recapitulation of the assessment data in the table above conducted on 33 students, the monopoly media based on QR-Code used by grade IV elementary school students get a very good response value, this can be seen from the average percentage given by students, which is 90,8 %. This amount is between 80% <x ≤ 100%. So that the use of QR-Code-based monopoly media is declared very suitable for students to use in learning theme 9 sub-theme 2 and in general the QR-Code-based monopoly media is not necessary for revision.
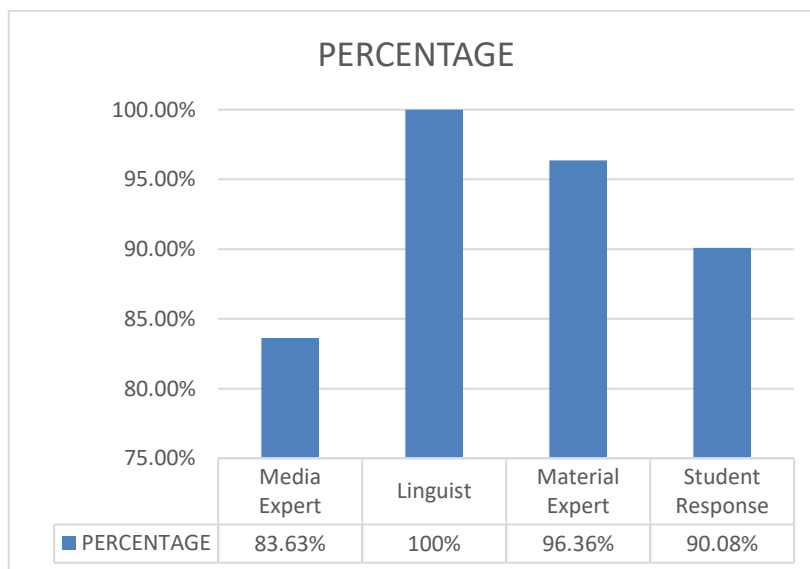

PERCENTAGE

	Media Expert	Linguist	Material Expert	Student Response
PERCENTAGE	83.63%	100%	96.36%	90.08%

Figure 4. Tabulation of Validation Results and Student Responses

Then in the *evaluation* phase, the researcher gave 20 pretest and posttest questions to 33 students in class IV B which aimed to measure the extent of students' understanding before and after being given learning material through monopoly media based on *QR-Code*

Table 4. Calculation results of the N-Gain Pretest and Posttest

Criteria	Pretest	Posttest
Number of Students	33	33
The highest score	90	100
Lowest Value	50	75
Average value	78,78	94,84
Average N-Gain	0.76	
Information	High	

Based on table 4.9 above, it is known that the recapitulation of the pretest average value is 78.78 and the posttest average value is 94.84. While the average N-Gain value is 0.76 which is included in the high category. Thus, monopoly media based on *QR-Code* on theme 9 sub-theme 2 is very effective in the learning process at school because it improves the learning outcomes of fourth grade students.

CONCLUSION

Based on the research results, the process of developing *QR-Code*-based monopoly media uses the ADDIE model (*Analyze*, *Design*, *Development*, *Implementation*, *Evaluation*). The feasibility of *QR-Code*-based monopoly media is proven from the results of expert validation and student responses. The validation results of the monopoly media expert test were declared very feasible to use with a percentage of 83.63%, which means this product is very feasible to use. Furthermore, the linguists obtained a percentage of 100%, with very feasible criteria to use. Then the validation results from material experts obtained a percentage of 96.36%, meaning that this product is very feasible to use. Meanwhile, based on a limited trial conducted on class IV-B students, as many as 33 students obtained a very good response with a percentage of 90.8% in the "very feasible" category and the overall average of media experts, linguists and material experts with a percentage of 93 .33%, then the development of QR-Code-based monopoly media on the theme of rich country is very suitable for use in elementary schools. For researchers who wish to develop monopoly media based on the same QR-Code, it is hoped that they can develop monopoly media with programming that is appropriate to the game so that monopoly media developed for students are not played manually but are played automatically, then they can add audio by explaining the material in monopoly media.

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