1st BICONE (Bhinneka Conference)
Empowering Society 5.0: Education, Technology, and Social Transformation
Vol 1 No 1 , 2025

Development Of Kebatar Media Assisted By Qr Code Based Ol Local Wisdom Of Reog Kendang Tulungagung For Elementary School Students

Ria Fajrin Rizqy Ana*[1)], Nadin Nabila Sari[2)]
1. Primary School Teacher Education, Sosial dan Humaniora, Universitas Bhinneka PGRI, Indonesian
Email address : riafajrin72@gmail.com
2. Primary School Teacher Education, Sosial dan Humaniora, Universitas Bhinneka PGRI, Indonesian
Email address : nabilanadin1234@gmail.com

Abstract - Mathematics is one of the subjects that must be learned from an early age. The teaching of mathematics requires appropriate media so that students truly understand the concepts. Based on the results of observations and interviews at SDN Samir, data showed a lack of variety in learning media and difficulties related to media for plane figures in mathematics. The introduction of plane figure concepts in mathematics can be taught through the art of Reog Kendang of Tulungagung. This is because Reog Kendang contains elements of geometric patterns such as circles, triangles, rhombuses, and repetitive shapes found on the drum or other attributes. This can be one of the solutions to the problems found at SDN Samir. The purpose of this study is to develop the KEBATAR media using the ADDIE model and to test the validity and practicality of the media. The research subjects were 17 second-grade elementary school students. This study used the R&D type of research with the ADDIE model. The results showed that the media expert rated the media 97% (very valid criteria), and the material expert rated it 94% (very valid criteria). Meanwhile, large-scale trials resulted in 89% (very practical criteria) and teacher responses in large-scale trials were 90% (very practical criteria). Based on these results, the KEBATAR media assisted by QR Code based on the local wisdom of Reog Kendang Tulungagung for second-grade elementary students is very valid and very practical to be used as one of the learning media.

Keywords: development, KEBATAR, local wisdom, reog Kendang

I. INTRODUCTION

Mathematics is one of the learning materials that must be learned from an early age [1]. Mathematics is a subject that contains various calculations logically. Mathematics is a language that is defined carefully, systematically, and precisely [2]. Mathematics is the center of all disciplines [3]. Based on the several opinions above, it can be concluded that mathematics is a subject matter that must be started from an early age which contains logical, systematic, and precise calculations from all centers of scientific disciplines. One of the materials contained in mathematics is flat shapes [4]. The material of flat shapes in mathematics in elementary schools is taught in semester 2 of grade 2 [5]. The benefit of learning flat shapes is to make students understand the basis of a shape [6]. A flat shape is a two-dimensional object that is bounded by curved lines or straight lines Flat shapes in grade II math lessons contain flat shapes such as triangles, squares, rectangles, circles, parallelograms, trapezoids, rhombuses, kites, pentagons, and hexagons) [7]. Mathematical concepts to grade 2 students who are still entering the concrete operational stage cannot be maximally taught to students if they do not use concrete learning media. This is because flat building material is an abstract concept. Based on some of the explanations above, it can be concluded that flat building material is abstract material for elementary school students who are still at the concrete operational stage of development so that concrete / real media is needed in learning. Based on the results of the observation of the analysis of existing needs in elementary schools, there is no concrete or audiovisual media, especially for Mathematics subjects on flat shapes. The existing media in class II is limited to sticky pictures on the wall and building spaces. Especially for the material of flat shapes, there is no media that is harmonious and able to accelerate the absorption of material or the delivery of information from teacher to student. Whereas the role of media is very important in learning, especially for math subjects. However, there are several drums / art tools typical of Tulungagung reog that are neatly arranged on top of the classroom cupboard. The drums look neglected even though if you observe the decorations on the Tulungagung reog drums have the characteristics of various flat shapes. Seeing this fact, researchers try to utilize, modify and develop the drumming tool so that it can be used as a learning medium, especially in class II flat building material. The drumming tool will be modified so that it can be used as a flat building learning media and can be used as a means of introducing the local wisdom of Tulungagung reog kendang art because the drumming tool is given a QR Code containing a video of reog kendang dance art that is directly connected to the youtube link. Learning media has various types and characteristics. One of the media that is suitable for application at the concrete

operational age stage is a combination of media with concrete and digital media types [8]. Digital media can be audiovisual based. Learning is more easily understood by 25% with audio media, 45% with visuals, and 80% with touch and audiovisual [9]. Audiovisual media is a technology-based media that can be combined with other media technologies, namely QR Code and sound. QR Code is one of the results of technological sophistication that can be utilized in the scope of education. This QR Code media is a two-dimensional image that can display data in the form of text, so that it can become an interaction tool between teachers and students in transferring knowledge and information [10]. Three-dimensional concrete media also equipped with a QR Code is expected to be a learning media that is currently able to display explanations about flat buildings contextually, easily understood, and keep up with the times. Learning media does not necessarily have to be made totally new. However, by modifying the utilization of materials or objects that already exist in the school environment into an appropriate learning media. Based on some literature and previous research on the development of QR Code-assisted digital comic learning media on photosynthesis material in elementary school, it was declared valid with a percentage of 98.3% and the results of the student's pre-test posttest had a significant increase in the average value of students with a percentage of the initial average value of 20.83 and a percentage of the final value of 81[11]. The results of research on the role of mathematics and its learning in developing local cultural wisdom turned out to have a good relationship and the results were that students could better understand mathematics, and better understand the culture of origin of the student's region [12]. Based on some of the above explanations, it can be concluded that local wisdom can support the success of mathematics learning and at the same time cultural preservation where each has mutual benefits. Local wisdom in Tulungagung which is currently intensified at all levels of elementary school is the art of Reog Kendang Tulungagung. In fact, based on the results of an interview with one of the teachers at the elementary school, the art of reog kendang has become a mandatory thing to do when there is an activity at school as an opener or one of the contents of the event. Reog kendang Tulungagung is one of the arts that can instill moral values in a student such as cooperation, responsibility, discipline and mutual respect when processing in performance and learning[13]. In addition, one of the efforts to achieve the competencies required by students in learning mathematics is the application of learning that utilizes the culture that develops around the students' environment[14]. The combination of culture and mathematics is expected to be able to form a generation of superior students while being able to preserve the culture of the region of origin. This research aims to develop learning media Kendang Bangun Datar.

II. RESEARCH METHODS

This research is a type of development research or can be called R&D research. The model used in this research is ADDIE. The ADDIE model is a model that has 5 systematic stages including analysis, design, development, implementation and evaluation. ADDIE was chosen for this development research activity because ADDIE has the advantage of being able to produce quality products [15]. The following is described in relation to the stages of the ADDIE model.

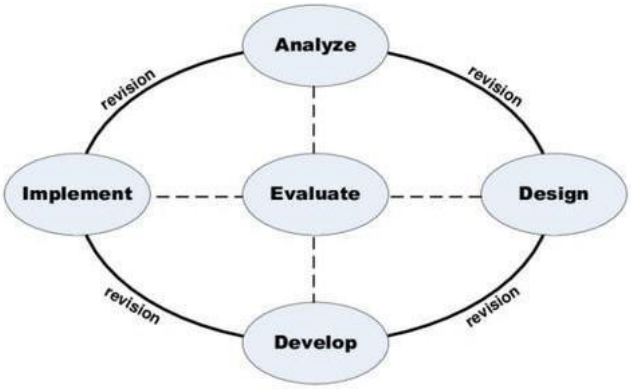


Figure 3.1 Stages of the ADDIE Model [16].

This study used a product trial design of all grade II students totaling 15. The data used in this study are qualitative and quantitative. The qualitative data were obtained from interviews, questionnaires and observations. The data is in the form of criticism of suggestions from media experts, material experts, teachers and students. Quantitative data is used to test the feasibility of learning media products, researchers collect data from learning media experts, material experts, teachers and students. In addition, quantitative data is also to determine the response of students to learning media products. The instruments used in the development of this product are observation sheets, questionnaire sheets, and validation sheets. Observation is done to see the learning process, especially the use of learning media at school. Questionnaires are used to obtain information from teachers and students related to the media. As for some questionnaires that will be analyzed by researchers related to media development, namely as follows. The quality of educational product development will be high if it includes valid and practical.

Table 1. Criteria for Product Validity

No	Interval Nilai	Kriteria
1.	0%-25%	Invalid
2.	26%-50%	Moderately Valid
3.	51%-75%	Valid
4.	76%-100%	HighlyValid

Resource: Adaptation [17].

Practicality analysis is carried out by recapitulating the data of the learning media user response questionnaire then determining the average of the total value of the answers to the user response questionnaire and converting the average value into a percentage. Student response data is obtained from questionnaires given to students.

Table 2. Practicality Criteria

No	Interval Nilai	Kriteria
1.	0%-25%	No practical
2.	26%-50%	Moderately Practical
3.	51%-75%	Practial
4.	76%-100%	Very Practical

Resource: Adaptation [17].

III. RESULTS AND DISCUSSION

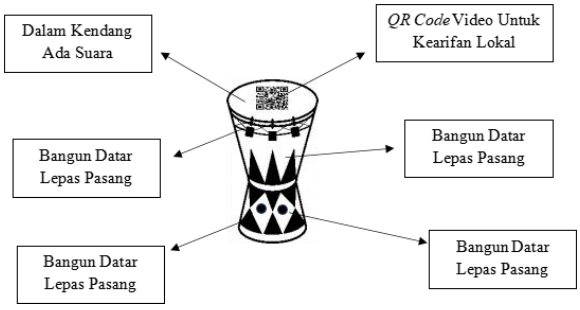
A. *Analysis*

The first stage in the ADDIE model is analyze. The analyze stage begins with analyzing teacher needs and student needs. Analyze the needs carried out implicitly with teachers and grade 2 students of SDN Samir. The results of interviews with grade II students in an unstructured manner and implied questions obtained information that students prefer learning using learning media. Meanwhile, based on the results of interviews from grade II teachers, it is obtained that teachers do not have time to make variations of learning media due to limited time and energy. The teacher also said that the media at SDN Samir is very limited but the facilities and infrastructure at SDN Samir are quite adequate. So it can be said that students need a variety of media while teachers are not optimal in providing or providing learning media. The teacher also said that the media that is really needed is media for math subjects. Because for grade II students, math subjects are difficult so that teachers are required to provide more detailed and detailed explanations. So based on the results of the analysis of the needs of teachers and students, researchers provide solutions by utilizing existing facilities and infrastructure by developing KEBATAR media.

B. *Design*

The Design process in the second stage of KEBATAR media development after compiling the instrument is to create a storyboard or blue print. This blue print is made on a small scale. Blue print on KEBATAR media as follows.

Figure 2 Blue Print KEBATAR in general



C. *Development*

The creation and development of KEBATAR media can be seen from the flow chart below.

Figure 2. Flowchart of KEBATAR Media

Media Validation

Validation is carried out before conducting field trials. Validation is carried out by people who are experts and competent in their fields. This is done to determine the level of validity of KEBATAR learning media that has been designed for learning. There are two media expert validators on KEBATAR media. This is possible so that the media really becomes valid and can be applied at SDN Samir optimally. The validation results of the two KEBATAR media validators can be presented as follows.

Table 3. Media Validation Results

No.	Validator	Value	Category
1	Validator 1	95	HighlyValid
2	Validator 2	98	Highly Valid
	Total	**191**	
	Average	**97%**	**Highly Valid**

Based on the results of the data presentation, it can be described and analyzed that the value of validator 1 is 95% with the criteria “Very Valid” and validator 2 is 98% with the criteria “Very Valid”. Based on the criteria that KEBATAR media meets the criteria “very valid” so that it can be used as a learning resource.

Material Validation

There are two material expert validators on KEBATAR media. This is possible so that the content or content on the media is completely correct and there are no concept errors. The results of material validation from two KEBATAR media validators can be presented as follows.

Table 4. Validation Results from Material Expert Validators

No.	Validator	Value	Category
1	Validator 1	96	Highly Valid
2	Validator 2	91	Highly Valid
	Total	**187**	
	Average	**94%**	**HighlyValid**

Based on the results of the presentation of two material experts from validator 1 is 95% with the criteria "Very Valid" and validator 2 is 98% with the criteria "Very Valid". Overall, if it is proxied, the result is 94%. Based on the criteria that KEBATAR media meets the criteria "very valid" so that it can be used as a learning resource. Researchers did not prepare teaching modules because the class teacher directly taught according to the usual way of teaching. Researchers prepare these things so that later learning is structured. However, the implementation is adjusted to the circumstances in the field. So it is hoped that with complete and mature preparation it can help teachers achieve student learning goals well. Overall learning went smoothly, the researcher only helped if asked for help by the class teacher if there were obstacles. Students who became large-scale subjects were 15 students. Questionnaires were given after the learning activities were completed. Questionnaires are used to see the final response of students after learning. The questionnaire was given to find out the extent to which students understood from a series of learning processes without using additional media. The questionnaire contains 10 statements. The questionnaire is in the form of choices where students can choose YES and NO answers. The results of the questionnaire can be presented. Based on the results of the questionnaire can be described and analyzed as follows. In the small-scale trial, there were 2 students who were tested using KEBATAR media. There are 10 statements given to students. Among the 10 statements, one student said YES to the entire statement. While the other student stated 8 statements with the answer YES and 2 students stated no. The 2 no statements were related to aspects of the KEBATAR media. The 2 no statements were related to aspects of difficulty and whether or not they were helped by the KEBATAR media. So that in both student responses, a percentage of 100% very practical criteria and 80% very practical criteria were obtained. So that the results of the KEBATAR media small-scale trial have an average value between the two respondents of 90% in the "Very Practical" criteria.

D. Implementation

Questionnaires are used to see the final response of students after learning. The questionnaire is given to find out the extent to which students understand from a series of learning processes without using additional media. The questionnaire contains 10 statements. The questionnaire is in the form of choices where students can choose YES and NO answers. This questionnaire uses a Guttman scale. Based on the results of data presentation, 12 students stated yes and 3 students did not so that a percentage of 86% was obtained and included in the very practical category. The average results of the large-scale trial with the subject of 15 students obtained a score of 89% with the criteria "Very Practical".

While the results of the teacher's response gave a high assessment (scores 3 and 4) on various aspects such as the ease of delivering material, interest in the media, media preparation, ease of use without other tools, to the media layout. Students also gave a 100% positive response on all indicators asked. Overall, the average results of the large-scale trial showed that KEBATAR media obtained a percentage of practicality of 90% with the category "Very Practical".

E. Evaluation

The last stage in the ADDIE model is evaluation. Evaluation is used to generalize from and make decisions from the data obtained. Each stage has been carried out carefully and obtained input from competent parties, such as supervisors, media experts, material experts, teachers and students. Implementation in the classroom shows that this media can be used easily by teachers and students, and supports the preservation of typical Tulungagung culture. Students seem enthusiastic and active during learning activities, and are able to understand the concept of flat buildings.

The validity of KEBATAR media "Kendang Bangun Datar" assisted by QR Code Based on Local Wisdom of Tulungagung Reog Kendang for Grade II Elementary School Students

Validation is carried out before conducting field trials. Validation is carried out by people who are experts and competent in their fields. Validation of KEBATAR media is divided into 2, namely based on the results of media expert validation, then material experts. The validity of KEBATAR media is the result of media experts with a total score of 191 with a percentage of 97% "Very Valid" criteria. Material experts with a total score of 187 with a percentage of 94% "Very Valid" criteria. Based on all experts, it can be determined that the average score is 384 with a percentage of 96% with the criteria "Very Valid". The results of validation from two experts for KEBATAR media can be seen and concluded that KEBATAR media is very valid for use. This is because the validation results from each expert above meet the predetermined criteria. This statement is in line with previous research related to the development of concrete media for flat building material. The results of the research at the evaluation stage showed a very satisfactory level of feasibility: validation by material experts resulted in an ideal score of 90% "Very Valid" criteria, assessment from media experts reached 97.5% "Very Valid" criteria, positive responses from teachers were recorded at 97.5% "Very Practical" criteria, and student responses to this media were also very good with a percentage of 91.96% "Very Practical" criteria. Furthermore, the effectiveness of the media in improving student learning outcomes is proven by the acquisition of a percentage of 90.57% [18]. Practicality of KEBATAR media "Kendang Bangun Datar" assisted by QR Code Based on Local Wisdom of Tulungagung Reog Kendang for Grade II Students of Elementary School

The practicality of the media from this study was taken from the responses of teachers and students during both small and large scale trials. This is used to draw data that KEBATAR media makes it easier for students. The aspects proposed to be assessed through KEBATAR include appearance and material. The number of statements given to students is 10 items. If the percentage of the results of the small scale test obtained a value of 90% of the criteria "Very Practical". While the large scale 8.9% criteria "Very Practical" and large-scale teacher

response 90% criteria "Very Practical". The criteria for practicality of both small-scale, large-scale trials, and large-scale teacher responses are "Very Practical". This statement is in line with previous research which states that the development of concrete media for flat shapes has a practicality value assessed by one teacher and 16 students. The results of the teacher's practicality assessment were declared very practical with a score of 4.9 and the student response questionnaire received an average score of 4.2 with a very practical category. The results of the student response questionnaire also show that Magic Geometry makes learning more interesting and easy to understand the material [19].

IV. CONCLUSIONS

1. Test the validity of KEBATAR learning media products assisted by Qr Code based on local wisdom reog kendang Tulungagung for grade II elementary school students in the subject of mathematics flat building material through media expert validation provides a value that is proxied obtained 97% "Very Valid" criteria. The material expert gives a value and is proxied to obtain a result of 94% "Very Valid" criteria so that the media is said to be "Very Valid" can be used as a learning resource.
2. Practicality test of KEBATAR learning media products assisted by Qr Code based on local wisdom reog kendang Tulungagung for grade II elementary school students in mathematics subjects on flat building materials from the results of small-scale trials of students obtained a score of 90% "Very Practical" criteria, large-scale trials 89% "Very Practical" criteria and large-scale teacher responses 90% "Very Practical" criteria so that the media is said to be "Very Practical" and can be used as a learning resource.

REFERENCE

[1] Hana, U. S., & Wulandari, M. (2024). Peningkatan Hasil Belajar Matematika Materi Nilai Tempat Satuan Dan Puluhan Melalui Media Papan Nilai Tempat Bagi Siswa Kelas 1 Sd

[2] Marfu'ah, S., Zaenuri, Masrukan, & Walid. (2022). Model Pembelajaran Matematika Untuk Meningkatkan Kemampuan Penalaran Matematis Siswa. *Prosiding Seminar Nasional Matematika*, *5*, 50–54. Https://Journal.Unnes.Ac.Id/Sju/Index.Php/Prisma/

[3] Tarigan, R. (2021). Perkembangan Matematika Dalam Filsafat Dan Aliran Formalisme Yang Terkandung Dalam Filsafat Matematika. *Sepren*, *2*(2), 17–22.

[4] Nurkhakiki, A. D., Jihad, F. A., Sabillah, M., Hasanah, A. F., & Sulistyani, A. (2025). Efektifitas Pemanfaatan Media Tangram Terhadap Konsep Bangun Datar Pada Siswa Mi. *Trigonometri: Jurnal Matematika Dan Ilmu Pengetahuan Alam*, *6*(1), 11–20

[5] Lestari, W. S., Irawati, R., & Maulana, M. (2025). Pengembangan Aplikasi Area Untuk Meningkatkan Pemahaman Matematis Siswa Pada Materi Keliling Bangun Datar Kelas V. *As-Sabiqun*, *7*(1), 140–154

[6] Unaenah, E., Hidyah, A., Aditya, A. M., Yolawati, N. N., Maghfiroh, N., Dewanti,

[7] R. R., & Safitri, T. (2020). Teori Brunner Pada Konsep Bangun Datar Sekolah Dasar. *Nusantara*, *2*(2), 327–349.

[8] Khairunnisa, G. F., & Ilmi, Y. I. N. (2020). Media Pembelajaran Matematika Konkret Versus Digital: Systematic Literature Review Di Era Revolusi Industri 4.0. *Jurnal Tadris Matematika*, *3*(2), 131–140.

[9] Syahruddin Mahmud. M. Ed., P. D. (2023). *Media Pembelajaran*. Lovrinz Publishing. Https://Books.Google.Co.Id/Books?Id=-O7leaaaqbaj

[10] Nafisah, D., & Ghofur, A. (2020). Pengembangan Media Pembelajaran Scan Barcode Berbasis Android Dalam Pembelajaran Ips. *Eduteach: Jurnal Edukasi Dan Teknologi Pembelajaran*, *1*(2), 144–152

[11] Safitri, I. G., Sujana, A., & Aeni, A. N. (2023). Pengembangan Barcodi (Barcode Comic Digital) Berorientasi Penguasaan Konsep Siswa Sekolah Dasar Pada Materi Fotosintesis. *Lectura: Jurnal Pendidikan*, *14*(1), 111–125.

[12] Budiarto, M. T. (2016). Peran Matematika Dan Pembelajarannya Dalam Mengembangkan Kearifan Budaya Lokal Untuk Mendukung Pendidikan Karakter Bangsa. *Seminar Nasional Pendidikan Matematika*, 1–11.

[13] Andriyani, F., & Nafingah, H. (2024). Analisis Pengembangan Bahan Ajar Berbasis Kearifan Lokal "Tari Reog Kendang Tulungagung" Materi Bahasa Indonesia Asal Usul Dan Perbedaan Budaya Di Kelas Iv Sd. *Pendas: Jurnal Ilmiah Pendidikan Dasar*, *9*(2), 4549–4560.

[14] Wulandari, I. G. A. P. A., & Puspadewi, K. R. (2016). Budaya Dan Implikasinya Terhadap Pembelajaran Matematika. *Jurnal Santiaji Pendidikan*, *6*(1), 129201.

[15] Susanti, D., Ekawati, R., Apfani, S., Lasari, Y. L., Nastuti, R., & Fatimah, N. (2024). Pengembangan Lembar Kerja Peserta Didik Pembelajaran Ipas Berbasis Project Based Learning Kelas Iv Sekolah Dasar. *Didaktika: Jurnal Kependidikan*, *13*(3), 4177–4184.

[16] Judijanto, L., Muhammadiah, M., Utami, R. N., Suhirman, L., Laka, L., Boari, Y., Lembang, S. T., Wattimena, F. Y., Astriawati, N., & Laksono, R. D. (2024). *Metodologi Research And Development: Teori Dan Penerapan Metodologi Rnd*. Pt. Sonpedia Publishing Indonesia. ttps://Books.Google.Co.Id/Books?Id=Y3ineqaaqbaj

[17] Hayati, S., Budi, A. S., & Handoko, E. (2015). Pengembangan Media Pembelajaran Flipbook Fisika Untuk Meningkatkan Hasil Belajar Peserta Didik. *Prosiding Seminar Nasional Fisika (E-Jurnal) Snf2015*, *Iv*, 49–54.

[18] Pou, F., Husain, R. I., Marshanawiah, A., Aries, N. S., & Pulukadang, W. T. (2025). Pengembangan Media Kocibantar Pada Pemahaman Konsep Ciri-Ciri Bangun Datar Kelas Iv Di Sd. *Science: Jurnal Inovasi Pendidikan Matematika Dan Ipa*, *5*(2), 461–472.

[19] Situmeang, N. K., Sasmitha, F., Perangin-Angin, N. A., & Mailani, E. (2025). *Analisis Kesulitan Belajar Siswa Kelas Iv Pada Mata Pembelajaran Matematika Materi Bangun Datar*. *07*(1), 63–70.