



## The Development of *Jateng Gayeng* Monopoly Media: Learn Unit Conversion by Loving Culture

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### **Abstract**

Math exercises needed to be presented in an appealing and pleasing approach. This study aimed to promote learning media in the form of a monopoly game as a medium to learn unit conversion while getting to know Central Java cultures. This Research and Development study utilized the ADDIE (Analysis, Design, Development, Implementation, and Evaluation) development model. The data collection methods that were used in this study were documentation, tests, and questionnaires. The *Jateng Gayeng* Monopoly Media had been validated by lecturers and mathematics teachers and declared legally valid with a percentage of 88.8% (excellent), and efficient with a rate of 87.4%. This learning media had also been tested on fifth-grade students of SDN Watuagung 02 Semarang Regency. Moreover, based on the result of the Wilcoxon test at the significant level  $\alpha = 0.05$ , it can be concluded that the *Jateng Gayeng* Monopoly Media effectively enhances students' learning outcomes. This result is expected to inspire the growth of learning media, which elevates Indonesia's local cultures so that Indonesian children will be more proud and love their cultures.

### **Abstrak**

Latihan soal perlu disajikan secara menarik agar tidak membosankan. Penelitian ini bertujuan untuk mengembangkan media pembelajaran monopoli yang dapat digunakan sebagai sarana latihan soal konversi satuan sambil mengenal budaya Jawa Tengah. Penelitian *Research and Development* ini menggunakan model pengembangan ADDIE (*Analysis, Design, Development, Implementation, dan Evaluation*). Metode pengumpulan data yang digunakan ialah dokumentasi, tes, dan angket. Media Monopoli *Jateng Gayeng* divalidasi oleh dosen dan guru matematika dan dinyatakan valid dengan persentase 88,8% (sangat baik) dan sangat praktis dengan persentase 87,4%. Media ini telah diujicobakan terhadap siswa kelas V SDN Watuagung 02 Kabupaten Semarang dan berdasarkan hasil uji Wilcoxon pada taraf signifikan  $\alpha = 0.05$  disimpulkan bahwa monopoli *Jateng Gayeng* efektif untuk meningkatkan hasil belajar siswa. Hasil ini diharapkan dapat menginspirasi munculnya media latihan soal yang mengaitkan dengan budaya lokal daerah-daerah di Indonesia agar anak Indonesia makin bangga dan cinta akan budaya yang dimiliki.

**Keywords:** *budaya jawa tengah, jateng gayeng, monopoly, unit conversion, learning media.*

## INTRODUCTION

Mathematics has an important role for human life whose learning process emphasizes concepts. According to Lestari (2017), understanding mathematical concepts means understanding comprehensive mathematical ideas and understanding the interrelationships between concepts and applying appropriate steps in problem solving. Understanding the concept of learning mathematics can be helped by providing the right stimulus. Budiningsih (2012) stated that to make it easier for students to construct a concept, students can be given a stimulus in two ways, namely reiterating the concept that has been conveyed by the teacher previously and repeating it to strengthen students' concept understanding.

Slameto (2013) mentioned that repetition which has the aim of strengthening students' learning outcomes can be done with practice questions. Through practice questions, it is hoped that students will be familiar with the concepts related to solving these problems. In line with this, the results of research done by Ratumanan (2016) showed that practice questions were useful in the learning process, because: 1) information can be stored longer in students' memory, 2) practice the skills and knowledge possessed that has been mastered more profoundly, 3) motivate students in learning, 4) strengthen students' learning outcomes, and 5) develop students' thinking skills in problem solving. In addition, the results of research done by Rindyana (2012) and Haryonik (2018) also stated that mathematics practice questions could stimulate students to practice mathematical problem solving competencies, strengthen students' learning outcomes, and train students in finding answers.

The importance of practice questions in learning mathematics was also recog-

nized by 15 mathematics teachers in Salatiga City and Semarang Regency. Teachers thought that giving practice questions in learning mathematics can deepen students' understanding of certain subject matter, can be used as repetition material of concepts and benchmarks for students' understanding of a subject matter, and can train students' skills and creativities in mathematical problem solving. The problem is, not every practice question is presented in an interesting way. The results of the survey of the teachers showed that 21,4% of respondents were not sure that the practice questions given had been presented in an interesting way and motivated students to solve the questions. The teachers thought that the practice questions were done because of the orders and taking grades by the teachers.

Hasyim (2012) stated that the intensity of giving practice questions greatly affects the improvement of students' learning outcomes. However, the implementation of practice questions that are not in accordance with the portion can possibly have a negative impact on students. Practicing the wrong questions can actually cause students to become bored. Setyowati (2016) and Rahmatin (2016) stated that some students thought that practicing mathematics questions is not interesting, difficult, and boring. Therefore, it is necessary to present interesting and not boring practice questions for students.

One way that can be done is to present practice questions using game media. According to Amir (2014), the use of game media or manipulative learning media to practice questions can be interesting, challenging, and increasing students' motivation to learn and understand the questions given. In line with that, Kirikkaya (2010) stated that games in learning are important because they can be warm-ups or refreshment and used for building a dy-

namic, passionate, and enthusiastic learning atmosphere. One strategy to present practice questions in the form of games is through various forms of board games. According to Afriansyah (2017), a board game is a game on a surface and a set of rules that can be modified in such a way as needed. Board game media needs to be developed because at this time many game developments contain cognitive aspects without paying attention to affective and psychomotor aspects, causing students to have high individualism (Andini & Yuniarta, 2018).

Research by Wahyuningsih (2020) stated that board game media can help students gain direct experience in the learning process, so they can overcome learning difficulties and improve students' learning outcomes. The results of a survey of 15 mathematics teachers produced data that all teachers agreed that board game could be used as a medium of practice questions, but 76,9% stated that they did not create and use it due to constraints and limitations of time, energy, and ability to make board game media.

One of the board games that have been developed and modified as a medium for practice questions is monopoly. This American game created and patented by Elizabeth Magie was originally called *The Landlord's Game*. The aim of the game is to dominate all the plots on the board through buying, renting and exchanging properties in a simplified economic system (Wicaksana, 2017). Monopoly can be used as a learning tool in various aspects (Evans & Hylton, 2008).

There are more than 300 monopoly editions in the world. Even in Indonesia, there is a national edition monopoly that covers regions in Indonesia. The rules of the monopoly game allow monopoly to be modified as a learning media, especially for practice questions. Modifications are usually carried out by modifying the rules,

namely the conditions for successfully solving problems before carrying out economic transactions from the monopoly.

Monopoly as a learning media has also been developed with different themes. Deviana (2018) developed monopoly with the theme *Wonderfull of Indonesia* where the plots in the monopoly are Indonesia's mainstay tourist attractions which stretch from Sabang to Merauke. There was also a monopoly that was developed by Prasetyo (2018) which was called *Monomath* with the theme *Cinta Indonesia* (love Indonesia), where each plot depicts Indonesian heroes. There was also Rahaju (2017) who made a monopoly in the form of a hexagon with the theme of Indonesia's wealth where each plot contained the characteristics of each province in Indonesia ranging from houses and traditional clothes and tourist attractions.

Based on these research, it is possible to modify the monopoly that elevates the local cultures of a region in Indonesia. Indonesia, a nation which has the motto *Bhinneka Tunggal Ika*, consists of 34 provinces, each of which has a rich culture. Therefore, the idea emerged to develop a monopoly that can be used as a medium of practicing mathematical questions and can also facilitate students to get to know the cultural richness in Central Java. This is in line with The Regulation of the Minister of Education and Culture of the Republic of Indonesia Number 81A (Peraturan Menteri Pendidikan dan Kebudayaan Republik Indonesia Nomor 81A) (2013) regarding to the Implementation of the Curriculum which states that the curriculum is developed in a diversified manner with the intention of enabling the adjustment of educational programs in educational units to the conditions and peculiarities of the potential that exists in the region as well as students. Local culture needs to be studied so that students can preserve regional potential and build bridges from generation

to generation (Nuraini, 2019). Yunian & Indriani (2017) stated that education can play a role in preserving local culture.

The creation of a monopoly media that elevates the cultural richness of Central Java is expected to help teachers in Central Java to be able to realize the process of practice questions with interesting activities, one of which is through a board game. Students can not only practice mathematical questions but also get to know more about regencies/cities in the province of Central Java, including the cultures of Central Java. This is in line with Andriani (2015) which stated that learning about local culture that is presented in an attractive way can create a sense of love for students for their local culture. In addition, the development of this monopoly is expected to inspire other researchers to develop a monopoly that elevates the culture of other regions in Indonesia. This is an effort to preserve culture while at the same time foster the love and pride of Indonesian students for the cultural richness that Indonesia has.

## METHOD

This research developed learning media to practice questions in the form of monopoly board games with the theme of Central Java. Although it was developed to practice unit conversion questions, this media could also be used for other materials by replacing existing questions.

This research belonged to the type of Research and Development (R&D) with the ADDIE development model consisting of five stages, namely Analysis, Design, Development, Implementation, and Evaluation.

The Analysis stage aimed to analyze the need for media development. The second stage, namely Design, aimed to design media and learning that would be carried out in research. The Development

stage aimed to realize the media from the design results at the design stage and media validation. The Implementation stage aimed to test the media and draw the results of each aspect to be achieved. The last stage, namely Evaluation, aimed to evaluate the results of using media.

This media was validated by elementary mathematics teachers in Salatiga City and Semarang Regency and had been tested on fifth grade students of SD Negeri Watugung 02 Semarang Regency.

The data collection method used was the documentation method to collect the data of the local culture of Central Java, the test method to measure students' understanding before and after using the media, and the questionnaire method to collect the data on the validity, practicality, and opinions of students.

The data in this research were analyzed quantitatively and qualitatively. The analysis of the validity and practicality of the media was carried out by processing the data of filling out the questionnaire, which was compiled with a *Likert scale*, namely according to the rules: 1) strongly agree, 2) agree, 3) undecided, 4) disagree, and 5) strongly disagree. The percentage of the results of the questionnaire data assessment was calculated using the formula written in equation 1.

$$P = \frac{T}{N} \times 100\% \dots \text{equation 1}$$

(*T* : total score obtained | *N* : maximum score)

The percentage of assessment results was categorized based on the criteria contained in Table 1. Media was said to be valid and practical if the percentage of the validation questionnaire was more than 69% or at least categorized as good and the percentage of practicality questionnaire was more than 69% or at least in the practical category.

Analysis of media effectiveness based on pretest and posttest data which

was tested statistically with SPSS. Data were tested for normality using *Kolmogorov-Smirnov* to determine the type of statistical test to be used. If the test of normality was fulfilled, the mean difference test for paired samples uses a parametric test, namely the *Paired T-test*. If the test of normality was not fulfilled, then use a non-parametric test using *Wilcoxon Signed Ranks*. The media was said to be effective if the results of the mean difference test between the pretest and posttest produced a significant value less than 0.05 with the posttest mean being higher than the pretest mean.

Table 1. Media Assessment Criteria

No	Interval	Categorization Criteria
1	$80\% < score \leq 100\%$	Very Good/ Very Practical
2	$60\% < score \leq 80\%$	Good/ Practical
3	$40\% < score \leq 60\%$	Fair/ Quite Practical
4	$21\% < score \leq 40\%$	Poor/ Less Practical
5	$score \leq 21\%$	Very Poor/ Impractical

(adapted from Arikunto, 2010:35)

## RESULTS AND DISCUSSIONS

### Result Research

The research results are described based on the five stages of ADDIE.

#### Analysis

The analysis stage carried out in this research is classified into two types, namely needs analysis to determine the form of learning media needed to practice mathematical questions and the scope of subject matter according to the curriculum and performance analysis to identify problems related to practice questions that occur in learning mathematics.

Based on the results of a survey of 15 mathematics teachers and 4 classroom teachers who teach mathematics at SD Negeri Watuagung 02, data is obtained that it was necessary to design practice

questions that can attract students' interest as well as presenting practice questions in the form of games. This is because the practice questions that have been used so far are drill questions or homework assignments by working on questions from books and questions prepared by teachers tend to force students to work, so that motivation does not grow within students to do it. This makes students bored and often not completed, or the last questions are filled arbitrarily. The drill process makes the gap between smart and less smart students wider. Most elementary school students know that their other friends have done a lot of questions and they are still few, students become intimidated and tend to give up and even disturb other friends so that they don't finish the practice questions.

Respondents agreed that practice questions could further motivate students and not make students intimidated if the practice questions were packaged in the form of games as well as games in the form of board game. Through these games, it is hoped that students will not only learn mathematics but also learn other aspects such as decision making, critical thinking in finding strategies to win matches and the possibility of increasing students' general knowledge. One of the knowledges that should be introduced to students is knowledge of local culture. This survey was conducted in Central Java, so the media developed is expected not only to practice questions but also to introduce the culture of Central Java.

The problem is the lack of time and ideas for teachers to design media. For example, the board game is deliberately designed for certain subject matter that may not be needed in the learning being carried out and has not been designed to introduce local culture.

Based on this identification, it can be concluded that there is a need for media



for practice questions that are packaged in the form of a games with a board game type that can be easily modified by the teacher to be used in other subject matter. The form of board games developed for learning media is monopoly. This is due to several considerations including: 1) elementary school students are familiar with the rules of the monopoly game, 2) monopoly games can train students to learn finances management, 3) there are various monopoly modifications that raise certain themes that can add insight, for example by modifying elements of the board game. such as the track and the complexes in it, modifying cards such as property cards, general fund cards, opportunity cards and pawn components, houses and hotels can also be adapted to the theme, 4) monopoly rules allow modification to include elements of practice questions.

### Design

This media is designed attractively and modified the components and rules of monopoly in general. Media tools that will be modified are game boards, property cards, general fund and opportunity cards, question cards, pawns, houses, and hotels as well as game rules that will be included in the media usage manual. The studies carried out have not modified the media by adding character education cards and question cards (*Pitakon Cards*) that are

flexible or can be used for various subjects.

The first step is to design the game board. The game board is adapted to the purpose of making media, which aims to increase students' insight into the culture of Central Java. So, the route used as a playing board is in the form of a map of Central Java. The complex in monopoly is based on residency in Central Java, namely Pekalongan Residency, Semarang Residency, Pati Residency, Surakarta Residency, Kedu Residency, and Banyumas Residency with a total of 6 cities and 29 regencies. The media board is made with a size of 72 cm x 48 cm with a design description as shown in Figure 1. The edges of the game board include Javanese proverbs that are advising students, for example: *urip iku urup* which means a useful life, *aja adigang, adigung, adiguna* which means don't be arrogant, relying on your strength, power, and intelligence and *ing ngarso sung tuladha, ing madya mangun karsa* which means in front of setting an example, in the middle building the will, in the behind giving encouragement. In addition, there are volcanoes and non-volcanoes in Central Java as a substitute for the plot of opportunity and general fund, and there is Nusakambangan Island as a substitute for the plot of going to prison. To make the game easier, there is a start sign and numbering that will show the game route.



Figure 1. Game Board



Figure 2. Character Education Cards

Cities and regencies will be distinguished in the process of taking question cards. If it stops at the city, then the player is asked to take a character education card. The character education cards use five guidelines of strengthening character education (*penguatan pendidikan karakter/ PPK*), namely religious, nationalist, independent, integrity, and cooperation. Character education cards contain pictures of an activity or situation, and students are asked to give their opinion about the picture. Each indicator is distinguished by a puppet image on the back of the card as shown in Figure 2.

If it stops at the regency, the player is asked to take a *pitakon* card containing questions regarding unit conversion. *Pitakon* cards are designed with various cognitive levels that are distinguished by the color of the card. The yellow card is a question with a Low Order Thinking Skill

(LOTS) cognitive level, the green card is a question with a Medium Order Thinking Skill (MOTS) cognitive level, and the red card is a question with a High Order Thinking Skill (HOTS) cognitive level. *Pitakon* cards are used to place question cards. These cards are designed complete with the logo of the related cities and regencies as well as the typical *batik* of the region. The back of the *pitakon* cards are given a picture of a puppet which is different for each residency. The question card will be inserted into the punched *pitakon* card, allowing the question card to be changed as shown in Figure 3.

The monopoly game has prison plot and general fund plots that includes gift cards and punishment cards. The prison symbol is replaced with the Nusa-kambangan island, so players who stop on the island are not allowed to play for 1 round. *Jateng Gayeng Media* replaces the



Figure 3. (a) The front side, (b) The Question Card on the Pitakon Card, (c) The back side



Figure 4. (a) Kabecikan Card, (b) Kaluputan Card

general fund and opportunity cards that are profitable with *Kabecikan* Cards which players will get when they stop at the non-volcanoes. The cards that are detrimental to the player are replaced with the *Kaluputan* Cards which the players will get when they stop at the volcanoes. These cards contain informative sentences about the culture of Central Java. The back side of the *Kabecikan* Card is equipped with a picture of the Wisnu puppet and the phrase 'becik ketitik ala ketara' which means that all good and evil deeds will be seen. The *Kaluputan* Card is equipped with a picture of the Dasamuka puppet and the phrase 'nyimpen primpren janganan wayu, tetep bakal mambu' which means that if hiding all evil deeds, it will be seen. The design of these two cards can be seen in Figure 4.

Monopoly games generally allow players who stop at each plot to buy that plot of land. Therefore, in the design of the property cards of city or regency in Central

Java, there are region rental prices, the prices of the purchase of a land, one house and one hotel. The front side of the property cards is also equipped with the pictures of the typical tourist attractions of each region and the slogan of the region. The back side of the card is equipped with a different puppet character for each residency as well as the motto of the region as shown in Figure 5.

For the game to run, supporting components are needed such as pawns, dice, houses, and hotels. In the *Jateng Gayeng* media, the pawns used are the *Pandawa 5* puppet characters consisting of *Yudhistira, Wrekudara, Arjuna, Nakula, and Sadewa*. The houses and hotels used in the game are replaced with *joglo* and *limasan*. The dice used are like dice in general, the media uses two dices. The supporting components are presented as shown in Figure 6.



Figure 5. Property Card





Figure 6. Supporting Components (Pawns, Dices, Joglo, and Limasan)

Each game requires instructions to prepare and run the game. In the *Jateng Gayeng* media, the manual contains not only the rules of the game but also a summary of the unit conversion subject matter, the meaning of the Central Java logo, and the meaning of the *gunungan* which is used as a symbol of the *Jateng Gayeng* media as shown in Figure 7.

Based on the criteria of a good learning media, it is necessary to pay attention to the media packaging model. *Jateng Gayeng* Media and its components are packaged in one box made of light wood.

Each component is put in its own pocket, so it does not mix with other components. *Jateng Gayeng* Media is packaged neatly and effectively so that it is easy to carry anywhere. The game board is made into a puzzle consisting of 6 parts and made of plywood. The packaging for *Jateng Gayeng* media is presented in Figure 8. The game board and card sets are designed using *Coreldraw X7 Graphic* software and highlight colors and images that are clear and attract attention, especially to elementary school students.

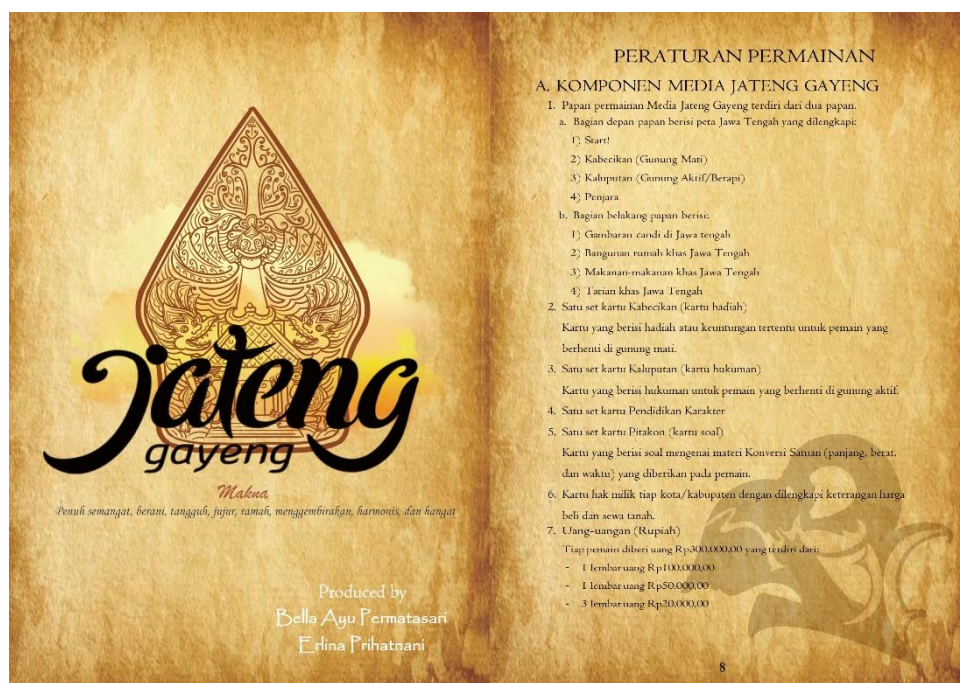


Figure 7. Manual



Figure 8. Packaging of *Jateng Gayeng* Media

### Development

Before conducting trials on research subjects, the feasibility of *Jateng Gayeng* media was measured by conducting validation. The validators consisted of 2 lecturers from Mathematics Education Study Program Faculty of Teacher Training and Education SWCU, 1 third grade teacher at SD Negeri Cebongan 03, 1 third grade teacher at SD Negeri Wonokerto, 1 fourth grade teacher at SD Negeri Watugung 02, 1 sixth grade teacher at SD Negeri Watugung 02, 1 fourth grade teacher at SD Negeri Plumutan, 1 fourth grade teacher at SD Negeri Bantal, 1 sixth grade teacher at SD Negeri Bantal, 1 fourth grade teacher at SD Negeri Boto 01, 1 fourth grade teacher at SD Negeri Jlumpang.

*Jateng Gayeng* media was validated by media experts and measured the suitability of the media with the selected subject matter. Validation was carried out in order to get criticisms and suggestions from the validators. Criticisms and suggestions would be a benchmark for improving the *Jateng Gayeng* media, as follows: 1) validator 1 provided suggestions, revised the unit conversion question cards size to be larger so that the questions included were not too small, 2) other validators stated that the media was ready to be used without revision. Based on criticism and suggestions, the media was revised by changing the size of the question cards to be larger. The initial question card has a size of (3,5 x 4,5) cm, after being revised, the size of the card is (4,2 x 5,2) cm.

### Implementation

The *Jateng Gayeng* media validity test was conducted in September 2020. The media validity test questionnaire was filled out by 2 lecturers from Mathematics Education Study Program Faculty of Teacher Training and Education SWCU and 9 elementary school teachers. The validation results are presented in Table 2.

Table 2. Media Validation Results

Assessment Aspects	Percentage	Category
Fit for Purpose	88,0%	Very Good
Supports Learning	89,0%	Very Good
Practical, Flexible, Durable	89,6%	Very Good
Cost	81,8%	Very Good
Usage/Access	90,7%	Very Good
Target Grouping Suitability	86,7%	Very Good
Technical Quality/Technology	92,9%	Very Good
Novelty	91,3%	Very Good
<b>Mean</b>	<b>88,8%</b>	<b>Very Good</b>

The percentage result for each aspect is more than 80% and categorized as very good. Based on the validation results, *Jateng Gayeng* media is valid with a mean percentage of 88,8% (very good).

*Jateng Gayeng* media was tested in November 2020 in class V SD Negeri Watugung 02. During the media trial, students were very enthusiastic to play while learning using *Jateng Gayeng* media. However, students were quite crowded, and the conditions were not conducive. To overcome this situation, the researchers took control of the game by holding the dice and supporting cards so that the

group did not throw the dice without orders and learning was effective again. Researchers tested the practicality of the media by filling out a questionnaire by the validator. The media practicality test was filled out by 1 lecturer from Mathematics Education Study Program Faculty of Teacher Training and Education SWCU and 9 elementary school teachers. The validation results are presented in Table 3.

**Table 3.** Practicality Test Validation Results

Assessment Aspects	Percentage	Category
Preparation	84%	Very Good
Usage	90,8%	Very Good
Storage and Maintenance	87,6%	Very Good
<b>Mean</b>	<b>87,4%</b>	<b>Very Good</b>

Based on the practicality test validation results from 3 aspects, a mean percentage obtained is 87,4% (very good), it can be concluded that the *Jateng Gayeng* media is said to be practical from every aspect with a very good category.

The media effectiveness test was carried out after the media trial on the subject. Learning outcomes were measured before and after using the *Jateng Gayeng* media. Before using the media, students were given a pretest. Then students were invited to learn and practice mathematical questions, especially unit conversion subject matter using the *Jateng Gayeng* media. After using the media students were asked to do a posttest. The pretest and posttest questions consisted of units of length, units of weight, and units of time, each of which there were 15 questions. The results of pretest and posttest were compared, and the results were obtained as shown in Table 4.

**Table 4.** Results of Pretest and Posttest Descriptive Statistics

	N	Min	Max	Mean	Std. Deviation
Pretest	14	0	93	35.21	25.901
Posttest	14	14	100	83.16	24.680
Valid N (listwise)	14				

Based on the results of pretest and posttest, it can be concluded that there is an increase in the score from the pretest to the posttest. In the pretest, the minimum score was 0 and the maximum score was 93 so that the mean score obtained was 35,21. While in the posttest, the minimum score was 14 and the maximum score was 100 so that the mean score obtained was 83,16. Researchers tested the effectiveness of the media in the population of elementary school students, then an inferential test was conducted. First, the test of normality was carried out. The results of the test of normality can be seen in Table 5.

**Table 5.** Results of the Test of Normality Tests of Normality

	Kolmogorov-Smirnov <sup>a</sup>		Shapiro-Wilk	
	Statistic	df	Statistic	df
Pretest	.170	14	.200*	14
Posttest	.296	14	.002	14

a. Lilliefors Significance Correction

Based on the results of the test of normality, the significance value of the pretest is 0.200 (>0.05). This means that the pretest results come from a normally distributed population. While the written significance value of the post-test is 0.002 (<0.05). This means that the posttest results do not come from a normally distributed population. Therefore, the test that will be used next was a non-parametric test for related data, namely *Wilcoxon Signed Ranks*. The test results can be seen in Table 6.

**Table 6.** Results of *Wilcoxon Signed Ranks Test*

Ranks			
	N	Mean Rank	Sum of Ranks
Negative Ranks	0 <sup>a</sup>	.00	.00
Posttest - Positive Ranks	13 <sup>b</sup>	7.00	91.00
Pretest Ties	1 <sup>c</sup>		
Total	14		

a. Posttest &lt; Pretest

b. Posttest &gt; Pretest

c. Posttest = Pretest

Test Statistica	
	Posttest - Pretest
Z	-3.192 <sup>b</sup>
Asymp. Sig. (2-tailed)	.001

a. Wilcoxon Signed Ranks Test

b. Based on negative ranks.

Based on Table 6 on the negative ranks, posttest – pretest < 0 as much as 0 samples. This means that there are no students whose initial score is better than the final score. In positive ranks, posttest – pretest > 0 as much as 13 samples. This means that there are 13 samples whose final score increases from the initial score. In ties, posttest – pretest = 0 as much as 1 sample. This means that there is 1 sample whose initial score is the same as the final score. The written significance is 0.001 which means less than 0.05. Therefore, it can be concluded that the posttest score is significantly better or higher than the pretest score. Based on the test results, it can be concluded that the *Jateng Gayeng* media is effectively used as a media for practicing mathematical questions, especially unit conversion subject matter. Qualitative data on students' opinions regarding learning media using *Jateng Gayeng* media are presented in Table 7.

**Table 7.** Results of Students' Opinions

Assessment Aspects	Percentage	Category
Easy to understand	89,2%	Very Practical
Easy use	89,2%	Very Practical
Fun and challenging	94,6%	Very Practical
Means of playing while learning	89,2%	Very Practical
Understanding the subject matter	83,9%	Very Practical
<b>Mean</b>	<b>89,2%</b>	<b>Very Practical</b>

Based on the opinion of the fifth-grade students of SD Negeri Watuagung 02, which amounted to 14 students, each aspect of their opinion stated that the *Jateng Gayeng* media was categorized as very practical with a mean percentage of 89,2%. Therefore, it can be concluded that the students' response to the *Jateng Gayeng* media was very well used during the mathematics learning process to practice questions.

### Evaluation

Based on the test carried out, the *Jateng Gayeng* media is declared valid, practical, and effectively used to practice mathematical questions, especially unit conversion subject matter. Media has several advantages, namely students were very interested and challenged to play without leaving the initial goal of using media as a means of practicing unit conversion questions. When the media trial was conducted, students also learned about the culture of Central Java such as typical food, tourist attractions, to certain regional traditional ceremonies. Learning about culture was given through pictures and things listed on the *Jateng Gayeng* media component.

However, the weakness of this media is that it creates conditions that are not conducive at the beginning of learning because students are very enthusiastic about using the media. Media is also limited because it does not allow students to borrow it or used it as a means of practicing questions at home. The cultural elements listed in the media are based on the official website of the city/regency but have not been officially validated by the city and regency in Central Java.

### Discussions

The results shows that the media validation test resulted in a mean percentage of



88,8% (very good) and the media practicality test resulted in a mean percentage of 87,4% (very practical). The *Wilcoxon Signed Ranks* test yields a significant value of 0.001 which is less than 0.05 with the posttest mean score (83.16) higher than the pretest mean score (35.21). This means that the posttest score is significantly better than the pretest score. In addition, 89% of students give a positive response to the use of *Jateng Gayeng* media in learning mathematics. From the results of pretest and posttest, it means that the *Jateng Gayeng* media is effective for students to use. Based on the results of the percentage of research and development that has been carried out, it can be concluded that the Central Java Gayeng media is valid, practical, and effective to be used as a media for practice questions on unit conversion subject matter in Elementary Schools.

*Jateng Gayeng* media can also develop a sense of love for culture, especially the local culture of Central Java, which is marked by students' interest in visiting certain regional tourist attractions, interest in learning how to play gamelan, to imitating dance movements that are included in the media component. Yuniawan (2014) stated that being interested in something can trigger a sense of love for that thing itself. Students also shows pride in the Central Java culture by telling interesting experiences when visiting tourist attractions in various regions in Central Java. The use of local cultural contexts has been researched quite a lot and it shows that the use of local contexts helped students to learn (Lisnani et al, 2020, Pratiwi and Pujiastuti, 2020).

## CONCLUSIONS

This research has proven that the development and use of *Jateng Gayeng* media has a positive impact on the achievement

of students' learning outcomes and a sense of love for culture. Therefore, it is recommended for teachers to use the *Jateng Gayeng* media for practice questions both on unit conversion subject matter or on other subject matters. This is possible because the question card model in the *Jateng Gayeng* monopoly can be disassembled (replaced with another question). It is hoped that other researchers can develop monopoly-based learning media with the theme of local culture in other provinces or specialize in certain cities/regencies. Thus, more students will be facilitated to practice questions while getting to know the local culture of the region where they live.

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