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Development of Monopoly Smart Games (MSG) Learning Media in Algebra Material for Grade VII of SMPN 92 Jakarta

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ABSTRACT
A widely applied branch of mathematics is algebra as an essential part of underlying mathematics, using numbers, symbols or letters to solve problems. Based on the results of a survey conducted by researchers, we found that a difficult subject in mathematics is algebra. In line with the survey conducted by student researchers, students need a monopoly learning medium to support learning. Monopoly games have been modified as learning media capable of evoking new desires and interests and motivating students to learn. The research method used is a method of research and development (R&D) with ADDIE development research procedures where R&D research is used to develop specific products. Based on the results and research discussions it was concluded that the Monopoly Smart Games (MSG) learning medium in algebraic class VII materials can be used as an alternative medium for learning students that can be used whenever students need to. All aspects of the media can be used properly, the layout and color settings of the media are appropriate. This is in accordance with the results of validation with two expert tests, namely material expert 84.34% and media expert 93.7%. Then, the results of the students' response were 94.98%. Students claim that the media is interesting, fun and easy to understand.

ABSTRAK
Cabang ilmu matematika yang banyak diterapkan secara luas yaitu aljabar sebagai bagian esensial dari matematika yang mendasar, menggunakan angka, simbol atau huruf untuk memecahkan masalah. Permainan monopoli telah dimodifikasi sebagai media pembelajaran yang mampu membangkitkan keinginan dan minat baru serta memotivasi siswa untuk belajar. Metode penelitian yang digunakan adalah metode penelitian dan pengembangan (R&D) dengan prosedur penelitian pengembangan ADDIE dimana ini penelitian R&D digunakan untuk mengembangkan menghasilkan produk tertentu. Berdasarkan hasil dan pembahasan penelitian disimpulkan bahwa media pembelajaran Monopoly Smart Games (MSG) dalam materi aljabar kelas VII dapat dijadikan sebagai media alternatif belajar siswa yang dapat digunakan kapan saja siswa memerlukan. Keseluruhan aspek pada media dapat digunakan dengan baik sebagaimana mestinya, tata letak dan pengaturan warna pada media sudah tepat. Hal tersebut sesuai dengan hasil validasi dengan dua uji ahli, yaitu ahli materi 84,34% dan ahli media 93,7%. Lalu, hasil respon peserta didik 94,98%. Siswa/i menyatakan bahwa media menarik, seru dan mudah dimengerti.

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KEYWORDS
Aljabar. Ilmu Matematika, R&D.

INTRODUCTION

Education is a conscious effort by humans to develop and advance the dignity and character of humans as a whole to become better (Ministry of Education and Culture, 2016). Education aims to make humans smarter and change their attitudes, values, understanding, and knowledge. Education can also develop spiritual, physical, mental, and cognitive aspects effectively, not just one or more aspects (Yusuf, 2015).

Currently, educational demands in the 21st century are undergoing changes from before (Wijaya et al., 2016). This is reflected in more collaborative and innovative learning. One of the efforts to meet the demands of 21st century education is that teachers must have the skills to create learning environments, learning models, learning strategies, and so on. This is done so that teachers can improve students' understanding and learning outcomes (Rustaman, 2015). In addition, teachers know how to create something more interesting to support the teaching and learning process.

Mathematics is a compulsory subject for students at every level of education, from elementary school to college

(Sulistyaningrum, Karyanto & Sunarno). This shows that mathematics plays an important role in the world of technology and education (Syahrir & Susilawati, 2015). In contrast to the important role of mathematics, students actually consider mathematics to be a difficult subject (Nurwani, Rizki Wahyu Yunian Putra, Ferdio Ganda Putra, 2017). This is evidenced by the results of the 2018 PISA survey released by the Organisation for Economic Cooperation and Development (OECD), which shows that the average mathematics score reached 379, with the OECD average score being 487 (Kemdikbud web administrator, 2019).

A branch of mathematics that is widely applied is algebra, which is an essential part of basic mathematics, using numbers, symbols, or letters to solve problems. This makes it difficult for students to understand certain problems. Supported by research conducted by Nurlela Nugraha et al., which states that students' learning difficulties can be seen from four mistakes in solving algebra problems, namely a lack of understanding of positive and negative operations, a lack of understanding of reading questions, errors in calculation, and the use of incorrect processes.

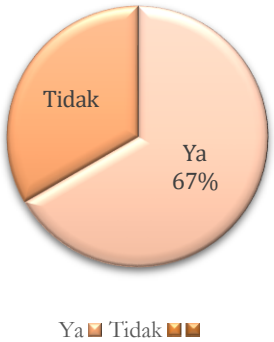


Figure 1. Students' difficulties in mathematics Source: Researcher data

Based on the results of a survey conducted by researchers, it was found that 67% of eighth-grade students consider mathematics to be a difficult subject, especially algebra, with a percentage of 33%.

Mardia and Andi (2017) stated that learning success can be influenced by several factors, including the use of learning media that can be used as a container, mediator, and unifier of learning messages. Appropriate and targeted media can enhance students' learning experiences and inspire them to learn. One learning environment that can engage students in learning is learning media in the form of games (Agustiya et al, 2017).

One form of learning media in the form of a game is Monopoly. The Monopoly game has been modified as an active and enjoyable learning medium that motivates students to learn. Several studies have even developed Monopoly media for junior high school learning. For example, research by Fajar and Prihatnani (2018) developed a mathematics learning Monopoly game on linear equations, Ramadhani (2016) on optical instruments, and Firdaus (2015) on the digestive system. Among the various monopoly media that have been developed, there are several similarities, including a complex set of fields arranged on a square game board with question cards and individual answer keys.

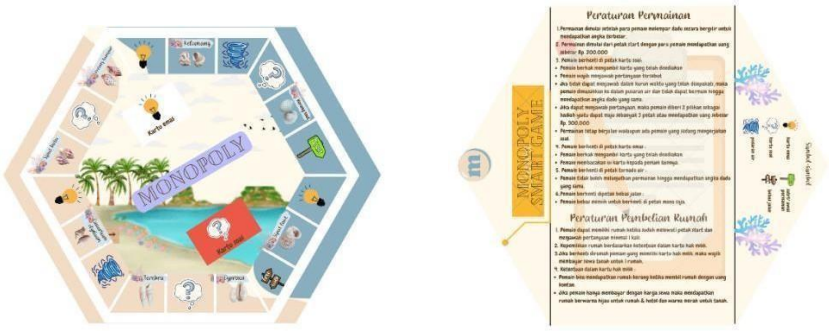
Monopoly media is one of the most enjoyable learning media. This monopoly game is adapted to the circumstances and conditions of students who still want to play in their daily lives. The characteristics of secondary school students are basically still fond of playing while learning (Ulfaeni et al., 2017). Playing while learning makes learning tasks more interesting and the learning atmosphere more enjoyable. This Monopoly media is able to arouse new desires and interests and motivate students to learn in such a way that their learning outcomes also improve. Students also enjoy using Monopoly media, creating a more enjoyable and meaningful learning environment. Therefore, the researcher was interested in conducting "Development of Monopoly Learning Media in Algebra Material for Grade VII at SMPN 92 Jakarta".

METHODS

The research method used is the research and development (R&D) method, whereby R&D research is used to develop specific products. According to Sugiyono's method (2013), Research and Development is a research method used to produce specific products and test their effectiveness. Before a specific product is produced, scientists must first analyze the problem so that the resulting product is suitable for the problem and then test the effectiveness of the product.

RESULTS AND DISCUSSIONS

The product design was developed based on the Basic Mathematics Competency (KD) indicators found in algebra materials. The topics presented were then guided by modules adapted from the subjects applicable to the independent curriculum. The use of a monopoly-style design was inspired by a beach theme, using shells as the main model. MSG has a concept consisting of gold cards, question cards, and is equipped with property cards and money. The gold cards contain information about algebra and the sea. The question cards contain questions about how to simplify algebraic forms and solve algebraic calculations.



a b

Figure 2. Product footage, a) Product front view, b) Product back view.

The needs analysis in this study was conducted by analyzing the needs of 75 eighth and ninth grade students at public junior high schools in East Jakarta. A total of 52% of students felt that they had difficulty learning algebra. In addition, 69.3% of students stated that they needed new learning media. MSG is a physical learning medium in the form of a monopoly game that uses cards to provide information.

The product was developed and then validated by two expert validators for feasibility and suggestions for improvement. The summary of the scores from the two expert validators is as follows:

Table 1. Product eligibility criteria

No	*Validator*	*Hasil Skor*
1	*Ahli Materi*	84,34%
2	*Ahli Media*	93,57%
	Total Skor	177,91%
	Rata-rata	89%

After the media development stage, implementation was carried out by testing seventh grade students at SMP Negeri 92 Jakarta. These students were respondents from the needs analysis conducted at the beginning of the study. In the first stage, students were directed to download the application that had been sent through their class group messages. Next, the students read the circle material on the media. Then, the students tried the educational game facilities, namely "Question Cards" and "Gold Cards". Then, the students were directed to fill out a student response questionnaire via Google Forms. The results of the student responses were analyzed based on the following aspects:

Table 2. Product eligibility by students respone

No	*Validator*	*Hasil Skor*
1	*Kemenarikan Visual*	96,6%
2	*Kepraktisan Media*	92,42%
3	*Keterbacaan Media*	94,9%
4	*Kesiapan Media*	96%
	Total Skor	379,92%
	Rata-rata	94,98%

CONCLUSIONS

Based on the results and discussion of the research described in the previous chapter, the conclusion is that the development of Monopoly Smart Games (MSG) learning media in the 7th grade algebra material at SMPN 92 Jakarta can be used as an alternative learning medium for students whenever they need it. All aspects of the media can be used properly as intended, and the layout and color scheme of the media are appropriate. This is in line with the validation results from two expert tests, namely 84.34% for subject matter experts and 93.7% for media experts. Furthermore, the student response rate was 94.98%. The students stated that the media was interesting, exciting, and easy to understand.

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