Development of Game Case Media to Increase Students' Interest in Learning Mathematics

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Abstract
Development research aims to develop game case media in order to increase student interest in the problem-solving-based mathematics learning process during the covid-19 pandemic. The method used is R & D (Research and Development) with the ADDIE model. The research instrument used was a validation sheet and a questionnaire sheet. The data analysis used is descriptive quantitative to process data in the form of scores from validator assessments and student responses and uses purposive sampling technique in taking samples. The validation results obtained a score of 4 for the assessment of the material aspect which was categorized as good and a score of 4.56 for the assessment of the material aspect which was categorized as very good. Based on the validation results, the game case learning media can be tested in the implementation phase. Based on the results of the student response questionnaire obtained 75.25%. This resulted in learning media in the form of game cases to be well received. These results indicate that this game case media can be developed in order to increase students' interest in learning in the problem-solving-based mathematics learning process during the covid-19 pandemic.
Keywords: Game; Learning media; Pandemic covid-19

INTRODUCTION

Education is a tool used to prepare a new generation for the challenges of the next era. According to Harta (2017), education also seeks to create quality human beings. Advance the nation can do with an education that is the transfer of knowledge and character formation of human resources in order to increase (Musanna, 2017). Teachers seek to optimize education for students in order to create quality education. One of the efforts made is to develop learning media to attract interest and improve student learning outcomes. Learning media can be used as an evaluation tool or used during learning (Seftiani, 2019).

Mathematics learning can be regarded as learning that requires a lot of innovation so that its implementation is more effective (Nugroho et al., 2017). This happens because teachers need students' interest to participate in learning activities (Suryani & Lestari, 2019). A fun learning process can increase student interest and be able to develop students' creativity (Mustaqim & Kurniawan, 2017). Therefore, teachers play an important role in the learning process in order to create interesting learning so as to increase student interest in learning.

In mid-March 2020, the government appealed to all schools to study from home. Learning from home during the pandemic has many obstacles (Prawanti &

Sumarni, 2020). Not only students who feel burdened in distance learning but teachers also have a big task in implementing the learning process (Basar, 2021). Teachers need to develop themselves and their abilities so that learning can be carried out properly. One of them is by developing learning media. Learning media is needed to support success in learning because it can foster student interest in learning (Nurrita, 2018). Seen from its function, learning media can be used to motivate students to make it easier for them to understand the subject matter and increase students' interest in learning (Sanjaya, 2014).

Based on the results of observations made at SMAN 5 Mataram, several problems were found, one of which was the lack of student interest in the learning process during the pandemic. Constraints experienced by students such as feeling bored in learning because it is done only through virtual, they feel they do not understand the material presented by the teacher. In addition, students also do not understand problem-solving-based learning because learning is not optimal. Based on research conducted by Rigianti (2020), the results of the obstacles experienced during online learning were learning applications, internet networks, learning management, assessment, and supervision. Based on the research of Huzaimah & Risma (2021), the results show that the obstacles in online learning are internet facilities and networks. In addition, teachers are required to be more creative in the learning process so as not to cause boredom or laziness. Research conducted by Kunanti (2020) results that by applying pop up book learning media during home learning can improve student social studies learning outcomes. Therefore, based on observations made and previous research, the researcher will develop a game case media to increase student interest in the problem-solving-based mathematics learning process during the covid-19 pandemic.

RESEARCH METHOD
The research method used is the development of R & D (Research and Development) with the ADDIE model. The ADDIE model consists of the analysis stage, design stage, development stage, implementation stage, and evaluate stage. The first stage is analysis. At this stage, it is done by looking at the problems that arise in learning. Next is the design stage, where the researcher creates a framework for learning media that will be carried out at the development stage. At this stage the researcher also makes research instruments, making questions in game cases. In the third stage, namely development, researchers will make game case learning media. The media created are conventional media designed with the Canva application. Next, the media game case is submitted to the validator for design assessment and content assessment. Then the implementation stage is an important stage because it is to determine the feasibility of the media to be used. After being declared valid by the validator, the game case was tested on class X and XI students. Then the students filled out a response questionnaire to the learning media that had been used. The last stage is evaluate, in this stage the researcher can make improvements suggested by the validator. Media that has been validated and used can be evaluated to find out its shortcomings. Improvements are made so that the game case media is better for use in the learning process.

The subjects of this study were students of class X and XI SMA. Sampling using purposive sampling technique. Data collection techniques were carried out using a questionnaire. The instruments used were validation sheets and student response questionnaires. Validation sheets are given to media validators and content validators to be tested for feasibility. While the response questionnaire sheet was given to students to see student responses after using the game case media. The data analysis technique used is descriptive quantitative to process data in the form of scores from the validator's assessment and student responses.

The criteria for the validity of learning media are as follows:

Table 1. Validity Interval

Average score ($\bar{x}$)	Classification	Conclusion
$(\bar{x}) > 4,2$	Very good	Can be used as an example
$3,4 < (\bar{x}) \leq 4,2$	Well	Can be used without repair
$2,6 < (\bar{x}) \leq 3,4$	Enough	Usable with minor improvements
$1,8 < (\bar{x}) \leq 2,6$	Not enough	Usable with many improvements
$(\bar{x}) > 1,8$	Very less	Can't be used yet

(Nugroho et al., 2017)

The criteria for the results of the questionnaire using the Likert scale are as follows:

Table 2. Score Interpretation Criteria

Classification	Percentage
0 % - 20%	Very weak
21% - 40%	Weak
41% - 60%	Enough
61% - 81%	Strong
81% - 100%	Very strong

(Riduwan, 2011)

RESULTS AND DISCUSSION

This development research will produce game cases on 3 materials, namely absolute value equations and inequalities, linear programming and a system of three-variable linear equations. The development carried out using the ADDIE model consists of the analysis stage, design stage, development stage, implementation stage and evaluate stage.

At the initial stage, namely analyzing needs during learning through wa groups and zoom. Students feel bored when learning through virtual only. According to some students, online learning results in them feeling tired to look at the screen continuously. A teacher also argues that many media are ICT-based and easier for students to reach. However, this causes children to be addicted to cellphone or PC screens. Distance learning also causes students' interest in learning to decrease. So that conventional-based learning media can be used to increase student interest in learning and reduce online activities. Then the researcher wants to develop problem-solving-based case game learning media in order to increase students' interest in learning.

The next stage is design. After analyzing the needs of students and teachers in learning during the pandemic, the researchers prepared the design of learning

media in the form of a game case. The researcher took three cases, where case 1 was intended for class X and case 2 and case 3 was intended for class XI. The first case discusses absolute value equations and inequalities, the second case discusses linear programming material, and the third case discusses the material of a three-variable system of linear equations. Then do the design of stories and questions related to these materials. The stories chosen are in accordance with everyday life to make it easier for students to complete them. In addition, researchers also determine the design that will be used in the game case. At this stage, a questionnaire framework for student responses to learning media in the form of game cases was also made.

In the development stage, researchers create and develop ideas that already exist at the design stage. Researchers began to compose stories and questions in the game case. Then the design of the game case is made using the Canva application. The main display design and the theme used uses bright colors to arouse students' enthusiasm and interest in solving problems in the game case. Game cases that have been made can be validated by several validators. The aspects assessed are the design aspects of the game cases and the material aspects of the game cases. In addition, the researcher developed a questionnaire framework for student responses to game cases that had previously been carried out at the design stage.

The results of the validation by the validator for the game case media are as follows:

Table 3. Media and Material Validation Results

	Media Validation		Material Validation	
	Validator 1	Validator 2	Validator 1	Validator 2
Results	4	4	4,56	4,56
Average yield	4		4,56	
	Good	Good	Very Good	Very Good

Based on the table above, it can be seen that the average result for the media assessment is 4 and the material assessment is 4.56. In accordance with the criteria in table 1, the media assessment is categorized as good and the material assessment is categorized as very good. So that the media can be used for testing at the implementation stage.

In the fourth stage, namely implementation, researchers tested the media that had been made and assessed by the validator to the students of class X and XI. Students were selected through purposive sampling technique. The trial was conducted to see the student's response to the development of media in the form of a game case. When the trial was conducted students were given a response questionnaire to assess the game case media. The following are the results of the student response questionnaire analysis:

Table 4. Results of Student Response Questionnaire Analysis

Respondent	Average Score
1	3,1
2	3
3	3,1
4	3,3
5	2,9
6	3
7	2,8
8	3
9	3
10	2,9
Jumlah	30,1
Rata-rata	0,7525

Based on table 4, it is known that the average result of the student response questionnaire analysis is 0.7525 or 75.25%. In accordance with table 2, it can be concluded that students' responses to learning media in the form of game cases are included in the strong category or can be said to be good. These results indicate that this game case media can increase students' interest in learning.

The last stage is evaluation. At this stage it is very important to do so that researchers know the feasibility of the media after the trial is carried out. In addition, improvements are needed from validators and student responses so that learning media can be used in the learning process. The following is a display of the learning media in the form of a game case.
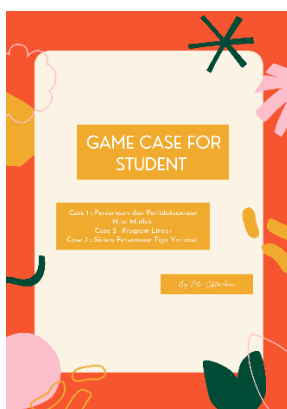
Pictures 1. Main View

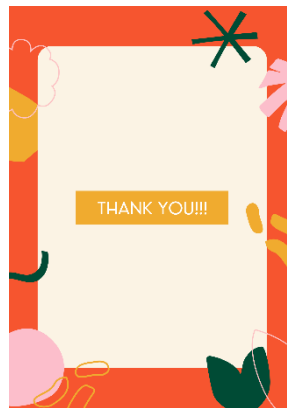**Pictures 2.** *Rule of Game*

Pictures 3. *Case* **1a**

Pictures 4. *Case* **1b**

Pictures 5. *Case* **2**

Pictures 6. *Case* **3**

Pictures 7. Final View

The main view of the game case contains the title, material for each case, and the creator of the game. In pictures 2 contains the game rules of the game case. Then case 1a and 1b are the first case of the game case which contains absolute value equations and inequalities. Furthermore, pictures 5 is the second case which contains linear programming material. In pictures 6 contains the third case with the material of a three-variable system of linear equations. The final display contains a thank you note as in pictures 7.

In line with the research conducted by Hartanti (2019), learning using the Kahoot application can increase students' learning motivation. Factors that make students interested in the kahoot application learning media and game cases are because they are game-based. Learning by using games will give the impression of playing and having fun. However, the difference between these two games is that the kahoot game can be used as an evaluation tool in learning while the game case is not used as an evaluation tool. Game cases can be used as an evaluation tool if the problem solved covers the entire selected material.

CONCLUSION

The development of learning media in the form of game cases has met the good criteria to be tested in the implementation phase. Obtained an assessment for the media aspect with a score of 4 which is categorized as good and for the assessment of the material aspect a score of 4.56 is included in the very good

category. After distributing student response questionnaires to the development of learning media in the form of game cases, the percentage obtained is 75.25% which is categorized as strong or equivalent to good category. These results indicate that this game case media can be developed in order to increase student interest in the problem-solving-based mathematics learning process during the covid-19 pandemic.

REFERENCES

Basar, A. M. (2021). Problematika Pembelajaran Jarak Jauh Pada Masa Pandemi Covid-19. *Edunesia : Jurnal Ilmiah Pendidikan*, *2*(1), 208–218. https://doi.org/10.51276/edu.v2i1.112

Harta, I. K. (2017). Pengembangan Prototipe Egg Boiler Sebagai Media Pembelajaran Prakarya Dan Kewirausahaan Untuk Materi Teknologi Tepat Guna Kelas Xi Mia Sma Negeri 4 Singaraja Tahun Ajaran 2016/2017. *Jurnal Pendidikan Teknologi Dan Kejuruan*, *14*(2), 178–187. https://doi.org/10.23887/jptk-undiksha.v14i2.11104

Hartanti, D. (2019). *PEMBELAJARAN INTERAKTIF GAME KAHOOT BERBASIS IMPROVING STUDENT LEARNING MOTIVATION WITH INTERACTIVE LEARNING MEDIA OF HYPERMEDIA-BASED GAME. September*, 78–85.

Huzaimah, P. Z., & Risma, A. (2021). Hambatan yang Dialami Siswa Dalam Pembelajaran Daring Matematika Pada Masa Pandemi COVID-19. *Jurnal Cendekia: Jurnal Pendidikan Matematika*, *05*(01), 533–541.

Kunanti, E. S. (2020). Penerapan Media Pembelajaran Pop Up Book Di Masa Belajar Dari Rumah. *Didaktis 5: Proseding Seminar Nasional Pendidikan Dasar 2020*.

Musanna, A. (2017). Indigenerasi Pendidkan : Rasionalitas Revitalisasi Praksis Pendidikan Ki Hadjar Dewantara. *Jurnal Pendidikan Dan Kebudayaan*, *2*, 117–133.

Mustaqim, I., & Kurniawan, N. (2017). Pengembangan Media Pembelajaran Berbasis Augmented Reality. *Jurnal Edukasi Elektro*, *1*(1), 36–48. https://doi.org/10.24252/lp.2018v21n1i6

Nugroho, A. A., Putra, R. W. Y., Putra, F. G., & Syazali, M. (2017). Pengembangan Blog Sebagai Media Pembelajaran Matematika. *Al-Jabar : Jurnal Pendidikan Matematika*, *8*(2), 197. https://doi.org/10.24042/ajpm.v8i2.2028

Nurrita, T. (2018). Pengembangan Media Pembelajaran untuk Meningkatkan Hasil Belajar Siswa. *Misykat*, *03*(01), 171–187. https://doi.org/10.1088/1742-6596/1321/2/022099

Prawanti, L. T., & Sumarni, W. (2020). Kendala Pembelajaran Daring Selama Pandemic Covid-19. *Prosiding Seminar Nasional Pascasarjana UNNES*, 286–291.

Riduwan. (2011). *Belajar Mudah Penelitia untuk Guru-Karyawan dan Peneliti Pemula*. Alfabeta.

Rigianti, H. A. (2020). KENDALA PEMBELAJARAN DARING GURU SEKOLAH DASAR DI KABUPATEN BANJARNEGARA. *Elementary School*, *7*(2), 297–302. https://online210.psych.wisc.edu/wp-content/uploads/PSY-210_Unit_Materials/PSY-210_Unit01_Materials/Frost_Blog_2020.pdf%0Ahttps://www.economist.co

m/special-report/2020/02/06/china-is-making-substantial-investment-in-ports-and-pipelines-worldwide%0Ahttp://www.

Sanjaya, W. (2014). *Media Komunikasi Pembelajaran*. Kencana Prenada Media Group.

Seftiani, I. (2019). Alat Evaluasi Pembelajaran Interaktif Kahoot pada Mata Pelajaran Bahasa Indonesia di Era Revolusi Industri 4 . 0. *Prosiding Seminar Nasional Bulan Bahasa (Semiba) 2019*, 284–291.

Suryani, D. R., & Lestari, N. (2019). Penggunaan Variasi Media Pembelajaran Untuk Meningkatkan Motivasi Dan Minat Belajar Matematika Siswa Kelas Xi Ips 3 Sma Negeri 2 Merauke. *Musamus Journal of Mathematics Education*, *1*(2), 74–79. https://doi.org/10.35724/mjme.v1i2.1376