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OPEN ACCESS

Indonesian Journal of Elearning and Multimedia

ISSN: 2830-2885

Vol 2 No 2 2023 (66-72)

Analysis of the Needs for Development of Kahoot Game-Based Learning Media

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Abstract

The use of technology in learning by using IT advances is intended to make learning activities more effective, one of which is the use of Kahoot media. This study aims to analyze the development of Kahoot game-based learning media so that it can increase student motivation and learning outcomes. The research data was taken from informatics teachers and class VII students at SMPN 2 Bengkulu Selatan. The data analysis technique used is qualitative and quantitative sequentially. Data collection techniques used are questionnaires and written tests. The development model used is 4D, consisting of 4 main stages, namely define, design, development, and disseminate. In this study, the questionnaire respondents consisted of 32 students and 2 Informatics teachers at SMPN 2 Bengkulu Selatan. The data distributed is in the form of the feasibility of the content of the material which is validated by material experts 83% "valid", evaluation experts 81% "valid". Furthermore, the test results obtained an average pretest score of 45.2 students and a student posttest of 87.2 where there was an increase in value of 42%. Finally, the assessment of student responses to the use of Kahoot obtained a percentage of 93% "very good". So it can be concluded that the Kahoot game media can increase student motivation and learning outcomes.

Keywords: *Kahoot, Learning Media, Motivation And Learning Outcomes*

A. Introduction

In Industry 4.0, many things are done by humans by utilizing technology. The industrial revolution 4.0 has also encouraged technological innovations that have a fundamental impact on people's lives. The digital revolution and the era of technological disruption are other terms for industry 4.0. It is called the digital revolution because of the proliferation of computers and the automation of records in all fields. Industry 4.0 is said to be an era of technological disruption because automation and connectivity in a field will make the movement of the industrial world and job competition non-linear [1].The increasingly sophisticated technology today brings major changes to the world. One form of technology that is widely used today is the use of gadgets. For example, in the past, people had to go to a store or market to shop, shop owners hired employees to take care of the warehouse, and even buyers had to bring cash to pay. Now, people can shop from home, they don't have to go anywhere even though there are no peddlers coming. The world's technological advances greatly affect the design and implementation of education in the future.

Technology in education is used as an intermediary to achieve learning goals. The existence of the internet network allows us to be able to learn anywhere and anytime with a very broad scope. For example, email facilities, chat, e-books, e-libraries and so forth. The government should have given more serious attention and effort. However, in the implementation of education itself is still not utilized optimally. In Indonesia itself, the education system has undergone many changes in recent years. The government has made various efforts to improve access to and quality of education in Indonesia, but problems related to education still occur.

These problems are not only structural in nature, but also include aspects of the quality and accessibility of education. Among them: (1) educational accessibility gap. There are still many people in Indonesia who do not have access to proper education. This is especially the case in rural and remote areas, which lack adequate educational facilities and infrastructure, for example the use of the internet (2) inadequate quality of education. Children who are lazy to learn and low morale and student behavior.

In the informatics subject that the author teaches, this is also often found in the author's school. Sometimes too, when given paper assignments some of them just copy and paste their assignments because they might think they don't need to bother looking for material from the internet because everything is available on Google and copy and paste the work of other people which makes students lazy to try and study. Not infrequently today's students become indifferent to the lessons and assignments given by the teacher at school. Then the lack of student activity in the teaching and learning process students tend to be passive in class so that the low value of student learning outcomes. Based on the problem identification, data collection can be carried out using a qualitative approach with data collection techniques through interviews and observation.

Then, to increase the accessibility of education, the government should expand the reach of education to remote areas and provide adequate educational facilities in these areas. In terms of quality, teachers should also use a variety of student-centered learning methods or models, for example using learning applications such as Kahoot. In line with this, the success of a country in facing the industrial revolution 4.0 is also determined by the quality of educators such as teachers [2]. With technology, learning can be packed with educational games so students don't feel bored in class. Moreover, these learning applications are also related to informatics subjects.Through learning that uses information technology students will be interested in learning [3].

Kahoot has advantages including being able to make the class atmosphere more fun, children are trained in their motor skills in operating the Kahoot. Simulation-based educational games are designed to simulate existing problems in order to obtain essence or knowledge that can be used to solve these problems [4].

Previous research was conducted by Setiawati which aims to determine the effect of using the Kahoot educational game, the research results show that Kahoot! able to improve student learning outcomes, but there are drawbacks, namely the display of questions in Kahoot! only equipped with pictures, different from the appearance of the Kahoot! which was developed by the researcher, which has been equipped with pictures inside [5].

The use of Kahoot is typically used for formative assessment, to monitor each student's progress towards learning objectives, identify strengths and weaknesses, and to identify areas where students would benefit from more than one lesson, more challenging learning opportunities, or a review of basic knowledge, More experienced users also integrate Kahoot into their curriculum to introduce new topics, improve retention of new facts, revise before exams, challenge classes worldwide, survey opinions, gather insights, facilitate discussion, or to reward and re-energize students in Study [6].

B. Method

Data analysis techniques in this study used qualitative and quantitative analysis techniques sequentially. The data collection technique used in this study used a feasibility questionnaire which was distributed to the Informatics teacher at SMP N 2 Bengkulu Selatan. The population of this study were informatics teachers and class VII students, totaling 32 people. The type of research used is R&D (Research and Development) development research. Furthermore, the selected development model is the 4D research and development model. The first stage is Define or often referred to as the needs analysis stage, the second stage is Design, namely preparing a conceptual framework for learning models and tools, then the third stage is Develop, namely the development stage involving validation tests or assessing the feasibility of media, and the last is the Disseminate stage, namely implementation on the target actually is the subject of research [7].

The basic reason researchers use the 4D development model is because this model has systematic stages and is suitable for development research. The product form of development that will result from this research is the Kahoot! as a medium to increase motivation and student learning outcomes. The stages in the 4D research model are as follows:

1. Stage of Define

   Define is the stage to determine all forms of requirements needed in learning development [8]. The purpose of the defining stage is to determine and define learning needs by analyzing the objectives and limitations of the material [9]. Based on this, the defining stage in this study is to analyze the learning objectives and material limitations in Informatics subjects.

2. Stage of Design

   Design is one of the stages that aims to be able to prepare Kahoot-based game media as a medium that can increase student motivation and learning outcomes. Activities that must be carried out at this stage include: designing Kahoot, preparing tests and selecting formats. At the design stage, this will produce a draft regarding the Kahoot application.

3. Stage of Development

   The purpose of the development stage is to produce a final draft of a good learning tool [10]. After developing the Kahoot application in accordance with the draft at the design stage, the product that has been produced is validated by experts, such as: material, media and evaluation experts to provide advice regarding the product that has been produced for improvement or revision so that the resulting product is even better. So that at this development stage it resulted in the Kahoot application as a suitable medium to be tested on class VII students of SMPN 2 Bengkulu Selatan with the subject of computer systems.

4. Stage of Dissemination

   This stage is to produce the final form of learning media after going through revisions based on input from experts and trial data [11].

This development research was designed as a trial run with a design that is One Group Pretest Posttest. The one group pretest-posttest design is an experiment that is applied to only one group without a comparison group [12]. Try out by using the pretest first then the results are known after the posttest. This research begins by distributing pretest questions to students, then explaining computer system material, if students feel they understand, then the researcher applies the Kahoot application in learning. Then, finally, the questions were distributed to students as a posttest whose results would be compared to determine the feasibility level of the Kahoot application being developed.

Table 1. Assessment Criteria According to Likert Scale

Criteria	Score
Very Good	5
Good	4
Less Good	3
Not Good	2
Very Bad	1

[13]

Based on the criteria in table 1, if the acquisition value or score is equal to or more than 4 then it can be tested.

Table 2. Criteria for interpretation of Eligibility

Criteria	Percentage (%)
Very Unworthy	0 – 20
Not feasible	21–40
Decent Enough	41–60
Worthy	61 - 80
Very Worth it	81 - 100

Based on the criteria in table 2, if the results of student responses obtain results of more than 60%, the product can be used by students. Furthermore, to get the results of the percentage of students' classical completeness obtained using the formula below:

$$\text{Formula} \quad \frac{\text{Number of Students who Completed}}{\text{Number of Students}} \times 100$$

After the results of the value are known, the calculation to get the value of learning outcomes can also be obtained with the N-gain Score formula as follows:

$$(G) = \frac{\text{Posttest score} - \text{Pretest score}}{\text{Maximum score} - \text{Pretest score}}$$

The value of learning outcomes can be stated to increase if the n-gain value is > 0.3 in the following classification:

Table 3. N-Gain Standard Value Classification

Default N-Gain Value	Classification
G > 0.7	Tall
0.7 > G > 0.3	Currently
G < 0.3	Low

[14]

C. Results And Discussion

In this study the development model used is the 4D model, with the following stages:

1. Define. At this stage, a problem was obtained, namely students who were lazy to study, seen from the assignments of students who often copied and pasted their friends' work, students who were not active in class, even had low daily scores. Based on the analysis of student characteristics, researchers developed Kahoot game-based learning media to increase student motivation and learning outcomes which aim to support learning optimization to make it more effective.
2. The Design Stage. In the planning stage it produces an initial design of the Kahoot application to be developed. In this design stage there are 3 steps, namely: a). The result of the design of Kahoot is that the Kahoot application can be accessed through the application or the web which contains 10 multiple choice questions with a duration of time to complete the questions of 30-240 seconds depending on the level of difficulty of the questions, where the highest score is 10 for each question, the questions are also equipped with pictures to make it look more attractive. b). test preparation, the researcher compiled data collection instruments through learning achievement tests in the form of 10 multiple choice questions which would be distributed to students with the aim of being able to find out the level of change in student learning outcomes obtained by students before and after using the Kahoot application as a learning medium, this test was given as many as 2 times, namely the first (pretest) and the last (posttest). c). Selection of the format, development of the Kahoot application, the questions prepared are related to the concept of computer systems. After the teacher explains the material, students will be asked to log in to Kahoot! then working on the questions in Kahoot the teacher will act as an operator who runs Kahoot as long as students work on questions in the form of quizzes, if all the questions have been completed by students then points will appear that are obtained by each student, then the teacher can analyze and assess student learning outcomes in computer system concept material.
3. Development Stage. The development stage resulted in a final draft of the development of the Kahoot application as a learning medium which has gone through revision after a review in the form of suggestions or input and validation from the validators. At the development stage, media implementation was also carried out in class VIIA SMPN 2 Bengkulu Selatan to test the effectiveness and practicality of the Kahoot developed.
    a. The feasibility of the Kahoot application as a learning medium to increase student motivation and learning outcomes. The validation results from material experts on the development of the Kahoot application in the informatics subject, the subject of computer systems, yield results as shown in table 4.

Table 4. Material Validation Results

Variable	Percentage	Eligibility Criteria
Accuracy	78%	Worthy
Completeness	78%	Worthy
Impact on Students	78%	Worthy
Impact on Teachers	78%	Worthy
understanding	78%	Worthy
Total percentage	390%	-
Percentage average	78%	Worthy

Based on table 4 it is known that the accuracy variable gets a validation percentage of 78% (feasible). The completeness variable gets 78% (decent). The impact variable for students gets a

percentage of 78% (decent). Furthermore, the impact variable for teachers gets 78% (decent). Finally, the understanding variable also gets 78% (decent). So that the validation of the Kahoot application development material on computer system material gets an average percentage of 78% (feasible). Furthermore, the validation results from media experts get the following results:

Table 5. Media Validation Results

Variable	Percentage	Eligibility Criteria
Legibility	85%	Very Worth it
Appearance	85%	Very Worth it
Letter	85%	Very Worth it
Ease of Use	85%	Very Worth it
Total percentage	390%	-
Percentage average	85%	Very Worth it

Based on the table above, it is known that the media validation results on the readability variable get a percentage of 85% (very feasible). On display variables get percentage of 85% (very decent). Furthermore, the letter variable gets a percentage of 85% (very decent). Finally, the easeof use variable gets a percentage of 85% (very feasible). So that the Kahoot application development on media validation gets an average percentage of 85% (very feasible).

b. The effectiveness of the Kahoot application as a learning medium to increase student motivation and learning outcomes.

The limited trial was conducted at SMP Negeri 2 Bengkulu Selatan in class VII with a total of 32 students. 10 pretest questions were distributed to students, then after using the Kahoot application, 10 posttest questions were distributed with the same question criteria. The effectiveness of the Kahoot application as an effective learning medium can be seen from student learning outcomes through the changes that occur before and after using the Kahoot application in learning. The intended change is the achievement of student learning completeness. The more students achieve learning mastery, the more effective the product will be developed. The KKM (minimum completeness criteria) set by the researchers is 75 according to the KKM that applies at SMPN 2 Bengkulu Selatan.

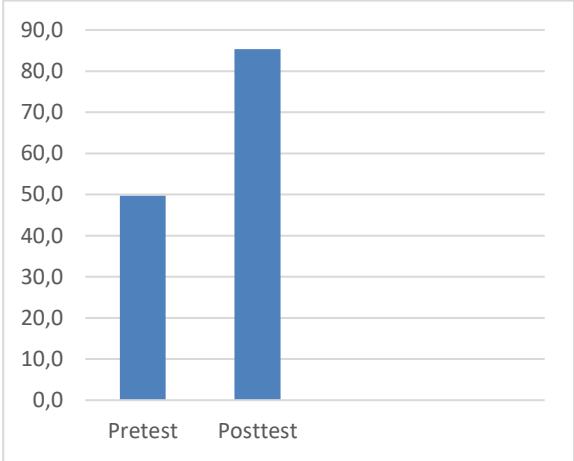
The results of the scores from the students' pretest and posttest are as follows:

Table 7. Pretest and Posttest Results

Name	Pretest	Posttest	Information
Student 1	30	70	Not Completed
Student 2	43	80	complete
Student 3	33	80	complete
Student 4	40	80	complete
Student 5	55	80	complete
Student 6	43	80	complete
Student 7	43	90	complete
Student 8	43	90	complete
Student 9	45	80	complete
Student 10	48	90	complete
Student 11	50	90	complete
Student 12	53	90	complete
Student 13	53	90	complete
Student 14	53	100	complete
Student 15	55	100	complete
Student 16	65	100	complete
Student 17	58	100	complete
Student 18	58	90	complete
Student 19	60	80	complete
Student 20	65	80	complete
Student 21	65	90	complete
Student 22	65	80	complete
Student 23	60	80	complete
Student 24	58	90	complete

Name	Pretest	Posttest	Information
Student 25	58	80	complete
Student 26	56	80	complete
Student 27	60	90	complete
Student 28	45	80	complete
Student 29	43	100	complete
Student 30	30	70	Not Completed
Student 31	25	70	Not Completed
Student 32	30	80	complete
Total	1588	2730	
Average	49,7	85,3	

Based on the table above, it can be seen that after the pretest is carried out, it can be seen if the average student pretest score is 49.7. Furthermore, after testing the Kahoot! developed will be redistributed posttest questions to find out how far the change in learning outcomes obtained by students. Posttest results obtained by students have an average value of 85.3. So that from an increase in students' pretest to posttest scores of 35.6, the use of the Kahoot! can improve student learning outcomes. However, on the average pretest results, students are still not able to fulfill classical completeness, but on the average posttest results, students are able to fulfill classical completeness. This can be proven from the number of students who answered correctly by ≥65% after being given treatment.



Based on the diagram above, it can be seen that there is an increase in student learning outcomes after using the Kahoot application. Increased learning outcomes can be calculated using n-gain and a value of 0.708 is obtained with the "High" criterion

This development research resulted in the Kahoot application as a learning medium to increase student motivation and learning outcomes at SMPN 2 Bengkulu Selatan. The achievement of learning objectives is influenced by the selection of good learning media as a support for learning practices and to arouse students' willingness to increase interest and motivation in participating in learning [15]. The Kahoot app! developed contains questions regarding computer system material with a total of 10 questions, where each question has a time limit for answering 30 seconds to 240 seconds. Students can answer quiz questions by selecting the code listed on the Kahoot! webquiz. through the computer they use. After the quiz is over, the results of the scores obtained by students can be immediately known. So that the scores obtained by students can be used as a teacher as a medium for evaluating student learning outcomes. The response shown by students during learning was very good, students were enthusiastic and interested in using the Kahoot application in learning, because students had never used the Kahoot application before.

D. Conclusion

The results of the research data analysis that has been carried out show that the use of the Kahoot! feasible, effective and practical to be used in learning as a learning medium. This research also proves that the use of technology in learning activities can increase student motivation and learning outcomes.

E. Acknowledgement

Acknowledgments are addressed to all parties involved in this research activity, especially the extended family of SMP N 2 Bengkulu Selatan.

References

[1] M. . Ghufron, "Industrial Revolution 4.0: Challenges, Opportunities and Solutions for the World of Education,"*Monday. Nas. and Disc. Multidisciplinary Panel Has. Researcher. and Servants. to Mass. 2018*, vol. 1, no. 1, p. 332–337, 2018.

[2] F. Doringin, NM Tarigan, and JN Prihanto, "The Existence of Education in the Era of the Industrial Revolution 4.0,"*J. Technol. ind. and Engineering*, vol. 1, no. 1, p. 43–48, 2020, doi: 10.53091/jtir.v1i1.17.

[3] A. Nursyam, "Increasing Student Learning Interest Through Information Technology-Based Learning Media,"*Expose J. Researcher. Huh. and Educators.*, vol. 18, no. 1, p. 811–819, 2019, doi: 10.30863/ekspose.v18i1.371.

[4] W. Sulistiyawati, R. Sholikhin, DSN Afifah, and T. Listiawan, "The Role of Educational Games Kahoot! in Supporting Mathematics Learning,"*Mat. and Science J. Matt. Science, and Learning*, vol. 15, no. 1, p. 46–57, 2021.

[5] HD Setiawati, Sihkabuden, and EP Adi, "The Effect of Kahoot! Against Class XI Student Learning Outcomes at SMAN 1 Blitar,"*J. Review. Technol. Educator.*, vol. 1, no. 4, p. 273–278, 2018.

[6] H. Bahar, D. Setiyaningsih, L. Nurmalia, and L. Astriani, "The Effectiveness of Kahoot for Teachers in Learning in Elementary Schools,"*KACANEGARA J. Servant. on Mass.*, vol. 3, no. 2, p. 155–162, 2020, doi: 10.28989/kacanegara.v3i2.677.

[7] A. Maydiantoro, "Development Research Model,"*Chem. educ. Rev.*, vol. 3, no. 2, p. 185, 2020.

[8] NA Damayanti and RM Dewi, "Development of the Kahoot Application as a Media for Evaluation of Student Learning Outcomes,"*EDUCATIVE J. Educator Science.*, vol. 3, no. 4, p. 1647–1659, 2021.

[9] N. Hikmah, "Development of an Interactive Module Based on Kvisoft Flipbook Maker for History Class X High School Using the 4D Development Model,"*digits. Repos. Univ. Jember*, 2019.

[10] D. Kurniawan*et al.*, "Development of Learning Devices Using Screencast-O-Matic Media for Calculus 2 Courses Using the Thiagarajan 4-D Model," J. Siliwangi, vol. 3, no. 1, 2017.

[11] PN Rohman, M. Na'im, and S. Sumardi, "Development of prezi-based media in history subjects for class X SMA with the 4d model,"*JINoP (Journal of Inov. Learning)*, vol. 7, no. 1, p. 1–9, 2021, doi: 10.22219/jinop.v7i1.13054.

[12] R. Nuryanti, "Use of Cooperative Learning Models with Team Games Tournament (TGT) Strategy to Improve Mathematics Learning Outcomes in Roman Number Material for Deaf Students in Class IV SDLB,"*J. Assessment and Interv. The child with special needed*, vol. 20, no. 1, p. 40–51, 2019, [Online]. Available at: https://ejournal.undiksha.ac.id/index.php/JET/article/view/21734

[13] Danuri and S. Maisaroh,*Research methodology*. 2019. [Online]. Available at: http://repository.upy.ac.id/2283/1/Metopen Pendidikan-Danuri.pdf

[14] A. Wahab, J. Junaedi, and M. Azhar, "Effectiveness of Educational Statistics Learning Using the N-Gain Improvement Test in PGMI,"*J. Basicedu*, vol. 5, no. 2, p. 1039–1045, 2021, doi: 10.31004/basedu.v5i2.845.

[15] MS Sakdah, A. Prastowo, and N. Anas, "Implementation of Kahoot as a Game-Based Learning Media for Learning Outcomes in Facing the Industrial Revolution Era 4.0,"*Educative J. Educator Science.*, vol. 4, no. 1, p. 487–497, 2021, doi: 10.31004/edukatif.v4i1.1845.