

Analysis of android-based game learning media needs on elementary thematic learning

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Abstract: This study aimed at identifying the need of android-based game learning media as an elementary thematic learning medium. This is qualitative research with an R & D (Research and Development) approach. The the ADDIE model was also used at the analysis stage. The samples of the study were 3 teachers and 37 students of 6th grade in Wonogiri elementary school. The sample was chosen using purposive sampling method. The data collection techniques were carried out using questionnaires and semi structured interviews. The data then analyzed using percentage system and then narrated descriptively. The results of this study show that there is a need for android-based game-based learning development as an elementary thematic learning medium, especially 6th grade students. Some development also needs to be done to be customizable to particular criteria and specifications. The development of game-based learning media with various applications and multimedia will be able to produce learning innovations, which ultimately realize a quality learning process in the classroom, so that learning goals can be achieved.

Keywords: *media needs analysis, game based learning, thematic learning*

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INTRODUCTION

The advancement of science and technology in the field of education and teaching as a result of the Covid-19 pandemic has had a significant impact on the learning process. Packaging of learning that contains technology, pedagogy, material content and knowledge is increasingly encouraged. Various learning models and media are used by teachers in an effort to maximize the learning process. The use of ICT as a means and learning resource, can help the teacher's task in the learning process (Budiana, Sjaifirah & Bakti, 2019). The use of ICT as a learning medium, one of which is by utilizing game media (Pratiwi & Musfiroh, 2014)

The world of games and androids today is very attached to the daily life of children, as well as elementary school students, both as a means of online learning, and as a means of entertainment. Android is a software platform and operating system for mobile devices, based on the Linux kernel, and developed by Google and later the Open Handset alliance (Rawat, Aggarwal, & Passi, 2014). Smartphone or android according to Widiastika, Hendracipta, and Syachruraji (2020) is a mobile phone with the advantage of having multitasking capabilities that make it easier for users to do many tasks at one time. Combining android-based games as a learning medium in the classroom, is an effort to package fun and challenging learning for students. Game-based learning media or often called game based learning is a form of learning centered on learners who use electronic or digital games for learning purposes

(Prasetya, Irianto, & Patmanthara, 2013). Game based learning is a type of serious game designed for a specific purpose in learning (Maulidina, Susilaningsih, & Abidin, 2018).

Several studies on the use of game-based learning in learning are widely found. However, in general, this research study is in the form of literature studies, analysis of the application of game-based learning to learning, as well as media development in learning activities at the junior high, high school, and high school levels. There is some development of game-based learning media at the elementary level, but this media is based on subjects that have not been integrated. While this study is the development of game-based learning media in integrated thematic learning at the elementary level.

Research studies on game-based learning in the form of literature studies, such as the application of science-based learning games at the elementary level (Setiawan & Phillipson, 2019; Putri & Muzakki, 2019). Research related to the analysis of the application of game-based learning both in learning and its effect on children (Ott & Pozzi, 2012; Ucus, 2014; Chin & Zakaria, 2015; Pirinen, 2015). Game-based learning research at the elementary level (Widiastika *et al.*, 2020; Latif, Utaminingsih & Su'ad, 2021), while at the junior high school level, it is research (Pratiwi & Musfiroh, 2014; Khoirudin, Ashadi, & Masykuri, 2021). Game-based learning research at the high school level (Ningtias & Harimurti, 2018; Khasanah & Rusman, 2021; Aini, 2018; Luhsasi & Permatasari, 2020; Hidayat, 2018; while the application of game based learning at the higher education level is research by (Budiana *et al.*, 2019; Winatha & Setiawan, 2020; Wibawa, Mumtaziah, Sholaihah, & Hikmawan, 2021).

Referring to some of the results of research that has been carried out before, it can be concluded that game-based learning can be one of the alternative learning media applied in thematic learning in elementary school. One of the applications of game-based learning in elementary thematic learning, is android-based learning-based games. With the use of android as a game-based learning medium, allowing students to be more excited to follow learning. With the reason that android is a technology device that has high interaction with students (Yunus & Fransisca, 2020) and is more often used by students in everyday life, the development of android-based game-based learning media in elementary thematic learning is expected to improve the quality of learning. Although several studies related to the development of android-based game media in elementary school learning have been found, but the development of android-based game media in integrated thematic learning at the elementary level has not been found.

It takes an analysis of the need for android-based game learning media to find out the need for the development of this media. Analysis of the needs of android-based game media is important, because in addition to knowing the needs of media development, as well as identification of the criteria and specifications of media needed by users, in this case teachers and students in elementary thematic learning.

Thematic learning of elementary school grade 6 in the 2nd semester so far tends to be less challenging and boring. In addition, the time limitation in the delivery of materials is inversely proportional to the amount of material and competencies that must be mastered by students. This of course has an impact on the learning process that pursues material fulfilment targets, rather than providing learning experiences to students.

Based on these problems, it encourages researchers to conduct a needs analysis of the need for android-based game-based learning development as a thematic learning medium for grade 6 elementary school. Game Based Learning to be developed is a game application based

on android. Thus, the purpose of this study is to describe the analysis of the needs of android-based game learning media on elementary thematic learning. Based on the description above, the following problems can be formulated: Is it necessary to develop android-based game learning media on elementary thematic learning? And how are the criteria and specifications of android-based game learning media on elementary thematic learning?

METHOD

This research is a type of qualitative research with an R & D (Research And Development) approach. The R&D model uses the ADDIE (Mulyatiningsih, 2019) model at the analysis stage. Sample data was taken by purposive sampling method. Data collection instruments used questionnaires and interviews. The aspects that were the focus of data collection were validated by the FGD (Forum Group Discussion) method with users and reinforced by the empirical results of Fathoni, Surjono, Mustadi, and Kurniawati (2021) research. This study sampled 3 teachers in the 6th grade of elementary school and 37 students of 6th grade elementary school in Baturetno District, Wonogiri Regency. The research was carried out in the 2nd semester of the 2021/2022 school year.

Data collection techniques were carried out by questionnaire of students' needs for android-based game learning media in the form of google form-based surveys. Data collection used was questionnaires with closed questions. Closed questionnaires were used to analyze the need for android-based game development. Questionnaires in questionnaires were compiled with Guttman scale models (Mulyatiningsih, 2014). The data was analysed with a percentage system and then narrated descriptively. There were three factors that used was considered in the analysis of media needs by students, namely the problem identification factor, the factor of availability of media and learning resources, and the ownership factor of supporting facilities (Fathoni *et al.*, 2021).

Semi structured interview data collection techniques were carried out on 3 6th grade teachers from 3 elementary schools. The interview data was used to analyse the needs of android-based game learning media as well as the criteria and specifications of the android-based game learning media to be developed. Data validation was done by triangulation techniques. This study was the first step in ADDIE model development research.

FINDINGS AND DISCUSSION

Analysis of student needs on problem identification factors in thematic learning of the 2nd semester of grade 6 includes aspects of difficulty understanding the material, the next aspect is the student's pleasure or boredom during the thematic learning process. The results of the analysis of the degree of difficulty show that it is easy or difficult to understand thematic material. A total of 78% of students answered difficulty understanding thematic material, while 22% of students answered easily understand thematic material. The results of the analysis of student questionnaires on the fun aspect of learning showed that 36% of students enjoyed learning thematically, while as many as 64% of students felt bored with thematic learning.

Identify the learning resources that have been used there are 5 learning resources that fall into the category, namely power points, internet, student worksheet, and game or game media. The results obtained are on the use of power point media, as many as 25% of students use power point media, and 75% have not used power points. In the use of internet media,

as many as 86% of students use internet media, and as many as 14% have not utilized the internet for learning facilities. In the use of textbook media and student worksheet, as many as 100% of students have utilized these learning facilities. In the analysis of the use of game media, as many as 100% of students have not utilized this media. The results of the needs analysis on the indicators of the development media desired by students showed that as many as 31 students or 86% wanted android-based game media as a thematic learning medium. While 5 students, or 14% do not need gaming media. In the ownership factor of android facilities owned by students is as many as 31% of students already have and use android, while 5 students do not have android facilities. The results of the student needs analysis are displayed in Table 1.

Table 1
Results of android-based game learning media needs analysis in students

No	Category	Question	Alternative Answer (%)	
			Yes	No
1	Identification of problems	Do you easily understand the thematic learning materials delivered by the teacher?	22	78
		Is the thematic learning carried out in your class fun and not boring?	36	64
2	Availability of media and learning facilities	Are the following media and learning tools used in your thematic learning?		
		- Power point	25	75
		- Internet	42	58
		- Textbook	100	0
		- Student Worksheet	100	0
		- Games Media	0	100
3	Ownership of learning facilities	Do you want media in the form of games based on android for thematic learning that you carry out?	86	14
		Do you have learning facilities in the form of android?	86	14

The acquisition of data from the results of interviews with 6th grade teachers, obtained three categories, namely: interaction in learning, the need for android-based game-based learning media as an interactive media in elementary thematic learning, and criteria and product specifications of android-based game-based learning media are needed. The results of interviews in the learning interaction category obtained by respondents 1, 2, and 3 stated that thematic learning is less interactive because students tend to focus on mastery of materials, as well as meeting material targets. The three respondents also stated that the learning carried out tended to be boring.

The results of the interview about media needs, obtained by respondents 1, 2, and 3 require android-based game learning media that is able to present thematic material

completely, but students are happy and interactive, and can save the learning time needed in elementary thematic learning because this media is expected to be an interactive and fun media in learning so that learning is not boring, but still able to accommodate the breadth of material for the 2nd semester of grade 6 elementary school.

Interview results about criteria categories and product specifications, the results were obtained as follows: in the aspect of respondent criteria 1 states that android-based game learning media is a practical and easy-to-operate media, respondent 2 states that android-based game-based learning media should be used without an internet connection, respondent 3 states that android-based game-based learning media can be used anywhere and anytime. From the specification aspect, respondent 1 needs android-based learning game media with specifications containing interesting animations and images and equipped with learning videos. Respondent 2 needed android-based game learning media with media specifications with images, music, and videos, and contained materials and exercise questions. Respondent 3 needed media with complete feature specifications, materials, and exercise questions such as chord quizzes, there are learning videos, also equipped with pictures. The results of the analysis of media needs by the teacher are displayed in Table 2.

Based on the results of the analysis of student needs data on learning problem factors, a learning medium is needed that helps students understand thematic materials in the 6th grade of elementary school. This learning medium, in addition to helping students understand the material, is also able to increase students' enjoyment in learning, because the use of game-based learning increases students' learning interest (Aini, 2018), increase students' motivation and intellectual abilities (Chizary & Farhangi, 2017), so that class learning becomes fun and not boring (Razak & Connolly, 2013).

Analysis of student needs on media factors and teaching facilities shows that game-based learning media has not been utilized by teachers in learning. Most students want the development of android-based game learning media (Yunus & Fransisca, 2020; Yamin & Sahrul, 2021). The use of android media as a learning media is an effort to accommodate science and technology in classroom learning, this effort is expected to increase student motivation (Budiana *et al.*, 2019).

Game learning media, effective and worthy of use as a learning medium (Pratiwi & Musfiroh, 2014; Prasetya *et al.*, 2013). Gaming media has several advantages compared to non-gaming learning media. Learning with a game approach makes it easier for students to understand and master the material (Widiastika *et al.*, 2020), learning becomes more interesting and fun (Putri & Muzakki, 2019), so that students' academic performance becomes more improved (Musselman, 2014), has a statistically significant influence on student learning outcomes with a higher average (Setiawan & Phillipson, 2019), increases student motivation and cognitive achievement in learning (Yadav & Oyelere, 2021), which will ultimately maximize the effectiveness and achievement of learning (Bakan & Bakan, 2018).

Analysis of media needs by teachers states that it takes the development of android-based game learning media to make learning interactive and interesting, so that it is not boring (Razak & Connolly, 2013). Interactive learning media helps students better understand learning materials (Utomo, Setiawan, Rachmadtullah, & Iasha, 2021). Less varied learning requires teachers to be more innovative and need to develop learning media (Ichsan, Dewi, Hermawati, & Iriani, 2018; Yunus & Fransisca, 2020). The product criteria needed are: media that is practice and easy to operate (Oktariyanti, Frima, Febriandi, 2021), can be

Table 2
Results of android-based game learning media needs analysis in teachers

No	Category	Question	Respondent 1	Respondent 2	Respondent 3
1	Learning interaction	Is the thematic learning that you carry out is active and interactive?	Less interactive learning, due to pursuing the fulfillment of material targets	The interaction relationship between students and teachers is lacking, the focus of learning is to complete the material, before starting to give the School Exam material	Yes, honestly it's less interactive, because the focus is on pursuing material. Less time in semester 2, because there are so many activities before the exam.
2	The need for learning media game based learning based on android	Do you think a media is needed? games based on android who is able to present the thematic material completely, but the students are happy and interactive, and can save learning time?	If possible, it is very much needed.	If such media can be developed, it is very much needed.	Learning media that contains complete thematic material, is interesting for students, can even save time is needed once.
3	Product criteria and specifications	What are the media criteria games based on android required? What are the specifications of the media games based on android required?	Must be practical and easy to operate. Media with interesting animations and pictures, and equipped with learning videos.	Should not require an internet connection and easy to use. There are pictures, music and videos. Also materials and practice questions.	It can be used anywhere and anytime. Maybe even at home, so that students can repeat the material that was given in class. There are complete features, materials, and practice questions such as quizzes that score. There are learning videos, also equipped with pictures.

used without internet network, can be used anywhere and anytime (Fathoni *et al.*, 2021; Hendriyani, Jalinus, Delianti, & Mursyida, 2018). The required product specifications are: have features with interesting colors and back sounds (background music) (Hikam, Kariada, & Santosa, 2013), equipped with animated images (Setia, Susanti, & Kurniawan, 2018), contains thematic learning materials (Winarni, Naimah, & Widiyawati, 2020), equipped with learning videos (Hendriyani *et al.*, 2018), clear instructions for use, as well as practice questions in the form of score quizzes to find out the results of training and student evaluations directly (Yuliawati, Aribowo, & Hamid, 2020). With these results, it is necessary to design android-based game media as an effort to realize the media needed.

Game-based learning media design must pay attention to various aspects both in terms of playing activities, conformity to learning needs, and student interests (Avdiu, 2019). It takes

in-depth exploration and analysis for the practical application of serious games in learning activities (Freire *et al.*, 2016), systematic and structured creation (Alaswad & Nadolny, 2015), able to accommodate e-learning activities, creative dramas, games with digital means, include educational and character values, pay attention to time management, student characteristics, and pay attention to teacher limitations in designing and applying games (Ucus, 2014), so that it is feasible (Maulidina *et al.*, 2018) and practically used (Fujiati & Rahayu, 2019).

Analysis of learning media needs is applied as an initial stage in identifying the needs of the media to be used in a learning. The process of identification, revision, design and specifications on the analysis of needs requires participation from both developers and users, who in this case are educators and learners (Utami, 2015). The media analysis stage is a stage to identify user needs in more detail in the new media to be developed (Bahar, Basuki, & Situmorang, 2020). Needs analysis becomes a process that bridges the gap between hope and reality (Sobri, 2018). Therefore, researchers conduct needs analysis as a first step in media development, the information of which can be used in subsequent research, especially research and development.

CONCLUSIONS

Based on the analysis of the needs of android-based game learning media carried out in Baturetno Subdistrict, it can be concluded that there is a need for android-based game-based learning development as an elementary thematic learning medium, especially 6th grade students. This is because 78% of students have difficulty in understanding thematic materials, 64% of students feel bored in thematic learning, 86% of students want android-based game-based learning development. This is reinforced by the teacher's statement that there is a need for the development of android-based game learning media with appropriate criteria and specifications.

The results of this study were used as a reference in developing android-based game learning media in elementary thematic learning. Android-based learning game media needs to always be developed by teachers in terms of adjusting the variety of teaching material content. The advancement of science and technology from time to time demands learning innovation in learning activities in the classroom. The development of game-based learning media with various applications and multimedia will be able to produce learning innovations, which ultimately realize a quality learning process in the classroom, so that learning goals can be achieved.

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