

Learning Game Based Android to Reduce Trauma Children in Disaster Areas

Rafika Bayu Kusumandari, Basuki Wibawa

ABSTRACT--- This study that aims to develop learning games based android for reduce trauma in children in disaster areas. Method of research is a Research and Development (R & D) approach. Results: in this study, Android-based learning games were produced. After the development of the Selective Draft I model, a mathematics learning test was conducted which included material. The draft II model is a revision of the model design. When conducting validation tests with mathematical learning experts, researchers present game learning which is then given input and input. Input received includes aspects of media and learning media that are in this media. The results of product development are carried out theoretical and empirical feasibility tests. The due diligence process is carried out in several stages, namely expert test, one to one test, small group test, large group test and field test.

Keywords— Game Learning, Android, Reduce Trauma of Children, After Disaster

A. INTRODUCTION

The occurrence of disasters resulted in the destruction of infrastructure, loss of life and trauma. Trauma as an individual who opposes, witnesses, or is confronted with an event involving death, seriousness, or opposition to your physical or other person further increases feelings of terror and despair, encourages very destructive and can restore physical and mental health, and sometimes even life itself (Everly *et al*, 2008: 11; Bryce, 2001: 7; APA, 1994: 4). Furthermore Shaw *et al* (2007: 18) says that : Trauma is always not only individuals, but also families and social systems in which individuals live. The impact of trauma on children is modulated by the fact that children have limited life experience. The child is still developing cognitively and emotionally and may struggle with problems such as separation, individuation, and formation of identity.

The existence of a disaster can cause prolonged trauma not only among adults but also in children. Children who directly experience, feel and witness the impact of a disaster will feel trauma. The trauma of children after a disaster are two problems faced by disaster areas after the disaster. In order for this problem to be overcome, it is necessary to have various developments carried out to create alternative handling trauma. The use of technology will help the trauma healing process in post-disaster children. One of the technologies used is the use of mobile learning for learning. The use of smartphones, ipad, playbook, tablet pc and the like is more widely used

today for various reasons and choices than PC (Personal Computer) that are at home.

Galatis & White (2013: 3) said that tablets have become the main choice tool, especially iPad, by many educational institutions to provide innovative learning opportunities. The use of smartphones, ipad, playbook, tablet pc and the like is more widely used for various reasons and choices than PC (Personal Computer) at home.

As stated by Hamdani (2013: 666), mobile devices are neutral towards the theory of teaching and learning; they can be used with traditional learning theories such as behaviorism and new learning theories such as constructivism. Furthermore Woodill (2011: 11-12) states: the introduction of various new learning technologies has had an impact on training methods. With the rapid increase of personal computers in the late 20th century, and the explosion of cellphone use in the past 10 years, we have begun to see a shift from classroom training models to instructors in front of the room, to a mixture of diverse approaches to learning in many different settings. Goksu & Bunyamin (2013: 689) stated that the mobile learning environment has an interest in providing effective learning in accordance with certain approaches such as Knowledge Objects and Learning Objects.

The use of mobile learning to reduce trauma can be made in game format. Game is a form of activity in which participants involved in it are bound by the rules that have been set to achieve a goal. Mobile learning is made in game format according to the characteristics of children who like to play so that the concept of playing while learning will be more effective. Many game features are not only for playing entertainment, but there are many games to hone thinking and logic that can introduce material to be more interesting to be accepted and understood especially by children. Digital games, like other form games, provide settings, rules and constraints where players can interact, either with each other or the game's environmental aspects to achieve some form of goal (Allsop & Jessel, 2015: 2).

Learning games can give birth to a pleasant atmosphere in the learning process of students. Images that appear make students not feel bored, because they are quickly saturated if the educator only explains in the form of writing. This is because at the age of children - children are very sensitive to stimuli received from the

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environment. His high curiosity will be channeled if he gets stimuli in accordance with the task of his development. Learning games are believed to be able to spur learners to learn something with interests, needs and abilities. The use of Android-based learning games is expected to be an alternative model of education that is effective, interesting, interactive and fun in order to reduce trauma to children post-disaster.

B. METHODS

This research is a study that aims to develop android-based learning games for trauma healing in post-disaster children in disaster areas using a Research and Development (R & D) approach for conducting research. Development research seeks to create knowledge based on data systematically derived from practice (Richey & Klein, 2005: 24). Furthermore Richey et al (2004: 1100) convey that development, in its most general sense, implies growth, evolution, and gradual change. This concept has been applied to various fields of study and practice. While Akker, et al (1999: 7) deliver development research often starts for complex and innovative tasks that only have very few validated principles available to compile and support design and development activities. Research and development methods are research methods used to produce certain products, and test the effectiveness of these products (Sugiyono, 2009: 297).

Research and development is a process or steps to develop new products or improve existing products. In the field of education, products produced through R & D are expected to increase the productivity of education, such as graduates who are numerous, qualified, and relevant to their needs. Educational products such as specific curricula for certain educational needs, teaching methods, learning media, textbooks, modules, evaluation systems, competency test models, and so on.

C. FINDINGS

In this study using the 4-D and ADDIE development models where the development model guides researchers step by step in the development of the model in detail. The relationship of the 4-D and ADDIE models to the development of the model that I developed is this model to produce learning products and this model has steps that are clear and easy to follow. The ADDIE learning model adheres to the instructional system design model theory because this model is a systematic model.

As we know that the 4-D model has 4 stages of development while ADDIE has 5 stages of development. For this reason, the model concept developed based on the two models named 4-DADDIE is as follows

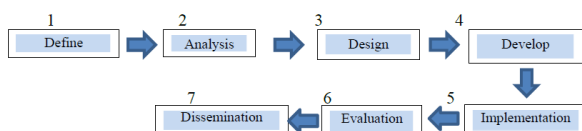


Figure 1. The Concept of The Model Developed

The concept of the model developed was used to develop learning models in disaster areas after the disaster which aimed to reduce trauma to post-disaster children. The model developed is an Android-based educational game (game learning), according to its purpose, it is called PEKA (Permainan Edukasi Kreatif Atratif) or CAEG (Creative and Attractive Educational Game). This learning game called PEKA is used to reduce trauma in post-disaster children. Thus children will easily eliminate the trauma they experienced after the disaster.

The teacher or facilitator has responsibilities and plays an important role in running Android-based learning game products. He ensures that the learning strategies that have been developed can run as they should. Components of students in mentoring teachers or facilitators actively follow the learning process and give their opinions about the products of android-based learning games used in the learning process.

The material is arranged based on the learning objectives to be achieved and the flexibility or scope and logical sequence of learning that has been compiled. In this process will involve many experts, in the fields of education, multimedia, children, and psychology, content and evaluation. The design of an Android-based learning game on the principle of learning is to provide a game method that contains elements of learning and reduces trauma to children post-disaster.

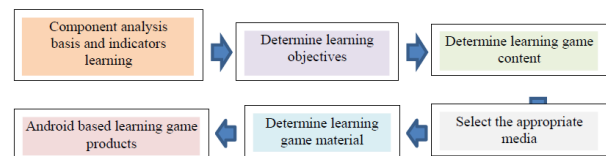


Figure 2. Design Development Phase

Process evaluation in development is carried out using formative and summative evaluations. Evaluation is a process to see whether the learning system being built is successful, in accordance with initial expectations or not. Actually the evaluation stage can occur in each of the four stages above.

Formative evaluation is carried out during and between these phases. The purpose of this evaluation is to improve the learning system that was created before the last version was applied. Summative evaluation is carried out after the last version is applied and aims to assess the effectiveness of the overall learning.

To test the effectiveness of the product, one to one test, small group test, large group test and field test were carried out. One-to-one trials were held on Friday, July 13, 2018 in Gentasari Village, Kroya Subdistrict with respondents as many as two students aged 9 years. While small group trials were held on Saturday, July 21, 2018 in the same place with one to one testing with respondents as many as 4 heterogeneous capable students. Respondents were asked to examine and study the



contents of game learning with the direction of the researcher. Then students are asked to fill out an instrument sheet by giving their suggestions and impressions of the learning game. In addition to filling out the instrument sheet, the researcher conducted a question and answer and interview with the two respondents in the one-to-one trial to get clearer information. From the one-to-one test and small group trials, it was obtained input that learning games were made interesting and fun to play.



Figure 3. One to One Test Activity Documentation

Children are given validation instruments that contain statements on a scale of 1 to 5 and direct advice. These results include material and media aspects. Validation results can be seen in the following table:

Table 1. Feasibility of One-to-One Test Results

| No | Dimensions | Indicator | Results |
|----|------------------|-------------------------------------|---------|
| 1. | Material Aspects | a. Problem clarity | 95 |
| | | b. Variation of choice answers | |
| | | b. There is question back | |
| | | c. Increase learning motivation | |
| | | d. The appeal of the question | |
| 2. | Learning Aspects | a. Clarity of game play instruction | 95 |
| | | b. Understanding of questions | |
| | | c. Motivation in playing the game | |
| | | d. Speed in playing games | |
| 3. | Media Aspects | a. Animation/image attraction | 97 |
| | | b. Use of background music | |
| | | c. Program operation | |
| | | d. Instructions for use | |
| 4. | Psychological | a. Interesting game | 100 |
| | | b. Fun game | |
| | | c. Motivate | |

Of the overall results obtained because it is already above 89%. Based on this test, it can be concluded that learning games can be categorized very well. After repairs from the results of the one-to-one test, a small group test is then carried out. The results of small group trials can be seen in the following tables and figures.

Table 2. Feasibility of Small Group Test Results

| No | Dimensions | Indicator | Results |
|----|------------------|-------------------------------------|---------|
| 1. | Material Aspects | a. Problem clarity | 96 |
| | | b. Variation of choice answers | |
| | | c. There is question back | |
| | | d. Increase learning motivation | |
| | | e. The appeal of the question | |
| 2. | Learning Aspects | a. Clarity of game play instruction | 95 |
| | | b. Understanding of questions | |
| | | c. Motivation in playing the game | |
| | | d. Speed in playing games | |
| 3. | Media Aspects | a. Animation/image attraction | 96 |
| | | b. Use of background music | |
| | | c. Program operation | |
| | | d. Instructions for use | |
| 4. | Psychological | a. Interesting game | 100 |
| | | b. Fun game | |
| | | c. Motivate | |



Figure 4. Documentation of Small Group Test Activities

From the overall results obtained because it is already above 87, the learning game can be categorized very well.

The results of the individual test revisions and small group trials were then tested in large groups. The final draft model produced was the result of a large group trial. Improvements of the draft III model are the results of

individual trials and small group tests used for large group trials. Large group trials were held on Saturday, July 27, 2018 in Karangjati Village, Sampang Sub-District, Cilacap District with as many as 8 children aged 8-10 years, with heterogeneous abilities. Children are asked to examine and study the contents of the learning game with the direction of the researcher. Then they were asked to fill out the instrument sheet by giving their suggestions and impressions of the interactive learning media. In the large group test phase there was no change in the draft III model, only received suggestions from several students, namely changing the font size to be larger.

The suggestion is a good suggestion, but according to the researcher, in theory the size used is appropriate, if enlarged again it will be lame with the title. The results of large group trials can be seen in the following tables and figures.

Table 3. Feasibility of Large Group Test Results

| No | Dimensions | Indicator | Results |
|----|------------------|-------------------------------------|---------|
| 1. | Material Aspects | a. Problem clarity | 95 |
| | | b. Variation of choice answers | |
| | | c. There is question back | |
| | | d. Increase learning motivation | |
| | | e. The appeal of the question | |
| 2. | Learning Aspects | a. Clarity of game play instruction | 95 |
| | | b. Understanding of questions | |
| | | c. Motivation in playing the game | |
| | | d. Speed in playing games | |
| 3. | Media Aspects | a. Animation/image attraction | 97 |
| | | b. Use of background music | |
| | | c. Program operation | |
| | | d. Instructions for use | |
| 4. | Psychological | a. Interesting game | 100 |
| | | b. Fun game | |
| | | c. Motivate | |

From the overall results obtained because it is already above 86, the learning game can be categorized very well.

In the field test conducted on Saturday, August 2, 2018 in Jatiroto Village, Kayen Subdistrict, Pati Regency with as many as 10 respondents aged 8-10 years, with heterogeneous abilities. In this large group test applied to children victims of floods.



Figure 5. Documentation of Field Trip Activities

Tabel 3. Feasibility Field Trip Test Results

| No | Dimensions | Indicator | Hasil |
|----|------------------|-------------------------------------|-------|
| 1. | Material Aspects | a. Problem clarity | 96 |
| | | b. Variation of choice answers | |
| | | c. There is question back | |
| | | d. Increase learning motivation | |
| | | e. The appeal of the question | |
| 2. | Learning Aspects | a. Clarity of game play instruction | 95 |
| | | b. Understanding of questions | |
| | | c. Motivation in playing the game | |
| | | d. Speed in playing games | |
| 3. | Media Aspects | a. Animation/image attraction | 97 |
| | | b. Use of background music | |
| | | c. Program operation | |
| | | d. Instructions for use | |
| 4. | Psychological | a. Interesting game | 100 |
| | | b. Fun game | |
| | | c. Motivate | |

From the overall results obtained because it is already above 87, the learning game can be categorized very well.

The results of product development are carried out theoretical and empirical feasibility tests. The due diligence process is carried out in several stages, namely expert testing, one to one test, small group test, large group test and field test. After going through a series of feasibility tests, it was determined that the product development results would be in the form of "Android-Based Learning Games to Reduce Trauma in Post-Disaster Children".

D. DISCUSSION

In the development process using qualitative



descriptive methods. Qualitative methods are seeking deep understanding of all symptoms, facts or reality (Raco, 2017: 1-2). Facts, reality, problems, symptoms and events can only be understood if researchers trace them in depth, not limited to visible phenomena. This method is most suitable to be used to find out how effective android-based learning game products can optimize learning in disaster areas and to reduce trauma to post-disaster child victims. Researchers in qualitative research try to understand the meaning of an event or event by trying to interact with people in the situation / phenomenon (Yusuf, 2016: 328). Creswell (2013: 19) stated that: researchers are looking to examine problems related to individual examinations. For this study, stories were collected from individual examinations using a narrative approach. Individuals were interviewed for some time to determine how they personally experienced examination.

This statement is supported by Murphy & Costa (2016: 150) where he said: it was demonstrated that, because the narratives are relatively easy to document, they provide accessible, qualitative representations and provide insights that are not easy to obtain by other means. This shows that, because narratives are relatively easily documented, they provide a qualitative representation of easily accessible habitus and provide insights that are not easily obtained by other means. Murphy (2017: 49) further states: as a qualitative researcher, it is very important for the interviewee to trust you. Overcoming a lack of trust with many interviewees requires time and effort, including providing my resume, detailed background information, documents, research summaries, and rescheduling interviews.

This is supported by the statement delivered by Barret & Bolt (2010: 126) which states the basis in qualitative methods; its practice obscures aesthetic boundaries and experience in an effort to capture and reflect the complex dynamics involved in the phenomenology of artistic practice. Furthermore Huisman & Tight (2015: 301) states: to overcome this tension phenomenographic research methods are used in unusual ways in several respects. The main feature is that qualitative phenomenography processes are combined with quantitative frequency analysis before and after the number of student responses that enter each description category, which is part of the results of phenomenographic studies. Thus, this qualitative method can be used to describe the results of research on the application of android-based learning games to optimize learning and reduce trauma to post-disaster children in disaster areas.

The model is essentially a visualization or conceptual framework that is used as a guide in conducting activities. Gustafon and Branch (2001: 1) define a model as a model said form that is presented simply from a complex form, contains the process and function of physical phenomena or ideas. Whereas Robins (1996: 25) states that a model is an abstract reality from; simplified representation of several phenomena in the real world. The model can be developed according to needs, it must be developed by

taking into account the suitability of the user's needs to achieve effective, efficient and interesting learning goals.

The model developed in this dissertation is an Android-based educational game (learning game). The game is part of playing and playing as well as parts of the game are both interconnected. Huotari & Hammart (2017: 22) defines games as a system in which players engage in artificial conflicts, which are determined by rules that produce measurable results. Games that have educational content are better known as educational games. This type of educational game aims to attract children's learning interest in the subject matter while "playing", so that with a happy feeling it is expected that students can more easily understand the material presented.

The Android operating system was chosen because Android is an open operating system that allows users to add their own desired applications freely in addition to the basic application of the default mobile phone. The learning game developed was used as a learning supplement and to reduce trauma to children after the disaster. As stated by Cahyana, et al (2017: 7038) that learning on cellular devices leads to the use of cellphones as a learning medium.

In learning games designed, students play games where game material is taken from subject matter in this case Mathematics. Thus, they play games while learning. This condition is very supportive to reduce trauma to them after a disaster. The trauma that children experience after a disaster will affect their lives in the future. If this trauma is not immediately dealt with it will have a bad impact on his future.

The problem of mental health (trauma) will also be experienced by disaster victims such as the feeling of fear, shock, sadness, feeling helpless, and so forth. This is not only experienced by adults, but also children. Childhood trauma affects us all. Traumatic events can damage children's personal lives, development, health, mental health, and the ability to do life's tasks adequately. The same thing was conveyed by Cohen, et al (2006: 4), ongoing trauma that began early in life had the potential to dramatically change the trajectory of young children's development more than chronic trauma which began later in adolescence. So, in some trauma situations, younger age may be protective while in other circumstances, it can give a greater risk. So that the use of learning games to reduce trauma in children post-disaster, is expected to be a solution to handling trauma.

E. CONCLUSION

Based on the formulation of the problems raised in this study, namely: This study aims to produce an Android-based learning game model to optimize learning and trauma healing in post-disaster children in disaster areas. The following conclusions are obtained:

1. The resulting model is an android-based learning game developed with the 4-DADDIE model.



2. The model developed is an Android-based educational game (game learning), according to its purpose, it is called PEKA (Permainan Edukasi Kreatif Atratif) or CAEG (Creative and Attractive Educational Game). This learning game called PEKA is used to reduce trauma in post-disaster children. Thus children will easily eliminate the trauma they experienced after the disaster.
3. The results of product development are carried out theoretical and empirical feasibility tests. The due diligence process is carried out in several stages, namely expert testing, one to one test, small group test, large group test and field test. After going through a series of feasibility tests, the results of this development product are determined to be in the form of "Android-Based Learning Games to Optimize Learning and Reduce Trauma in Post-Disaster Children".
4. This game can be easily installed on all brands and types of Android phones. It can be played without using the internet, is interesting for children to adults, and this learning game is effective to overcome learning in disaster areas and to reduce trauma to children after disaster.

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