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# The Development of Android-Based Mobile Learning Media (MLM) for Elementary School Students of Kendal Indonesia

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## Abstract

Learning Media is one of the essential aspects in creating a meaningful and good quality learning process. The use of mobile device in the learning process is called mobile learning (m-learning). It is defined as a learning in which the learners are demanded to be active or moving to places by utilizing a mobile technology device. The existence of m-learning is indeed unable to substitute e-learning (electronic learning) let alone replacing face-to-face meeting in a class. M-learning is intended to complement the learning took place in a class. It also helps the students to re-learn the material they have not understood anywhere and anytime they want. This surely provides novel learning experience for the students. Developing Mobile Learning Media (MLM) is the alternatives in providing the most suitable and effective media in this era. The type of research used in this study is the developing method of SDLC (System Development Life Cycle) of Waterfall. According to the FGD conducted with elementary teachers in Kaliwungu District Kendal, the discussion lead to the need upon android-based MLM was in mathematics subject. The researcher then developed the media with the materials that the students needed. This media had been validated by the experts of material, media, and children psychology. Based on the test conducted for the media, it presented that the media is feasible to be used. The try out for the Android-based MLM-media was limitedly administered to ten students of Fifth Grade and one teacher, and try out was conducted successfully and showed positive results.

**Keywords:** android, e-learning, media, MLM (Mobile Learning Media)

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# 1. Introduction

## 1.1. The background of research

Principally, the objective of education is to help the students develop optimally according to their potential, skill, and self-value (Semiawan, 2000)1. One of the indicators of optimum development is high academic achievement. High academic achievement is the prior indicator of education at school, since it determines the students' level of competence in understanding the material they learn. There are several aspects that can

help teachers to achieve high academic achievement, those are; learning innovation, learning method, and learning media. Based on the preliminary study conducted by the researcher at several elementary schools in Kendal Regency, it was found that students had low enthusiasm in learning due to the strategy that the teacher used. The teacher applied teacher center strategy that did not actively involve the students in learning. According to the questionnaire administered to the students, 65% of students felt bored during the teaching and learning process in the class. Instead of the teacher, students should be the center of learning. In the preliminary research, the researcher distributed a questionnaire in SD Kutoharo II Kendal Regency in the 2015/2016 period. It was resulted that 75% of the students demanded innovation in the learning by using an effecting and modern IT- based learning media, while 5% of them did not want any media whatsoever. In other words, elementary students wanted to have an innovation in their learning. They wanted and effective and modern It-based media.

The development of information technology (IT) in Education in Indonesia cannot be considered vast. Despite of many innovations made concerning IT-based media invented, the teachers are still reluctant to develop the media further due to their abundant duty they have in the institution they work in. This problem was particularly found in elementary school. Elementary school teachers are not yet capable in developing a media. Most of them are satisfied to only use the available media. This problem is frequently encountered, especially in the elementary schools located in rural areas. This is what encourages the researcher to conduct this research. The researcher intended to develop an interesting, creative, fun, and non-conventional media for elementary school.

These days, there had been many multimedia-based learning media developed by teachers or researchers. Thus, the researcher wanted to create novel technology in learning, android-based mobile media learning. This technology is one of many alternatives of learning media that is not yet being developed and used in Indonesia. Through a systematic development in this research, the problem of boring learning can be solved.

In the proses of implementing android-based media, the users tend to have difficulties in searching the content. They have difficulties to access and use the media. They sometimes could not load the following page of the content or go back to the previous content. They feel disoriented and do not know what to access in the media (Jane Webster & Jaspreet S. Ahuja, 2006)2.

Therefore, the need upon a practical, interesting, and feasible media is urgently needed at the moment. It is important to always use the recent technology in developing new media, as in this research.

Basically, there had been many information and communication technology- based learning media developed by educator or practitioners in Indonesia, and each of them has its own superiority. And ICT-based media has been proven to be effective to elevate the students' interest and their achievement in learning (*Kadek Surya Mahedy,2010*). But the problem is less teachers willing to implement the media, especially in the elementary school in rural areas. They prefer not to use media since it is costly. Thus, this media, Android-based mobile learning media, is developed to improve the students' interest in learning, elevate the teachers' performance, optimize the students' achievement in learning, and provide innovation to the teaching and learning process in elementary school. Android-based learning media will also give new knowledge for the teachers and students in Kendal Regency since the area could not maximize the use of IT-based media.

## 1.2. Objective of the study

1. To study about the use of ICT technology in the teaching and learning process in Elementary School.

2. To formulate the system of information technology in education.

## 1.3. Significance of the study

1. Give recommendation regarding to the usage of Information and Communication Technology in learning.

2. Optimize e-learning through the use of mobile learning media.

## 1.4. Implementation of MLM (Mobile learning media) as the E-learning in the elementary school

Mobile Learning Media (MLM) is a latest technological advancement that the implementation is using the smartphone as the media. Different from the non-mobile multimedia, the complexity and the completeness on the MLM is higher. The main content of this MLM is the audio, text, video and animation focusing on android system, that is strengthen by the essay of Mereseth (1996), "The promise of android application from

the vantage point of its potential to scaffold case based learning, consists in large measure of its capacity to represent the complexities of learning and learning."

Android based Mobile Learning Media (MLM) as the form of e-learning can function as the media of learning as well as the learning source for the students. Mobile Learning has proven to help the students to share knowledge and creating the social interaction (Suanpang, 2012), and Mobile learning is useful to increase the knowledge of the students along with the increase of learning results.

In the other sides, the perception of the teacher upon the influence of using e-learning reflecting the influence of technology in the learning process (Ertmer, 2005). The understanding of the teacher upon the e-learning produced the learning the is more meaningful by using the ICT in the classroom learning.

While the influence for the students, e-learning opens more chances for the students to explore the study materials more from various perspective. Through the e- learning, the students can be connected to the learning in class (Murphy, 2011). The results of the research indicated that the students are more involved in the learning when they are using the mobile technological devices. According Churchill & Wang (2014), mobile technological device can increase the motivation of the students, so that the it is suitable to be used as the tool to strengthen the learning process in the elementary school.

The other positive influence from the e-learning is that because the presence of feedback that is quick and the learning process in groups throughout the learning activity, then the use of technology in learning can increase the communication between the students and the teachers in class. It is done so that the students can learn better because by using the mobile learning can create the group work and discussion that is better.

Therefore, there are a number of influence of the use of e-learning that is to create new ways in learning, increase the involvement and creating the collaboration in learning process (Domingo & Gargante, 2016).

## 2. Research Method

### 2.1. Type of research

The type of research used in this study is the developing method of SDLC (System Development Life Cycle) of Waterfall, 2001 that is the most accurate method to develop the information system as well as developing learning media of It based. While the steps in SDLC are divided into 6 parts, those are: Investigation, Analysis, Design, Testing,

Implementation and Maintenance. In detail, research and development (R and D) is described in the Fishbone Diagram in Figure 1
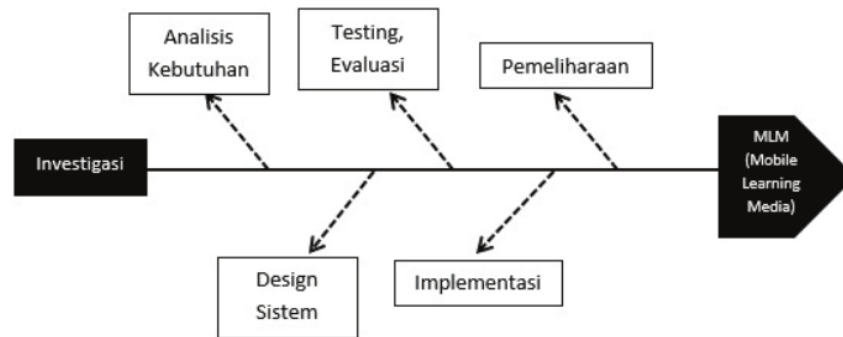


**Figure** 1: Fishbone Diagram of the Steps of Research.

This research is done in Kendal Regency that having cooperation with the elementary under the jurisdiction Department of Education and Culture of Kendal Regency.

## 2.2. Data analysis

The first year in the developing process the MLM media is the step of need analysis. On this step, the data analysis is done using statistical description by calculating the percentage and the average from the questionnaire that is given to the teacher of elementary school of higher grade on FGD.

## 3. Results and Discussion

The need analysis upon the use of information technology and the communication in the learning process in elementary school, the results gained. For the grade V of elementary school, it is identified that the materials that are hard really need the use of media, in this case is the MLM media, are the materials of "distance, time and speed" of mathematics. Other than the difficult material to understand for the students by only reading the instruction from the book as well as the explanation from the teacher, the presence of animation is needed to help the students to understand the material of "speed". It is expected that the suitable visualization on the MLM media will be developed may solve the issue of such difficulty.

The form of media that is needed supposed to be complete to be seen from both aspects, the content material as well as the technical form in the MLM media. Table 1 is the result of the summary.

TABLE 1: Summary of result of questionnaire about the content material of MLM media.

| No. | Question | Option of Answer | Percentage |
|---|---|---|---|
| 1 | The way the intended material is delivered | a. Short and clear | 80% |
| 2 | Is the material of learning delivered completely? | a. Yes | 80% |
| 3 | Is the material of learning completed with the SK, KD, and the teaching purpose? | a. Yes | 80% |
| 4 | Is example given after the material shown? | a. Yes | 100% |
| 5 | Is the content of media needed to be completed with the scoring (evaluation)? | a. Yes | 100% |
| 6 | If you will to have any scoring in the learning media, what type of exercise preferred? | a. Multiple choices | 60% |

The result of questionnaire about the content of this media becomes the instruction on the moment of designing and the development media, those are the materials delivered supposed to be short and clear, the entire material delivered is attached with the basic competence and the learning purpose, also completed with examples and scoring, while the form of scoring is expected to be multiple choices.

According to (Liu et al., 2010), there are three distinctiveness of mobile learning such as follows: to provide learning environment anytime and anywhere, learning activities are more situational, provide Just –In-Time learning content. Futhermore Yahaya & Salam (2014) said that mobile learning now currently is most useful as a supplement to ICT, web learning and others traditional learning methods and can do much in order to enrich the learning experience of the user. In the future, mobile learning could be a huge factor in getting unsatisfied people in learning, where more traditional methods have failed.

Technically, the form of media is expected to cover the texts, pictures, animations and voices, also with the presence of icon buttons to ease the navigation in the MLM. Furthermore, on the materials of mathematics that is abstract can be presented to be more visual for the students through the illustration from the picture and animation. According to Churchill and Hedberg (2008) designed the material for concept learning by representing one or more related mathematical ideas in an interactive and visual way. The material allowed students to explore mathematics properties by manipulation.

Based on the result of the need analysis, the design developed for the MLM media that has been consulted by the experts of content and experts of media. The presentation of the prototype of MLM media which cover a number of the following items:

**Figure** 2: Main Menu.



**Figure** 3: Opening part, the content of curriculum and the introduction of main characters of the story in MLM media.

**Figure 4**: The content part of media, it contains the materials about distance, time and speed.



**Figure 5**: The Evaluation part. It is divided into three parts, the exercise, problem sovling, and evaluation.

The scoring from the expert of media and the expert of children psychology upon the media developed is presented in the Table 2.

The average score of the 3 experts upon the quality of MLM media gained is 4,9 or 90,25% and is classified in the category of very good. From the result of the three experts, it is announced that the MLM media is good for use.

The next step is the limited experiment for the MLM media on 10 students of V grade and a teacher of V grade to measure the readability of the media and ease of access of the navigation of the media on the students of Elementary School and the teacher that using the MLM media. It is also done to see the perception of the students and the
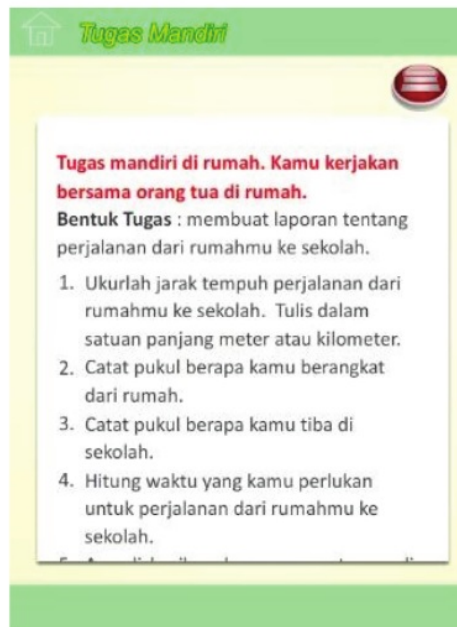
**Figure** 6: The independent study part, it caontains tasks that is done by the students at home with their parents.

TABLE 2: the scoring of expert of media and the expert of children psychology upon the MLM media.

| No. | Scoring Aspects | Average | Category |
|---|---|---|---|
| 1 | Quality of display | 4,7 | Very good |
| 2 | Software Engineering | 4,5 | Good |
| 3 | Flow of program | 5 | Very good |
| 4 | Interface | 47,5 | Very good |
| 5 | Reusable | 5 | Very good |
| 6 | Maintainable | 5 | Very good |
| 7 | Compatibility | 5 | Very good |
| 8 | Curriculum | 5 | Very good |
| 9 | Presentation | 4 | Good |
| 10 | Flow of program | 5 | Very good |
| 11 | Evaluation | 5 | Very good |
| 12 | Language use | 4 | Good |
| 13 | Concentration | 4 | Good |
| 14 | Problem solving ability | 3,5 | Fair |
| 15 | Socialization ability | 2,75 | Fair |
| 16 | Influence of the components of media upon the children psychology | 5 | Very good |
| | Average | 4.5125 | Very good |

teacher of grade V towards the content (material, text, picture, and animation) of the android based MLM learning media.

There are two parts of the interview that is done, those are the early experience of the students in using the smartphone and about the experience of the students after using the MLM media. Based on the responses of 10 students of V grade of elementary school and the teacher, some conclusions can be drawn.

1. The students of V grade has already been familiar in using the smartphone in their daily, for the needs of learning in finding learning sources, for games, as well as to socialize.

2. The students of V grade has not experienced any difficulty in operating the android based MLM media.

3. The students of V grade feel happy that they can use the android based MLM media, although the material inside the MLM media has not completely able to be understood since the materials about distance, time and speed has not yet to be learned in the first semester, especially before October.

4. The texts and pictures in the MLM media can be seen and are readable even when accessed from android.

5. The animation on the MLM media can help the students in understanding the materials that is considered abstract.

6. The independent task for home study in MLM media helps the students to learn at home.

## 4. Conclusion

The conclusion from the result that has been achieved on the first year (2017) of this research are as follow.

1. The study about the use of information and communication technology in the learning process in Elementary School, has produced the early data that is the importance of learning media in the learning process of the students of V grade. It is used especially for the materials that is difficult for students to understand, that is the mathematics subject on the materials of distance, time and speed.

2. The formulation of the MLM media developed is the media that can be used by the teachers as well as the students. This media can be used together by both

students and teacher in the classroom learning also for the independent study for the students at home.

## Acknowledge

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