

The Development of *Android*-Based Interactive Media to Increase The Learning Outcome of Civics Education on 3rd Graders

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Abstract—On a pre-research in Karangayu 02 Semarang elementary school, learning process has not been optimum in the use of media which caused students were lack of focus and the outcomes of learning were low, from 29 students only 7 students (24.14%) who reached the minimum score criteria (KKM), so *android*-based interactive media needs to be developed. The type of this research is Research and Development with Waterfall SDLC of research models, which consists of: analysis, design, implementation, testing, and maintenance. This research aimed to find out the development, the properness, and the effectiveness of *android*-based interactive media. The population and sample of the study were 29 students of 3rdB grade Karangayu 02 elementary school. The research design was one group pre-test post-test. The results showed that *android* media was decent to be used with percentage of assessment test of 79% from media expert, and from expert material amounted to 85% with the very decent criteria. *Android*-based interactive media was effective to be used, it was proved by the pretest and post-test learning outcomes acquired N-Gain = 0.57 with the moderate criteria. In addition, on the hypothesis test obtained $t_{count} = 8.027 > t_{table} = 2.064$, so H_a was accepted and H_o was rejected. The summary of this research was *android*-based interactive media was effective to be utilized in civic education learning and it could increase the results of the study civic education on the materials of The Youth Pledge.

Keywords—*android, civic education, development, interactive media, the learning outcome.*

I. INTRODUCTION

Education is a form of activity conducted consciously to develop the potential of students so that they are able to control themselves in various aspects, enhance their intelligence and creativity which are beneficial for themselves, society and nation and face global challenges in modern era.

Civics is a means to instil education of values, morals and norms continuously, in order to form a scrupulous citizens immediately. Ministry of National Education Regulation Number 22 Year 2006 concerning Standard Content Examples of Civics Study Room includes the aspects of: (1) National Unity, (2) Norms of Laws and Acts, (3) Human Rights, (4) Public Needs, (5) State

Constitution, (6) Power and Politics, (7) *Pancasila*, and (8) Globalization.

In the National Education Standards, besides the Content Standards includes Process Standards which relating to the implementation of learning in educational units to achieve graduate competence. Standard Process comprises lesson plans, learning design, assessment of learning outcomes, and supervision of learning process in order to create an effective and efficient learning process.

Ahmad Susanto [14] revealed that Civics learning is considered ideal if the learning does not only include lecturing, but also must be carried out until reaching the operational phase in accordance with the students' roles now and in the future. Rusminiati (2007: 1-30) added that Civics is a forum to socialize and internalize the values of *Pancasila* and national culture as mentioned in the curriculum of Civics in primary schools.

In essence, learning process is a communication process and a unified system that becomes an inseparable part of the learning process [3]. Azhar Arsyad (2013: 2) also suggested that the use of media is necessary in order to meet the learning objectives particularly and meet the education objectives in general.

The obstacles regarding the use of learning media occur in Elementary Schools in Semarang. From the initial research conducted by the researchers, the findings of the interviews with classroom teachers and the documentation of learning outcomes in class IIIB of SDN 02 Karangayu Semarang showed that the Civics learning in that school has been in accordance with the standards of the educational process, but the teacher has not used the learning media yet. That issue impacts the learning outcomes of the slow learners which reflected in table 1 that showed Civics learning outcomes is in the lowest position.

Table 1. The Students' Completion of IIIB Class of SDN 02 Karangayu

No	Subjects	Total Students		Percentage (%)	
		Completed	Uncompleted	Completed	Uncompleted
1	Civics	7	22	24,14 %	75,86%
2	Bahasa Indonesia	17	12	58,62 %	41,38%
3	Math	13	16	44,83 %	55,17%
4	Natural Sciences	17	12	58,62 %	41,38%
5.	Social Studies	11	18	37,93 %	62,07%

The development of ICTs provides various facilities for humans to carry out all activities, such as the use of smartphone. Smartphones have been widely used by the public. However, it is lamentable if this technology cannot be utilized properly and right on target, for example it has not been able to be used in teaching and learning activities. From these circumstances, one of the alternatives to solve the problem in the learning process of Civics Education in IIIB Class of SDN 02 Karangayu Semarang, is by developing android-based interactive learning media.

According to Daryanto [3], students will more easily learn concrete things than abstract ones. Jerome Bruner suggested that in the learning process should use the learning sequence from learning with pictures (iconic), then learning with symbols (symbolic). It is expected that android can be applied to various kinds of things like computers, the media developed must contain concrete things (can be videos and images) and abstract things (symbols). Azhar Arsyad (2013: 25-27) also revealed that using learning theory in learning, the knowledge can be received more interactively.

The previous studies that relate to this research are the studies conducted by Isma Ramadhani Lubis and Jaslin Ikhsan [9]. The research findings indicated that the post-test in the experimental class was 80.31 with the motivation increase score of 0.31, while in the control class' was only 77.81 with the motivation increase score of 0.16. The data were analyzed using Manova, and it was obtained the sig value of. <0.05 which means that there was an increase in cognitive achievement of students who engaged the learning using android-based media than before using conventional learning.

The other previous study is by Chung-Ming Hung [5], Iwen Huang, Gwo-Jen Hwang. The population of this study consisted of 3 classes totaling 69 students. One class became the experimental group A, the other class became the experimental group B and the third became the control group. Each class consisted of 23 students. The research findings revealed that the game on the e-book could effectively improve students' learning outcomes, students' self-confidence and students' motivation to learn on mathematics subjects. From the

two studies that explained, it can be seen that Android has a large and huge potential to be developed as a learning media particularly for learning media of Civics, the material of Youth Pledge.

Based on this background, the objectives of this study were to 1) Develop an android-based interactive learning media that is suitable for Civics subjects particularly the material of Youth Pledge conducted in IIIB class of SDN 02 Karangayu. 2) Identify the feasibility of the android-based interactive learning media to be used in Civics learning, particularly the material of Youth Pledge conducted in IIIB class of SDN 02 Karangayu. 3) Find out the effective-ness of the android-based interactive learning media to be used in Civics learning, particularly the material of Youth Pledge conducted in IIIB class of SDN 02 Karangayu.

II. METHOD

This is a Research and Development (R & D) study with Waterfall SDLC research model. It consisted of 5 steps where each step must be completed in sequences. It means one step must be completed before proceeding to the next steps. The Waterfall SDLC Stage is based on the International Journal conducted by Youssef Bassil [2] entitled "A Simulation Model for the Waterfall" consists of analysis (needs analysis), design (system design), implementation, testing, and maintenance. The researchers limited the research only to the 4th stage due to the limited research permits and the need for continuous monitoring, therefore the maintenance stage was carried out by the school.

In the analysis stage, the data collection was carried out by conducting interviews with students and teachers of IIIB class and distributing questionnaires to teachers and students, the result of the initial analysis of data collection brought the needs of students and teachers regarding learning media that will be developed by researchers. Furthermore, at the design stage, the need for media development from teachers and students is translated into a software design which initially that can be estimated before it will produce a document in the computer device that further can be called as software requirements such as prototypes and flowcharts.

The next stage was implementation. In this stage, the students' and teachers' necessity regarding learning media were translated into a product. The next stage was testing. In this stage the products developed was tested by the testing media experts and material experts, besides that, this stage the product in the form of application was implemented as the learning media in the small group tests. The last stage was maintenance. In this stage, the product provided was maintenance. In this study, the researchers only limited to the fourth stage that was 'testing' since the purpose of this study was only to determine the effectiveness of the use of Android-based media in the interactive learning in the Civics subjects for Youth Pledge.

The research design used in this study was one group pre-test post-test with the subject of research are

students, teachers, experts, and researchers. The variables of this study were ‘android-based interactive learning media’ as the dependent variable and ‘the learning outcomes of Class III students in the Civics Subjects for Youth Pledge’ as the independent variable. The population and sample in this study were all students of class IIIB in SDN 02 of Karangayu Semarang in the academic year of 2016/2017 (saturated sample).

The data were collected using the test technique consisting of pre-test and post-test, and non-test technique consisting of (1) research documentation in the form of videos, photos and the data of student’ scores, (2) questionnaires to identify the needs of media development from teachers and students, to get the feasibility of material and media experts, and to find out the responses of teachers and students on the use of android media in the Civics learning process, and (3) interviews.

The data had been analysed using prerequisite test and final data analysis. In the prerequisite test, the researcher used the normality test without homogeneity test as this study only used one sample group. Afterwards, the researcher used the t-test in the final data analysis to deduce the hypotheses. In addition, researchers also used N- Gain test to find out the improvement in learning outcomes.

III. RESULT AND DISCUSSION

The result and discussions elaborate the android-based interactive media models and designs, the expert feasibility assessments, and the effectiveness of android-based interactive media.

Models and Designs of Android-Based Interactive Media

Android-based interactive media for Civics learning particularly the material of Youth Pledge, was a means that can be operated in accordance with the expectations of the user to learn Civics. This media was designed to provide knowledge and history of the Youth Pledge. Android media developed was made to be interactive since it was supported by research conducted by Yueh-Min Huang [4], Tsung-Ho Liang, Yen-Ning Su, and Nian-Shing Chen in 2012 that Interactive E-book Learning System (IELS) was needed in learning in order to empower students personally about the experience of using ICT-based media.

Furthermore, at the stage of implementing media products involving eclipse editors to coding media applications. The final format of the Android media application is .apk with a minimal android system, Jellybean. The use of Eclipse as an editor was supported by research conducted by Gusti Ngurah Wira Satryawan, I Gede Mahendra Darmawiguna [7], I Made Gede Sunarya (2014). The findings showed that the design implemented in the Java programming language using Eclipse and ADT plug-ins had been successfully implemented in accordance with the design and it was known that the use of Eclipse editor in making Android-

based applications was appropriate and feasible in this research.

In addition, research conducted by Komang Wisnu Adi Putra [15], Ketut Resika Arthana, Gede Saindra Santy adiputra in 2015 also designed a media and applied it using Java with the Eclipse editor. The percentage of the results of the Expert Test was 92% means that the results of the content expert test was in the Very Good category. The percentage of the results of the Media Expert Test was 93.5% means that the test results was in a Very Good category, the percentage of the results of the Test of Student Response was 93.27% means that the test results was in Very Good category. In addition, the research by Komang Wisnu Adi Putra *et al* [15]. also revealed that Eclipse was feasible of being used as an editor in making Android-based applications.



Figure 1. Android-based interactive learning media for Civics Education, the material of Youth Pledge.

The media covered several menus including competency, material, play, evaluation, and profile buttons. Figure 1 shows the appearance of the product of Android media.

Expert Judgement Validation

In the validation process there was an assessment of the media feasibility and material on the implemented Android media. The media produced was then assessed and received input as a material to improve or revise. There were some enhancements so that Android-based interactive learning media could be feasible for third graders learning media in Civics Education subject matter for Youth Pledge in Elementary School.

Table 2. The Recapitulation of the Result of an Assessment Validation

Validator/expert	Percentage	Criteria
Material	79%	Suitable
Media	85%	Extremely suitable

Based on table 2, it can be seen the results of the validation assessment by material experts and the media showed that the overall aspects received a positive response. In the media expert validation, the feasibility aspect is divided into 7 aspects. There were the media aspects which got the score of 80% with 85% of learning aspect, 80% of the navigation aspect, 70% of the

interactivity aspect, 80% of the display aspect, 80% of the language aspect and 70% of program aspects.

In addition, the media experts also gave suggestions to enhance the media which can be seen in Table 3.

Table 3. The Revision of the Button Option Menu on the Media evaluation of Android-based interactive learning based on Suggestion and Revision from media Experts

Answering <i>Button</i> Option Evaluation Menu before Revision	Answering <i>Button</i> Option Evaluation Menu After Revision
	

While the expert validation of android-based interactive learning media validation assessment material was divided into 3 feasibility aspects. They were material aspects of 83%, learning aspects of 93%, and language aspects of 80%. In addition, material experts provide suggestions for improvements that the material presented must focus on indicators and learning objectives that have been predetermined.

From expert media and material assessments obtained, the appropriate research was the research conducted by Dedy Santoso [13], I Nyoman Mirya, and I Gede Wawan Sudatha (2013) whose findings that on the assessment belonged to (1) very good qualification (90%); (2) Test of learning media experts was well qualified (88%) so that it can be concluded that the interactive learning media based on Android subjects in Civics, the material of Youth Pledge was feasible of being used.

Questionnaire for Student and Teacher Responses

Based on the responses of students in IIIB class of SDN 02 of Karangayu Semarang, in the small group responses were obtained with the percentage of 97% with very feasible assess-ment criteria.

Criteria for the feasibility of response are seen in Table 4 based on the journal article of Nur Endah Islamiyah and Susanti [6] on the proceedings of the national seminar on accounting and financial education.

Table 4. The Criteria of the Assessment of Response Questionnaire

Percentage	Criteria
0% - 20%	Not very feasible
21% - 40%	Not feasible
41% - 60%	Quite feasible
61% - 80 %	Feasible

81% - 100 % Very feasible

In addition to the small group, the student response looked positive also in the large group at 95.38% (very feasible), and the responses by the teacher obtain an average percentage of 96% (very feasible). In addition to providing responses, the teacher also gives advice to researchers. Positive responses of students are in accordance with Wanda Ramansyah's [10] research, in the study in small groups it was known that the overall percentage average of the quality of game education was 88.4%, and in the large group was 87.6%.

Research conducted by Ellenita, Kenneth, Kristian Martian, and Joy also strengthened the research, from students' responses of 28 students on the graphic aspects of music or sound effects averaging 4.62 on a linkert scale indicating students agreed or signalled a positive response, and the aspects of learning and navigation also indicated a positive response with each gaining a score of 4.43 and 4.32. Therefore, it showed that the android-based interactive learning media was easy to be used by elementary school students.

The Effectiveness of Android-Based Interactive Learning Media

The effectiveness of *android*-based inter-active learning media can be seen from N-Gain obtained, and hypothesis testing.

Table 5. The Result of Big Group *N-Gain*

Average Score of Pre-Test	Average Score of Post Test	N-Gain	Interpretation
65,63	85,21	0,57	Average

Source : The data of Processed Development Research 2017.

Based on table 5, it can be seen that android-based interactive learning media is effectively used from the results of the pre-test and post-test learning calculated using N-Gain has increased and is included in the medium category. The following are the N-Gain value criteria in table 6.

Table 6. The Criteria of *N-Gain* Score

Score g	Interpretation
$0,7 < g < 1$	High
$0,3 \leq g \leq 0,7$	Average
$0 < g < 0,3$	Low

The *pre-test* and *post-test* values were then re-tested using the t-test. The t-test in this study was used to determine whether or not there was a significant increase in learning outcomes.

Table 7. The Average Difference Test of *Pre-test* and *Post-test* Score

Data	<i>t</i> _{count}	<i>t</i> _{table}	Δ	
<i>Post-test</i> – <i>Pre-test</i>	8,027	1,711	5%	H _a accepted

From Table 7 based on calculations using a simple paired dependent formula, then H_a is accepted because $t_{count} > t_{table}$. Therefore, it was concluded that android-based interactive media was effectively used in the Civics Education program for Youth Pledge material.

IV. CONCLUSION

The conclusions of this study are (1) the development of android-based interactive learning media using Eclipse editor by implementing several stages based on the Waterfall SDLC model, from material collection, curriculum analysis, analysis of teacher and student needs (analysis phase), design phase, implementation stage, and testing (testing). (2) The level of feasibility of android-based interactive learning media products is known based on the validation of material experts by obtaining an average percentage of 85% and media experts with an average percentage of 79%. The feasibility of android-based interactive learning media was also measured by the response of teachers who obtained an average percentage of 96%, responses of small group test students with a percentage of 97%, and responses of large group test students with an average percentage of 95.38%. With this acquisition it is known that android-based interactive media get a positive response from teachers and students. (3) In addition, the android-based interactive media from the N-Gain calculation gets a score of 0.57 and the t-test shows $t_{arithmetic} (8.027) > t_{table} (1.711)$. From these calculations, it can be concluded that H_a is accepted and H_o is rejected, which means that using interactive learning media based on Android is effective on learning outcomes of Civics subject in class IIIB of SDN 02 of Karangayu Semarang.

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