

Development of Mobile Learning Applications Containing Local Wisdom with Problem Based Learning Model to Improve Social Studies Critical Thinking of Grade V Elementary School Students

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ABSTRACT

This research develops mobile learning application media containing local wisdom in social studies learning class V SDN 1 Datar Jepara Regency. The purpose of this research is to examine how to develop, test the feasibility, and test the effectiveness of mobile learning media containing local wisdom. In this study the model used is the development of Borg and Gall. Techniques of data collection used include tests, interviews, documentation, and questionnaires. Data analysis techniques use normality, homogeneity, t-test, and N-gain test. The results obtained from the study showed scores by material experts of 95.68%, media experts of 86.95%, and linguists of 92.18% with very feasible criteria. Mobile learning applications containing local wisdom are effective for use in class V social studies learning content on diversity material in the social and cultural fields. This is evidenced by the increase in critical thinking skills of SDN 1 Datar students in terms of *pretest* and *posttest scores*. The results of the t-test using the Paired Sample t-test, the results were obtained that $t_{count} > t_{table}$ ($41,706 > 2,079$). While the N-Gain test has an increase of 0,784 with the "High" category. The conclusion of the research is that mobile learning application media containing local wisdom with a problem based learning is feasible and effectively used to improve the ability of students' critical thinking in social studies learning material in class V.

Keywords: Learning Media, Mobile Learning, Local Wisdom, PBL, Social Science.

INTRODUCTION

Education is the most important element of welfare indicators as enhancing the quality of human resources to advance the country. There is an education to explore one's potential and develop it according to ability. Based on Law of the Republic of Indonesia Number 20 of 2003 concerning the National Education System, it is stated that education is a planned and conscious effort to create an environment and learning activities by enabling students to actively improve spiritual religion, self-control, personality, intelligence, noble personality in life in the nation and state. In the implementation of quality education, it must have an appropriate and good system related to existing resources, one of which is the national education curriculum set by the government, namely the 2013 curriculum. Social science is a learning effort that is formed by the problem of social reality, as well as the phenomenon of an approach between fields of science that is integrated in the humanities social science family to create a society to actively solve social problems (Surahman & Mukminan, 2017: 2). Problems in social studies learning occur from teacher and student factors. In addition, based on research conducted

(Rusmawan, 2013) concluded that interests, strategies, and motivations when learning social studies are simultaneously and significantly influenced by the difficulty of learning social studies. The paradigm in education is a *student center* by emphasizing the involvement of students in every learning to be active and independent. However, in reality in the field, social studies learning is considered boring because it tends to be a *teacher center*.

The curiosity of students in community life makes it easier for students to accommodate between theory and the results of their observations in the surrounding environment. Social studies education acts as a means for students to learn about themselves, the environment, and further prospects to apply it to real life. Therefore, the social studies learning activity carried out by teachers must focus more on provide a real experience to develop from competency, so scientifically students can learn, explore, and understand the environment, not just hearing material explanations from teachers. So, in social studies learning, teachers are required to provide and facilitate learning media tailored to the needs of students in achieving learning objectives.

According to Angelo (in Prameswari et al., 2018: 744) critical thinking is about using rational higher-order thinking, including analyzing, synthesizing, recognizing problems and solvers, concluding and evaluating. Stobaugh (in Anggraeni et al., 2022: 86) explained that critical thinking is deep reflective thinking to make decisions and solve problems in an effort to analyze the situation, evaluate arguments, and draw appropriate conclusions. Therefore, critical thinking can be interpreted as the ability to make a decision by considering everything and using consistent and reflective thinking methods.

Problems regarding IPS learning are also found at SDN 1 Datar Jepara Regency. Based on the pre-research conducted by researchers on teachers in grade V SD Negeri 1 Datar, namely through observation

data, interviews, and documents, there are several problems in the learning activity, including from its use and development of IT-based learning media that are less than optimal. There is still a lack of learning media, especially in social studies learning, which should use contextual social studies learning media but is not fulfilled properly. Suboptimal learning media and the lack of use of media are still using teacher books, student books and image media only in the learning activity and the lack of innovative media use in helping learning make students less motivated, quickly bored and bored because of students only listening to lectures and doing assignments from teachers by focusing on learning resources in student books and student activity sheets (LKS) and the learning activity can't improve students critical thinking skills. The existing problems are reinforced by student learning outcomes in grade V of SD Negeri 1 Datar in the Final Exam of Semester 1 of the 2022/2023 academic year, the social studies learning content shows a high percentage of incompleteness according to KKM, which is 75%.

With the problem of social studies learning content, the media used by teachers is still limited, causing it not to support contextual IPS learning. In line with the rapid development of a technology, information and communication (ICT) in modern times has become imperative in the world of Indonesian education to integrate elements of technology in learning activities. Mobile learning as an effective tool in teaching and learning activities because it increases stimulus in students. In addition, mobile learning can be applied anywhere or anytime. The same is true with e-Learning technology, mobile learning can also be combined with other media such as audio, video, internet, and so on (Fozdar, 2014: 4). This is supported by Uno (in Adi & Arief, 2016: 671) explains from cybernetic learning theory which is aligned with the developmental theory of information science. Cybernetic learning is given to students to visually receive the material

given so that students do not only receive theoretical knowledge in the learning activity in class. based on cybernetics theory, the use of multimedia in learning makes the learning activity more effective for delivering material.

Shufa and Khusna (2018: 50) stated that a potential of the local area derived from human thinking as a characteristic of the area that is passed on to the next generation is called local wisdom. Learning that integrates local wisdom can increase love for local culture and environment for efforts to maintain the sustainability of local wisdom in the midst of the times. This is based on so that students can easily understand the concept of subject matter because it starts from their immediate environment, therefore students not only gain knowledge but also apply it in practice in everyday life, Hidayat and Haryati (2020: 586).

Along with the development of the curriculum applied to elementary school level education units today is the 2013 curriculum which is centered on students. One of the learning models that uses a scientific approach is the *Problem Based Learning* model or problem based learning model. Atminingsih et al., (2019, 142) the *problem-based* learning model is one of the innovative learning models that can be applied to learning because it can encourage students to use optimal thinking skills during learning activities through a group learning activity for cooperation in solving problems, so that students Can empower, hone, and develop his mind continuously and systematically.

By referring to the problem of social studies learning content, the media used by teachers is still limited to using teacher books, student books and image media without any more innovative learning media and the use of the internet is still not optimal, causing it not to support contextual social studies learning. Based on the existing description, the researcher is interested in conducting research entitled "Development of Mobile Learning Applications Containing Local

Wisdom with Problem Based Learning Model to Improve Social Studies Critical Thinking of Grade V Elementary School Students".

MATERIALS & METHODS

This research is the type of Research and Development (R&D) which aims to develop mobile learning application media containing local wisdom on the learning content of Elementary School Social Sciences. This research uses a development model according to Borg and Gall in Sugiyono (Mahardika & Siswoyo, 2021: 41) which has 10 stages of implementation, including: (1) potential and problems; (2) data collection; (3) product design; (4) design validation; (5) design revisions; (6) product trials (7) product revisions; (8) usage trials; (9) product revisions; (10) manufacture of mass products. But in this study researchers only reached 8 development steps, namely until trial use, this is due to the limited time and costs needed. On the research subject is grade V students of SD Negeri 1 Datar. The independent variable of this research is mobile learning application media containing local wisdom and the dependent variable is the critical thinking ability of students. Techniques for collecting data are in the form of test and non-test techniques, in non-test techniques using interviews, observations, documentation and questionnaires. And data analysis techniques using normality, homogeneity, t-test and N-gain.

RESULT

Results of research and also development of mobile learning application media containing local wisdom with the Problem Based Learning model include: development of mobile learning application media containing local wisdom applied in social studies learning diversity material in the social and cultural field of grade V elementary school; 2) the feasibility of mobile learning application media containing local wisdom; 3) the results of

critical thinking skills of grade V students using mobile learning application media containing wisdom local.

Design of Mobile Learning Application Media Development Containing Local Wisdom

Development of a learning media product for mobile learning applications containing local wisdom is carried out to fulfill the learning media that can support social studies learning activities of diversity material in the social and cultural fields of grade V elementary schools. This research is in line with Darmawan's opinion (in Widiastika, 2020: 50) Mobile learning is a choice of learning services that can be done anywhere and anytime. This is supported by research conducted (Winarni and Purwandari, 2018) explaining that Mobile learning applications make it easier for teachers to develop material learning and help achieve competencies and can increase student self-confidence, independent learning, motivation, and remember the material. Another supporting research was

conducted (Nugroho & Arrosyad, 2020) in which the development of multimedia as a learning medium is arranged with an attractive appearance, varied to be effectively used in the learning activity.

Mobile learning applications containing local wisdom are developed according to the needs of students and teachers. The development of mobile learning applications is designed in the form of slides with colors, images, illustrations, and videos that are interesting and support the content of diversity material in the social and cultural fields. The language and audio used are clear and communicative and the letters are easy to read clearly. Mobile learning application for social and cultural diversity materials, with slide content: splash screen, login / start page, main menu, virtual meeting menu, information menu, competency menu, material menu, games menu, evaluation menu, certificate menu and exit menu. For more details, the following shows the design of media products that have been developed by researchers.



Figure 1 MenuStart Login



Figure 2 Main Menu



Figure 3 Virtual Meeting Menu



Figure 4 Competency Menu



Figure 5 Material Menu



Figure 6 Games Menu



Figure 7 Evaluation Menu



Figure 8 Information Menu

Results of the Feasibility Assessment of Mobile Learning Application Media Containing Local Wisdom

The feasibility assessment of media a mobile learning application containing local wisdom on elementary school social studies learning content is assessment by media, material, and language experts. Assessment validation was carried out by filling in the assessment instrument that had been prepared by the researcher. The percentage of feasibility assessments conducted by experts is as follows.

Table 1 Media, Material and Language Expert Assessment Results

Assessment Validation	Percentage	Criterion
Media Validation	86,95%	Very Worth It
Material Validation	95,68%	Very Worth It
Language Validation	92,18%	Very Worth It

Based on table 1, it shows the feasibility of a mobile learning application media containing local wisdom that researchers develop, from the results of due diligence by media experts provide value with a percentage of 86.95%, material experts give a value with a percentage of 95.68%, and linguists give a value with a percentage of 92.18%. Therefore, feasibility conclusions can be drawn from mobile learning media application containing local wisdom in the school social studies learning SD Negeri 1 Datar is categorized as very feasible to be tested at the trial stage of use.

This is in accordance with research by (Bintaro, 2017) results of interactive multimedia products with media and material expert validation that includes it in very good criteria. And by (Hardinata et al., 2018) results showed that the media received a material expert assessment of 95,83% very good, media experts 89,71 in the very good category, the quality of

learning media with a percentage of 85,13 in the good category. In the second trial, the percentage of 86,91 very good category.

Results of Assessment of the Effectiveness of Mobile Learning Application Media Containing Local Wisdom with a Problem Based Learning Model

A study is said to be successful if the research is effective for improving learning outcomes. The results of students' critical thinking skills are the value of the pretest and posttest. Through large group product trials, student learning results were obtained on the use of mobile learning applications containing local wisdom developed. The learning outcomes of students in large group product trials involving 22 grade V students of SDN 1 Datar, as follows:

Table 2 Critical Thinking Skills Results in Large Group Trials

Information	Pretest	Posttest
Average Grade	59,43	90,68
KKM	70	70
Lowest Value	50	82,5
Top Rated	70	100
Complete Number of Students	3	22
Number of Students Incomplete	19	0
Completeness Rate (%)	13,6%	100%

The evaluation system used in curriculum learning activities in 2013 is authentic assessment. In Permendikbud No. 23 of 2016 concerning Education Assessment Standards, it is explained that authentic assessment is an assessment of learning outcomes based on aspects of attitudes, knowledge and skills. An increase in a student's cognitive learning outcomes can be measured from the pretest and posttest scores. In line with research (Widiastika et al., 2020) The understanding of students before and after using the media is obtained from the results of calculating pretest and posttest scores, so it can be said that the

media is effectively used in the learning activity. To test the validity of pretest and posttest value data, normality tests are carried out to test the normality distribution

of student learning outcome data. The following is a table of normality test calculation results from research with Microsoft Excel application.

Table 2 Pretest and Posttest Normality Test Results

Data	Average	Standard Deviation	L _{Count} (L _o)	L _{Table}	Information
Pretest	59,43	6,897	0,115	0,190	Normal Distributed
Posttest	90,68	5,465	0,128	0,190	Normal Distributed

Table 2 shows if normality test results of pretest and posttest value results that the price of L_o Pretest 0,115 and the price of L_o Posttest 0,128. As for the L_{table} is 0,190. It can be concluded from the data obtained from the results of the Pretest and Posttest values in large group trials are normally distributed, because the prices of L_o < L_{tables}. After the level of normality of a data is known, then a homogeneity test is carried out in order to find out that both data variances (pretest and posttest data) are consistent. Researchers conducted a homogeneity test with the F test formula which was analyzed using Microsoft excel as follows.

Table 3 Pretest and Posttest Homogeneity Test Results

Data	Variance	Df	F _{Count}	F _{Table}	Information
Pretest	47,578	21	1,592	2,084	Homogeneous
Posttest	29,870	21			

Based on the Homogeneity Test from the Pretest Posttest results that were carried out in large group trials totaling 22 students, the calculation of the price of F_{count} 1,592 and F_{table} 2,084 can be obtained. Conclusions can be drawn from the data from the Pretest and Posttest results in the second large group trial the variance of homogeneous data, because the price F_{count} < F_{table}.

Next, a t-test was carried out to find out the effectiveness of mobile learning applications containing local wisdom with a problem-based learning model in social science learning. The effectiveness of the use of mobile learning applications containing local wisdom in elementary school social studies learning can be reviewed through significant average score differences between scores before and after the test. Here's a table of t-test calculation results with Microsoft Excel.

Table 4 t-Test Results

Data	N	Average	Variance	t _{count}	t _{table}	Criterion
Pretest	22	59,43	3,514	41,706	2,079	Ho was rejected
Posttest	22	90,68				

Based on the t-test produced between the Pretest and Posttest, from the calculation results using Microsoft Excel using the Paired Sample t-test, the calculation results were obtained with a t_{count} price of 41,706 and t_{table} price of 2,079 with a significance level of 5%. In the Paired Sample t-test, reject Ho if t_{counts} > t_{table}. on the results of the calculation it can be seen that H_o was rejected because the price of t_{count} > t_{table} (41,706 > 2,079). This shows that in large group product trials there are differences on

the results of students' critical thinking skills between before and after implementing mobile learning applications that contain local wisdom.

The N-gain testis carried out so that it is known that there is an increase in the results of critical thinking skills after using mobile learning application media containing local wisdom. The following is the N-gain test data in group product trials using mobile learning application media containing local wisdom.

Table 5 N-Gain Test Results

Class	Multiple Learners	Average		N-gain	Criterion
		Pretest	Posttest		
Large Groups	22	59,43	90,68	0,784	Tall

Based on the N-Gain results from the data in the trial using the large group above. In the large group test, the N-gain value was 0,784 with high criteria. in the value shown there is an increase in pretest and posttest scores that have been carried out on learning using mobile learning application media containing wisdom local in class V SDN 1 Datar. And in the questionnaire, the responses of teachers and students received a positive response with a percentage of 100%.

DISCUSSION

Design of Mobile Learning Application Media Development Containing Local Wisdom

Researchers in developing mobile learning application media containing local wisdom in social studies subjects, diversity materials in the social and cultural fields of class V use the research and development procedures of Borg and Gall adapted by Sugiyono. The development model carried out by researchers includes 8 stages out of a total of 10 stages, namely: (1) potential and problems; (2) data collection; (3) product design; (4) design validation; (5) product revisions; (6) product trials; (7) product revisions; and (8) usage trials.

The characteristics of mobile learning developed are in line with Darmawan's ideas (in Widiastika, 2020: 50) mobile learning is learning using a mobile device so that it is easy for users to access learning content anywhere and anytime without being limited by place or time, so that learning does not only occur in the school environment. As well as making it easier for students to understand and motivate during the learning activity.

Based on the characteristics of students and previous research, researchers developed a mobile learning application media for diversity material in the social and cultural fields, with slide content: splash screen, login/initial page, main menu, virtual meeting menu, information menu, competency menu, material menu, games

menu, evaluation menu, certificate menu and exit menu. Mobile learning development is designed in the form of slides with colors, images, illustrations, and videos that are attractive and support the content of water cycle material. The language and audio used are clear and communicative and the letters are easy to read clearly.

Results of the Feasibility Assessment of Mobile Learning Application Media Containing Local Wisdom

The feasibility of mobile learning applications containing local wisdom is known through mobile learning validation carried out with expert assessments and user responses. In mobile learning validation activities, it aims to determine the assessment and evaluate the media that has been developed so that it is suitable for use for learning activities. The score results processed by researchers showed that the assessment by media experts was 86.95%, material experts by 95.68%, and linguists by 88.75%, which means that mobile learning application products containing local wisdom developed are categorized in very feasible criteria. And supported by the percentage score of the results of the teacher response questionnaire, and grade V students of SDN 1 Datar of 100% in the large group usage test. This shows that the use of mobile learning applications containing local wisdom has received positive responses so that it is suitable to be implemented in learning activities.

Results of the Assessment of the Effectiveness of Mobile Learning Application Media Containing Local Wisdom

In the results of the research conducted, it can be seen that mobile learning application media containing local wisdom is effective in improving students critical thinking skills. Large group tests were conducted in class V of SDN 1 Datar as many as 22 students. After conducting the pretest and

posttest and obtaining the results, the next step is the normality test to know the data is normally distributed or not and determine the statistical technique that will be used next. To test data normality, researchers use the Lilliefors test with the help of Microsoft Excel. The normality test data of pretest and posttest results from 22 students obtained pretest results L_o 0,126 and posttest L_o 0,159 with L_{table} from 22 students namely 0,190. From these results, it can be said that the data is normally distributed because the pretest results are $0,126 (L_o) < 0,190 (L_{table})$ and posttest results $0,159 (L_o) < 0,190 (L_{table})$. Then a homogeneity test was carried out by obtaining calculations on group trials, $F_{count} 1.486 < F_{tables} 2.084$ so that it was known that the data on the results of Pretest and Posttest values in large group trials, both data variances were homogeneous.

Then, researchers conducted a t-test using the Paired Sample t-test with the help of Microsoft Excel. In the t-test, the results of $t_{count} 80,668$ and $t_{table} 2,079$ with a significance level of 5% is 0.05. From the results of these calculations, it can be seen that H_o was rejected because the price $t_{count} > t_{table} (80,668 > 2,079)$. This shows that if the trial stage of large group products there are differences in student learning outcomes in social studies learning diversity material in the social and cultural fields before and after using mobile learning applications containing local wisdom.

After the t-test, researchers looked for a large average increase through N-gain. From these data, it was obtained that the average pretest score was 59,65 and the posttest score was 90,45 so that the N-gain test results on the pretest and posttest result data there was an increase of 0,780 with an average difference of 30,8 indicating the "High" category. Based on the results obtained from the research data, it is concluded that mobile learning applications that contain local wisdom are effective to be applied to improve the critical thinking

skills of class V social studies subject matter in the diversity of social and cultural fields.

In this study according to research by Fatchurahman et al., (2022) concluded from the research results can help teachers create interesting learning in order to increase student learning outcomes according to the results of data analysis before and after the media is applied to the learning activity. Another study by (Puspa & Lubis, 2022) From the research conducted, it can be concluded the application of problem-based learning with local wisdom content oriented to social science issues affects conceptual knowledge and literacy in the students environment.

Another supporting research is the research conducted by Restuti et al., (2021). In the journal, it was explained that the research concluded that the Problem Based Learning model assisted by Prezi media in social studies learning in class IV meets the requirements for instrument validity so that it is feasible and valid for social studies learning activities. In addition, Prezi's media-assisted Problem Based Learning model effectively improves critical thinking skills and concept understanding. Next is a study by Nurhidayat et al., (2020). In this study, media expert validation results obtained a value of 79,16% which is valid and suitable for use in learning. validation results by material experts obtained a value of 89,57% which is valid and suitable to be implemented in learning. The results of trials with students in the overall results were 97% valid and suitable to be implemented in learning. On the results between the students' pre-test and post-test increased their scores by 100% with assertive criteria when used in learning.

CONCLUSION

Mobile learning applications containing local wisdom are developed according to the needs of students and teachers. From the development of this mobile learning application it is designed in the form of a slide with colors, images, illustrations, and videos that are interesting and support the

content of diversity material in the social and cultural fields. The language and audio used are clear and communicative and the letters are easy to read clearly. Based on the feasibility assessment by material experts on the mobile learning applications containing local wisdom including very feasible criteria with an assessment percentage score of 95,68%. While the feasibility assessment by media experts at mobile learning applications containing local wisdom included very feasible criteria with an assessment percentage score of 86,95%, and the feasibility assessment by linguists at mobile learning applications containing local wisdom included very feasible criteria with an assessment percentage score of 88,75%. Mobile learning applications containing local wisdom are effectively used in class V social studies learning content on diversity material in the social and cultural fields. This is evidenced by an increase in the critical thinking skills of SDN 1 Datar students in pretest and posttest scores. The results of the t-test using the Paired Sample t-test, it was found that H_0 was rejected because the price of $t_{count} > t_{table}$ ($80,668 > 2,079$). While in the N-Gain test there was an increase of 0,780 with the "High" category. And in the questionnaire, the responses of teachers and students received a positive response with a percentage of 100%.

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