

Critical Thinking and Learning Outcomes through Problem Based Learning Model Based on LBK Application

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The purpose of this study was to determine the effect of the problem based learning model of LBK media assistance on critical thinking skills and learning outcomes of PPKn (Pancasila and Citizenship Education). Then a quasi-experimental, non-equivalent posstest-only control group design was conducted. The population is in the form of all grade XI students of SMA Negeri 1 Banda Aceh, consisting of 8 classes. The sample was determined by multistage random sampling technique, two sample classes were selected, namely class X 1 as the experimental group and class X 2 as a control. Quantitative data types are in the form of critical thinking skills scores, with questionnaires and learning outcomes data, using learning outcomes tests. Data was analysed by t-test and MANOVA aided by SPSS 15.0 for Windows. The following hypothesis test results were obtained: 1) there is a significant influence on the model of problem based learning with LBK media assistance on critical thinking skills and learning outcomes, and 2) there is a simultaneous influence on the problem based learning model with LBK media assisted critical thinking skills and learning outcomes. The conclusion of the research is the ability to think critically and the learning outcomes of PPKn can be triggered through the application of the problem based learning model with the assistance of LBK media.

Key words: *Problem based learning, LBK Media, Critical Thinking, Learning Outcomes PPKn.*

Introduction

Entering the 21st century, the advancement of information systems and technology, demands individual abilities and skills in exploring the digital world. The three pillars of education of the century at the 2015 World Economic Forum are mastery of literacy, competence and character. Then "The 4Cs", namely communication, collaboration, critical thinking, and creativity. These three pillars and 4Cs are expected to colour the learning process at all levels of education to prepare students for competitiveness at the global level. Preparing quality output, being able to compete globally, and mastering technological development is important for everyone and important for the future of a country (Kanematsu & Barry, 2016; Hallissy, M., Butler, D., Hurley, J., and Marshall, 2013).

The ability to think critically must be improved in line with the shift in conventional learning patterns towards more openness by utilizing information systems and technology. In addition, the learning model is very important in the learning process to improve critical thinking skills and student learning outcomes. The media acts as an intermediary for communication between students and teachers so that communication in learning becomes more meaningful. Harum (2016) states that teachers still use conventional learning media, with books as the main source for learning still looking less attractive.

Problem based learning is a learning process that emphasizes student activity, where students are required to be active in learning as something the students must learn to practice critical thinking skills, the learning process by expelling student abilities is truly optimised through systematic group or team work processes, so students can empower, hone, test, and develop thinking skills on an ongoing basis that is oriented to real-world problems. Because students' intellectual development occurs when they are faced with new and challenging experiences and when they then try to solve the problems that arise.

Problem Based Learning is a learning model that is recommended for use in the 2013 curriculum, with consideration of activities or teaching and learning processes using reality or real world problems as students' thinking material so students can solve problems and gain knowledge from teaching and learning processes (Bligh, 1995; Doig, 1993; Evans & Taylor, 1996; Kaufman & Holmes, 1996; Christina, 2014). In learning, relevant and conducive media are needed to foster student enthusiasm for learning. One of them is focused on developing deeper and more critical learning by utilising learning media in an effort to help students develop skills (Ontario, 2016).

Technology can help students facilitate communication and collaboration processes (Ontario, 2016). Generations that grow and develop at different times tend to have different lifestyles, characters, and learning preferences (Yaumi, 2017). Even more than that, this generation is

very focused on technology and tends to depend on technology (Aloysia & Chia, 2017). Its complexity due to changes in learning goals is so fast and massive that it requires educators to update science and technology all the time (Yaumi & Damopolii, 2015).

Heinin, Molenda, Russell, and Smaldino (2002: 6) define the media as a means or channel of communication. For example, print media, audio, visuals, videos, objects, and people (Yaumi, Damopolii, & S.Sirate, 2016). Ozma (1991) believes that the media not only contribute greatly to the process and results of learning, but can arouse motivation and passion for learning. Canlan (2012) found that media can facilitate learning and can increase understanding of learning material. Reiser and Dempsey (2012) view learning media as the physical equipment to present learning to students with.

Technological progress is faster than the development of education, especially learning. And making high-technology tools has become an important part of life (Zuhal, 2000; Naisbitt, 2002). So that the design of learning provides some recommendations and guidelines for using learning media and incorporating it into the classroom both done before or at the beginning of the learning process (Chuntao, 2011). The learning process carried out in schools must be adapted to technological developments and rapid developments in the fields of technology and information such as the internet (Sanaky, 2009: 2).

The quality of learning is currently oriented towards the digital era. In an effort to improve the quality and quality of education, PPKn is one of the subjects that must significantly replace the conventional learning media with digital options. Digital learning media play a very important role for PPKn subjects in the Perseko area. Bear in mind, almost all students get bored easily in PPKn learning. With a smartphone, students train themselves to examine problems through their own gadgets. Thus lessening the use of gadgets only for social media and communication. Students can also be trained to work together to show the results of discussions through powerpoints. Their creativity is also trained to continue to be innovative in generating PPKn learning. The role of information technology in learning PPKn serves to provide opportunities for educators to become facilitators of student learning activities. Meanwhile, the purpose of learning PPKn according to Ruminiati (2007: 26) is to provide competence in: 1) Thinking critically rationally and creatively in responding to the issue of citizenship. 2) Participate intelligently, responsibly and act consciously in community activities. 3) Developing positively democratic to form themselves based on the character of the people in Indonesia so they can live together with other nations. 4) Directly interact with other nations in the world to take advantage of information and communication technology.

Based on preliminary observations, it is known that the ability to think critically and the learning outcomes of PPKn in state high schools 1, 2 and 3 in the city of Banda Aceh especially in class X is relatively low. The learning process is dominated by conventional

ways, and it appears students are still less active when learning. The learning media that are used have not yet fully utilised the facilities provided by the school. Based on the results of interviews with students, most of them prefer a learning atmosphere that follows the development of technology and information. In this case educators need to design a learning model and associated media that can improve critical thinking skills and be more active in their own knowledge so that the learning atmosphere is not rigid. One of them is by applying a learning model that uses modern facilities and infrastructure.

Research Method

This research belongs to the type of quasi-experimental research. In this experimental study the authors used two sample groups namely the treatment group (experimental) and the control group. This was done in order to determine the effect of LBK media-based problem-based learning models on critical thinking skills and learning outcomes of PPK students in class XI of SMA Negeri 1 Banda Aceh. The research design used is Non Equivalent Posttest-Only Control Group Design. The study population consisted of 8 classes and used random sampling to obtain class X1 as an experimental group and X2 as a control group. The study was held over 8 meetings consisting of 6 meetings for teaching and learning activities and 2 meetings for tests. The instrument used to collect data is in the form of a critical thinking abilities questionnaire and learning achievement tests. Each test and the validity test were tested using the product moment correlation, by correlating the scores of each test item with the total score and the reliability test used the Cronbach Alpha formula.

The collected data is processed by inferential statistics while the hypothesis is tested by t-test and MANOVA. Before testing the hypothesis, the analysis prerequisite tests include the normality test, the homogeneity test, and the homogeneity test and the variance-covariance similarity test between the dependent variables simultaneously. The first and second hypothesis testing uses t-test analysis with the help of SPSS 15.0 for windows. The third hypothesis test uses multivariate analysis of variance, namely multivariate analysis of variance (MANOVA). Data collected in this study are data about critical thinking skills and PPKn learning outcomes data.

Results and Discussions

The following data generated in the form of a critical thinking ability score and learning outcomes through model problem based learning LBK media assistance is presented in table 1.

Table 1: Critical Thinking Ability and Experimental Group Learning Outcomes

No	Critical Thinking Ability				Learning outcomes			
	Class Interval	Frequency	Middle value	(%)	Class Interval	Frequency	Middle value	(%)
1	57-62	1	59	2,85	54-60	2	59	5,7
2	63-68	2	65	5,7	61-67	5	65,5	14,2
3	69-74	5	71,5	14,3	68-74	7	73,5	20
4	75-80	17	77,5	48,5	75-81	12	80	34,2
5	81-86	6	83	17,15	82-88	6	87	17,15
6	87-92	4	89	11,42	89-95	3	93,5	8,57
		35		99,92		35		99,77

Based on table 1, it can be described that the experimental group data for critical thinking skills, for the category below the average there are 8 students, 17 students around the average category, while 10 students get a score above the average. Based on the obtained learning outcomes data, 14 students scored below average, 12 students got grades around average, and 9 students got grades above average

Table 2: Critical Thinking Ability and Control Group Learning Outcomes

No	Critical Thinking Ability				Learning outcomes			
	Class Interval	Frequency	Middle value	(%)	Class Interval	Frequency	Middle value	(%)
1	53-57	4	54	11,42	43-49	4	46	11,42
2	58-62	7	60,5	20	50-56	5	52,5	14,3
3	63-67	9	64,5	25,7	57-63	7	60,5	20
4	68-72	8	70	22,85	64-70	9	67,5	25,7
5	73-77	4	75	11,42	71-77	6	73	17,15
6	78-82	3	80,5	8,57	78-83	4	80	11,42
		35		99,96		35		100

Based on table 2, it can be described that the control group data for critical thinking skills, obtained 20 students below the average, 8 students around the average, and 7 students above the average. Based on learning outcomes data, it appears that 16 students get below average scores, 9 students get around average scores, and 10 students get above average scores.

Data was analysed using parametric statistics so that the prerequisite tests were carried out; the normality test, the homogeneity test and the Variance-Covariance Similarity Test Between Simultaneous Variables. The test for normality and homogeneity of critical thinking ability data and learning outcomes of PPKn using SPSS 15.0 for windows application was

obtained by Sig. Pada α in the experimental group as well as in the control group which means that critical thinking skills data and the value of the learning outcomes of the PPKn experimental group and the control group come from a normally distributed population. Homogeneity test of the two groups used the SPSS 15.0 application for windows, obtained the Sig. Berarti α . This means that critical thinking skills data and learning outcomes of PPKn have variance in the same sub-population (homogeneous). While the variance-covariance similarity test between bound variables is similar. For this test the Box's Test of Equality of Covariance Matrices numbers was used, the test results are presented in the following table.

Table 3: Box's Test of Equality of Covariance Matrices

Box's M	2.467
F	.892
df 1	3
df 2	3354372
Sig.	.654

Tests the null hypothesis so that the observed covariance matrixes of the dependent variables are equal across groups.

a. Design: Intercept+group

The significance value of the calculated results is $0.654 > 0.05$, which means that the dependent variable is the ability to think critically and the learning outcomes of PPKn have the same variance-covariance matrix in the group of independent variables namely the problem based learning model with LBK media assistance and conventional learning models. Because all the requirements have been met, then the hypothesis test using MANOVA can be continued. The first hypothesis test and the second hypothesis are used t-test with the application SPSS for Windows. The following table shows the output for hypothesis testing.

Table 4: T-Test results for critical thinking skills
Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Berpikir_kritis	.375	.541	5.831	64	.000	10.220	1.664	6.935	13.883
Equal variances Assumed			5.745	56.469	.000	10.220	1.684	6.879	13.852
Equal variances not assumed									

Based on these test results, the value of sig. (2-tailed) 0.00. can be interpreted as that there are differences in critical thinking skills between students who follow the problem based learning model of LBK media assisted compared with students who follow conventional learning models in SMA Negeri 1 Banda Aceh, indicating that there is a significant influence on the application of the problem based learning model of LBK media assisted in their critical thinking abilities. Hypothesis II shown in table 5.

Table 5: T-Test Results Civics learning outcomes

	Levene's Test of Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Study Results	.571	.439	4.375	64	.000	10.841	2.751	5.381	16.821
Equal variances assumed			4.921	63.287	.000	10.841	2.492	5.671	16.732
Equal variances not assumed									

Based on table 5, the output obtained is the value of sig. (2-tailed) 0.00. then it is interpreted that there are differences in learning outcomes between students who take the LBK media-based problem based learning model compared with students who follow conventional learning models. This is an indication of the significant influence of the application of the problem based learning model of LBK media assistance on the learning outcomes of PPKn.

The third Hypothesis Test uses the MANOVA test, used Pillai's Trace, Wilks Lambda, Hotelling's Trace, and Roy's Largest Root analysis at a significance level of 5% ($\alpha = 0.05$). For this purpose the Multivariate Tests table is used. The test results shown in table 6 obtained the sig value. 0.00 so that it is interpreted that there are simultaneous differences in critical thinking skills and learning outcomes of PPKn between students who take the problem based learning model with LBK media assistance compared with students who follow the conventional learning model.

Table 6: Tabel Multivariate Tests
Multivariate Tests b

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.873	3238.476 ^a	2.000	62.000	.000
	Wilks' Lambda	.006	3238.476 ^a	2.000	62.000	.000
	Hotelling's Trace	131.124	3238.476 ^a	2.000	62.000	.000
	Roy's Largest Root	131.124	3238.476 ^a	2.000	62.000	.000
Group	Pillai's Trace	.300	21.644 ^a	2.000	62.000	.000
	Wilks' Lambda	.500	21.644 ^a	2.000	62.000	.000
	Hotelling's Trace	.565	21.644 ^a	2.000	62.000	.000
	Roy's Largest Root	.565	21.644 ^a	2.000	62.000	.000

a. Exact statistic

b. Design: Intercept+kelompok

Based on the first hypothesis test obtained differences in the ability to think critically students who follow the problem based learning model of LBK media assisted by those who follow the conventional learning model in SMA Negeri 1 Banda Aceh. conducted by teachers and students where students are divided into groups, then each group opens a smartphone and works on material related to freedom of religion and belief in Indonesia. The material is contained in LBK media, wherein each group conducts a centralised discussion to analyse the problems contained in LBK media content. Then in turn each group presents the results of thoughts to the reality in their environment in turn. At the end of the meeting, after all groups present their thoughts, each group is given time to write down the results of their ideas.

Based on observations, found a high enthusiasm in group discussions by using the theories they got from LBK media on the problem based learning model. Student interest does not stop during the discussion, but the interest continues until each group can write down the results of the discussion. Furthermore, LBK media gives a new impression as a source of learning. To simplify the use of LBK media, the teacher gives directions for uploading LBK media through smartphones and explains the operation of the media. Results obtained, there is an increase in students' critical thinking skills by using the problem based learning model of LBK media assistance compared to students who take conventional learning. The superior option of the problem based learning models is media-assisted LBK, which is teaching



students to understand a material by self-teaching and fostering an understanding of every other student's ideas.

The second hypothesis test results obtained that there are differences in learning outcomes of PPK between students who follow the problem based learning model of LBK media assisted compared with students who follow conventional learning models in SMANegeri1 Banda Aceh. Problem based learning is learning based on problems. In this learning model, the learning procedure is held face to face in the classroom. Learning is done by utilising learning resources LBK media, where the model and the media can improve student learning outcomes. The teacher assigns students to work on several questions related to the material that has been discussed. Students have the opportunity to write answers to each question contained in LBK media content. Then, the teacher corrects each student assignment in LBK media content online. Based on the results of the examination, there was an increase in learning outcomes in the experimental class rather than the control class.

The third hypothesis test results indicate that the relationship between learning models with learning outcomes of PPKn shows that there are differences in learning outcomes of PPKn which are caused by differences in learning models. These differences indicate that the problem based learning model of LBK media assistance improves PPKn learning outcomes. Based on the MANOVA test that the problem based learning model supported by LBK media has given simultaneous influence so that it can trigger critical thinking skills and learning outcomes of PPKn. The problem based learning model of LBK media assistance is a problem based learning model where the learning process is a face-to-face group discussion. LBK media will contain material studied by students with different views that can attract students' interest in learning and contain things that students need to learn independently, so the learning process is not passive. This is in accordance with the demands of the 2013 curriculum, which is learning centered on students and has the educators as facilitators. Full student involvement during the learning process takes place by dividing up several groups. Then students discuss and work on each material on religious freedom and belief in Indonesia and then present the results of group work from LBK media. Students are trained to be more critical thinking because in addition to being assigned to discuss in their respective groups, students also get to explore other subjects created by other groups. Students' interest in discussing is seen when they collide with one another in groups. Based on the description, the problem based learning of LBK media assistance in learning PPKn simultaneously is proven to trigger critical thinking skills and student learning outcomes.



Conclusion

The problem based learning model of LBK media assistance can trigger critical thinking skills and learning outcomes. The problem based learning model of LBK media assistance simultaneously triggers critical thinking skills and learning outcomes of PPK.

For PPKn teachers, it is expected that the problem based learning model of LBK media assisted can be an alternative in the application of 2013 curriculum in addition to the learning models that have been recommended by the Minister of Education and Culture Appendix No.103 of 2013 concerning Learning in Primary and Secondary Education and can be applied to all PPKn subjects specifically on animalia material.

Because this research that was carried out was limited to class XMIPA students in the even semester of SMA Negeri 1 Banda Aceh, it was suggested to develop this research in a wider scope.



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