

DEVELOPING PIBL MODEL (PROBLEM INQUIRY BASED LEARNING) IN HISTORICAL LEARNING TO IMPROVE THE STUDENTS' CRITICAL THINKING SKILL IN SENIOR HIGH SCHOOL

Yessyca Yunitasari^{1*}, Muhammad Akhyar² and Sudiyanto³

^{1,2,3}Department of Historical Education, Magister Program, Sebelas Maret University, Surakarta, Indonesia

*Corresponding Author

ABSTRACT

The purpose of Historical learning in digitalization era is not only to foster the spirit of students' nationalism but also to develop the students' critical thinking skill. Here, the students not only discuss about Historical issues but they are hoped to be able to reflect the values from the Historical event. Nowadays Historical learning in the class still used conventional model. Therefore, an innovative Historical learning model is needed to support the improvement of the students' critical thinking skills. The purpose of this research was to develop a product from PIBL (Problem Inquiry Based Learning) as a model that could be used to support the Historical learning at SMAN 4 Jember. PBIL model were developed through the collaboration of PBL (Problem Based Learning) model and IBL (Inquiry Based Learning) model. Research method used in this research was Research and Development. The effectiveness of model to improve the students' critical thinking skill was tested by using test instrument. Model and test were validated through experts' validation and revision process. The effectiveness of model's implementation could be seen from the differences between the experimental group who was applying PIBL model and the control group who was not applying PBIL model tests result. The result proved that PIBL model was quite effective to improve the critical thinking of High School Students.

KEYWORDS: PIBL model, PBL model, IBL model, critical thinking skills, historical learning

1. INTRODUCTION

Industry revolution era 4.0 requires some knowledges to be mastered by the students, one of that is to support the students' critical thinking skill. Improving the students' critical thinking skills is a need in all subjects in the school, including in Historical education. Historical education is needed in our life. With the historical value, Indonesian will have a strong history and national belief so that cannot be accounted with external factors, for example from foreign. Moreover, Historical education in the globalization era is demanded urgently on the students' cognitive development that relies on the thinking and reasoning ways. Historical education not only memorizes the facts or historical facts (oral repetition) from the textbooks but also develops the ability to think rationally, critically, creatively, and empirically (Hasan, 2008; Susrianto, 2012).

One of Historical learning process weaknesses nowadays is the lack of efforts to develop the students' critical thinking skill. In general, Historical teachers only supported to master Historical

material. The teacher's orientation was just focused on achieving low-level cognitive. This problem caused the students only be able to work on the problems that exemplified by the teacher, for example about the difficulty of working on problems that had a high level of variation (Utomo, 2017). Meanwhile, in discussions about Historical, it needs a high level thinking skill to look for the relationship between each historical event. In the learning process, the students will not be able to understand what is learned by them without processing received information (Santosa, Firdaus, & Sarkadi, 2018).

The statement above proved by the preliminary study that conducted by the researchers at SMAN 4 Jember. The result showed that there were some problems in Historical learning process in the class. The Historical learning model that was applied in the class by the teacher such as discussion and lecture learning varies, which was occasionally supplemented by the independent assignments. The process of Historical learning conventionally tended to be passive and less to develop the students' potential. Monotonous learning methods could cause the students bored and not interested in Historical learning. The students' willingness for studying Historical material was very lacking. The students thought that Historical lesson was not important because it was not in accordance with their career in the future. For the students, the questions about Historical facts such as the name of a character, the year of important event occurred, the name of important event, and the place where an important event occurred were the important questions in Historical learning. But the students did not understand yet and did not remember about the fact in Historical learning. In fact, it prioritized the understanding of meaning and values that contained in Historical event to solve the social, cultural, economic, and political problems (Hasan, 2008). The teacher had never make an assignment that specifically to assess the students' critical thinking skills. The assignments and Historical material that was taught by the teacher just depended on the worksheets and textbooks. Lukitaningsih (2014) stated that conventional Historical learning in high school nowadays tended to the textbooks that contained Historical stories in the same type and grand narrative. With the fact above, it is necessary to implement the innovative learning method that can stimulate the students' activities and the students' critical thinking skill in Historical teaching and learning process.

The curriculum that applied in Indonesia nowadays is 2013 curriculum (K13). Then the whole of learning process in the school must be adjusted to the rules of K13, including Historical learning process. In K13, the learning model that was applied by the teacher must be able to encourage the students to find out actively rather than to be told by the teacher, train the students to be able to ask some questions rather than to answer the question from the teacher, and train the students to think and collaborate with other in solving the problem (Sadikin, 2017). K13 requires the students to be more active and more critical in the process of Historical learning. Therefore, the researcher decided to develop PIBL (Problem Inquiry Based Learning) model that was collaborated from PBL (Problem Based Learning) and IBL (Inquiry Based Learning) models.

Based on the problem identification and supported by the various opinions above showed that there was a need to develop an innovative Historical learning model. Therefore, the researchers develop PIBL (Problem Inquiry Based Learning) model to solve the problem in teaching and learning Historical subject. PIBL (Problem Inquiry Based Learning) model is expected to be able to create an active, challenging, interesting learning process and the most important thing is it can improve the students' critical thinking skill.

METHODS

2.1 Type of Research

This type of research was development research that refers to ADDIE model with some stages; they were analyzing, designing, developing, implementing, and evaluating (Branch, 2015).

1. Conducting a need analysis to gather the information about the gap between the conditions of Historical learning nowadays and the students' ideal critical thinking skills with the reality on the research's area, then the researchers looked for the solution from the discovered problem.
2. Designing the research instruments, including: made a prototype of PIBL (Problem Inquiry Based Learning) model, lesson plan (RPP), and questions or tests.
3. Developing the prototype that had been prepared through the process of expert validation and then made the product revisions based on criticism and suggestions from the experts.
4. Conducting the product tests at SMAN 4 Jember through a small group tryout, a large group tryouts, and quasi-experimental.
5. Evaluating the entire learning process by processing the data that was obtained from the implementation result so that it would be known the effectiveness of product on the variables that would be improved.

2.2 Time and Place of Research

The research was conducted at SMA 4 Jember, in the academic year 2018/2019. The research started from February to April 2019.

2.3 Population and Sample

The population of this research was the students of SMA 4 Jember. The research sample was 10 people of tenth grade students for the small group tests; 20 people of tenth grade students for the large group test; 30 people of tenth grade students as the control group and 30 people of tenth grade students as the experimental group.

2.4 Implementation of Research

The implementation in this research was conducted through three stages, namely:

1. Small group tryout

This tryout was conducted to determine the feasibility of revised model results from the experts before being tested in the class. The sample of this tryout was 10 students who each student assessed

through the observation sheet of model feasibility. Based on the result of criticism and suggestion from the students, then the model would be revised again.

2. Large group tryouts

This tryout was conducted to assess the validity and reliability of test instrument that would be used to measure the students' critical thinking skill. The data obtained such as the results of students' pretest and posttest were analyzed and declared as valid and reliable. This tryout sample was 20 students. The learning process that conducted by the researchers in this tryout used a revised instrument based on the experts' and the students' criticism.

3. Quasi experimental

This experimental activity used a sample of research from two classes. X social 1 class as the control group that was not treated or did not apply by using developed model. While X Social 2 class was the experimental group that was given the treatment or applied by using developed model. Both groups were given the same test where the results could measure the effectiveness of students' critical thinking skill from the learning model.

2.5 Data Analysis Technique

Data analysis technique was obtained from the result of critical thinking skill test using essay test. Essay test was developed from several indicators of critical thinking skill, namely analyzing, arguing, interpreting, evaluating, and concluding. Before being used, the test instrument was tested for the validity and the reliability using Anates program. The results were analyzed descriptively and inferentially using SPSS 23. The normality test in this research used Kolmogorov-Smirnov test. While homogeneity tests in this research was used Bartlett test with significance of 0.05. The test then continued with the N-Gain Score test to see the comparison of students' critical thinking skill level between experimental group and control group.

4. RESULT AND DISCUSSION

3.1 PIBL Model Syntax (Problem Inquiry Based Learning)

The result of this research was PIBL (Problem Inquiry Based Learning) model that developed through the collaboration of PBL model and IBL model. The urgency of PBL and IBL collaboration is based on K13 theory that these models include the preferred models in the implementation of K13 (Sufairoh, 2016). In addition, many studies stated that PBL and IBL could improve the students' critical thinking skill.

PBL is widely recommended by many researchers to improve the students' critical thinking skill, foster the students' initiative and motivation in learning, develop interpersonal relationships in group, and establish the students to become independent, autonomous, and sustainable learners (Duch, et al., 2001; Saefuddin & Berdiati, 2016; Weiss, 2003). Magsino (2014) stated that by implementing PBL with inquiry collaboratively, it can improve the students' critical thinking, especially in the ability of

analysis, synthesis, and evaluation. The statement was confirmed by the result of the research that conducted by Shaer & Gaber (2014) stated that there was a statistically significant improvement in the students' critical thinking between before applied PBL and after applied PBL. PBL can be used for improving the skill of inquiry, analysis, and problem solving, as well as fostering the students' interest in learning (Eglitis, Buntman, & Alexander, 2016). PBL is easily adapted for any discipline. The application of PBL makes learning process more interesting and enjoyable for the students and the teachers also encourages active involvement between the students and others with their teacher (Downing, 2013).

IBL is a learning model that involves the students in formulating the questions, investigating, thinking critically, building understanding, meaning, and new knowledge used to answer the questions or determine the problem solutions (Friedman, et al., 2009; Vaughan & Prediger, 2014). IBL has potential to foster a more interesting, meaningful, and effective learning environment for solving the learning goals in all disciplines and in various long-term educational goals (Blessinger & Carfora, 2015; Pittaway, 2009). Inquiry emphasizes that critical thinking, problem solving, and communication skill are more important than just having knowledge about the learning content (Avsec & Koncijancic, 2016; Spronken & Smith, 2012). In line with Laxman (2013), IBL has potential to encourage the students to find new knowledge rather than memorizing the facts. Sahhyar & Nst (2017) stated that the teacher who applied inquiry learning in her or his teaching and learning process found that her or his students' cognitive competence was better than just using conventional learning. The implementation of IBL can improve the students' experience because the students are more involved in learning through doing the assignments and the investigations. The students' learning independence develop because the students do more of their own research in teaching and learning process (Reynolds, Saxon, & Benmore, 2006).

The collaboration of PBL and IBL will give a positive impact because the students help each other to solve some problems in learning process. By asking and solving their own questions through inquiry, it helps the students understand the material more deeply because the students work hard to solve their own problems (Vaughan & Prediger, 2014). PBL combined with IBL will create a learning environment that prepares the students more confident to face the challenges of industry revolution 4.0 era, including the professional context in which they exist in their society (Huijser, Kek, & Tewijn, 2015). Here,

If the PIBL model is applied, the students not only expert in solving the problems but also expert in the process of solving the problem. They are not only able to solve problems in learning history but are also able to find and investigate problems more deeply. So they can link past events with the present and take wisdom from historical events. The competence that to be achieved by developing this model was to support the improvement of students' critical thinking skills, through the learning steps that shown in scheme 1.

Scheme 1. PIBL (Problem Inquiry Based Learning) Model Stages

3.2 Test Instruments

The measurement of students’ critical thinking skill was done by analyzing the students' test results before and after Historical learning process was over. The test used essay test for Historical subject was 15 items. Before being used for this research, the test had passed the expert validation stage and had been declared eligible for used as research instrument. In addition, the test had also measured its validity and reliability using Anates program and had been declared as valid and reliable. The test indicators in this research were adapted from critical thinking indicators by Ennis (1996), Waston and Glaser in Filsaime (2008), and Bloom in Anderson & Krathwohl (2015), namely: 1) the students can analyze the problems that studied by them; 2) the students can provide logical arguments to support their personal opinions; 3) the students can interpret a statement related to the problem that they being studied; 4) the students can evaluate and assess the solutions to select the problems; 5) the students can make conclusions. Critical thinking was a part of cognitive competence, so the best way to measure it was using test. By giving test, it could be seen the students’ achievement from the learning given by the teacher. So hopefully the achievement of cognitive competence could be maximized later (Sulistyorini, 2013).

3.3 The Equality Test of Students’ Critical Thinking Skills Between Control and Experimental Groups

Table 1. Independent sample t test results

Group	N	Mean	Sig.	t
Control Group	30	47,283	0,482	-1,178
Experimental Group	30	49,110		

The results of pretest that had been done by the students then tested for the equality test of students’ critical thinking skill using independent sample t test which was first tested for m normality and homogeneity as a prerequisite test with a significance value obtained > 0.05. Kolmogorov-Smirnov normality test result obtained significance value (Sig.) Control group equal 0.127 and experimental group equal 0.159. Both data showed that the values more than 0.05 which was means that the data was normally distributed. Homogeneity test result (Bartlett Test) showed that a significance value (Sig.) of 0.492 where more than 0.05, which was means that control and experimental groups were homogeneous or had an equivalent level of achievement. The data which were declared as normal and homogeneous were then performed by using t test. Table 2 showed that the average value of control group was 47,238 while for experimental group was 49,110. To prove whether the differences was significant or not, it was necessary to look at T table. Sig value amounted 0.482 >

0.05 which was indicated that the data had same variance. Decision making comparison of the t-count value with t-table was known that t-count value of $1.178 < t\text{-table } 2.002$, it could be concluded that H_0 was accepted and H_1 was rejected, which was means that there was no significance differences of average between control and experimental classes.

3.4 Critical Thinking Skill Improvement Test of Experimental Group

Table 2. Paired sample t test results

	N	Mean	Correlation	Sig. (2-tailed)	t
Pretest Result	30	49,110	-0,173	0,000	-20,520
Posttest Result	30	80,560			

Critical thinking improvement test aimed to measure the improvement of students' critical thinking skills based on the results of pretest and posttest in experimental class using paired sample t test. The results of Kolmogorov-Smirnov normality test showed that the results of Sig. $0.159 > 0.05$ and $0.200 > 0.05$ so that both of pretest and posttest data of experimental group had normal data distribution. While the Bartlett test result obtained significance of $0.978 > 0.05$. So it could be concluded that the data came from a homogeneous population. After the data appropriate with the prerequisites, then t test could be performed. In table 3, the correlation value of -0.173 was obtained. A negative number indicated that the first group had a lower mean than the second group. Because the correlation value was $0.173 > 0.05$, it could be said that there was no relationship between pretest and posttest variables. Column Value of Sig. 2-tailed result obtained 0,000 which was less than 0.05, it means that there was a significance differences between before and after treatment. If comparing the value of t-count with t-table, the value of t-count was $20.520 > t\text{-table } 2.045$ which means that H_0 was rejected and H_1 was accepted or there was a significance differences of average test result before and after treatment which means that there was an influence using the model in improving the students' critical thinking skills.

3.5 The Effectiveness of Critical Thinking Skill Between the Control and Experimental Groups' Tests

Table 3. Independent sample t test results

Group	N	Mean	Correlation	Sig. (2-tailed)	t
Control Group	30	74,390	-0,173	0,000	-3,816
Experimental Group	30	80,560			

The effectiveness test of critical thinking skill was conducted in order to find out the differences in students' critical thinking skill between experimental class who were given Historical learning using the PIBL (Problem Inquire Based Learning) model and control class that did not apply the PIBL model. The data tested were the results of experimental class and control class post-test. The differences in critical thinking skills were known by using Independent Sample T Test. Kolmogorov-Smirnov normality test results showed a significance value of control group of 0.081 and experimental group of 0.200 where both were the values of more than 0.05, it could be concluded that both data were normal. Bartlett test results obtained the significance of 0.068 which was more than 0.05 ($0.068 > 0.05$), it means that the post-test data of control and experimental groups came from homogeneous variance. T test results in table 4 obtained the value of -3.816 with a significance of $0.000 < 0.05$ so that H_0 was rejected and H_1 was accepted, it could be concluded that there was a positive or significant effect between the results of control and experimental groups posttests. If comparing the value of t-count with t-table, t-count value of 3,816 $>$ t-table 2,002 was obtained, it could be concluded that H_0 was rejected and H_1 was accepted so that there were significance differences of post-test average between control and experimental groups.

3.6 Test N-Gain Score

The results of test effectiveness then carried out by control group and experimental group N-gain score calculation to determine the difference between pretest and posttest scores of control group and experimental group using SPSS 23. Based on the results of N-gain score test calculation measured through the effectiveness category of N-gain adapted from Hake (1999), the mean value of control group was 50,9229 or 51%, it could be said as less effective category. Meanwhile, N-Gain average score of experimental class was 61%, it could be said as adequate effective category. From the result above, it could be concluded that the implementation of PIBL (Problem Inquire Based Learning) model was effective enough to improve the students' critical thinking skill in Historical learning at SMAN 4 Jember.

The results of this research were in line with the results of previous studies that conducted by other researchers which also stated that the collaboration of PBL and IBL had a positive effect on teaching and learning process. Saye et al. (2016) stated that collaborating inquiry activities to solve the problems in Historical learning influenced the teachers' understanding of Historical phenomena that were increasingly developing. The teachers were also more motivated to involve the students in challenging learning and improve the teacher's learning strategies. Roberts (2010) stated that the collaboration of IBL into PBL gave the students a more positive, open minded, creative, holistic, and more realistic to follow PBL challenges so it enhanced the students' learning experiences. Huijser et al. (2015) explained that collaborating of PBL and IBL could improve teaching and learning process of 21st century skill. By the collaboration both of models, the learning process become active so it equipped the students with necessary skills such as problem solving skill, collaboration skill, independent learning skill, and critical thinking skill, and other skill to apply the knowledge in ever-changing context to succeed and thrive in 21st century environments.

4. CONCLUSION

This research resulted a syntax of PIBL (Problem Inquiry Based Learning) model that was developed through the collaboration of PBL and IBL models and Historical test instruments to measure the students' critical thinking skill. The results of test effectiveness showed the group that was treated (experimental group) had an improved skill to think critically higher than control group. These results proved that the implementation of PIBL (Problem Inquiry Based Learning) model was effective to improve the students' critical thinking skills in Historical learning.

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