Enhancing students creative thinking skills through web blog-assisted cooperative integrated reading and composition (CIRC) learning

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Abstract. This study examined Web Blog-Assisted CIRC Learning in the subject of research methodology of physics education toward Student Creative Thinking Skills. Reading activity and finding main ideas cooperatively were able to improve students' creative thinking skills. The improvement of students' creative thinking after Learning CIRC Learning assisted by Web Blog get the mean of pre-test of creative thinking skill 2.33, the mean of post-test is 54.22 and the mean of N-Gain is 0.53. The improvement is in the medium category. The differences Test of Creative Thinking Skills of students before and after Web Blog-Assisted CIRC Learning shows that there are significant differences between pre-test and post-test values of creative thinking.

1. Introduction
Learning achievement the subject of physics education research methodology consists of learning achievement of knowledge and work skills. The achievement of knowledge is the student able to master the method of physics education research and the work skill achievement is the student able to conduct physics education research in the form of study and evaluation of physics learning with quantitative and/or qualitative approach to solve physics learning problem and reported in scientific article form. Among the achievements of special learning is mastering research methods of quantitative and/or qualitative in solving the problems of physics learning and designing physics education research proposal.

Classroom learning is expected to be able to practice 21st century skills. Among the 21st century skills are, Critical thinking, problem solving, decision making, Communication, Collaboration (teamwork), Information literacy, ICT literacy [1]. The learning process in the subject of physics research methodology is expected to generate students' creative thinking skills, so that it will train students to make research problems and arrange them in the draft of research proposal. Learning is expected to develop students' thinking patterns so as to increase and deepen their knowledge. Thinking skills that can support students' thinking skills are creative thinking. Aspects of creative thinking include the ability to generate many ideas, answers, problem solving as well as questions, and the ability to generate ideas varies from the information that has been obtained [2].

The task of reading in groups will provide an opportunity for all members to discuss a topic and can help each other solve a problem found together. In CIRC, students are taught in reading groups and then return to mixed ability teams to work on a series of cooperative activities, including partner reading,
making predictions, identification of characters, settings, problems and problem solutions, summarization, vocabulary, spelling and reading comprehension exercises. CIRC provides a structure to help teachers and students succeed in helping all students become effective readers [3]. Students work in pairs within their teams on a series of cognitively engaging activities, including partner reading (reading to each other), making predictions, identification of characters, settings, problem solutions, summarization, vocabulary, reading comprehension exercises and story related writing [4].

The development of science and technology can change the behavior of student life one of them is in the learning process. Students get information easily through very open internet access. Learning-assisted e-learning is something that needs to be done as a facilitator of learning, so that students can take advantage of internet access for useful things. Website blogspot is one facility from the internet that can be used as a medium of learning. Blogspot is a personal web page written in sequence and managed through a specific software.

Blogging technology has several advantages. It serves to: introduce a creative approach to the organization of learning; foster a feeling of community and build a closer relationship between learners; encourage online communication; promote out-of-class communication; develop the skills to analyze and synthesize information; improve writing skills; provide extra reading; improve learning outcomes [5]. The results of research about ICT-assisted learning media in the form of web blog on physics learning showed results can improve student learning outcomes [6]. An educator may create a classroom blog that simply lists homework assignments and links important documents, or he or she may use a blog to produce an online gallery of student work and pictures of the class’s undertakings in science, an experienced blogger may publish a weblog with assignments, links to documents, links to video and pictures, journal entries between student and teacher, writing prompts, and newsletter the possibilities are endless [7].

This study aimed to examine the influence of CIRC Learning assisted Blogspot website in the subject of physics education research methodology. This learning was expected to develop students' creativity in designing the title of the latest physics education research. Students can be actively involved in the learning process. Students can get to know the research journals that supported them in designing the research proposal plan as the final project.

2. Method
This research method used pre-experiment method. The research design used is one group pretest-posttest design. Research carried out Study Program of Physics Education of State Islamic Institute of Palangka Raya Year 2017. The population of this current study was all students of semester V at Study Program of Physics Education that takes courses in Physics Education Research Methodology. The number of student samples was 09 (nine) students who program the subjects of physics Education research methodology. N-gain was used to determine the improvement of students' creative thinking skills. It was used the following formula by Hake[8]:

\[
< g > = \frac{Final \ Score \ % - Pre \ Score \ %}{100 - Pre \ Score\%}
\]

\(1\)

| Index N-Gain | Interpretation |
|--------------|----------------|
| \(g > 0.70\) | High           |
| \(0.30 < g \leq 0.70\) | Medium |
| \(g \leq 0.30\) | Low            |

Table 1. Criteria N- Gain.

Testing the influence of learning after applied Web Blog-Assisted CIRC Learning on creative thinking skills of students was conducted using SPSS for Windows 17.0 Paired Sample t-test.
3. Result and discussion

The results showed that the mean of pretest of creative thinking skill is 2.33, the mean of posttest is 54.22 and the mean of N-Gain is 0.53. This finding is in the medium category. Different test results on pretest and posttest data of creative thinking skills can be seen in Table 2.

Table 2. The result of Paired Sample T Test.

| Data   | N  | Mean | SD  | Test      | Sig* | Explanation          |
|--------|----|------|-----|-----------|------|----------------------|
| Pre-test | 9  | 2.33 | 1.87| Paired    | 0.00 | There is significant difference |
| Postest | 9  | 54.22| 11.09| Samples   |      |                      |

Table 2 shows that there are significant differences in pretest and posttest values of creative thinking on the application of the Web Blog-Assisted CIRC Learning. Students were actively in learning process. Students' reading and writing activities both on face-to-face and on-line were influential. Students in reading and writing learning activities together with group members found their own concepts about the definition of Educational Research Methods, the types of research methods, the characteristics of quantitative and qualitative methods, the formulation of research problems physics / physics education, variables in the study. Lecturers facilitated by preparing reading material in the form of articles and materials from the book Research Methodology. Lecturers provided guidance through Student Worksheet.

CIRC learning process also gives opportunity to a group to share or discuss their analysis result to others and the activity allows students to exchange their knowledge, students will have more experience and in turn, it will form better concept mastery [9]. The process of learning with reading and writing activities cooperatively both face to face and online provided an opportunity for students to practice their thinking skills. Students did not only receive information in the direction of the lecturer. At each meeting lecturer students practice students' thinking skills for all indicators of thinking skills i.e. fluent thinking, flexibility, thinking of originality and elaboration. Students also enthusiastically learned through Blogs learning. This corresponded to the study Sidek dan Yunus show that students enjoyed the use of computer tools in their lesson and most of them expressed their wish to see blogging being used more widely. The findings also reveal the students recommendations to improve the use of blog as learning journal based on their own experiences [10].

Students are trained to analyze articles jointly/cooperatively, Students are given the task of discussing together with group members that is about the type of research, alternative types of research, make examples of other research titles that correspond to the type of research in the article, and practice giving ideas to expand or enrich the article. Further development is done online discussion on lecturers’ blog. Online discussion provides an opportunity for students to develop their thinking skills in other types of research articles. Students are introduced to several types of research related to physics education research. Student's thinking skill for fluent indicator (Fluency) does not experience any obstacle, most of student can identify research type from journal article either on face-to-face activities or on online discussion activity, but some students still not able to explain correctly and focus the reason of choosing type research. Students need to get deep guidance from the lecturers, although in this case it is constrained by time.

Students are just still not good in Creative Thinking originality. This is because the students have not many references to be able to make a research topic. Students have not been able to formulate a new research topic in a clear title editor. Students tend to search for samples of research titles via the Internet and have not been able to either develop them or formulate them in a new one. Lecturers need to direct the students about the importance of reinforcing the research variables on the research title. This provides a new information for students about the research variables. Students with members of each group can complement each other in a discussion either face to face or online. The results of the study by Nanda P, A, et al support this case that CIRC learning model more invites students to think individually to predict their own answers and in group discussions to interact deeply and encourage students to think critically in obtaining predictions of answers that are considered
most appropriate [11]. Web Blog-Assisted CIRC Learning was quite successful in creating student-centered learning. Online discussions provide an opportunity for students to deeply review the material that has been obtained in the face to face. Most of the students were able to develop a new and different research topic from the sample of articles analyzed during the lesson. Step learning using web blogspot train students to use the development of information technology in a healthy manner. Students can find new research ideas that can be developed. The majority of pre-service teachers reported that their blog experiences were positive and that blogs have enhanced their overall learning, blog discussions helped them to share their knowledge and experiences with others and the majority of them acknowledge that other students’ comments on their blog posts are important and blog discussion helped them understand others’ points of view [12].

The improvement of students’ creative thinking skills after learning is only able to improve in the medium category and still not maximal, especially in the ability to think flexible and originality. Achievements which have not maximized caused in the learning activities is the group presentation of students and lecturers giving reinforcement is still not deep. The average students have been able to compose a research topic, only still weak in making the background and formulating the problem. The number of new meetings 4 (four) times is still not enough to make student creativity increase maximal. The frequency of student interaction with research articles both face-to-face and online also affects the level of achievement of students’ thinking creativity. The more often and many research articles are studied together, the creativity of student thinking will also be better. Constraints in web blog learning is not all students are used to discuss together online. Despite multiple benefits, technology-supported learning offers several limitations. Some students might be anxious of writing and posting a text that contains various errors; they can be inhibited to post comments on their classmates’ blogs [13].

4. Conclusion
The improvement of students’ creative thinking after Web Blog-Assisted CIRC Learning in physics education research methodology class included in medium category with N-Gain is 0.53. There was significant difference between pretest and posttest mean creative thinking on the application of the Web Blog-Assisted CIRC Learning.

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