Research Based Learning Model Implementation and Its Impact on Scientific Writing Ability
(An Experiment to Economic Education Students)

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Abstract

This research is an experiment research conducted to economic education students. The aim of this research is to analyze the improvement of students writing scientific paper ability through the implementation of research based learning model. The ability to write the scientific paper was believed to improved the students logical and critical thinking. The learning process was implemented using the learning instruments through research based learning model. The results of this research reveals an improvement in students writing ability and syllogism of thinking. The output of this research is the short scientific paper. Based on the results it can be concluded that the research based learning model can improve the students writing ability, especially scientific paper. There is a significantly improvement in students' writing ability, but there are still some students who achieved a medium level of ability in writing. It can be assumed that it is caused by the lack of students' knowledge about writing a scientific paper, because students have not learn the research methodology subject. It is supposed to do this kind of research for the fifth or sixth semester students.
Keywords: RBL, scientific writing ability

Introduction

Students as academics are the intellectuals who must have the capability to develop science and technology for the progress of the nation. All forms of science and technology development that generated will have no meaning if they are not documented in writing. Although students have a great scientific discovery, but if it is not documented in written form, it will only be a momentary oral story that will soon be forgotten in the next period. On that basis, writing ability is very important for students.

Students are expected to have the ability to convey ideas or thoughts through writing in a coherent, logical, and well understood. Therefore, since becoming a university students, they have been trained in obtaining information from various sources to be processed through critical reasoning so that they have material to be conveyed to others in writing. Those exercises are practiced in finishing the assignment given by the lecturer through observation, reading, conducting interviews or conducting experiments which results are reported in writing. Written evaluation of learning outcomes is also an exercise for students to convey their processed thoughts in written form. The article mentioned here is a student scientific paper in the form of a journal.

The capability to write scientific papers is one of the goals and processes of education in higher education. A kind of the success in an educational process is the ability to publish a scientific paper, starting from the final report (final assignment) to the thesis, dissertation, or scientific journal, while the goal achievement of education by increasing scholars who did many research and have a good respond to the environment. It's improved by many scientific journal have been published as the results of prestigious research in accordance with their respective scientific fields.

Based on the explanation above, the researcher can conclude that the student's writing ability is still low. Plagiarism habits make students lazy to read more references for scientific writing, besides that lecturers also need to get used to use references from the latest theories in writing scientific paper, so that it can be an input for students in writing. There is the perception of students that the

ability to write scientific paper is only needed as a fulfillment of graduation requirements. This also shows the low motivation of students in writing scientific paper.

Another problem that researcher found was that students were not interested in making international journals as a reference in writing, because it was difficult to understand the content of the journals that were used as references. One of the causes of this problem is the low English language ability of students. These problems, if not followed up, are assumed to affect the ability of students to think scientifically.

Besides, the changes and challenges in the world affect students and society in the future, in order to build their knowledge capacity, it is necessary to develop high-level thinking skills of students, such as critical thinking systems, decision making, and problem solving. The development of high-level thinking skills is an important factor in encouraging students to change their knowledge and skills into more responsible actions related to their role in society (Miri, David, & Uri, 2007).

In another sense, to be successful at college, a student must not only meet academic standards (to pass the exam, etc.), but also to be able to present his knowledge adequately, to form relationships with teachers and classmates, to engage in activities that will compensate poor performance. This is a type of intelligence called practical intelligence for educational institutions, which refers to an individual's understanding of the ability to respond appropriately to the demands of the educational environment (Williams, Blythe, White, Gardner, & Sternberg, 2002).

Then it need a learning model that combines learning with research. One learning model that combines research with learning is research based learning models (research-based learning models / RBL). This learning model is also potential to stimulate the ability of students to think scientifically. RBL is a learning method that uses contextual learning, authentic learning, problem solving, cooperative learning, hands on & minds on learning, and inquiry discovery approach. The target of implementing RBL is to encourage the creation of high-level thinking skills in students. Students are not only crammed with information and knowledge but must be brought to a high level, namely creating (Williams et al., 2002).

Research Based Learning (RBL) is a very important technique for learning and teaching by using research element into the learning process. As we known that new knowledge is rapidly occur in the world in the period of technology and influence information come from around the word. RBL is very important which increasing not only knowledge but increasing cognitive, ability to think, consideration and creative learning. Student should be active learning and continuously to search research, new knowledge then analysis, synthesis including applying for create new knowledge further (Sota & Peltzer, 2017). Some evidence suggests that RBL is more effective than conventional teaching methods (Nuchwana, 2012).

A great improvement of science that resulting a creation or discovery must be documented in a scientific writing. Based on the explanation, it can be said that a science or discovery will be useless if it is not saved in a scientific writing, which it must be published to a media, national or international scale. Besides, its publication is meaningfull in propagating science. This is how we see that scientific writing ability is an important skill that the students should own.

Regarding the benefits of writing, in essence writing provides many benefits including: (1) writing contributes to intelligence, (2) writing develops the power of initiative and creativity, (3) writing fosters courage, and (4) writing encourages the willingness and ability to gather information (Graves 1978: 14).

A further theme running through this thoughts is that students are likely to gain most benefit from research, in terms of depth of learning and understanding, when they are also involved in research, for example, through various forms of active learning, such as inquiry-based learning (Healey and Roberts 2004). This presents challenges to university staff to reshape curricula and may lead to new ways for staff and students to work together in communities of inquiry, albeit ameliorated by the nature of different disciplinary spaces.

There is a learning strategy must be implemented, that RBL (research based learning). In this research, the application of RBL is expected to improve students' scientific writing skills. By looking

at academic achievements obtained by students in the previous semester through GPA, then what are the implications of applying RBL to the ability to write scientifically.

Based on those explanations, it can be concluded that the hypothesis of this research is a significantly impact of the research based learning model to the scientific writing ability.

Methods

This research is an experiment research to analyze the impact of the implementation the research based learning model in improving the students writing ability, especially scientific paper. The sample of this research is college students that consist of two classes, those are the experiment class and the control class. The experiment class is given the RBL treatment using the learning instruments completely, while the control class is conducted without treatment. The sampling used purposive sampling technique. The tools used to analyze the research result is SPSS 16 version. Therefore, this research a quantitative approach with factorial design 2x2.

The research is conducted in six meetings, which its subject is the Introduction to Economic Development. In each meeting, the researcher conducted the learning using RBL model with its steps, and observed the students' development in writing the paper. The students was given a test to write a scientific paper at the last meeting of the experiment. The output of this research is the students' scientific paper.

Results and Discussion

The research results reveals that there is a significant improvement in students ability of writing scientific paper. It can be seen from the improvement on the writing test result. In the first meeting before conducting the RBL model, the students was asked to write a scientific paper, it is aimed to assess the students' initial ability in writing. It is intended to see the improvement of students' ability in writing until the final test. The table mention as followed :

Table 1 The Improvement of Writing Ability

Numb.	Information	Experiment Class		Control Class	
		The Pre-Test	Test Result	The Pre-Test	Test Result
1.	Mean	52.0294	75.71	52.1714	81.43
2.	Median	50.5000	76.00	52.0000	83.00
3.	Mode	47.00	80.00	60.00	85.00
4.	Std. Deviation	5.62724	3.94300	5.34397	1.01613
5.	Min	43.00	69.00	44.00	55
6.	Max	61.00	80.00	60.00	95

The table describes the research result, there is an improvement in students' ability to write the scientific paper. It can be seen from the mean of the test results in both classes, control and experiment. In experiment class, before the students were treated with the learning model of RBL it gained the mean score 52 in writing, and after the RBL model was implemented in this class, the average of the students score raised to 75.71. Meanwhile in the control class, the pre-test mean score is amount 52, and average of students' test results is 81.43 for writing test ability. It is a significant improvement. Even though there are many students gained high score reach up more than 80, but there are still some students that obtiained medium score, so it indicates that not all students were capable of writing scientific paper after the implementation of the RBL model. It can be seen from the mode score.

Based on the experiment results, from the first meeting the researcher observed the students ability in writing scientific paper. It is known that students' writing ability was still low, especially in the aspects of content of the paper, paper organizing, the choise of words, sentences, spelling, and

paper mechanism. The students have lack ability in interpreting the theories, lack understanding in the formulations of the problems, and also structure of the paper. In additional, less ability of the students in quoting techniques. Then the researcher conducted six meetings by implementing the research based learning model (RBL).

At the second meeting, the students were treated with the research based learning model through the syntax of its model. They were able to identify the problem of the research that they've observed as a variable of a research, although it was positioned reversely for some students, they put the endogenous as the exogenous variable. Then they were taught by using RBL model, there is an improvement in the way they interpreted the variables. On the third meeting, the students were taught about the aspects of the paper content, paper organizing, the choise of words, sentences, spelling, and paper mechanism. For the fourth meeting, the students were asked to practice in writing the scientific paper. But before that, they were guided to download the relevant and qualified international or national journal, and how to use mendeley program to cite a reference. In the fifth meeting, the lecturer evaluate the progress of the students' paper, and made some correction. In the sixth meeting, the students' paper were evaluated for the final and were given the score through the instrument of assessment that have been designed.

The research results reveal that the students' writing ability have an improvement in each section of the meeting. The students got a better understanding about how to write a good scientific paper through the relevant research conducted by previous expert. They have a better ability in interpreting the journals, even national or international journal. Because in research based learning model that was implemented, the students were required to download, read, and comprehending the relevant journals of the expert, and they tried to analyze it. And some of them have a better improvement in their writings, some others do not get it.

This research implicated the importance of writing competence of the students on all levels. As we knew that the students of economic education are all going to be the teachers or lecturer in the future, so it is needed to mention that they need the competence in writing the scientific paper to train them having a logic and scientific way of thinking. Because writing is recognized as a vital sources they draw on while teaching. As such, these teachers serve as the primary decision makers regarding whether they will use writing in the classroom. The need for improving the effectiveness of writing teachers is underscored by a recent evaluation by the National Assessment of Educational Progress, which indicated that only half the students in Grades 4, 8, and 12 in the United States are able to write adequate responses to informative, persuasive, and narrative writing tasks (Street & Stang, 2008).

This condition call to an action included several recommendations for improving writing instruction, such as increasing the amount of time devoted to writing and better preparing teachers to teach writing (Gilbert & Graham, 2010). It is needed a new learning model such as research based learning that improve sudents and lecturer comprehension about the importance of writing scientific paper. On the other side, the RBL model is a way in improving the students' critical thinking. Our ever-changing and challenging world requires students, our future citizens, to go beyond the building of their knowledge capacity; they need to develop their higher-order thinking skills, such as critical system thinking, decision making, and problem solving. The development of higher-order thinking skills, or higher order cognitive skills by others is prominent in order to facilitate the transition of students' knowledge and skills into responsible action, regardless of their particular future role in society (Miri et al., 2007).

This research have been conducted and proved that the students ability to write was improved through the RBL model, but some of students were not reach an achievement in writing as expected. The researcher assumed that the students have different passion about writing a scientific paper. It is suggested that the next researcher need to implement another learning model to improve the students writing ability especially writing a scientific paper. And it is also supposed for a further development of writing instructional modul based on relevant subjects.

Conclusions

This research is an experiment research that implemented a learning model, that is research based learning model. It aimed to improved the students ability in writing a scientific paper, because as we knew that it is needed for the students to graduate, and to make them having a better understanding how to write their idea of research in a scientific paper. From the research results, it showed an improvement in students writing ability, they knew a better way to interpret the theories and the systematics of writing, and they have a better understanding how to use words in writing their idea in the scientific paper.

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