

The Implementation of Inquiry-Based Learning to Reading Comprehension of EFL Students

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Abstract: *Inquiry-Based Learning has been widely applied in sciences and maths. Others also have implemented it in different settings such as humanity, speaking skill, higher education, etc. Yet, little has emphasized on the use of IBL in reading context classroom. Thus, the goal of this study was to find out whether or not the use of IBL had improved reading comprehension and how IBL in reading class was implemented. Forty students of third semesters at STKIP Muhammadiyah Sidrap, Indonesia were the samples of this study. While, this applied quantitative method with quasi-experimental design with control and experimental groups: 21 students in experimental class and 19 students in control class by providing pre-test and post-test for both groups. The instrument used was test of IELTS reading. The data were analyzed through SPSS 22. This study revealed that the IBL approach was able to improve reading comprehension of EFL students showed in the significant difference between post-test scores of control and experimental group. Also, it investigated the implementation of IBL which referred to previous research that was 5E model aligned with the strategies applied in the reading subject of EFL Learners: engaging with the topic, exploring reading comprehension strategies, explaining the result of the reading comprehension strategies used, elaborating answers of formulated questions related with the text and evaluating the whole text through finding new vocabulary and learning process. This study resulted in the use of IBL theoretically and pedagogically in reading class of undergraduate students of English Education major.*

Keywords: Inquiry-Based Learning, Reading context, approach, reading comprehension, implementation

1. Introduction

To begin with, Inquiry-Based Learning is derived from science study which is one of the researchers is John Dewey. This approach has been implemented in various learning settings: sciences: by Xie, Talin and Sharif (2014), Maxwell, Lambeth, and Cox (2015), etc, humanity: Preston, Harvie, and Wallace (2015), speaking skill: Ajit, et.al (2016), English as a foreign language class: Arauz (2013), higher education: Spronken-Smith (2008), Pinard and Herman (2015), Martinee-Lee and Duncan (2015), etc.

A learning cycle is likely to be recognized model of Inquiry-Based Learning. It is this assumption of directive inquiry that is at the core of most learning cycle models, including the 5E model. The 5E model is developed by the Biological Sciences Curriculum Study (BSCS) and included five learning cycle stages, each beginning with E. These stages are Engagement, Exploration, Explanation, Elaboration, and Evaluation (Bybee, et.al, 2006).

Furthermore, Inquiry-Based Learning leads students to learn independently to improve the ability to think related to their own thoughts (Suhartono, et.al, 2014). On one hand, Inquiry Based Learning is a way of learning through questioning and experimenting (Ajit, et.al, 2016). This IBL could make learners to become more critical and creative which facilitates them to work at any given situation than any other approaches. Inquiry learning requires a classroom environment in which students feel free to work, have a notion, make inferences and make educated guesses toward the learning process in the classroom (Suhartono, et.al, 2014). This approach honors the complex work of learning. Certainly, it prioritizes the knowledge and experience students bring to the classroom and it promotes active problem solving, communication of results, and the shared construction of new ideas.

The implementation of Inquiry-Based Learning, however, has placed little emphasis on teaching reading comprehension in EFL class. Therefore, the purpose of this study is to explore the role of Inquiry Based Learning toward reading comprehension. In particular, the study seeks whether Inquiry Based Learning can significantly improve reading comprehension, investigates the role of Inquiry Based Learning in teaching reading comprehension and finds out the students' perception toward the implementation of Inquiry Based Learning to improve reading comprehension.

Due to the purposes, Inquiry Based Learning is approach that is hoped to lead the students to think critically and to lose the paradigm of Indonesian people that are always wanted to be provided the materials without letting them control their own learning. By IBL the students are expected to think effectively in order to find their own answers from the questions they are facing. Similarly, IBL lets the students connect with their learning by stimulating materials provided through questions about topic. Learning process organized and managed well enables teacher to prepare qualified materials related to IBL process.

Sometimes, teacher loses their idea about classroom interaction to keep the students active and fully interactive in the learning process. Then, this IBL becomes the solution in which the students get active to control their learning process. Learning by doing introduced by John Dewey as the basic theory behind this approach provides the students fully interactive and students' experience-based learning process.

2. Review of Literature

Inquiry-Based Learning

a) Definition of Inquiry-Based Learning

Caputo (2014) points out that IBL is in particular emphasizing the responsiveness, authenticity, and intellectual-engagement that makes this approach a useful

means of ensuring that students get the most out of their shared learning environment. As well as, Ajit, et.al. (2016) defines Inquiry-Based Learning as a way of learning through questioning and experimenting. They claim that in ELT context, they could remark that IBL is an effective way of learning English language. IBL serves greater opportunities to create interesting, cross-cultural and practical lessons.

From the definition above, Inquiry-Based Learning was defined as an approach which activates the students' prior knowledge before coming up with the entire materials provided by teacher. Also, it could be simplified as questioning, making inferences and finding out the open answers of the problems then evaluating the process of the inquiry experienced before.

b) Theory Supporting Inquiry-Based Learning

The theory supporting Inquiry-Based Learning is as John Dewey (1910) theory about learning by doing. John Dewey began his career as a science teacher. No doubt, the early influence of science explains the obvious connection between Dewey's conception of thinking and scientific inquiry. In 1910, Dewey outlines what he terms a complete act of thought and describes what he maintains are indispensable traits of reflective thinking. Those traits include defining the problem, noting conditions associated with the problem, formulating a hypothesis for solving the problem, elaborating the value of various solutions, and testing the ideas to see which provide the best solution for the problem (Bybee et.al., 2006).

c) Importance of Inquiry-Based Learning

IBL approach is able to develop problem solving, research and management skills which can be useful for study and work. It could make the students more critical and creative. Also, it backs up the students work with team (Ajit et al, 2016). Besides, Joe Excline (2014) finds out that through the process of inquiry, individuals construct their understanding. It does not seek the right answer. Instead, it looks for the appropriate resolutions to questions and issues. For educators, inquiry applies emphasis on the development of inquiry skills and nurturing of the inquiry attitudes or habits of mind that will provide individuals to continue the quest for knowledge through life. Then, inquiry is important in the generation and transmission of knowledge. Again, for education, it is essential, because the fund of knowledge is remarkably increasing. The inquiry has tried to focus on what we know to an emphasis on how we come to know.

d) Stages of Inquiry-Based Learning

There is a cycle of Inquiry-Based Learning that involves several steps that concern with engagement, exploration, explanation, elaboration and evaluation (Bybee et.al., 2006). The first stage is engagement. In this stage, the teacher or a curriculum task accesses the learners' prior knowledge and helps them become engaged in a new concept through the use of short activities that promote curiosity and elicit prior knowledge.

The second is exploration. Exploration experiences provide students with a common base of activities within which current concepts (i.e., misconceptions), processes, and skills are identified and conceptual change is facilitated. Learners

may complete lab activities that help them use prior knowledge to generate new ideas, explore questions and possibilities, and design and conduct a preliminary investigation.

After that, it is explanation stage. Learners explain their understanding of the concept. An explanation from the teacher or the curriculum may guide them toward a deeper understanding, which is a critical part of this phase.

The next phase is called „elaboration“. Teachers challenge and extend students' conceptual understanding and skills. Through new experiences, the students develop deeper and broader understanding, more information, and adequate skills. Students apply their understanding of the concept by conducting additional activities.

The last step is evaluation. The evaluation phase encourages students to assess their understanding and abilities and provides opportunities for teachers to evaluate student progress toward achieving the educational objectives.

e) Characteristics of Inquiry-Based Learning

Kahn & O'Rourke (2004) have identified five characteristics of IBL. They are explained briefly as follow. Firstly, engagement with a complex problem or scenario. Next, students direct the line of inquiry and the methods employed. After that, the inquiry requires students to draw on existing knowledge and to identify their required learning needs. Then, tasks stimulate curiosity in the students, encouraging them to actively explore and seek new evidence. Lastly, responsibility falls to the student for analysing and presenting the evidence in appropriate ways and in support of their own response to the problem.

f) Principles of Inquiry-Based Learning

The principles of Inquiry-Based Learning is adapted to the work of Science by Doing Program an online website for engaging science through Inquiry-Based Learning. These principles are applied in IBL stages such as engagement, exploration, explanation, elaboration and evaluation.

Firstly, An inquiry based approach starts with engagement of the students prior to explaining. This serves several purposes: provide a conflict between prior learning and the new more scientific understanding - such conflict will lead students to ask questions, get students' attention and focus, elicit and assess prior knowledge students may have constructed alternative conceptions.

Second stage is exploration without teacher explanation. During this stage, students ask questions, hypothesise, work without direct teacher input but are guided, gather evidence, record and organise information, share observations, make evidence based claims, draw conclusions, and work cooperatively and collaboratively.

Thirdly, it is explanation stage. During this stage, students draw on experiences to offer ideas and explanations in his/her own words, uses evidence to support ideas, critically appraise explanations, listen critically and respectfully to others, reflect on and assess their own understanding, produce multiple representations of concepts to improve

understanding. The next stage is elaboration. During this stage, students apply scientific terms, definitions, apply understandings to new contexts, use previous information to ask questions, propose solutions, to make decisions and design investigations, draw reasoned conclusions from the evidence and check for understanding with their peers.

Lastly, the stage is evaluation. During this stage, students demonstrate their understanding of the ideas and concepts, answer open-ended questions, evaluate his/her own progress, ask questions and participate in peer assessment.

3. Method

This study implemented a quantitative method by using quasi-experimental design with control and experimental group. Both groups were given pre- and post-test.

The subjects were students of third semester in academic year 2016/2017 at STKIP Muhammadiyah Sidrap, Indonesia. There were 40 students participated in this research. 21 students were for experimental group, while 19 others were samples of control group.

The data were collected by: giving pre-test, treatment and post-test for both groups. The difference was only in treatment provided for both groups in which IBL approach was treated to experimental class, while the conventional way was applied in control class.

After getting all the data needed, some analysis were used to find out the result of the instruments provided. The procedures of analyzing the data was divided based on reading test.

Firstly, the data were accumulated after providing the test and analyze it quantitatively. The steps in analyzing the data quantitatively were first by analyzing the raw data of pretest and posttest. The scoring was based on IELTS band score. Second was by converting the score of the students into values and classifying the score of the students. Then, the fourth was calculating the mean score, finding the significant difference and ranks of both groups by using SPSS 22.

4. Result and Discussion

To find out the significant difference between control and experimental group post-test score, the result of the SPSS 22 program was shown below:

Table 7: Mann-Whitney U Test of Experimental Group

Test Statistics ^a	
	Post-test
Mann-Whitney U	39.000
Wilcoxon W	229.000
Z	-4.443
Asymp. Sig. (2-tailed)	.000
Exact Sig. [2*(1-tailed Sig.)]	.000 ^b
a. Grouping Variable: post-test	
b. Not corrected for ties.	

The table above shows that Probability value is 0.000 which is the rule is if the probability value (Asymp. Sig) is less than

5% at the level of the significance 0.05 ($P < 0.05$), it means that it is a significant difference. Furthermore, the result of the Asymp. Sig is 0.000 which is less than the significant level of 0.05 ($P; 0.000 < 0.05$), so that it indicates that H_a is accepted. The description reveals that there is a significant difference between the control group score and experimental group score. The explanation means that the use of IBL has provided a role for the improvement of the score of the experimental class which is given a treatment of IBL approach.

Through the significant difference found from the result of the SPSS program regarding to the score of reading test of control and experimental group, it could be strongly stated that IBL has improved the students' reading comprehension.

By this finding, it is important to identify the implementation of the IBL used to find the difference of both classes which one of them is treated by using IBL.

The implementation of Inquiry-Based Learning refers to principles of Inquiry-Based Learning (Science by Doing Program) by focusing on the stages of IBL by Bybee et al (2006). This implementation is also based on the previous concept of the reading. By combining both the concept of IBL and the reading comprehension, these theories combination was further explored. Then, this research focused on IBL implementation and its alignment with the reading comprehension strategies.

a) Engagement with the Topic

The goal of this phase was to stimulate the students to get excited about engaging in the topic of reading. In this phase, the teacher asked the students about the topic and correlated it with their prior knowledge. After that, the teacher proposed students answer the questions given by the teacher about the topic. Then, they were required to discuss in pairs about it. Next, the students were asked to share their opinions in the class while teachers generated the list on board of class idea and informed the students about them.

This phase enabled the students to engage in the topic before coming to the real passage so that they could identify the whole meaning of the passage. It merited with Caputo's (2014) comments about IBL for emphasizing the intellectual-engagement that made the students feel the shared learning environment.

Furthermore, the background knowledge was strongly needed in this phase to engage with the text. It activated the reading process; top-down process. This process occurred when an individual implemented background information to predict the meaning of the text they were going to read. Here, the students enhanced expectations about what they would read and be ready to confirm or reject as they read.

b) Exploring Reading Comprehension Strategies

In this phase, the learners were provided with some strategies to comprehend the text. The strategies were given in form of questions, so that the students identified the answer as a way to master the strategies. In a meeting, one or two simple strategies were explained in the course before

letting the students identified the text themselves. It provided the activities the students did during this phase.

The activities conducted here were the reading strategies. The students searched for the answer in a group to ease the students to form in the learning community. They used their prior knowledge to generate new ideas and explored the questions to investigate the possible answers. This phase also sustained learners to be active readers and they were encouraged to find out the strategies asked for. The active readers developed an ongoing relationship with the text. While, they observed the information sought, all strategies applied required the learners to be active readers.

This phase took the longest duration in each meeting. The teacher honed and familiarized the use of strategies of comprehending the text. Lastly, the students were asked to draw conclusion of the text given based on their understanding.

c) Explaining the Result of Reading Comprehension Strategies Used

This phase led the students to explain what they got from the exploration phase. Also, this put the critical part that was providing deeper understanding about the text. Students drew on experiences to offer the ideas in their own words. They were asked to write down the result of the exploration process on a piece of paper to help them to remember what they had shared before with their group. They used the evidence from the text to support their ideas. While, other groups critically appraised explanations, listened respectfully to others, gave a comment on their friends' explanation, assessed and compared their own answer. Teachers helped the students to collaborate in discussion section. Furthermore, the teacher stimulated other students to give questions or response. Also, s/he let the students answer freely, because every possible answer was open.

d) Elaborating Answers of Formulated Questions

Elaboration phase was applied to familiarize the students with the text, to apply their understandings to new concepts. In this phase, the teacher provided the students with a handout comprising several questions. They were instructed to answer the questions with their group in 10 to 12 minutes. Students were told that their work/answers were shared with the class on a random basis, so they did in detail to show their work and write their answers.

After the students had sufficient time to answer the questions, class "Cube" the answers to go over them. The cube meant that the answers to the questions were given to a random group to answer without considering that the first group answered first, but it could be given to second, third or other groups first. In this stage, the teacher expected the students to use appropriate terms to connect their understandings from the explanations, reminded students of alternatives and asked students "what do you think if.... In what paragraph do you find this, what does mean?"

e) Evaluating the Whole Text and Learning Process

The goal of this phase was that the students were encouraged to demonstrate their understanding of the ideas and concepts and evaluated their own progress. In this phase, the teacher

asked the students to give their opinion about the passage and were asked to write down their new vocabulary they got from the text and handled them to stick their opinion on a cartoon. Similarly, the teacher had a cartoon to be stuck on and provided many sticky notes for students. Then, the teacher proposed them to stick their opinion on it.

Furthermore, this phase led the students come up with critical comprehension, because this phase involved students making judgments about the text and the learning process. Several students liked the reading and enjoyed the learning process while others did not.

5. Conclusion

This study comprises two main points: the use of IBL was able to improve reading comprehension of EFL students at STKIP Muhammadiyah Sidrap and the implementation of Inquiry-Based Learning to reading comprehension. The implementation of IBL consists of five steps, called 5E instructional model which confirms the previous research by Bybee et. al (2006) which 5E model stands for Engagement, Exploration, Explanation, Elaboration and Evaluation. These stages are attributed to be implemented in reading class. Engagement process leads the students to engage with the topic of the text, exploration process aligns students with the reading strategies to be mastered, explanation focuses the students to explain the result of the reading comprehension strategies provided in exploration phase, elaboration provides students to answer some questions related to the text and the evaluation instructs the students to evaluate the whole learning process and the text given and to identify the new vocabulary they got from the text. As a result, IBL is an inevitable approach to be implemented in language learning context especially in receptive skill which is reading comprehension.

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