Blended Project Based-Instruction and its Impact an High Order Thinking Skills

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Abstract. This research is aiming at scrutinizing the effect of blended project-based learning instruction on students' higher order of thinking skill as well as its effective practice. It employed quasi-experimental research design. The population was the 4th semester pre-service teachers of English Education Department at IAIN Ponorogo. The data were collected through test. The quantitative data were analyzed by ttest using SPSS program for Windows. The finding showed that there is significant effect of blended project-based learning instruction on students' higher order of thinking skill as it can be seen from the result of ttest is 1.798 which is higher that ttable at 1. 679. The greatest number of pre-service teachers reached out level 3 in Factual domain, however for the conceptual, procedural and metacognitive domain, they reached out level 2 respectively. Finally, the finding is expected to facilitate teachers as well as curriculum planners to integrate blended and project- based learning into accounts while designing EFL instruction.

Key words: blended project-based learning; higher order thinking skill.

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INTRODUCTION

The 21st-century learning as a global phenomenon has been influencing Indonesian Higher Education like other educational policies and regulations in the world. In this case, education should provide opportunity for the learners for promoting knowledge and skills' transfer (Chapelle, 2014) as well as the use of technology which has exerted a major influence on education development. Furthermore, the COVID-19 crisis requires educators to shift how teaching and learning happens. The pandemic spotlights a lack of readiness among higher education institution to facilitate 21st Century learning practices. Consequently, an educated individual need to have the ability to continue learning to cope with the changing circumstances.

Facing the 21st century challenge students are required to develop high order of thinking skills /HOTS (Thompson, 2008), since HOTS plays an important role in applying, connecting, or manipulating the prior knowledge in order to effectively solve new problems (Thomas & Thorne, 2009). To be succeeded in fostering HOT skills, the approach to learning should provide multiple opportunities for students to engage in challenging tasks that address 21st Century skills. HOTs in EFL class especially in the COVID-19 outbreak can be acquired through technology which encompasses a wide-concept of learning through problem solving, and collaborative and cybernetic learning.

Studies have provided evidence that technology can be used to enhance language learning effectively through the requirement of high-quality input (Zhao, 2003) as well as encourage engagement and motivation of students (Imlawi & Gregg, 2014). Also, the use of technology impacts on the cost saving, time saving, and stress reduction (Alshamrani, 2019) Nevertheless, there is controversy related to technology and language learning. Recent studies find that students' social and spatial awareness is more developed in the face-to-face classroom rather than in the virtual class (Wuensch et al., 2006). Classroom traditional meeting is likely to engage in collaborative learning, (Buchenroth-Martin et al., 2017; Dumford & Miller, 2018).

Referring the debatable case above, there needs to be a balanced approach to integrating face-to-face and virtual learning environment which is called blended learning (Marsh, 2012). It facilitates students to work in partnership, ask questions, and think critically (Wahyuni et al., 2019). Then, it enhanced social interaction, communication and collaboration, and optimizing development cost and time (Azizan, 2010). However, virtual learning platform itself has not yet made students well equipped with adequate knowledge, linguistic competences or high order thinking skills. Therefore, integration of technology and project-based learning are considered essential to be applied for fostering students' HOTS as a skill, through dynamic

learning activities that support its development. As one of constructivism philosophical approach, project-based learning leads students to get involved in preparation, investigation, and evaluating projects that has real-world applications (Westwood, 2008). Project-based learning also gives chances for students to develop their critical thinking (Anazifa & Djukri, 2017; Junisbayeva, 2020; Rochmahwati, 2015).

Based on the result of preliminary observation and informal interview with some English lecturers in several colleges of Islamic studies in East Java – IAIN Ponorogo, IAIN Tulungagung, and UIN Surabaya, they applied face to face interaction before the Covid-19 outbreak and they use online platform such as Google Classroom, Moodle, Edmodo as learning tools during covid-19 pandemic. They consider that students' high order of thinking skills isn't well equipped by using those two approaches due to students' lack of motivation. There are several causes of low motivation. The first reason is that classroom instruction does not engage them. Lecturers are less providing a supportive and challenging learning environment as well as lack of reinforcement from the lecturers due to the limited interaction in the classroom. Moreover, the major problems of online learning during covid-19 pandemic is unavailability of internet connection. For fostering students' high order thinking skills, students must be encouraged to have strong willing to learn. By making lessons more appealing through encouraging activities, building supportive environments, and reinforcing students positively, teachers can boost students' motivation (Dişlen Dağgöl, 2013) and take sound steps on the path to fostering high order thinking skills.

Studies revealed the effective implementation on blended learning. Hew and Cheung (2014) reported a study that examines the positive effect of using blended learning approaches on social studies students' critical thinking. Positive impacts also showed on student enrolment and learning motivation (Law et al., 2019). Moreover, blended learning can help learners outperform in their reading comprehension (Behjat et al., 2012). Several researchers addressed several outcomes, challenges implications, and possible future directions for blended learning (BL) in higher education (Dziuban et al., 2018; Rasheed et al., 2020). Research deals with project-based learning was conducted by Rochmahwati's qualitative research focused on the Project Based Learning which can foster students' critical thinking (Rochmahwati, 2015), high order of thinking skills (Sasson et al., 2018), creative thinking (Chen et al., 2019) and creativity (Gunawan et al., 2017). Moreover, project-based learning impacts on student' academic achievement (Poonpon, 2017).

Combining the advantages of both blended learning and project-based learning, this research is intended to reveal the impact of blended-project based instruction on high order thinking skills as well as pre-service teachers' responses on its implementation by using the following research question: (1) is there any significant effect of blended project-based instruction on students' high order thinking skill?, and (2) how are students' responses on blended-project based instruction?

METHODS

Research Design

This research employed experimental design in order to verify whether there is significant different of students' high order of thinking skills who are taught by blended-project based instruction. The research was conducted at English Department of IAIN Ponorogo, East Java for quantitative research design. The 5th semester students will be selected as the subject of the research since they have sufficient language proficiency to perform in complicated task for comprehending content course.

Population and Sample

The population was the 4th semester students of English Education Department at IAIN Ponorogo. The total number of the students is 110 students. The sampling technique used is cluster random sampling in which 32 students in A class as experimental group was taught by using blended project-based instruction and 26 students in B class as control group was taught by lecturing instruction.

Research Instrument and Procedure

In this stage, data were collected through test and questionnaire. A set of questions was employed both in pretest and posttest to measure the students' level of high order thinking skills.

Table 1. Design of Instrument for Pre-Test and Post-Test

Variable	Indicators	Example of Instruction
Dependent variable (Variable Y): High Oder thinking Skills	Factual Knowledge	(classify, compare, correlate)
	Conceptual Knowledge	(explain, analyze, examine)
	Procedural Knowledge	(distinguish, conclude, resume)
	Metacognitive Knowledge	(create, find, asses)

The result of the test will be assessed by the following scoring rubrics proposed by Bloom (Wilson, 2016) in order to determine the students' level of thinking:

Table 2. Scoring Rubric for High Order Thinking Skill Level

Dimension		Level One (Nice)		Level Two (Good)		Level Three (Great)
Factual	10	Limited amount of information is explained, little or no evidence to support	20	Sufficient amount of facts are explained, adequate evidence to support	30	Numerous facts are explained, uses examples and illustrations to support
Conceptual	10	Solution shows minimal classification of element' no relation between elements and structure to each other	20	Solution demonstrated the relation and structure between elements; recognize pattern; rationally supported	30	Solution classify elements, their relationship to each other while identifying the arrangement and the structure and structure connecting them in a rational and persuasive way
Procedural	10	Solution lack self-expression; some important elements excluded; not clearly communicated	20	Workable solution is new and includes essential elements; adequately communicated solution to appropriate audiences	40	Workable solution is new and includes all parts; demonstrate unique self-expression; communication is directed to a specific audience in a unique and highly effective manner
Metacognitive	10	Judgments have little or no support	20	Judgments are on both cognitive and effective levels, based on given criteria	40	Judgments are based on a variety of aspect s at both the cognitive and effective levels.

Data Analysis

The data in was in the forms of students' score in high order thinking skill level viewed from its achievement. The next phase is related with fulfillment of statistical assumptions by testing homogeneity and normality of the data. Independent-Sample T-test makes certain assumptions that must be fulfilled i.e., homogeneity and normality (Bartlett & Bartlett, 1995). When all this statistical assumption are fulfilled, parametric testing will be employed.

RESULT AND DISCUSSION

The findings will highlight the procedure and the result post-test for experimental and control group. Then, the result of analysis of t-test by suing IBM SPSS 22 for Windows will be elaborated.

The Result of Post Test For Experimental Group

Procedures of Project-Based Blending Instruction in Experimental Group

The students of experimental group were 32. The students were instructed through a blended learning approach in which they have to meet face-to-face with the lecturer and were taught orally and visually interacting with the lecturer over the content material as well as exercise

presented by the lecturer. They have to participate actively in one of teaching platform, namely Google Classroom.

The Implementation of project-Based blended learning was in the following:

1) Explain Course Outline and the preview about the importance of curriculum in Educational Program Divide the class into 8 groups based on the topics stated in the Course outline
2) Ask students to read references which had been uploaded in Google Classroom, search additional material in the library and the internet in order to finish the project. The product must be in the form of paper for presentation and mind mapping.
3) Discuss the result of reading with group
4) Upload the product in the Google Classroom
5) Present and discuss in front of the class
6) Online discussion in the Google Classroom Feed based on lecturer's questions.

After all topics discussed, the students are given a written test and the result were in the form of score. Furthermore, the researcher classified the level of High Order of Thinking Skills based on the set-up criteria. The result of students' posttest is presented as follows:

Table 4. The Frequency Distribution of Post-Test Score for Experimental Group

Post-Test for Experimental Group					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	70	2	6.3	6.3	6.3
	72	1	3.1	3.1	9.4
	76	2	6.3	6.3	15.6
	78	2	6.3	6.3	21.9
	79	4	12.5	12.5	34.4
	80	6	18.8	18.8	53.1
	81	2	6.3	6.3	59.4
	82	2	6.3	6.3	65.6
	83	1	3.1	3.1	68.8
	84	1	3.1	3.1	71.9
	87	1	3.1	3.1	75.0
	88	3	9.4	9.4	84.4
	94	1	3.1	3.1	87.5
	95	1	3.1	3.1	90.6
	96	1	3.1	3.1	93.8
	98	2	6.3	6.3	100.0
	Total	32	100.0	100.0	

The table above informs that among 32 students in the Experimental Group, only 2 students who got the highest score at 98 and the same number of students who got the lowest score of 70. Most of students got 80 to 90.

The Result of Post Test for Control Group

Procedures of Applying Group Discussion in Control Group

The students of control group were 26. Those students were in a traditional classroom setting, which is a face-to-face session. Instructional materials used in traditional method were the textbook from library. The procedure is in the following:

1) Explain the Course Outline and the importance of Curriculum in the Educational Program
2) Divide the class into 8 groups based on the topics stated in the Course outline
3) Ask students to read references as the sources to write a paper
4) Present and discuss in front of the class

The Result of students' Post Test for Control group is presented in the following:

Table 5. The Frequency Distribution of Post-Test Score for Control Group

Post-test Control Group					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	75	2	7.7	7.7	7.7
	76	4	15.4	15.4	23.1
	78	6	23.1	23.1	46.2
	79	2	7.7	7.7	53.8
	80	4	15.4	15.4	69.2
	81	1	3.8	3.8	73.1
	82	2	7.7	7.7	80.8
	83	2	7.7	7.7	88.5
	84	2	7.7	7.7	96.2
	95		3.8	3.8	100.0
	Tot	26	100.0	100.0	

Based on table 4.7, it showed that the greatest proportion of the students in the control group reached 78. The lowest score was 75 and the highest one is 95. The frequency of students who got 76 and 80 is the same.

The data analysis was done by using independent sample t-test. If H_0 is rejected $t_{test} > t_{table}$ it means that there is a difference. The result of t_{test} by IMB SPPS 22 for Windows can be seen in the following table.

Table 6. The Result for T-test

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
Result	Equal variances assumed	7.514	.008	1.798	56	.035	2.762	1.627	-.497	6.021
	Equal variances not assumed			1.795	50.022	.049	2.762	1.539	-.329	5.853

Based on the output of Levene's Test for Equality of Variances in the Table 3 the sig. is 0.08 an it is higher than 0.05. It is implied that the data from both experimental and control group are homogenous. Furthermore, the result of ttest is 1.798 and it is higher that ttable at 1. 679. The result of ttest implied that there is significant different of higher order of thinking skills of the students who are taught by blended-project based learning instruction and who are not when it is viewed from the students' achievement at the end of the course. Also, the post-test result revealed the level of the students' high order of thinking skills which is presented in the following figure.

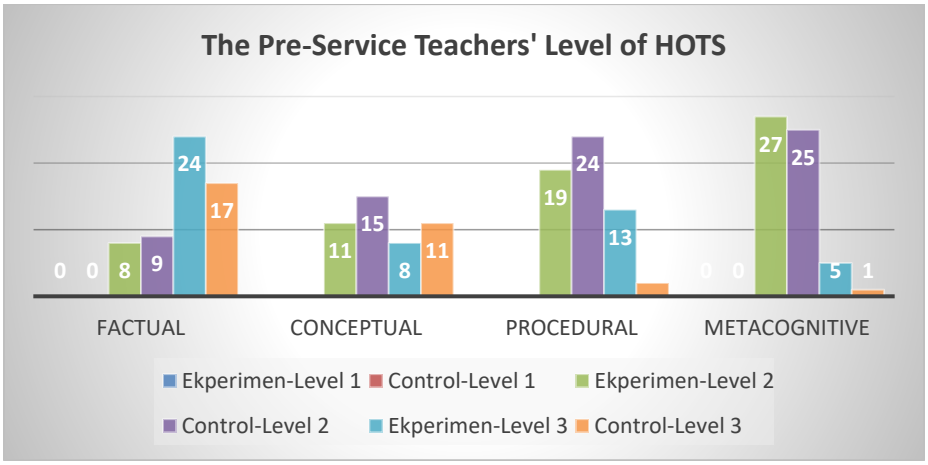

Figure 1. The students' Level of High Order of Thinking Skills

Figure 1 reported the level of high order of thinking skills level of the students in the Experimental and Control Group. It is evidently seen that the greatest number of students reached out level 3 in Factual domain. The number of students in Experimental group is higher than the control group. However, for the conceptual, procedural and metacognitive domain, most students in experimental group reached level 2. No one was at the level 1 category.

Based on the acquired data, the initial achievement of both experimental and control group is relatively at the same level. The average pre-test score was 74.81 and 74.03 respectively. After the experimental group is given treatment of blended-project based instruction and conventional method for control group, they show significant different score on high order of thinking skills viewed from their achievement.

The result of ANOVA showed that the students' higher order of thinking skills when it is viewed from the achievement at the end of the course increased significantly when they were taught by blended project-based instruction. This research result is supported the views that project-based learning gives chances for students to develop their critical thinking (Anazifa & Djukri, 2017; Dimmitt, 2017; Rochmahwati, 2015) intellectually controlled process of competently applying, analyzing or evaluating information gathered from, observation, experience, reflection, reasoning for guiding them to act as the criteria of high order thinking skills. Furthermore, blended learning itself as learning that combines face-to-face learning in class with online learning that facilitate students to work in partnership, ask questions, and think critically (Wahyuni et al., 2019).

The findings also showed that there is different level of thinking skills. The great number of students who are reached out level 3 in Factual domain. In blended project-based instruction, students are facilitated to acquire factual knowledge since it is important to students because it serves as basic building blocks to define the idea of subject being learnt (Wilson, 2016). Level 3 showed that students are able to explain several facts as well as examples to support it based on the result of reading references, online and offline discussion as well as lecturer's feedbacks. However, for the conceptual, procedural and metacognitive domain, most students reached out level 2.

Blended project-based instruction in this research is the combination of two approaches, namely blended learning and project-based learning. Blended learning integrates online and face-to-face instruction (Young, 2002). It integrates all available technologies be used along with common classroom teaching. In this case, the lecturer applied Google classroom as a learning management system which was launched in 2014 (Azhar & Iqbal, 2018) as media for online discussion as well as sharing materials and assignments. Furthermore, project-based learning enables students to solve the problems by active participation in creating the project (Kizkapan & Bektas, 2017). Furthermore, The ability of lecturers for developing students' higher-order thinking skills is important in both online and face-to-face delivery means mostly when seeking to engage students in group activities (Gillett-Swan, 2017) as well as the individual task. The lecturers have to engage students' high order thinking skill by providing them stimulating questions.

CONCLUSION

Blended-project based instruction is proven to be effective for the development of high order of thinking skills viewed from their achievement. It can be seen from the result of t_{test} is 1.798 and it is higher that t_{table} at 1. 679. Furthermore, the great number of students reached level 3 in Factual domain. Though, for the conceptual, procedural and metacognitive domain, most students reached level 2.

The institutions should recommend blended project-based instruction to be applied by lecturers in their class due to its advantages. Besides, institutions must provide sufficient infrastructure to support the successful implementation of this approach such as supplying the accessibility of internet connection for practitioners as well as the students. Other researchers are suggested to conduct a research dealing with blended project-based instruction in different point of views such as the effect of blended project-based instruction on students' learning autonomy or other psychological aspects.

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