Innovative Journal of Curriculum and Educational Technology
8 (2) (2019) : 67 – 73

https://journal.unnes.ac.id/sju/index.php/ujet/article/view/31342

The Effectiveness of PBL-Based HOTS in English Learning

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Article Info

History Articles
Received:
June 2019
Accepted:
July 2019
Published:
November 2019

Keywords:
discovery learning HOTS, english, PBL

DOI
https://doi.org/10.15294/ijcet.v8i2.31342

Abstract

One of the disadvantages in the process of learning that is conducted by teachers is the lack of effort to increase the effectiveness of PBL-Based High order thinking the skill of students. The purpose of this research is knowing the Learning HOTS-Based in English Learning. The research method that is used in this research is a quantitative method. The population in this study was students of class XI- Public Senior High School 12 Semarang. The sampling technique was carried out by a random sampling technique, which is class XI IPA 2 as an experimental class and XI IPA Class 1 as the control class. Learning outcomes using HOTS-based PBL-Based HOTS has increased pre-test and post-test values from 33.47 to 35.00 while the Discovery Learning-based HOTS has increased from 33.29 to 34.20, (2) on the PBL-Based HOTS, pre-test value of high motivated-students is 31.89 has increased in post-test of 6.55 to 38.44. While the low-motivated students have a pre-test value of 29.89 and have increased in post-test of 1.89 to 31.78 for Discovery Learning-based HOTS, pre-test value on high-motivated students of 34.11, it has increased in post-test of 0.45 to 34.56 while in low-motivated students has the pre-test value of 29.67, experiencing an increase on post-test of 3.11 to 32.78, and (3) there is interaction between PBL-based HOTS with Discovery Learning-Based HOTS to student learning outcomes. The research is capable of generating synthesis about the effectiveness of Discovery Learning-Based HOTS in English learning, providing empirical evidence so that schools and teachers can select effective learning models and it can be a basis or a reference to further research in English learning.

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p-ISSN 2252-7125
e-ISSN 2502-4558

INTRODUCTION

The implementation of learning requires learning devices as a guideline in the learning and teaching activities as a supporter of the effective learning process, such as; Curriculum, syllabus, up to the learning process plan that will be applied in the learning. In this case, the researcher raised the issue of learning about high order thinking skills in English learning where students still often memorize in learning; there is no motivation to learn and not to master the material that is given by the teacher. According to Syahril, and Riska (Syafni, Syukur, and Ibrahim, 2013) The problem is an individual's failure in the fulfillment of one or several needs, thereby causing an imbalance. A skill imbalance in learning is a skill in the mastery of the material learned and must be mastered by learners in a way to be able to undergo learning in school. After the researcher observed Public Senior High School 12 Semarang, the researcher found many students have not been able to work on questions based on text-shaped material questions. Around 60% of learners have a value below KKM on the exposition text material with a score range of 60-74. This is what makes researchers want to research the school, assuming that there is a problem in English learning. The teachers admitted that they did not receive adequate teacher education to teach critical thinking Che (Fembriani, Khumedi, and Anni, 2015).

One of the disadvantages of the learning process that implemented by teachers is the lack of effort to develop the thinking skills Wina Sanjaya (Rahmah, and Aswad, 2015). It is needed a good and quality learning, and that can improve the skills that the students have. One of the ways to improve the quality of learning is by changing the method of teaching (Wulandari, and Surjono, 2013). Besides the learning methods that must be changed, there is also a problem-solving in the learning process. It is necessary for learners to get experience in using the knowledge and can be applied to the problems faced in daily life and problems that are not routinely faced by learners Nitko (Rahmadi, 2015). In the class actions research which is conducted by (Noma, Prayitno, and Suwarno, 2017) on biology subjects, from total of data increased in the aspect of high-level thinking ability from the preset to the cycle 2 shows all aspects of high order thinking skills undergo improvement in accordance with the target research determined that is ≥ 23. The results of the research (Prasetyani, Hartono, and Susanti, 2016) in class XI MIPA 1 Public Senior High School 18 Palembang, obtained that in mathematics subjects with the method of PBL, percentage of students who have a high level of thinking skills with the excellent category is 16.667%.

Furthermore, 26.667% have high-level of thinking abilities with good categories, 30.000% have a high level of thinking ability adequately categorized, 26.667% have high-level thinking skills categorized less, and no one has High level of thinking skills with very fewer categories. Research results (Syamiya, 2017) in the economic subject, the average value of critical thinking skills in the classroom that used Discovery Learning is higher than the value of critical thinking using the LBL. The relevant research (Noma, Prayitno, and Suwarno, 2017) concluded the PBL model is effective to improve high-level thinking skills in biology subject, research of (Prasetyani, Hartono, and Susanti, 2016) also concluded that the PBL model was effective on mathematics, and the research of (Syamiya, 2017) implemented the PBL and Discovery Learning in economic subjects and concluded that Discovery Learning Model is better than the PBL. The difference in this research implements PBL Model and Discovery Learning model are collaborated with HOTS to analyze which learning model is more effective on English subjects, where English is a subject *Noneksakta* and not using formulas and counts. The research also added an attribute that is motivation to see the difference between the learning outcomes of high-motivated students and the low-motivated students of each learning model. The benefits of this research can be used as reading material to increase knowledge in conducting English learning in the classroom.

METHODS

The research methods use quantitative research methods. Researchers use the experiment quasi with ANOVA Factorial design 2x2 (Anggraini, Mukhadis, and Muladi, 2013). Based on table 1, the Learning model column (A) is divided into two parts, i.e., PBL-based HOTS (A_1) and Discovery Learning-based HOTS (A_2). The motivation column (B) is divided into two categories: high motivation (B_1) and low motivation (B_2). A_1B_1 is a PBL-based HOTS for high-motivated students, A_1B_2 as PBL based HOTS for low-motivated students, A_2B_1 as Discovery learning-based HOTS on High-motivation learners, and A_2B_2 as a Discovery Learning-based HOTS for low-motivation students. Low-and high-motivated students are determined based on the value of the student's poll Quartil value. The second quartile is median; it is used as a median, the first Quartil is a group of highly motivated learners, and the third Quartil is a low-motivated group.

Table 1. Factorial 2x2 Research Design

Learning model (a) Motivation (b)	PBL based on HOTS (A_1)	Discovery learning based on HOTS (A_2)
High motivation (b_1)	A_1B_1	A_2B_1
Low motivation (b_2)	A_1B_2	A_2B_2

An instrument must have adequate reliability, and if the instrument is used to measure the aspect measured several times, the result is the same or relatively the same. If the questions have high validity and reliability, then the instrument is valid and suitable to use (Hayati, and Lailatussaadah, 2016). The population in this research is the students of class XI Public Senior High School 12 Semarang year 2019/2020. Sampling technique uses random sampling techniques by taking classes randomly in a homogeneous population. In student's experimentation, the class is taught with PBL-based HOTS, and in student's control classes is taught with Discovery Learning-based HOTS. The variables that are used in this research are free variables, bound variable, and attribute. The free variables in this research are learning models, whereas the bound variable is learning outcomes while the attribute is motivation. The methods of collecting data on this research include test methods and poll methods. The test method that is used is a test-based HOTS in an essay form to obtain data about the critical thinking skills of students of XI Public Senior High School 12 Semarang which will be analyzed as an answer to the problems formulated and to test the hypothesis that has been proposed. The test will be given in a trial class first and analyzed to determine the degree of validity and validity of the test which includes the legality, reliability, difficulty level of each of item and differentiation of each item (Kurniati, Pujiastuti, and Kurniasih, 2018). The poll method is used to determine the level of students motivation.

Final Data on English learning values and the learner's motivation poll scores are analyzed for testing hypothesis.

RESULTS AND DISCUSSION

Based on table 2 column of learning model is obtained significance value of 0.021 or smaller than 0.05, then it can be concluded that H_0 is rejected so that H_a is accepted. It can be concluded that there is a difference in effectiveness between student's learning outcomes using PBL-based HOTS with Discovery learning-based HOTS. The Differences in English learning outcomes between students obtaining PBL-based HOTS learning with Discovery Learning-based HOTS. Based on a hypothesized test that has been done obtained that there is a difference in effectiveness between student learning outcomes using PBL-Based HOTS with Discovery learning-based HOTS

Table 3. Data on Students Learning Outcomes

Learning model	Students score	N	Mean	Standard deviation
PBL-based HOTS	Pre-test	35	33.29	6.397
	Post-test	35	34.2	6.703
Discovery learning-based HOTS	Pre-test	34	33.47	3.203
	Post-test	34	35	4.105

It can be seen that from the average pre-test and post-test using PBL based HOTS in class IPA

2 There is a change or an increase of approximately 1.53 while the Discovery Learning-based HOTS in class IPA 1 has increased about 0.91. This is aligned with the research results (Syamiya, 2017) which compares between the PBL-based HOTS with Discovery Learning-based HOTS to the students' critical thinking skills, found that from the number of learners of 36 people, after and before the class was given The treatment with the PBL-based HOTS there is an average increase score from the pre-test value of 9.28 to 29.61. Discovery Learning-based HOTS has an average score of pre-test from 9.53 to 31.94 for the average score of post-test. High-level thinking is the process of thinking that puts them in a new sense according to the understanding of each of the students Gunawan in (Hayon, Wariani, and Bria, 2017). Learners who speak idea or notions actively, they can be said to have a high level of thinking skills as stated by (Singh, C. K. S., Singh, R. K. A., Singh, T. S. M., Mostafa, and Mohtar, 2018), comparing ideas or notions and contrasting the idea is one of the components of critical thinking ability. This stimulates learners to identify the material provided from different perspectives and answers the questions according to the answers after they evaluate and select the right answer. In the PBL-based HOTS teachers only as facilitators that guides learners to study, this learning model is effective and suitable for use in English learning. The implementation process of PBL affects learners to be active in discussions in the classroom, using their ways to solve problems, sharing ideas, and concluding a concept. (Suprapto, Fahrizal, Priyono, and Basri, 2017).

In the column of Motivation obtained the significance value of 0.000 or smaller than 0.05 then Ha is accepted so that it is obtained that there is a difference in effectiveness between learners motivation with PBL-based HOTS with Discovery Learning-based HOTS.

In PBL-based HOTS, the pre-test value on high-motivated students is 31.89. It has increased from 6.55 to 38.44. Meanwhile, low-motivated students have a pre-test value of 29.89 and have an increase of 1.89 to 31.78. For the Discovery Learning-based HOTS on the Pre-test value of high-motivated students is 34.11, it has increased from 0.45 to 34.56 while in low-motivated students have a Pre-test value of 29.67, it has increased from 3.11 to 32.78. It can be seen that there are changes or improvements of learning outcomes from pre-test value and post-test value where students outcomes with use PBL-based HOTS has higher students outcomes than Discovery Learning-based HOTS as a learning model that directs learners to find unknown concepts, and has been researched that learning model can increase the students skill in learning (Hanafi, 2016).

Table 4. Learners Outcome Based on The Level of Motivation

Learning models	Level of motivation	Average score of english learning in class XI IPA		
		Pre-test	Post-test	Increased
PBL-based HOTS	High	31.89	38.44	6.55
	Low	29.89	31.78	1.89
Discovery learning-based HOTS	High	34.11	34.56	0.45
	Low	29.67	32.78	3.11

PBL can increase motivation because when students solve real problems, then they will be pleased to handle it than working on something abstract and based on theory (Serife, 2011). Motivation affects Learning results because students who have high motivation will also have high learning outcomes and vice versa if the students who have low motivation then they will have low learning outcomes. Motivation is one of the psychological factors that affect the outcome of learning, in other words, if it has achieved the outcome of learning, it is the keyword that a person has the motivation to learn (Muhammad, 2016) so that it can be concluded that the PBL-based HOTS Model that had been implemented in class XI IPA 2 experienced a significant improvement than the Discovery Learning-based HOTS Model which can be seen from the value of the learning outcomes of the

pre-test value up to post-test for each of the high-motivated students and low-motivated students.

Significance value is 0.032 or smaller than 0.05 then it can be concluded that Ho was rejected so that Ha was accepted. It could be concluded that there was an interaction between motivation and learning Model of learning outcomes. This was aligned with the research results (Aziza, Djaeng, and Amri, 2016) that highly motivated students tend to be optimistic, confident, able to overcome a difficult and always motivated to find a way out of the difficult situation for himself and have a high responsibility. Low-motivation students tend to be pessimistic, low self-esteem, consider himself a fool, and always avoid responsibility when they were given the task of working on the matter so that learning is a burden to them. The relationship between learning models, motivation, and learning outcomes are a reciprocal relationship where learning and motivation models have interactions with learning outcomes. Learning outcomes can be seen from the use of the learning Model used in learning. The implementation of the learning Model aims to motivate students to achieve better learning outcomes (Samara, Juraid, Samuel, and Patampang, 2016), Discovery Learning-based HOTS tended to be used to arise students curiosity so that they will often learn by doing self-trafficking or discovery if learning results have increased then the skill to think critically will also increase. While learning by using the PBL-based HOTS model aims to facilitate students in exchanging minds in group discussions. Students who have a higher ability can teach students who have less ability so that they can understand the material provided. High-motivated students will have high initiative and effort to strive in improving knowledge so that the model, methods, and strategies that are used, they will still obtain maximum learning outcomes. Active learning will spur students ability as a result of social interactions and are more motivated to work on assignments in the discussion group. Communication in direct learning occurs because the two-way that is between teachers with students or vice versa (Suphi, and Yaratan, 2016). It can be concluded that there is an interaction between learning Model and student motivation at Public Senior High School 12 Semarang.

CONCLUSION

Based on the analysis that has been done can be concluded that: There are differences of learning outcomes between PBL-based HOTS Model and Discovery Learning-based HOTS in class XI IPA at Public Senior High School 12 Semarang. It is obtained class XI IPA 2 as experimental class and class XI IPA 1 as control class. The learning outcomes that use PBL-based HOTS models have increased from 33.47 to 35.00, whereas the Discovery Learning based HOTS model has increased from 33.29 to 34.20. There are different learning outcomes between low and high motivated students — pre-test and Post-test values by using the PBL-based HOTS Model and Discovery Learning-based HOTS model. On the PBL-based HOTS Model, pre-test value on high-motivated students of 31.89 has increased by 6.55 to 38.44.

Meanwhile, the low-motivated students have a pre-test value of 29.89 and have an increase of 1.89 to 31.78. For Discovery Learning-based HOTS pre-test value on high-motivated students of 34.11, it has increased by 0.45 to 34.56 while in low-motivated students have a value of pre-test of 29.67, increased by 3.11 to 32.78. There is an interaction between motivation and learning Model. The relationship between learning models, motivation and learning outcomes are a reciprocal relationship where learning and motivation models interact with learning outcomes. Learning outcomes can be seen from the use of the learning Model used in learning.

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