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The Implementation of Project Based Learning in EFL Class: Fostering students' high order thinking and autonomy

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ABSTRACT

The purpose of this study is to analyse students' HOTS and learn autonomy for English department students in EFL class to design lesson plans through implementing Project Based Learning. Three cognitive domains were used as parameters to identify students' HOTS: analysing, evaluating, and creating, while learning autonomy was portrayed through five aspects as the indicators: determining the objectives, setting the plan, selecting methods and techniques, reflecting on learning, and assessing and evaluating the project. This study used a mixed method in which three observations were made during the teaching-learning process, and questionnaires were distributed to 33 English department students in EFL class. In addition, students were chosen using the snowball method and interviewed. Both quantitative and qualitative approaches were used to analyse the data. The discovery revealed that indicators and characteristics of HOTS and learning autonomy were presented consistently during classroom interaction and accomplishing projects outside the classroom. Students frequently demonstrated critical and creative thinking in various ways when participating in the classroom. In contrast, learning autonomy is portrayed in every stage of accomplishing the project to design a lesson plan. Implementing project-based learning is highly effective and contributes significantly to fostering students' HOT and autonomy.

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INTRODUCTION

The teaching and learning process carried out by a teacher greatly affects student learning outcomes in understanding the material and gaining knowledge and life skills (Asari et al., 2019). That's why activities in the learning process both inside and outside the classroom should integrate critical and creative thinking skills contained in activities that require High Order Thinking Skills (HOTS) and form students' habits of autonomous learning. So far, critical and creative thinking skills are often manifested in the form of HOTS questions or presenting a problem where students are asked to find solutions as alternative problem solving

(Mukhlifida, 2021). However, not all subjects only require problem solving but require results in the form of products as the final output. One example of the course that require a product as the earning objective is a micro teaching class where one of the outcomes of learning is a lesson plan. In this class, EFL prospective teachers must be able to think critically and creatively and be able to independently develop good quality of lesson plans. They must have skills in preparing learning that integrates high order thinking skills in the learning activities they design. In fact, online learning had reduce students interaction as it happen in face to face class to support students critical and creative thinking during the discussion in the classroom (Yuliansyah & Ayu, 2021). One basic question arises, namely how can a teacher design learning that encourages students to think creatively and critically if he/she him/herself does not have the skills to think critically and creatively? Thus, this class would implement PjBL to foster students' HOTS.

From the results of the partnership program conducted with SMK Muhammadiyah 1 Gresik, the researcher and some teachers, who collaborated in Lesson Study for Learning Community, implemented project-based learning to encourage students to produce a product at the end of the lesson. SMK as a vocational school emphasizes more on product-oriented learning at the end of each lesson. It was carried out to measure the achievement of the targeted competencies in the form of products as a form of mastery of skill from the material they have learned (Yuliansyah & Ayu, 2021). From the results of the implementation at SMK 1 Muhammadiyah, the use of project-based learning as a learning model facilitated students to be able to produce the products for each targeted learning achievement. This was what researchers then brought to campus to be implemented in micro teaching classes where prospective teachers learned from preparing lesson plans and implementing lesson plans that had been prepared previously in micro teaching class. PjBL is certainly appropriate for learning in micro teaching courses because the result of the learning is a product, namely a lesson plan. However, PjBL is expected to improve students' skills in HOTS and learning autonomy, so that in this research, researchers want to capture the extent to which PjBL can encourage prospective teachers to have high order thinking skills and learning autonomy by observing the indicators of HOTS and learning autonomy during learning inside and outside the classroom.

Project-based Learning

Project-Based Learning Project-Based Learning (PjBL) is an instructional model that is based in the constructivist approach to learning, which entails the construction of knowledge with multiple perspectives, within a social activity, and allows for self-awareness of learning and knowing while being context dependent stated (Yeh & Lan, 2018).There are five criteria for PjBL: projects should be central to the curriculum, focused on problems that drive the students to struggle with major concepts, involve the students in constructivist investigation, student-driven, and realistic (Laur, 2013). PjBL is an "outlet for every student to experience success" (Guo et al., 2020). Furthermore, common features to PBL implementation are an anchor of the activity, a task, an investigation, provision of resources, scaffolding, collaboration, and opportunities for reflection and transfer (Condliffe et al., 2017). Eyring (1997) defines projects, in language learning settings, as "assignments that incorporate student input, with content deriving from real world by integrating language skills and extending over several weeks or more". From the definitions above, the writer sees that Project-based learning (PBL) as a dynamic approach to teaching in which students explore real-world problems, issues and challenges, are inspired to obtain a deeper knowledge of the subjects they are studying and more likely to retain the knowledge gained through this approach. In addition, the students develop confidence and self-direction as they move through both team-based and independent work (Pratiwi et al., 2020).

Project-based learning is one of the scientific learning models that gives students the freedom to plan learning activities, carry out projects collaboratively, and ultimately produce work products that can be presented to others (Woro Sumarni, 2015). In addition, project-based learning is more geared towards student-centered learning, involving students in learning knowledge and skills through developing inquiry processes to obtain products (W. Sumarni et al., 2016; Wijayati et al., 2019) whereas the role of teacher as a facilitator and motivator which emphasize learning outcomes as proportional process skills. Thus, the project-based learning model can theoretically influence student learning outcomes and levels of creativity. Project- based learning steps are carried out through a project within a predetermined period with steps that include preparation / planning, implementation, reporting and communicating the results of activities and

evaluations. Through project learning, there is the development of an inquiry process in learning topics that are real in nature to attract students to study. This is also supported by research results which show that project-based learning models in addition to motivating students to learn material that exists in everyday life can also enhance creativity (Guo et al., 2020; Tiantong & Siksen, 2013), improves creative thinking skills (Kimsesiz et al., 2017), improves student performance (Akinoglu, 2008; Fitriana, 2019; Pratiwi et al., 2020), facilitate students to gain high cognitive abilities (Pratiwi et al., 2020)and improve students' learning autonomy(Phasuk et al., 2019). Therefore, it is felt appropriate to apply the project- based learning model (PjBL) which has been empirically proven to be able to foster students' HOTS and learning autonomy.

High Order Thinking Skills

The term Higher Order Thinking (HOT) refers to "thinking on a level that is higher than memorizing facts or telling something back to someone". Moreover, "HOTS takes thinking to higher levels than restating the facts and requires students to do something" (Fakhomah & Utami, 2019). In addition, the traditional paradigm often confronted the consciousness of the importance of building a learning process that emphasizes on HOTS. They still focus on aspects of knowledge and material mastery. However, as a consequence, the learning process that occurs will rather focus on LOTs and the learning activities will rely on teachers in the classroom that makes the learners become inactive recipients of information. Some research showed most of teacher admit the important of HOTS for their students, but the implementation in the classroom were still low (Ansori, 2019) and even teachers were less sure of how they might assess thinking(Syamsul Arif et al., 2020). Relating with the important role of teacher in fostering HOTS to students which integrated in learning activities, students of English department as a prospective teacher should be aware of the importance of HOTS and learning that emphasizes the aspect of HOTS to gain 21st century competence (Fakhomah & Utami, 2019). Thus, students who take micro teaching course have to know the way how to integrate HOTS in learning activities so that they can assess students' thinking.

Students' learning autonomy

One of influential definition of learning autonomy had been stated by Holec (Borg et al., 2019) which learning autonomy involved the skill of reflection and analysis, implying that students need to develop their mental power to perform their own duties of learning, including planning, monitoring, and evaluating their learning progress. While Reinder (2010) provided a different way to explain this concept. They described five possible ways to interpret learner autonomy: ''(1) for situations in which they study entirely on their own; (2) for a set of skills which can be learned and applied in self-directed learning; (3) for an inborn capacity which is suppressed by institutional education; (4) for the exercise of leaners' responsibility for their own learning; and (5) for the right of leaners to determine the direction of their own learning. In addition, Thanasoulas as cited in Yeh (2018) stated that the autonomous learner takes a proactive role in the learning process, generating ideas and availing himself of learning opportunities, rather than simply reacting to various stimuli of the teacher. This means that learners become more pro active by relying less on teachers. Empirically some researchers identified six factors related to autonomous learning: role of the teacher, role of feedback, learner independence, learner confidence in study ability, experience of language learning, and approach to studying(Yeh & Lan, 2018). This means that learning autonomy may be formed by students' empowerment of using resources (Lai & Gu, 2011). Thus teacher should be aware of supporting students to develop their self-directed learning ability by providing sufficient learning sources (Lai, 2019), monitoring learning progress (Sykes, 2018)and engaging with a community to boost learning (Knowles, 1975).

From several definitions related to HOTS and learning autonomy, it can be concluded that both are interrelated and influence each other. HOTS produces learning autonomy, while students who have learning autonomy automatically already have HOTS. Thus, in this research of implementing Project Based Learning, researchers wanted to investigate by collecting data from three times observations, questionnaire, and interview to see how did Project-based Learning foster students' HOTS and learning autonomy in designing lesson plan?

METHODS

This study employed a mixed method research approach in which analyses were performed separately and each set of data was interpreted. During analysis, the result of one set of data was not used to build on. The inferences were integrated after separate phases of data collection, analysis, and interpretation. The subject of the study were 10 male and 23 female students of fifth semester in English department who took micro teaching courses and had project in designing lesson plan. During learning process, data was collected through three observations, questionnaires, and interviews with both the teacher and students. The interview was given to students using the snowball method. Three times observation were conducted with the focus on the learning process to see students' high order thinking skill and autonomy while the learners were engaged in designing lesson plan. Three observers and a teacher's model were involved as a team in Lesson study as learning community in Teacher Training and Education Faculty, University of Muhammadiyah Gresik.

Project based learning was chosen as a model in teaching to gain the product of lesson plan. Students individually and groups tried to design lesson plan as their product before implementing a micro teaching. The questionnaire consisted of two components, HOTS, and autonomy. HOTS covered three dimensions, they are students' analysis dimension, students' evaluation dimension, and students' creation dimension, while autonomy covered five aspects. The researchers created the questionnaire, which was then validated by a panel of expert. To guarantee the quality of the questionnaires, internal reliability was assessed using Alpha Cronbach statistical analysis. The result showed that the overall measurement scale's Alpha Cronbach's value is 0, 860. It implies that it is dependable. Then, the questionnaires were distributed to students after finishing their project in designing lesson plan. An interview was conducted to confirm any findings derived from the observation and questionnaire results. The data was then presented in accordance with the findings of the observation, questionnaires, and interviews

FINDINGS AND DISCUSSION

The finding showed that Project base Learning (PjBL) engaged students to be interactive during learning process both in and out of classroom. When they were in group or individually design the project, it engaged them to have critical and creative thinking in designing their timeline, finding sources of material, choosing learning models for their own class, creating the stages of teaching learning process, designing students' worksheet, and creating the assessment. This project also employed students to have autonomy in finishing the project. students should have timeline for executing their project to produce lesson plan. They tried to observe the class, choosing the level of students being thought, choosing the topic of the lesson, creating the scenario of teaching learning process, creating students' worksheet, and creating the instruments for assessment independently.

Students' High Order Thinking Skill

The result of the observation, questionnaire, and interview indicated that Project Based Learning has received positive feedback. Each domain of parameters used can be exploited to identify it. One domain produces consistent results in term of HOTS indicators as indicated by students' creative and critical thinking during teaching learning process in the class. During teaching learning process, each indicator appears frequently, and each students perform enthusiastically. The analysis' skill, which has eight indicators, appears in every interaction that come out in the class discussion when they were analysing the existing lesson plan that they were picking up from the internet and one lesson plan that has been provided by the teacher. It also emerged when students had to analyse their friend's lesson plan in peer feedback session. Table 1 shows the dimension of students' analysis skill.

Table 1. Students' "Analysis" skill dimension on hots

Dimensions of 'Analysis' skill	Result of				
	Observation	Questionnaire			Interview
		Less Agree	Agree	Strongly agree	
Able to identify acceptable learningobjectives	√	0	15.1%	84.8%	√
Able to distinguish between appropriate and inappropriate indicators that do not match with learning objective.	√	0	30.3%	69.7%	√
Able to distinguish between appropriate and inappropriate learningactivities that do not match with indicators	√	0	24.2%	72.7%	√
Able to distinguish between appropriate and inappropriate assessment that do not match with learning objective	√	0	33.3%	66.7%	√
Able to explain the learning activitiesthat do not create a challenge to students to have critical and creative thinking.	√	0	24.2%	72.7%	√
Able to provide conclusion supported with relevant statement	√	0	36.7%	63.6%	√
Able to connect the ideas to be one entity	√	0	39.4%	60.6%	√
Able to provide logical reason by supporting relevant statements	√	0	33.3%	66.7%	√
Able to question classmate opinion.	√	0	24.2%	72.7%	√

Each dimension of students' analysis skill occurred and was performed by students, as shown in Table 1. All students in this class exhibited these dimensions on a regular and consistent basis. Positive responses had been found as a result of observation, questionnaire, or interview. Students were exhibited logical reason when they analysed the existing lesson plan that they had taken freely from the internet and also the provided lesson plan given by the teacher. Most of them were able to identify the acceptable learning objective based on the government syllabus for secondary schools. They were also distinguished significantly between the appropriate and inappropriate indicators to gain the objective learning that have been stated. In matching the indicators and the learning activities, students were able to present their analysis for some activities that were irrelevant with the indicator. Even they were able to show how students' worksheet should have role to provide didactic situation which engaged students to have critical and creative thinking. Even they were able to support it with the extensive references on the subject at hand and present the opinion convincingly.

This dimension is not the only indicator of how students' HOTS function. Students were also capable of identifying any differences in the items in lesson plan that will support to gain learning objective from the product that their friends have created. Students can be very critical of opinions if they show that the design of learning activities and students' worksheet were not related and match to indicators to gain learning objective. They mentioned some reason for irrelevant assessment since it did not measure the competency to be gained. They also give solution for the inappropriate assessment by providing some alternative solutions. According to Chinn (Chinn, 2011), students with HOTS can distinguish irrelevant information, solve problems and draw the conclusion from any information that they have studied. This

is a very positive outcome given that students in this class are frequently silent, hesitant, unmotivated and tend to be passive.

The analysis skill is demonstrated not only by the points discussed above, but also by some important aspects represented by students during the discussion and peer feedback. Students can relate the ideas into one big concept of didactics situation that should be existed in students' learning process very convincingly which result in both detail explanation and argument. The discussion of lesson plan as their product become more developed which challenge students to be involved deeply to defend what they have designed by providing some fact of students' situation that usually exist in real EFL classroom. This frequently emerge students' ability to ask critical questions when they believe their friends are out of line with the discussion, irrelevant to the solved problem, or still debatable. Students attempt to criticize any ideas that are not match to the problems or any illogical reasons. This result in an interesting and remarkable classroom teaching environment in which all students participate actively and contribute positively to the classroom discussion. As a result of rationalizing opinions, this act of asking critical questions characterizes the domain of analysis. According to Sydoruk (2018) allowing students to identify and make judgments on what they learn are crucial part of critical thinking because they encourage students to constantly question and build upon what they know. Finally, the class becomes quite lively.

An analysis skill, as one of the three domains of HOTS, is also performed by how students draw conclusion. Students are able to draw conclusion from emerging ideas and opinions by making very critical statements. They do not summarize points made by themselves or others, but rather draw inferences and synthesize opinions to arrive at a conclusion. Students demonstrate self-efficacy by freely expressing their ideas, whish can lead to students' independence in conveying their critical perspective in the form of comprehensive and vivid conclusion. All the dimensions shown in Table 1 have strongly acceptable responses from the majority of the students with the biggest presence 70.02%, while some other students demonstrating positive responses by stating agree on those dimensions with the presence 28.97%. None of respondents stated disagree with all the dimensions. This result was confirmed by consistent and reliable data collected as a result of both observation and interviews. Finally, as a conclusion of the use of HOTS, all dimensions within analysis domain are performed.

An 'evaluation' domain is another element that contribute as the indicator of students' High Order Thinking Skill (HOTS) that students have to possess. As shown in Table 2, the result of three times observation, students' responses on questionnaires, and interviews show consistent and reliable responses of students' HOTS toward the use of Project Based Learning in supporting students to create lesson plan which provide learning activities to support creative and critical thinking.

During three times of classroom teaching using Project Based Learning, the six dimensions indicating students' HOTS on the 'evaluation' skill domain occur constantly. Based on the result of tree observers, in all meeting students seem demonstrate every dimension in this domain with such conviction and assurance. They can perceive both didactic situations presented in lesson plan and the feedback given by their friends during the discussion. Even in the first meeting seem students less demonstrate it and tend to be receive other feedback, but at second and third meeting students develop the courage to confirm, argue and even counterclaim other's feedback. They can construct a strong and logical argument to interpret another's or their own opinion. According to Sydoruk (2018), strengthening opinion and reasoning development allows students to improve their critical thinking skill by improving conceptions about problems and situation that usually exist in EFL classroom. More specifically, they can justify and criticize opposing viewpoints by presenting logical arguments and critical questions. Those two conditions represent two dimensions of students' HOTS, analysis and evaluation, which according to Kratwohl and Anderson (2001)that training students to develop evaluation techniques should include activities such as coordinating, detecting, monitoring, testing, critiquing, and judging. In PjBL, students coordinating with their groups in making timeline for designing lesson plan and also finding out the appropriate material. Detecting was done for analysing others' lesson plan and give the feedback, while monitoring, testing, critiquing and judging was occurred during discussion for the product of lesson plan. This domain performed consistently during three observations. It also supported with the result of students' questionnaire, where they dominantly agree that giving feedback, and justifying feedback are formed well.

Table 2. Students' 'Evaluation' skill dimension on hots

Dimensions of 'Evaluation' skill Observation	Result of				
		Questionnaire			Interview
		Less agree	Agree	Strongly agree	
Able to summarize various feedback	√	0	81.8%	18.1%	√
Able to interpret various didactics situation in lesson plan	√	0	75.5%	24.4%	√
Able to interpret students' response	√	0	90.9%	9.1%	√
Able to compare various feedback	√	6.1%	72.7%	21.2%	√
Able to argument to own opinion or other opinion	√	0	84.8%	15.2%	√
Able to justify opinion arising on the product of lesson plan	√	3.0%	78.8%	18.9%	√

The use of PjBL in teaching learning for designing lesson plan in microteaching class also performed the encouragement of students in comparing of feedback emerging during the discission in the classroom. They can demonstrate their abilities to communicate various activities in lesson plan held by other students or themselves. This is a high skill performance that leads to critical thinking in order to evaluate lesson plan weather it facilitates the studentsin gaining learning objectives. This dimensions frequently performed by students as well as theevidence on the observation during the class. It also supported by students' responses on questionnaires which shown an agreeable stance, and even some of them strongly agree that they are able to compare a variety of feedback concerning to lesson plan that they have created.Only two students give response in their questionnaire that they less agree that PjBL support them to have skill in comparing and contrasting the opinion that others' give as feedback in assessment stage.

In term of summarizing various feedback from different students, students' HOTS are also identified so frequently and consistently. As evidenced by the questionnaire results, students frequently demonstrate good performance with no denying stance in this indicator. Students can summarize by eliciting points from a group of emerging the feedback. They demonstrate a creative and critical way of summarizing any opinions that arise. There is not a single meeting in which this summarizing performance does not occur. It is a distinguishing feature and an indicator of creative and critical thinking. On the stage of PjBL process, the stage of assessment become the last stage to evaluate the product. The assessment was done byhaving parallel discussion, here students evaluated their product and got comment from othersand their teacher. Primarily, all dimensions presented in the domain of 'Evaluation' emerge during classroom teaching and observation. It is inline with the result of students' response inquestionnaires in which students who agree to the emerge of the 'Evaluation' indicators in HOTS during classroom teaching reach 80.75 %, while those who strongly agree reach 17.81%.the number of students who disagreed is very small, accounting for only 1.51% of allrespondents.

Table 3 shows that students' results of the questionnaire indicate a dominantly agreeable stance (85.2%) on some dimensions, while very few students (2.27%) responding disagreeable on some dimensions in this domain. Meanwhile, despite the fact that only 13.6%of students strongly agree on some dimensions, this summary is supported by observational results, which show a consistent performance on students' ability to express those dimensions.

The interview yields similar results to the previous two data seta. As demonstrated, all studentsperform the dimensions of this domain.

Table 3. students' 'Creation' skill dimension

Dimensions of 'Creation' skill Observation	Result of				
		Questionnaire			Interview
		Less agree	Agree	Strongly agree	

Able to create ideas on designing good lesson plan	√	0	95.7%	12.1%	√
Able to describe the problems that usually exist in EFL class	√	0	84.8%	15.1%	√
Able to combine various ideas to be used in designing lesson plan	√	3.0%	81.8%	15.1%	√
Able to combine several similar ideas to create good lesson plan	√	6.1%	78.8%	12.1%	√

Referring to table 3 on the dimensions items indicates that students are able to create lesson plan since PjBL provide students with the stage of planning the project and followed bydoing the project. It forced students to have timeline on the activities that they should do on finishing the project as the out put of their learning. HOTS is defined as the expanded use of mind to meet new challenges (QEP, 2014). They saw HOTS as a thinking function of the mind's ability to solve the difficult problems. Students are encouraged to provide their originalideas as a 'forced response' to create a lesson plan that facilitate learners to have critical and creative thinking. At this point, students must speak up in order to express their ideas, describethe offered solution, give reason for their choosing solutions in their lesson plan. Students alsoencourage to design lesson plan which provide their students a didactics situation to engage them by some learning activities which make them used to have creative and critical thinking.As a consequences students have to filter and synthesize some learning activities using operational verbs that can be measured in assessment, and finally formulate the instruments toaccess their students' competency.

Students' learning autonomy

To answer the second questions, whether project-based learning foster students' learning autonomy, especially in designing lesson plan in micro teaching course. Table 4 reveals the result of three times observation, questionnaire and interview focusing on five aspects: determining the objectives, setting their plan, selecting methods and techniques, reflecting on learning and assessing, and evaluating by their own order to measure learner autonomy.

Table 4. Students' learning autonomy

Dimensions of Autonomy	**Result of**				
	Observation	**Questionnaire**			**Interview**
		Less agree	**Agree**	**Strongl yagree**	
Are able determine objective	√	0	90.9%	9.1%	√
Are able to set the plan	√	0	78.8%	21.2%	√
Are able to select methods and techniques	√	0	84.8%	15.1%	√
Are able to reflect on learning	√	0	84.8%	15.1%	√

On the aspect of determining the objective, the table shows that none of respondents less agreeable to this aspect, while most of them agree that project based learning support them in determining the objective (90.9%), and only 9.1% stated strongly agree with this aspect. From the observation can be investigated that during the instruction in the first stage of PjBL, students determined the objective of their own project and also determine learning objectives of lesson plan they would design. They should find out the syllabus and determine the learning objectives that their students would achieve during teaching learning process that covered in the lesson plan. Students' activities in this stage help them determine objectives such as propose interest session and organize the plan session. It also provides opportunities for students to practice how to determine their objective of learning.

The second aspect to be observed is the ability of students in setting the plan. During learning process, students need plan how to execute their designing lesson plan project and also create timeline in order to

accomplish the work. On the other hand, on designing lesson plan, students have to be able to set plan for creating lesson plan individually and in group. Students would try to break the learning objective into some indicators, find the right materials, find the right media, design effective learning activities, design students' worksheet, and create instruments for assessment. This stage give opportunity for students to learn in setting their plan and shared their plan to class. The result of questionnaire showed the same result in which none of students disagree of this aspect, while most of them agree (78.8%) and a few of them stated strongly agree (21.2%).

The next aspect is selecting method and technique. The result of the observation and interview displays positive result, while the result of questionnaire shows that most of respondents agree (84.8%) and a few of them (15.1%) state strongly agree that PjBL train them to be able to select methods and technique in accomplishing the project. Students also engage in selecting the method and technique of teaching model in order to be able to appropriate with the targeted students. They should design learning activities that present a didactics situation to encourage students to be creative and critical thinking. The aspect of reflect on learning and assessment are the next two aspects that based on the observation and interview show positive stance, while the result of questionnaire had the same result in which respondent dominantly agreed and some of them stated strongly agree. This aspect showed when students present the result of their project in class, another gave the comment which it encouraged them to reflect on what they have done. The reflection is not only for the activities that they have passed to accomplish the project, but also toward the lesson plan they have created. It is supported with the last aspect, assessing and evaluating their own in which students were encouraged to set the criteria for evaluating their work and their friends' work after finishing and presenting the project. The assessment had done not only for the result of the project, but also for designed lesson plan. The lesson plan should cover the criteria in which there was appropriateness among of learning objectives, indicators, learning activities, students' worksheet, and the assessment.

CONCLUSION

The use of project-based learning is clearly capable of fostering students' higher order thinking skills with all dimensions of three domains performed during classroom teaching, such as analysis, evaluation and creation. Students' performance on all identified indicators leads to critical and creative thinking. It is in line with Woolfolk (2017) statement that the main characteristic of HOTS could be elaborated when students possess and demonstrate a critical and creative thinking while they interact with one another in and out of classroom. All dimension in HOTS link each other in which one dimension can cause other dimension occure. Based on the result of qualitative and quantitative data displayed that project-based learning can foster students' autonomy in five aspects; determining objective, setting the plan, selecting methods and techniques, reflect on learning and assessment and evaluation. This result is similar with the research finding of Nagehan (R & Nagehan, 2015), who reported that project-based learning helped improve students' learning autonomy. The improvement was the result from the fact that students were engaged in the process of 'learning by doing' (Phasuk et al., 2019). Furthermore, students' autonomy could be improved by giving training (Benson, Phil; Reinders, 2011) in which project-based learning could be regarded as a type of training to help students take responsibility for their own learning. Students were exposed to many skills and competencies such as collaboration, project planning, decision making, and time management throughout the project.

For those interested in teaching which the final objective is to have a product, project- based learning can be the alternative solution to engage students to have mini project. During the process of accomplishing the project, students were engaged to have creative and critical thinking as well as to be autonomous learners.

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