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INTEGRATING TEACHING ENGLISH AND SCIENCE BY IMPLEMENTING PROJECT BASED LEARNING FOR ELEMENTARY PRESERVICE TEACHERS

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Abstract

Learning English as a foreign language (EFL) and science which has abstract concepts basically have problems for preservice teachers in the learning process. The problems can be solved by a project-based learning approach that adopts constructivist learning. In this research, the researchers integrate technology to create project-based learning. Smart apps creator (SAC) is the media that the researchers choose. The aims of this study are to investigate how Project-Based Learning (PjBL) solves the preservice teachers' problems like understanding the abstract concept of science, and to identify how preservice teachers respond to using PjBL in learning English. In the form of collecting the data, the researchers use the triangulation method. This study is qualitative in nature. The data were collected through observation and interview. The results showed that the activities of PjBL gave a significant effect on the participant's understanding of the abstract concept of science, and it helped solve the preservice teachers' problems in speaking such as pronunciation and fluency. The participants indicated positive responses to PjBL learning, and admitted that PjBL could potentially increase participants' knowledge, vocabulary, self-confidence to speak English.

Keywords: *Science, Speaking, Project-Based Learning, Smart Apps Creator*

INTRODUCTION

Language as a tool of human communicate the ideas uses in two forms transactional and interpersonal which had length and complexity (Khanh 2021). Those forms have different function in teaching and learning that will give to students dependent their level and their focus material in the class. Even though, the aims of teaching are to make learners product literacy (Haidara 2016). In a reality those are difficult to realize (Eshankulovna 2021). The problem of developing speaking skill becomes difficult because the position of English as a foreign language is not much used in daily social life.

While the problems faced by students in learning can be seen from two factors, namely internal and external. Haqiqi (2018) assumes internal factors are related to interest in learning, attitudes, motivation, and self-confidence while external factors include school facilities, teachers, infrastructure and student activities. Solving the problems in learning

can be tackles by the teacher as the coach in the classroom. Making learning situation to be active, interactive and joyful are great option to clear those problems. The abstract concept and doing transferring knowledge to verbal language are difficulty process for learners (Rabiah 2020). It has same problem occurring in learning English and Science. Students which have lack understanding of the material and lack of vocabularies will have difficulty to convey accurate information to others in foreign language, due to it influences lack of a self-confidence.

In case of teaching and learning process in Indonesia, there are some teachers do not try to do embedded learning language in another subject. For example, the researchers have case in teaching Science. Learning with theoretical concepts is no longer expected by learners. It makes leaners tending to be less enthusiastic in learning. The researchers assume that innovative learning media fosters a sense of enthusiasm for learners. That becomes the basis for researchers to carry out this research. The curriculum currently applies Merdeka Belajar Kampus Merdeka (MBKM) which emphasizes students to be active, creative, and innovative individuals. It requires teachers to be critical of the students' need to keep up the times (Maghfiroh and Sholeh 2022).

Learners basically have problems in understanding abstract concepts when doing learning process. It was supported when the researchers do observation in STKIP INVADA Cirebon, and also interview the students randomly. The researcher found that students had problem in speaking, especially in the aspect of pronunciation and fluency. For instance, they seemed hesitant, worried, and anxious to speak up. This made students' pronunciation and fluency become falter. While the lecturers' problem is challenging to manage a big class, passive

and low motivated students, which makes the lecturers always play a dominant role in direct student's responses. The limitations of space and media in learning science are a factor in the weakness of creativity in the learning process. Even though the development of the times has had a major influence in overcoming the problems of concrete learning barriers. The learning practice can be integrated with the use of technology such as the creation of learning media using Smart Apps Creators (SAC). SAC can build students creativity to fostering the knowledge, concept, and skills (Rizki, Pahmi, and Febtiningsih 2022). By improving this media, provided learners to be cooperative learners.

Based on the issues above, it becomes important aspect of lecturers to conduct this study. Project-based learning as a method that provides students with classroom activities. Several activities can make students active in the learning process as the students-centered. By having the project-based learning, students will obtain several opportunities. (Desiana, Sulastri, and Syahrial 2022) mentions the opportunities of applying PjBL, such as meaningful and contextual learning for students, optimal environment to practice speaking English, students actively engage in project learning, enhancing motivation, engagement, and enjoyment, and promoting social learning that can enhance collaborative skills. Obviously, there are many benefits to implementing project-based learning in teaching speaking as second language or foreign language.

Project-based learning is a powerful approach to integrate multiple skills and subject (Desiana et al. 2022). It means, this approach can help the teacher to teach become meaningful and students become responsive in the learning process through interaction with each other to create knowledge. The previous study had

been already conducted by (Yustina, Syafii, and Vebrianto 2020). Her study showed that blended learning using PjBL is effectively to increase the preservice teachers' creative thinking ability in learning Biology. In the other research was improving language skill overall presented a positive outcome with collaborative subjects to demonstrate students' knowledge in a practical way (Yulia 2017).

The category of this project is collaborative learning which is carried out in groups. The collaborative learning here makes students learn something together to integrate students' knowledge and ability. Collaborative learning process is the root of constructivism learning where the students work together (Alzahrani 2013). Based on the research about project-based learning previously, the researcher interests to investigate how project-based learning solves the students' problems about the abstract concept of science, how PjBL solves the students' problems in learning English, specifically in pronunciation and fluency problems, and to identify how the students' response toward integrating learning Science and English by implementing PjBL for elementary preservice teachers. The researchers do scope and limitation to make this research focus on the study. The Science material is about environmental pollution. It is one of the materials taught as a basic course in STKIP INVADA Cirebon. while the aspect of English that is observed is speaking, as a means of communication that prioritizes fluency and pronunciation.

METHOD

The study uses qualitative approach focus on descriptive qualitative research to collect and to analyze the data. Descriptive in qualitative research is talk about detailed rendering of people and setting. The object of the research is elementary preservice teacher at STKIP INVADA as the participant.

In this way, the researchers collect data from observation sheet and interview by using triangulation. Triangulation use to collect data more than one method in same topic, which strengthens reliability as well as internal validity. The researchers choose environmental pollution as science' material. To conduct this research, the researchers do peer teaching of science' lecturer and English's lecturer to make this research doing clear.

In this research, the researcher adopts Kriwas' procedures that includes; (1) Speculation (2) Designing the project activities (3) Conducting the project activities (4) Evaluation (Kusumawati 2019). In every stage, this study promotes constructivism learning in process to construct students' understanding and knowledge through experiencing things.

Based on the researchers' observation, SAC has advantages and disadvantages. The advantages are; the application is easy to use because there has no coded program, it can be used using an android or laptop, and the users can enter materials, images, and create navigation buttons so that the results of the learning media become interactive. While the drawbacks are; this application is a trial that can only be used for 30 days. It makes the user should buy the license, the available features are limited, and it can only design and build simple learning applications/media.

The participants observe by the researchers as observers. The observers use observation checklist to investigate how project-based learning using SAC solve the participants' problems in learning Science and English especially, pronunciation and fluency of learning English's problems. Observation has opportunity to gather a naturally data occurring social situations (Cohen,

Manion, and Morrison 2007). The observation consists of teaching learning process starting from pre-activity includes perspective (opening) and stimulation, whilst-activity includes instructions or participation, and post-activity includes closure and follow up. To support the data, the researchers do pretest and posttest to find out the increasing the students' understanding of the material being studied which consists of 20 questions of 10 multiple choice and 10 essays. Then the researchers use speaking rubric as specific assessment divide five criterions, such as very good, good, adequate, poor, and very poor (Brown 2007). It uses to analyse participants perform in the class that focus to analyse participants' pronunciation and fluency.

To identify how the participants' responds, the researcher uses interview in the types of open-ended question to get a verbal data from participants' experiences through learning activities. The researchers will interview ten participants randomly and will analyse the data to explain in general.

RESULTS AND DISCUSSION

The results of qualitative data are presented here. To enrich the data, the researcher did three steps. Firstly, the researcher used transcript the interactive dialogue among speakers in the learning process by using data recording. Secondly, the researcher used observation checklist which made sure the implementation of project-based learning applied in the class. Thirdly, the researcher used open-ended questions as interview form to know the participants' responses.

Investigating project-based learning in teaching science and English

The procedure of the implementation project-based learning in integrating teaching Science and English has been improvement for the student through project-based learning activities. The activities lesson phases are perspective (opening), stimulation, instruction or participation, closure, and follow up. In the instruction part the researchers enter the four procedures of implementation project-based leaning, namely speculation, designing, conducting the project activities, and evaluation (Kusumawati 2019).

From the observation checklist, the researchers concluded that participants had done create project-based procedures Kriwas' procedures. The lecturer gave more explanation when taught Science in environmental pollution's material. The participants gave high attention during learning activities.

In the opening section, the lecturer asked what participants had learned in previous and gave simulation like game to make the atmosphere becomes lively. In the stimulation section, the lecturer did four procedures of project-based learning activities. In this process, the interaction between lecturer and participants occurred. The lecturer always asked participants to give the questions using foreign language, but mother language (*bahasa Indonesia)* was still dominant. To minimize it the lecturer directed participants and asked participants to repeat his voice to convey the question into English. While in the evaluation activity, the lecturer did not ask the participants about what the problems encountered during the process of working project and did not evaluate the participants' attitude during in learning process.

The fourth activity was evaluation. The lecturer evaluated the project organization of SAC media, evaluated problem encountered during the process of working project, but did not evaluate participants' attitudes toward working project. Those activities as a form of

instruction or participant lesson phase in while activity.

After simulation section, the closure section had implemented in the class, but the lecturer did not complete to do the activities, such as giving piece material for next meeting. The last section was followed up, here the lecturer did give reinforcement the material to the participants as the last activity in lesson phase. That could a pear possibility results where the participants would return to the previous situation that they had low motivation in learning and want to speak up, especially in English.

By keeping the lecturer guiding, it helped participants in the group to present the project in front of the class using projector to show their SAC media in the environmental pollution's material. That is created interactive learning by using Smart Apps Creator (SAC) as the interactive media. More than a half from the total participants asked questions and gave opinions concerning a group when the lecturer assessed the participants' project. To support the data the researcher used speaking rubric adopted from Brown.

The researcher has conducted a pretest to the participants before conducting project-based learning with a total of 20 questions consisting of 10 multiple choice questions and 10 essay questions. This pre-test activity was carried out to know the students' conceptual mastery of environmental pollution material. Based on the test results with the same number of questions showed an increase. Thus can be seen from the results of the pretest and posttest. The average of the pretest is 53.33 and the average posttest is 81.67. Thus show an increase of 28.34. Based on the posttest results, it is known that the participants' understanding has increased. Mastering a material can also be seen from the participants' behavior in learning process,

such as participants become active and creative. Participants are also able to give a positive response to other participants who are presenting the project in front of the class.

As a line speaking assessment from stated that he high criterion of pronunciation is having equivalent and fully accepted by listener (Brown 2003). From the data, the researcher found that the eighteen from thirty participants obtain very good criterion which mean their pronunciation is clearly and could be accepted by the listener. Well understanding of environmental pollution as science's material. Creating interactive learning media using SAC as the learning project. That happened because the learning process made them enjoyable in the learning situation. The concept of the approach is "learning by doing" that can make the environment in the class become different, because it had the real activities (Suharyanto, Prasetyo, and Lutfiyah 2021). In the other case, some participants still obtain low criterion that having frequent errors in pronunciation, but it was still acceptable by listener.

Furthermore, as the data was taken by the researcher about pronunciation and fluency aspect. The results gave positive affect for the participants in pronunciation and fluency aspect. It meant the implementation of project-based learning was giving significant effect for the participants to solve the participants' problem in the pronunciation and fluency.

Besides the result of the participants' speaking transcription, the pronunciation and fluency aspects could be a solution to overcome participants' problem in teaching speaking. The main points were made the activities in teaching speaking process become more interactive. Fluency is the ability to talk without too much stopping or hesitating to keep going (Umisara, Faridi, and Joko Yulianto 2021).

In other that the participants were able to speak English well and to deliver the information.

The Participants' response to PjBL in learning science and English

Based on the interview data analysis, the researchers make questions consist of five basic questions as a form open-ended question. The researcher interviewed ten participants randomly to get their opinion and feeling by recording.

Based on the first question, *what do you think about integrated learning English and science using project-based learning?* The student had delivered their opinion about integrated learning English and science using project-based learning in the class. Participants agreed that project-based learning was challenging, this could add vocabulary and more creative to learn science. Presenting material using SAC made participants' fun and made them more confident to speak up in front of the class. In generally, participants admitted that they began more understand what the people said by doing the activity.

The second question, *what is your problem when creating learning project using SAC?*. Mostly, the participants had a problem to present their work in front of the class like nervous, not be confident, anxious, not fluent to talking, and less compactness when creating a project. In order to solve this problem, the lecturer should make the situation become comfortable. Then in the form of creating project, the participants did not find difficulties, because the material could be access on internet.

The third question, *what is the positive benefits that you have after learning science using PjBL model and presenting the material in English?*. The researchers concluded that project-based learning made them easily to understand the material. Some of them declared that it could add creativity, vocabulary, solidarity, confident and dare them to speak up. In addition, they also said by doing a project and presentation, it could increase student's motivation.

The fourth question, *which is a part that you interested in learning using project-based learning?* The participants anwered that they interested in learning to speak when they did the activities like presentation and creating a project. Those activities made participants prefer to create some project to be presented in the class.

The fifth question, *what is the situation that you feel in this learning project using SAC?*. The participants expressed that they felt happy, enjoy, and not bored. In other side, some participants felt dizzy and obtain tense because they felt unusual to speak up in front of the class.

Based on the data interview, the researcher got the conclusion that project-based learning could increase participants' mastering in understanding the material, increasing vocabularies, creativity, and confidently to speak English in the class. Participants liked to do the activities in the class and make some of them want to continue this activity. Particularly from this research, the researcher got the result where participants felt not confidence to speak English because they felt unusual using English to speak in front of the class. Developing speaking skill becomes difficult because is not used in daily social life for example the activities in the class (Burhanudin 2018).

CONCLUSION

Answering the research question about how project-based learning using SAC solve elementary preservice lecturers' problems in understanding the abstract concept of science and learning English's problems in speaking. The researchers use observation sheet and speaking's

transcription to answer the research questions. From the data of observation sheet, the researchers conclude that the three of project-based learning activities like speculation, conducting the project, and closure can help preservice lecturer understanding the abstract concept of science and solving their pronunciation and fluency problems. The lecturers always did monitor and guide preservice lecturer in every part of the learning process to speak English that made participants active and creative in learning process as the concept of project-based learning approach "student-center." In other side, the evaluation activity did not apply well that the lecturers did not give the reinforcement about reflection the materials. That could a pear possibility results where the participants would return to the previous situation that they had low motivation in learning English and science.

The participants give response to the project-based learning using SAC, from five questions and ten participants as samples of data interview give positive response toward thus activities. Moreover, project-based learning using SAC provides an opportunity for preservice teachers becoming active learner and have better understanding of the material environmental pollution. They argue that project-based learning can increase their vocabulary, knowledge, better understanding of the learning material, self-confidence to speak English and want to continue learning by integrating project and technology. Finally, based on the result of this study the researchers give suggestion to do embedded learning or collaborate learning between language and other learning subject to make the participants interest and active in learning process. Thus, can make students to be able fluently to deliver message in verbal language.

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