Promoting the 21st Century Skills Using Project-Based Learning

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Abstract

The requirement of the 21st century demands teachers to design a learning process that emphasizes student-centered learning. Project-based learning is seen as an effective model to solve this problem. Therefore, this study aimed at analyzing the use of project-based learning viewed from its characteristics, syntax, advantages, and disadvantages. This study was designed in a library study in which the data were obtained from reviewing some articles related to the topic. The results of the study showed that 1) the main characteristic of this model is the project itself which is guided by a real problem or question; 2) in general, the syntax of project-based learning can be categorized into three, that is, planning, implementing, and evaluating; 3) the advantages of this model meet the 21st century skills; 4) the disadvantages of this model mainly deal with time allotment, students' characteristics, and school facilitation. In conclusion, project-based learning is an effective model to promote 21st century skills.

Keywords: 21st century skills, critical thinking, English teaching-learning, project-based learning

INTRODUCTION

The change of globalization influences human life, especially in education (Noviansyah & Sudira, 2020participant observation, and document analysis. The informants of this study were: principal, viceprincipal, teachers, employees, and students. The results of this study showed that: (1; Sari & Prasetyo, 2021). The students are required to master 21st century skills including 6C, namely creativity, citizenship, creativity, collaboration connectivity, and communication. As a result, the learning design must be directed to the 6C skill and the use of technology (Anazifa & Djukri, 2017while XI MIPA 1 was as control group. Data was collected using two instruments to measure student's creativity and student's critical thinking. Data was analysed using t- test, multivariate analysis, and univariate analysis. The results reveal that (1; Anugerahwati, 2019). Furthermore, in 21st century learning, students need to be designed as a center of learning (Isa & Kamin, 2019). They need to be engaged in the teaching and learning activities to make them active in the learning process. They are given a chance to solve their real problems and experience authentic materials (Guo et al., 2020). This situation leads students to develop their abilities.

However, teachers tend to design their classes in teacher-centered learning in which teachers dominate the teaching and learning process. In line with this matter, Nugroho and Anugerahwati (2019) and Mukti et al. (2020) also found out that teachers did not give chance to the students in developing their skills. They focused on giving a lecture during learning. The students listened and waited for the teachers' instruction. These kinds of learning activities decrease students' competency in both knowledge and skill. They cannot expand their ideas and participation (Santyasa, 2015). The role of teachers in learning is the key to activating learning activities. Considering the phenomenon above, teachers need to change their role to activate the students' activities.

In the learning process, teachers are required to be facilitators. They facilitate their students to practice and develop their competency reflected in learning activities (Ratama et al., 2021). In spite of teachers' role, teachers also need to consider the use of a proper learning model in which it encourages and motivates students to join actively in the teaching and learning process (Gunawan et

al., 2017; Ratminingsih, 2018). Thus, the use of learning model can support the role of teachers in the learning process.

There are some learning models that can be used to engage students actively. One of them is known as project-based learning. It provides an opportunity for students to get a meaningful experience from the task or project given during learning process (Younis et al., 2021). Students have opportunities to share an idea and explore themselves as an effort to solve their problems (Trisdiono et al., 2019). In addition, this model can be designed for individual or group work which results in performance, presentation, or product as an outcome of learning activities. It emphasizes both process and product of the learning process (Kusumawati, 2019; Apriliani & Listyani, 2021). Besides, it also emphasizes student-centered learning as the demand of the 21st century learning. Students actively participate in the learning process due to proposed projects involving investigation to accomplish it (Sadrina et al., 2018). This model promotes exercises of the 21st century skills by investigating, solving complex challenges, and problems (Mukti et al., 2020). The successful implementation of project-based learning depends on how teachers activate students to participate in the learning activities (Kokotsaki et al., 2016). Therefore, project-based can be effective to be implemented as the effort to enhance students' skills in facing the 21st century demands.

Some previous studies found out that project-based learning could develop students' 21st century skills (Artini et al., 2018; Changwong et al., 2018; Chiang and Lee., 2016; Fatimah, 2016; Jalinus & Nabawi, 2017; Mamahit et al., 2020; Mutakinati et al., 2018; Rati et al., 2017; Suryandari et al., 2018; Trisdiono et al., 2019). Besides the skills, project-based learning boosted students' confidence (Shin, 2018)Myeong-Hee. (2018, resilience (Rahayu & Fauzi, 2020), and motivation to be engaged in the teaching and learning process (Chiang & Lee, 2016; Kusumawati, 2019; Sumarni, 2015). Thus, it can be seen that project-based learning is suitable to be implemented in the learning process.

Considering its contribution to promote the 21st century skills, this paper aimed at analyzing the use of project-based learning in promoting 21st century learning skills viewed from the characteristics, syntax, advantages, and disadvantages. The result of the present study was expected to give a contribution to English language teaching, particularly in promoting the 21st century learning skills by conducting project-based learning.

METHODS

The present study was designed in the form of a library research concerning the use of project-based learning in teaching and learning activities. The present study applied the research model proposed by George (2008) which was adapted by Ariantini et al. (2021). It was conducted through reading, analysis, and conclusion of the related articles to answer the aim of the study. In this study, there were eight steps implemented as follows. Firstly, the topic of the study was identified, that was, the use of project-based learning as an effort to promote the 21st century skills. Secondly, the research questions of the study were formulated involving 1) what are the characteristics of project-based learning; 2) how is the syntax of project-based learning; 3) what are the advantages of implementing project-based learning in 21st century skills; and 4) what are the disadvantages of implementing project-based learning. Thirdly, research plan was determined. It was done by browsing the information related to proposed research questions taken from articles and books. Next step, databases were determined including Springer Links, Science Direct, and Science and Technology Index (SINTA). From the obtained references, the use of project-based learning in the previous studies was observed. The fifth step was done by determining the criteria of the articles. The articles discussing the use of project-based learning in the 21st century was published in national journals indexed by SINTA and international journals indexed by SCOPUS. They were published in 2015-2022. Several keywords were inserted to find the sources, namely "project-based learning in 21st century", "characteristics of project-based learning", "how to implement project-based learning", "advantages of project-based learning", and "disadvantages of project-based learning". From these keywords, around forty articles were collected related to the use of project-based learning. Sixthly, the obtained articles were reviewed in order to see the characteristic, syntax, advantages, and disadvantage of project-based learning. After that, a synthesis was conducted to the articles with similar arguments on the use of project-based learning to construct a comprehensible idea related to the research questions. Finally, review of literature was written by providing some supporting theories and opinions from summarizing the findings.

RESULT AND DISCUSSION

Characteristics of project-based learning

Project-based learning is a learning model that provides a purposeful project as main activity to develop authentic products by purposing questions or problems to direct students (Hugerat, 2016; Guo et al., 2020). Students can engage with real context in the learning process. This model provides an activity that leads students to ask questions, solve problems, and express their idea (Suryandari et al., 2018). This kind of activity develops students-centered learning. Afriana et al. (2016) argued that project-based learning provided beneficial experiences for the students. In this model, students can construct their experience and concept through their several activities after producing a product. In producing a product, students follow investigations to solve problems found in real-world (Farida et al., 2017). The problem is close to students' environment. Then, the students can engage themselves in a meaningful situation (Eliana et al., 2016). This model results in a practical product or students' performance depending on the aim of the project (Cörvers et al., 2016). The products can be used to solve the existing problem, whereas students' performance can be used as a measurement of students' development (Habók & Nagy, 2016).

Considering its characteristics above, it directs to the different roles of both teachers and students in the learning process. Teachers have a role as facilitators in learning process in which they facilitate students to involve them in active learning activities (Annetta et al., 2019; Pan et al., 2021). Teachers provide feedback for students' performance. In this situation, teachers can engage students to explore themselves. In addition, students become active learners, whereas teachers become observers while students are engaging with their projects. The students discover their concepts by discovering information by themselves from many provided sources. The students can also connect their experience to give meaning to an investigation conducted by the students (Farida et al., 2017; Fatkhurrokhman et al., 2017; Sumarni et al., 2016).

From the characteristics mentioned above, it can be concluded that the main characteristic of project-based learning is the project itself. Then, this project is designed in the form of questions or problems. Through this project, students conduct an investigation to solve the proposed questions or problems. The outcome of the project can be a product or students' performance. Considering its characteristics, this model influences the role of teachers and students. It emphasizes student-centered learning rather than teacher-centered learning. In this sense, students take dominant participation during learning process. The teachers become a facilitator when students face difficulty and need direction.

Syntax of project-based learning

A study conducted by Hugerat (2016) showed six stages of implementation of project-based learning as follows. In the first stage, it is called pre-preparation stage. Teachers aim at introducing the subject to the students as well as cooperating with them. Next, teachers prepare for the project. In this stage, teachers deliver the goals, tasks, and students' responsibility in doing their projects. In the third stage, a project plan is designed. Teachers divide students into several groups and ask them to develop their plans. The students are asked to discuss their own goals, sources, and potential difficulties. Teachers' role is as a facilitator who guides students to complete their projects. The next stage is project implementation. Students along with their groups do their projects. Teachers encourage students in experimenting with their projects. Then, the fifth stage is post-project stage. In this stage, students present their projects in front of other groups and teachers ask some questions related to the presented project. The last stage is assessment and evaluation. Teachers and students conduct discussions and give an evaluation to the conclusion of the project. The evaluation is conducted continuously from the previous stage to this stage. Evaluation is conducted as an effort to overcome the problems that may be raised in the next projects.

Anazifa and Djukri (2017)while XI MIPA 1 was as control group. Data was collected using two instruments to measure student's creativity and student's critical thinking. Data was analysed using t- test, multivariate analysis, and univariate analysis. The results reveal that (1 explained six steps in implementing project-based learning as follows. Firstly, teachers start with an introduction of the projects and design team planning for the project. Secondly, the students conduct an initial study to gather the needed information. The students can gather information from doing library research or documentation from articles, journal articles, or books. Thirdly, teachers conduct an initial evaluation of the presentation. After conducting an experiment/project, students are asked to give an evaluation of their experiments. Fourthly, teachers conduct the second phase of the project. In this case, teachers ask students to continue their experiment. Fifthly, teachers con-

duct a final presentation progress toward what has been done in their experiment. The last, the teachers ask students to publish what they have done. In this step, the students present their work to be shared with other friends.

Farida et al. (2017) described four phases in conducting project-based learning. Firstly, students observe the important issue raised by the teacher in the learning process. Secondly, the students conduct a discussion on the issue. In this step, students start to discuss it with their friends. Thirdly, after conducting a discussion with their friends, the students are expected to find more relevant information toward the issue from several sources like articles or journal articles. The last is presentation. In this step, the information from the discussion and relevant sources are reported in the form of reports. Then, the students are asked to present what they have discussed and found in front of their friends.

Suryandari et al. (2018) state six steps in conducting project-based learning as follows. In the first step, an important question was started at the beginning of the class. Teachers raise a current issue/problem in the form of questions to encourage students to give their responses. Next, a project plan is designed. Students find some sources related to the topic of the project. They also plan activities to solve the proposed questions. Then, students are encouraged to create a schedule to conduct their project. They make a timetable for their schedule. Then, teachers monitor students' progress in finishing their project as well as guide them to arise it. After that, the students conduct an assessment of the outcome of the project. In this phase, students along with the teacher assess the product that they have made. The provision of feedback can be inserted in this process. In the last step, students evaluate their experience. Students present conclusions as well as predictions based on the collected data. In addition, students are given opportunities to show their learning experience and their understanding of the discussed topic. Besides, teachers can do reflection for students both individuals and groups.

Based on the explanation above, in general, the implementation of project-based learning in different studies shows a similar pattern of syntax. It is started with the introduction of the questions or problem. Then, it is continued by doing a discussion to gather more information related to the discussed issue. After that, the presentation of the product or performance is done as the result of an investigation from the previous step. The product can be in the form of an academic product (essay, article) or a physical pro-duct (application, tools) to solve issue being discussed. Next, the evaluation and assessment are conducted in the form of discussion to check the result of product or performance. Teachers can also conduct reflections on what have been done by the students.

The advantages of implementing project-based learning to promote students' 21st century skills

Chu et al. (2017) explain five benefits of using project-based learning. Firstly, it promotes problem-solving and critical thinking. Students can solve the problem and develop their thinking by conducting an investigation. A study conducted by Hikmah et al. (2016), Makrufi et al. (2018), Sularmi et al. (2018), and Sumardiana et al. (2019) also found out significant influence of project-based learning on students' critical thinking and problem-solving which could be seen from their active participation and high motivation joining the class. Secondly, it promotes personal communication. The students are asked to conduct discussions and they can share their ideas toward the issue being discussed. Students can share and express their idea through communication (W. Sumarni & Kadarwati, 2020). Thirdly, it increases the access to information and media literacy since the students need to elaborate more on their idea from different sources. The integration project with e-learning can increases students' digital literacy skills since they have to use it in doing the project (Azmi et al., 2022; Eliana et al., 2016;Wahyuni & Sarosa, 2017). Students are asked to use e-learning and find information online. Fourthly, it increases teamwork in the learning activity. It is done by the students when they investigate to create a product. Finally, it develops students' creativity and innovation. It is connected to a study conducted by Fatimah (2016) and Rati et al. (2017) in which project-based learning has a significant influence on students' creativity. It is because students have greater chances to explore themselves in making their project, think differently to solve problems, and train students to express their idea. The project in the learning process can guide the students to produce an innovative product to solve the problem effectively.

Ummah et al. (2019) state five advantages in implementing project-based learning. First, it supports the students to collaborate as well as cooperate in understanding concepts (Ratminingsih, 2015). It means that the students have the opportunity to work together in understanding the concept. Second, it allows the students to express

their abilities. It can be shown from the experiment or project that is done by the students. It is because students get comprehension from the investigation in accomplishing their work (Rofieq et al., 2019). Third, it guides the students on how to solve real problems which are useful for the students in their life. Wulandari et al. (2021) stated that this model makes students familiar with real way to cope with real problems. Students can face similar problems in proper ways. Fourth, it motivates students. This motivation can be raised from the existence of project that should be accomplished by students. In addition, this model also provides real situation of the students. Then, the students can easily connect the issue and their prior knowledge. The last, it meets the students' needs. Since the issue arise based on the real phenomena, the students can use the result of their product in project-based learning to be used in their real life (Coyne et al. (2016).

Choi et al. (2019) propose eight advantages in using project-based learning. First, it guides the students to find the solution. The solution is found after the students conduct an exploration of the issue being discussed. Second, it provides a debate in ideas. In this sense, the students deliver different ideas in the discussion. Third, it enhances students' communication. It is done when the students deliver their thought toward the discussed issue. Fourth, it explains the essential question of the project. This model focuses on the question that is raised in the learning process. Fifth, it provides specific and clear instruction in the learning process. The students have clear information on what they should do in doing this kind of learning model. Sixth, it provides brainstorming. This model requires the students to come with current issues that will be solved by the product of project-based learning. The last, it gives a chance to organize ideas. Here, students can be directed to follow some organized activities of the learning model. This influences how students organize their idea in the learning activity.

In a nutshell, the explanation of the advantages of project-based learning meets the requirements of the 21st century skills. The students are engaged with real issues in their life that need an investigation to be solved. This learning model provides a learning design in which students can show their ability and thinking from investigating to create a product or do performances. It trains students' creativity, collaboration, communication, connectivity, citizenship, critical thinking by following some activities in the learning process provided by project-based learning. In addition, the integration of project-based learning with technology can train their digital literacy skill to involve in this digital era.

The disadvantages of implementing project-based learning in teaching and learning process

Besides its advantages, on the other side, project-based learning also has disadvantages towards its implementation in the learning process. Habók and Nagy (2016) and Mihi□ and Završki (2017)communication and other soft skills as well as in engineering thinking, engineering intuition and higher order thinking and problem solving skills. Project based learning (PBL found out that the planning and implementation of this model take much time. Students need to prepare for the project in the planning stage and follow several activities in implementing stage. These stages are greatly time-consuming. In addition, a study conducted by Kusumawati (2019) showed two disadvantages of this model, namely limited time and students characteristics. This model requires a lot of time allotment to conduct project in a meeting. Students need to follow several steps in accomplishing the project. Related to students' characteristics, this model is difficult to be implemented when students have a low willingness to participate actively in making the project. Teachers need to encourage students.

Moreover, Noviansyah and Sudira (2020) participant observation, and document analysis. The informants of this study were: principal, viceprincipal, teachers, employees, and students. The results of this study showed that: (1, in their study, found out several disadvantages of project-based learning as follows. Firstly, this model is not suitable for students who have low comprehension of the concept. When the students are lack of concepts, they get confused to follow the process in making the project. As a result, they tend to make mistakes during the steps of project. Secondly, it spends more money. This model results in an outcome. This outcome can be in the form of products (academic or physical tools) or students' performance. In accomplishing this product, students prepare the materials and other needs. This preparation needs money to produce a product. For example, in making an article as a product of the project, students need to think about the cost when they want to publish their article. Thirdly, this model cannot run if the schools do not have adequate facilities and infrastructure. Students need facilities to support them in making their project. Schools which do not have supported facilities face difficulty to implement this model in learning process. The last disadvantage is time-consuming. Since this model requires

students to follow process and produce product, it takes a lot of time to conduct in one meeting. Each step requires long time to accomplish it. When the topic is complex, students require more time do it. Teachers need to manage the time for students in making their project.

In summary, the main problem in implementing project-based learning is on time allotment. This model requires amount of time to be spent on finishing the project. Besides, students' characteristics and school facilitation also become the disadvantages of this model. The management of learning process is required to implement project-based learning in the learning process.

CONCLUSION

After conducting reviews on some articles, it is believed that project-based learning is useful to be implemented in the learning process. Project-based learning can be viewed as a complex learning model covering some aspects such as critical thinking, real problem context, teamwork, and communication. The main characteristic of project-based learning is project itself. Teachers are expected to guide students in conducting the investigation based on the real situation and students' level in the learning activity. In implementing project-based learning, teachers can be a facilitator in, whereas students conduct investigation. Students and teachers need to follow several steps in accomplishing the project. Project-based learning promotes advantages to develop students' skills. On the other hand, this model also has disadvantages in the implementation. Teachers need to consider the disadvantages of this model to improve their management and planning for the learning process. Furthermore, some previous studies also found that project-based learning can improve students' skills. Thus, project-based learning can be considered to be implemented in learning process to promote the 21st century skills. Further study is suggested to be conducted discussing the integration of project-based learning with other learning models since the present study only covers the implementation of project-based learning

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