# Project-Based Learning: Enriching Students' 21st Century Skills

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**ABSTRACT**
With the advancement of technology, today's industry seeks to maximize its efficiency and effectiveness. Meanwhile, in education, technological advances make it easier for students to get more comprehensive knowledge and information. However, technological sophistication also poses challenges for students. If students do not develop their skills, they can be left behind because they cannot keep up with technological advances. Therefore, this paper attempts to describe the implementation of project-based learning in enriching the students' 21st-century skills. This paper uses primary data to see student learning experiences after carrying out class projects. The populations in this paper are all students taking part in the Human Rights and Global Justice class in the Department of International Relations, Universitas Andalas. This paper shows that, in practice, this method does not eliminate the role of lecturers in learning. In addition, project-based learning can maximize students' learning experiences. Class projects provide opportunities for students to enrich their non-technical skills, such as flexibility, media literacy, leadership, and collaboration. The student can hone their skills if they can experience firsthand the dynamics outside the classroom. This method is effective because students can apply the knowledge learned in finding solutions to the problems found. Students also have the freedom to think creatively in producing outcomes from class projects that have been practiced.
***Keywords:*** *Project, Skills, Students, Method*

## 1. INTRODUCTION

The world's transformation towards industry 4.0 makes technology an essential part of today's life. With technology, human work becomes more manageable. Technology also plays a role in education. In the learning process, lecturers can use technology to maximize learning to make it more exciting and easy to understand. Meanwhile, technology can make it easier for students to get helpful information to increase their knowledge. With the sophistication of technology, students can access information from remote sources at the same time. In this case, technology removes the limitations of space and time in expanding knowledge.

Like two sides of a coin, technological developments have a positive impact and raise concerns, especially for students. They are used to convenience, so they feel dependent on technology and lose creativity and productivity. In addition, with the advancement of technology, the industry is also growing. Of course, this phenomenon will affect the abilities possessed by a graduate. Because today, industry 4.0 is synonymous with the development of cyber-physical systems, digitalization, the internet of things, and artificial intelligence. This development provides an opportunity to maximize the use of technology to realize efficiency and effectiveness in an industry.[1] Of course, with the integration of production processes and innovative business models, a profession that used to be cultivated by humans may be replaced by artificial intelligence. This phenomenon is certainly a challenge for the world of education today. Because, if left unchecked, of course, it will increase the high unemployment. Therefore, today's lecturers and students are required to be creative in the teaching and learning process. They can design students' learning experiences from outside the classroom by linking them to project-based learning methods. This experience aligns with today's learning objectives, which are focused on gaining knowledge and developing student skills. Therefore, this paper seeks to describe the implementation of project-based learning in enriching the students' skills of 21st Century.

## 2. LITERATURE REVIEW

Many experts have discussed the implementation of project-based learning in lectures. According to DeFillippi (2001), project-based learning uses theory

and practice in learning by providing projects according to real problems whose implementation is limited by time.[2] Furthermore, according to Helle et al. (2006) the project-based learning method has three main objectives. First, this method can provide comprehensive experience related to particular fields. Second, students can apply the theory they have learned by using this method. Third, this method can maximize the independent learning process. [3] Then Guo et al. (2020) explain that project-based learning methods could maximize affective, cognitive, and behavioral learning outcomes measured by specific instruments, such as questionnaires, rubrics, tests, interviews, observations, self-reflection journals, artifacts, and log data. [4] Their writing illustrates that each outcome requires specific measurements. Moreover, Sumarni (2013) describes that this project-based learning method has advantages and disadvantages in her writing. The advantages, according to Sumarni, are building student motivation in learning, then increasing student skills and knowledge, increasing the ability to work together and communicate between students in finding solutions to problems, and encouraging the emergence of creativity in students. Meanwhile, according to Sumarni, the drawbacks of this project are that it requires much time to complete a project, then the need for adaptation by lecturers in controlling classes that were formerly centered on lecturers. [5] Sumarni's writing shows that although there are shortcomings in implementing project-based learning, lecturers still need to consider using this method considering the many advantages that students can get.

Next article, Sudibjo et al. (2019) identified that in the development of the world in this industrial era 4.0, project-based learning is one of the suitable learning models to be applied. Because according to Sudibjo et al., students can develop critical thinking skills.[6] Sudibjo's writing shows that project-based learning can hone students' skills in analyzing information that is very easy to find. Furthermore, Maisiri et al. (2019)'s article explains that today's sophisticated technology impacts industrial development. However, Maisiri et al. explain that technological sophistication requires collaboration between humans and machines. Therefore, humans need to hone non-technical skills in the future.[7] Their opinion shows that the role of humans in the industry can still exist if humans have skills.

Furthermore, Putri (2019) describes students' perception in facing the challenges of industry 4.0, and students' need to master 21st-century skills.[8] Then, Bell (2010) states that it is essential to prepare students as early as possible to hone their 21st-century skills. Bell also mentions that project-based learning can be one of the lecturer's choices in improving student skills. Bell's writing demonstrates the relationship between project-based learning and 21st-century skills.[9] In addition, according to Kaufman (2013), these 21st-century skills are essential so that students can survive in the world of work and life in society. According to Kaufman, 21st-century skills include critical thinking, problem-solving skills, communication, media and information literacy skills, contextual learning skills, innovation, and creative skills.[10] The arguments of Putri, Bell, and Kaufman show that preparations must be made from an early age so that student competencies are more honed and do not stutter with the realities of the world of work and life. Based on these writings, many have discussed project-based learning, industry 4.0, and 21st-century skills, but no one has specifically discussed how it relates to student learning experiences. Therefore, this paper focuses more on the practice of project-based learning on student skills in the 21st century.

## 3. METHOD

In collecting data, this paper uses primary data. The aim is to see the learning experiences felt by students regarding the class projects that have been implemented. The instrument used is a questionnaire with five Likert scales, namely "5" explaining "strongly agree," while "4" explaining "agree," then "3" which is "neutral," then "2" and "1" explaining "disagree." and "strongly disagree." This scale is a measuring tool for students' opinions regarding the statement being asked.

The population in this paper are all students taking part in the Human Rights and Global Justice class, Department of International Relations, Universitas Andalas. Before being distributed, members of the lecturer team reviewed the questionnaires. Based on the feedback, the statement was rewritten to ensure that the respondent could understand the statement. Lecturers distributed questionnaires via an online platform to class participants. After that, analysis was carried out from the summary that has been provided automatically by the platform.

## 4. RESULT AND DISCUSSION

Krajcik and Blumenfield (2006) explain that there are five indicators in running the project. First, there is a problem to be solved; second, exploration of the questions posed by associating the knowledge learned; third, carrying out collaborative activities with certain actors to find solutions; fourth, the participation of class participants in activities that they have not done; and fifth, the existence of a solution or product resulting from the project being carried out. [11] These five indicators serve as a reference in the implementation of this class project.

The students did the class project based on the Semester Learning Plan agreed upon at the beginning of the lecture. According to the Semester Learning Plan, class projects are not carried out directly in the first week of lectures but begin to practice in the 3rd week. Lecturers used the first two meetings to discuss the design of the lecture implementation and give lectures related to the primary material of the course to students. At the second meeting, the lecturer divided the students into eight groups and the topics that became the focus of group discussion. The topics include women's welfare, disability, environmental pollution, indigenous peoples, forest conservation, education and child welfare, natural disasters, and their health impacts. This topic was chosen based on the problems still found in West Sumatra and the availability of non-governmental organizations that work on these issues.

After the students get the topic discussed, in groups, the lecturers ask questions, and they are asked to map out the problems that still occur. In addition, they also discuss options that could be a solution to these problems. At this stage, the lecturers ask students to send the results of each group's discussion in the form of a mind map to the LMS (Learning Management System). Through this mind map, lecturers can see the suitability of the solutions offered regarding the identified problems. For students themselves, preparing this mind map is helpful to train them to convey the results of the discussion concisely and interestingly visualize arguments. The supporting lecturer's feedback regarding the group's plan is conveyed through LMS.

Then, each group chose a non-governmental organization with the same mission to collaborate with based on the topics and problems identified. This collaboration train students to gather more valuable information about the topics discussed. At this stage, student groups also offer several programs that can be implemented with partners. They also get feedback from partners about the program recommendations. Then for several weeks, groups of students and partners actively carry out the program of activities that they have planned together. To ensure that students continue to carry out the stages of their project activities, lecturers always check weekly reports that contain activities, constraints, and solutions, as well as the information they find. In addition, this weekly report also serves as a reminder for them regarding activities that have not been carried out with partners to improve their class projects. Through this weekly report, lecturers can also provide feedback on their progress. This activity shows that the role of lecturers is also significant in the implementation of dynamic classroom projects.

This collaboration with non-governmental organizations requires students to discuss matters face-to-face. However, due to the ongoing Covid-19 pandemic, this activity has been hampered. Based on discussions conducted through zoom and distributed surveys, the mandatory requirements for vaccines and the level of Enforcement of Community Activity Restrictions applied to the provinces provide mobility barriers for students and partners to carry out activities. However, this can still be anticipated by taking offline activities online.

Projects that have been implemented require students to produce learning outcomes. These outputs can be in seminar activities, publication of articles, posters, and videos. The shape of the output depends on the needs of the program they are doing. In addition, the supporting lecturer also asked student groups to submit final reports and present group class project activities in front of the class. It is so that students can share their knowledge with other class participants.

In addition, as a form of measuring success from a cognitive perspective, the lecturer team provides tests before and after the project is carried out. The test results show that there is an increase in knowledge after the project is implemented. In the test before the project was carried out, only 58% were answered correctly, but after the project was carried out, it increased to 73%. The average mid-semester test scores in this course are 76 or the same with A- grade. This test result shows that project-based learning also has a role in increasing students' understanding of knowledge.

Besides, this class project is also expected to hone students' skills. To see student learning experiences from class projects, the team of lecturers distributed surveys online. The statements in the survey are adapted to the 21st-century skills that students should ideally possess. According to Voogt and Roblin (2010), there are three main categories in 21st-century skills, *first*, learning skills related to self-development needed to adapt and thrive in society. *Second*, literacy skills are skills in using technology and sorting out credible and valid information. *Third*, life skills, namely non-technical skills, relate to everyday life for self-development as a professional person.[12] According to the survey, it is seen that this class project maximizes student skills sequentially, namely life skills (97.1%), then learning skills (95.6%), and literacy skills (88.3%). This figure shows that through the classroom projects, students gain experience in these three skill categories because the percentage of the three is more than 50%. However, the learning experiences most felt by students in the implementation of class projects are non-technical skills related to everyday life, namely life skills. This is because these skills can only be honed if students are accustomed to being in certain situations and

environments and are required to express themselves appropriately.

Furthermore, based on the survey, flexibility gets the highest percentage of skills experienced by students, which is 99.7%. This number shows that almost all students feel a situation where they have to be flexible. One example situation is when a partner's schedule suddenly changes from what was agreed upon, and then changes to the program implementation plan because it is not following the current situation and the process of implementing solutions that must be adapted to local cultural practices. This ability, of course, cannot be maximally honed if learning is only carried out in the classroom.

The survey also showed that 98.6% of all students also felt experiences related to media literacy skills after flexibility. This skill can be practiced in their class project because students have to dig up information about the problem being studied. For the knowledge produced to be objective and precise, students must choose relevant and reliable information from sources. This skill is important; considering the free and large flow of information with the internet, students are vulnerable to getting exposed to hoaxes.

The students also got experience in leadership (98.4%), collaboration (98.3%), and social skills (96.7%). They hone these skills by doing the project with many people. A given project also requires the students to set their priorities toward goals and strategies to complete this project. Of course, this can run optimally if students also have the skills to collaborate and social skills. Through class projects that are carried out, students can share tasks and help each other if needed, learn how to accept and respond to an opinion that differs from those they convey, and learn how to manage disputes in teams. From this experience, students learn to negotiate so that the goals that have been set can be achieved. Such dynamics are very likely to be encountered in real life in the future. Therefore, they must equip themselves with these skills.

Critical thinking (96.2%) shows that class participants can find solutions to a problem. It can be achieved due to the implementation of class projects that focus on field lectures with partners. Each partner has various challenges and problems that they must face; students then not only solve the main questions or problems that have been given but also, in practice, are also involved in solving problems faced by partners. Furthermore, the percentage of productivity is about 95.7%. It means that the students experienced managing time, priorities, and goals effectively through class projects. It is an ability that will help students in pursuing a career in the future. Furthermore, one of the indicators that class participants considered the most impact was communication (93.7%). Class projects do hone the ability of class participants to build and establish communication with other people, especially new people. Class participants, through class projects, meet new people outside their circle of friends or social circle in general. They are then required to be able to communicate well with partners during the lecture. Next is the initiative (92.9%). This number indicates that class participants increase their ability to plan and start a job without the encouragement of others. By the project implemented, the students learn to finish their work without having to be ordered. They also experience how to initiate the meeting plan and program with their partner alone.

In addition, creative (92.8%) also got high results in the survey. Creativity is a student's ability to think outside the box. By carrying out projects, students meet many people with different ways of thinking and find so many challenges that will trigger them to solve problems with fresh ideas. For this subject, Human Rights and Global Justice, this skill is essential because the problems in society are always related to cultural aspects that differ between communities. So by doing a project, they learn to formulate their ideas in a way that is acceptable to society. Besides, project-based learning also shifts students' paradigm from monotonous learning to dynamic and fun learning. Then, technological literacy (84.8%) and information literacy (81.4%) is the ability of class participants to understand machines or technological products and the ability to understand facts, pictures, statistics, and data. Although not as high as other indicators above 90%, this figure is still relatively high. These two abilities are obtained because in processing the data that has been obtained from partners, participants process it and analyze it to make a report. Therefore, if you only copy the data without analyzing and interpreting it first, then the report will not be optimal and will only become a "report."

The student learning experience is undoubtedly beneficial for the Human Rights and Global Justice course. This course does emphasize not only the knowledge aspect but also the affective aspect. By carrying out class projects, students can express values and feelings appropriately based on their situation. Directly experiencing it will make the knowledge and skills be remembered longer than just conveyed through lectures by lecturers.

## 5. CONCLUSION

Implementation of class projects in lectures does not eliminate the role of lecturers in the classroom. Instead, lecturers play an active role in supervising and guiding students in carrying out their projects. In terms of results, the class projects that have been carried out are proven to contribute to the ability of class participants to

achieve 21st century skills. The skills acquired by students in this class are more related to life skills, such as flexibility. However, other skills such as media literacy, leadership, collaboration, social skills, critical thinking, productivity, communication, initiative, creativity, technology literacy, and information literacy are also experiences that students also feel.

The practice of project-based learning methods is effective in this course. It is because the class projects allow students to be dynamic in the projects. This method also shifts the paradigm of lecture routines, not only being in class but also providing experience to class participants outside the classroom by providing opportunities to face issues and apply theories and concepts in real life. This combination can then enrich students' abilities and skills to face future challenges.

## AUTHORS' CONTRIBUTIONS

All the authors contributed to this article.

## ACKNOWLEDGMENTS

This paper is supported by the Institute for Educational Development and Quality Assurance of Universitas Andalas through the Class Action Research Grants granted by Universitas Andalas in 2021.

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