

## Collaborative Project-Based Learning to Develop 21st Century Skills: A Case Study at SMAI Nurul Fikri Boarding School Lembang

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**Abstract:** The 21st century requires individuals to possess essential skills to face complex challenges. Education, as a crucial tool in nurturing students, must transform to create learning that develops 21st century skills. This research aims to explore the nurturing of 21st century skills through collaborative project-based learning at SMAI Nurul Fikri Boarding School Lembang. The choice of this school as the research subject is based on its organization of collaborative project-based learning, which is purportedly capable of shaping various student characteristics, including 21st-century skills. This research employs a qualitative approach using a case study design with a descriptive method. The data collection techniques used include observation, interviews, document analysis, and triangulation. Data analysis was performed through data reduction, data display, verification, and conclusion. The results showed that collaborative project-based learning carried out in this school is in the form of collaborative learning between several subjects integrated with the Adiwiyata program such as making biopores, ecobricks, compost, recycling, waste banks, and school medicinal plants. This approach has been shown to enhance students' learning motivation, critical thinking, problem-solving, creativity, and collaborative skills, all of which are essential 21st-century competencies.

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**Keywords:** Learning, Collaborative Project, 21st Century Skills

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### A. INTRODUCTION

Given the rapid changes in global demands and labor market needs, 21st-century skills have become a major focus in modern education. The concept of 21st-century skills refers to skills, attitudes and knowledge needed to adapt to the 21st century, including critical thinking, metacognition, problem-solving, creativity, communication, collaboration, and digital, technological and environmental literacy (Kim & Seidman, 2019). The increasing complexity of the challenges individuals face in this digital era calls for a transformation in education to prepare the younger generation to face them (Alpaydın & Demirli, 2022).

In this context, learning needs to be adapted to be effective in improving 21st-century skills in students. The need for learning that seeks to enhance 21st-century skills is a response to technological developments and the global job market and a step towards building individuals who can adapt, innovate and collaborate in an increasingly complex society. One prominent learning approach is collaborative project learning. Collaborative project learning relates to a learning approach involving cooperation between subject teachers who have

intersections of basic competencies in a theme to organize student project-based learning (Latip et al., 2022). Also, in the implementation of learning, students work on projects in collaboration with their group mates (Soekmono & Ningtyas, 2020). This approach places students in situations where they are actively involved in real projects that require collaboration between individuals, problem-solving, and creativity (Genc, 2015). Through collaborative project learning, students acquire academic knowledge and develop social skills, critical thinking, and adaptability, which are essential in the 21st century (Latip et al., 2022).

Unfortunately, Indonesia has not optimally illustrated the concept and examples of collaborative project learning models. Previous studies have mostly emphasized project-based learning and collaborative learning. This is because the term "collaborative project" has only appeared in the new curriculum, namely Emancipated Curriculum. Thus, research on collaborative project learning to develop 21st-century skills is still rare and necessary. This is because collaborative project learning has great potential to improve 21st-century skills, but its implementation takes work. This kind of research can provide information related to examples of implementation models, what the impact is, what the obstacles are, what the solutions are for schools with limitations, and so on. Therefore, this research will conduct a case study on implementing collaborative project learning in developing 21st-century skills at SMA Islam Nurul Fikri Boarding School Lembang. This school was chosen as the object of research because, based on the results of the pre-survey, there are indications that the implementation of collaborative project learning in this school is instrumental in training several student skills, including 21st-century skills. To prove this assumption, research needs to be done. This research has the potential to provide valuable insights for educators and researchers in understanding the role of collaborative project learning to achieve 21st-century education goals and prepare students for a challenging future.

## **B. METHOD**

### **1. Research Design**

This research uses a qualitative approach. Qualitative research seeks to understand certain situations, events, groups, or social interactions; it can be interpreted as an investigative process in which researchers slowly interpret a social phenomenon (Creswell, 2017). The research design used is a case study design. According to (Johnson & Christensen, 2014), case study design research examines a case in detail and holistically using qualitative data and several other methods. It can answer exploratory, descriptive, and explanatory research questions focusing on real-life cases' unity. The case study design was chosen because this research aims to explore efforts to improve 21st-century skills through collaborative project learning in a particular school, in this case, SMA Islam Nurul Fikri Boarding School Lembang. Then, the method used is descriptive because this research aims to investigate a particular situation, and the results are described descriptively.

### **2. Time and Place of Research**

This research was conducted at SMA Islam Nurul Fikri Boarding School Lembang. This research was conducted for 2 years from 2021-2022.

### 3. Data Collection Technique

The data collection techniques in this study used observation, interviews, documentation studies, and triangulation. This aligns with the concept that data collection methods in qualitative research include observation, interaction with informants through interviews, review of written material or documents (documentation), and combining or triangulating sources of information (Johnson & Christensen, 2014). The observation and interview techniques that researchers conducted referred to (Sugiono, 2017). In the observation technique, researchers use participatory observation because they are involved in daily activities in the place used as a research data source. The type of participation is moderate, in which the researcher does what the source does, but not completely, while maintaining most of the naturalness of the situation. Then, in the interview technique, the researcher uses a semi-structured interview type, which is more flexible to get a broader view. Meanwhile, the documentation study was conducted by reviewing written materials in the draft learning plan (RPP), meeting minutes, and important documents such as evaluation results and activity accountability reports (LPJ). Data collection was recorded as field notes, interview notes, and document review notes. The data was then tested for prerequisite analysis by conducting triangulation checking techniques and increasing persistence in analyzing the data so that the data needed is valid.

### 4. Data Analysis Technique

Data analysis techniques are carried out continuously from the beginning until completion. The steps in analyzing data by researchers begin with data transcription, data reduction process, data display, verification, and conclusion making. This method is based on the guidelines provided by Miles and Huberman (Sugiono, 2017). Data transcription is presented as field notes, interview notes, and document review notes, which are then subjected to data reduction. Researchers reduced data by selecting, sorting and summarizing data relevant to the research objectives. Researchers presented the data in tabular form, resulting from data reduction. The next stage of the reduced data is then concluded and described in narrative form.

## C. RESULTS AND DISCUSSION

The results of this study are presented in tabular form as follows:

**Table 1.** Implementation of Collaborative Project Learning Activities at SMAI Nurul Fikri Boarding School Lembang

Information	Findings
Based on documentation studies, observations, interviews with teachers and students	The collaborative project learning implemented in this school is in the form of integrating eye learning with the Adiwiyata School program as follows: 1. Collaborative project activities in Geography, Compulsory Mathematics and Specialization Mathematics: making Biopores.

2. Collaborative project activities in Biology, Physics, and Economics: ecobricking, recycling and cultivating fish and vegetables in buckets.
3. Collaborative project activities in Economics and Sociology subjects: creating a Waste Bank.
4. Collaborative project activities in Biology, Crafts and History: making dioramas from recycled paper.
5. Collaborative project activities in Chemistry, Economics, Biology and Crafts: making hand sanitizer, compost, and hydroponics.
6. Collaborative project activities in Islamic Religious Education (PAI), Civic Education (PKn) and Sociology: collecting donations of used goods.
7. Collaborative project activities of Indonesian and English subjects: creating energy conservation and environmental awareness campaigns using Indonesian and English.

**Table 2.** Students' 21st Century Skills Trained from Collaborative Project Activities

<b>Information</b>	<b>Findings</b>
Based on documentation studies, observations, interviews with teachers and students	The collaborative project learning activities train students' essential 21st-century skills in critical thinking, creativity, problem-solving, collaboration spirit, communication, digital literacy, environmental care attitude, and sustainable lifestyle awareness.

**Table 3.** Development of Students' Learning Motivation from Collaborative Project Learning Activities

<b>Information</b>	<b>Findings</b>
Based on documentation studies, observations, interviews with teachers and students	Through collaborative project learning, students' learning motivation increases, students are enthusiastic and like collaborative project learning, able to take lessons/meaning from collaborative project learning, and able to produce creative work.

**Tabel 4.** Faktor Pendukung dalam Menerapkan Pembelajaran Proyek Kolaboratif

<b>Information</b>	<b>Findings</b>
Based on documentation studies, observations, interviews with teachers and students	The supporting factors for the good implementation of collaborative project learning activities in this school are: <ol style="list-style-type: none"> <li>1. The role of teacher collaboration</li> <li>2. Well-organized and planned program design</li> <li>3. Adequate infrastructure and funding</li> </ol>

SMA Islam Nurul Fikri Boarding School Lembang (SMAI NFBBSL) is a private boarding school under the Yayasan Pesantren Pendidikan Islam Madani. This school is also a private school committed to producing graduates who are superior and able to compete.

## **1. Implementation of Collaborative Project Learning Activities at SMAI Nurul Fikri Boarding School Lembang**

SMAI Nurul Fikri Boarding School Lembang often organizes collaborative project-based learning at least 2-3 times a year. Collaborative project learning activities carried out at this school integrate subject learning with the Adiwiyata program. According to (Aprianto et al., 2023), the Adiwiyata program is an award for schools implementing environmental education. The Adiwiyata Award is an appreciation to schools that can implement efforts to improve environmental education correctly by predetermined criteria.

Adiwiyata is a Ministry of Environment and the Environmental Agency program that provides counseling and guidance to schools to instill environmentally friendly learning. A school can be declared and awarded as an Adiwiyata School if it has met the Adiwiyata assessment criteria conducted by the Environmental Agency (DLH) (Prahasti et al., 2022). Some indicators that become Adiwiyata assessments are the need for learning activities regarding maintaining cleanliness, energy conservation, water conservation, managing waste through 3R, planting and maintaining trees/plants, hydroponics, making bio pore holes, infiltration wells and compost (Aprianto et al., 2023).

All forms of collaborative project learning organized at SMAI Nurul Fikri Boarding School Lembang in 2021-2022 are collaborative between subject learning and the Adiwiyata School program. This means that these collaborative project learning activities are deliberately arranged to support the Adiwiyata program and in the context of preparation for implementing the Emancipated Curriculum, which emphasizes project-based learning a lot. In addition to being collaborative between subjects with the Adiwiyata program, students work on their projects collaboratively (in groups). The forms of collaborative project-based learning are as follows:

### **a. Biopore Making Collaborative Project Learning**

Making biopores (infiltration holes) is a collaborative project between Geography, Compulsory Mathematics and Specialization Mathematics subjects. This biopore-making project is carried out in grade 12 as a learning activity and is included in the assessment (evaluation). Technically, students are divided into groups and instructed to make biopores while working on the Student Worksheet. The worksheet consists of a summary of material and questions from Geography, Compulsory Mathematics and Specialization Mathematics. After working on the biopore-making project and working on the Student Worksheets, each group presented the Student Worksheets, the purpose and process of making biopores, and the meaning of learning from the biopore-making project.

Biopore infiltration holes are holes in the ground with a diameter of 10 to 30 cm and a length of 30 to 100 cm that trap water flowing around it so that it can become a source of water reserves for underground water and surrounding plants. In this case, biopores play a role in flood prevention. Biopores can also be filled with organic waste and worms to help weather the organic waste into compost that can be used as plant fertilizer (Yohana et al., 2017). The learning project of making biopores is indispensable in the Adiwiyata assessment and is important to be taught to students and the

community as part of an environmental education effort (Aprianto et al., 2023; Baguna et al., 2021).



**Figure 1.** Biopore Making Activities

b. Waste Bank Collaborative Project Learning

The collaborative project learning between Economics and Sociology subjects was to create a waste bank system and simulate waste bank transactions. The school's Adiwiyata team then uses the waste bank system they have created to run the SMAI NFBSL waste bank. For example, within 1 year, the SMAI NFBSL waste bank can produce a collection of plastic waste, plastic bottles, papers, and cardboard boxes to be used as learning materials for recycling and eco-bricks. According to the Minister of Environment Regulation No. 13 of 2012, a waste bank is a place for sorting and collecting recyclable or reusable waste that has economic value (Ulfah et al., 2016). The School Waste Bank is an initiative to encourage recycling and waste care learning in the school environment, carried out by students and guided by teachers (Fitria et al., 2015). Waste bank learning in schools, especially in boarding schools or pesantren, is effective for building the character of students who love and care about the environment (Syafi', 2018).



**Figure 2.** Waste Bank Collaborative Project Learning

c. Collaborative Project Learning Recycling

Making recycled products is a collaborative project learning between Biology, Physics and Economics subjects. This activity is carried out in grade 12. Students are challenged to be able to make a work from used items that the SMAI NFBSL waste bank has collected. Learning by utilizing media from used goods can be a means of learning to

care for the environment and train thinking skills to produce creative ideas (Wahyuni et al., 2022). Recycling learning makes students learn about the importance of environmental awareness and entrepreneurial skills, sustainable resource management, developing entrepreneurial innovation from recycled products, and understanding the link between environmental sustainability and entrepreneurship (Hanafiah et al., 2024).



**Figure 3.** Collaborative Project Learning Recycling

d. Collaborative Project Learning between Islamic Religious Education (PAI), Civic Education (PKn) and Sociology subjects

Collaborative project learning between PAI, Civics and Sociology subjects in the form of collecting donations of used goods suitable for use. The teacher explains the essence of this learning, gives directions to the students, and gives the Student Worksheets for students to work on. Students work on this project in groups, collecting used items worth selling. The used items are then auctioned (sold at a low price), and the money from the sale and the remaining items are donated to more needy people.

This collaborative project of donating used items that are still usable contains two essences: First, it teaches students about Reuse. Collecting used goods is one of the Reuse actions; on the one hand, there are parties who no longer want to use the goods, and on the other hand, there are parties who need the goods. 3R (Reuse, Reduce, Recycle) learning can improve students' environmental literacy, influence the mastery of natural science and social science materials, and instill awareness of a helpful activity (Kurniasari, 2019). Second, it teaches students about charity. Donating used goods worth selling and suitable for use is a form of charity. According to (Abdullah, 2021), people who transact the sale and purchase of used goods worthy of use to be donated to people in need are driven by the motivation to want to give alms, and buyers feel helped because they can get quality goods at a lower price.



**Figure 4.** Collecting Donations of Used Goods Suitable for Use

e. Campaign Poster Making Collaborative Project Activity

This collaborative project learning between Indonesian and English subjects aims to create an energy conservation and environmental awareness campaign using Indonesian and English. Students are asked to make as creative posters as possible about campaigns to save water, save electricity and care for the environment. Their works were then displayed in strategic places in the school environment. Poster media as an energy-saving campaign can help raise students' awareness of carrying out energy-saving movements, such as turning off lights when not needed (Wardany et al., 2018). The environmental awareness multimedia campaign project, presented as posters and content, is part of learning about sustainable lifestyles. This learning trains students to think critically, creatively, innovatively, and information literacy (Haq et al., 2023).



**Figure 5.** Example of a Campaign Poster Created by Student



f. **Ecobricking Collaborative Project Learning**

Ecobricking is a collaborative project learning between the subjects of Biology, Physics and Economics. This ecobricking project learning is carried out in grades 10 and 11 in the middle of the semester. Technically, all students gather in the field, divided into groups, and work together. At first, the teacher opens the event, briefly explains the essence of ecobrick learning, and gives directions. Then, the students began to work; each group had to be able to make 10 bottles filled with inorganic waste while working on the Student Worksheet. Once all groups have completed their ecobricking and the worksheet, the next step is for representatives from each group to present their work and the lessons learned from ecobricking.

Ecobricks linguistically means environmentally friendly bricks. They are called bricks because they can be used as building materials such as fences, forts, chairs, and others (Elvania et al., 2023). Ecobrock is an effort to recycle waste from used plastic bottles filled with plastic until they are complete and solid. This ecobrick reduces plastic waste (Palupi et al., 2020). The utilization of eco-bricks in learning has several significant benefits, including: First, teaching students about environmental responsibility. Second, as a learning media that increases student interest, involvement and activeness in the learning process. Third, teach students to think critically about eco-bricks benefits as a solution to handling plastic waste globally (Elvania et al., 2023).



**Figure 6.** Ecobricking Collaborative Project Learning

g. **Collaborative Project Learning of Fish and Vegetable Cultivation in a Bucket**

Fish and vegetable cultivation in a bucket is a collaborative project learning between Biology, Workshop and Economics subjects. This activity was implemented in grades 10 and 11. Students were divided into groups. The teacher first explains the essence of this learning and then gives directions. Students worked on the instructions from the teacher while working on the Student Worksheet and, at the end, presented the results of their work. Fish and vegetable cultivation in a bucket is cultivating fish and vegetables in one bucket, which is a fish and vegetable polyculture system (Setiyaningsih et al., 2020). This project learning teaches students about one of the strategies to strengthen food security, especially when there is a pandemic like the COVID-19 pandemic yesterday, and teaches about entrepreneurship (Sukmaya et al., 2024).



**Figure 7.** Collaborative Project Learning of Fish and Vegetable Cultivation in a Bucket

h. Collaborative Project Learning of Diorama Making from Recycled Paper

Making a diorama is a collaborative learning project between Biology, Chemistry and History subjects. The main materials are newspapers and waste paper. The old newspapers and paper are soaked in water and made into paper pulp. The students created the paper pulp to make creative diorama works. This activity is carried out in grades 10 and 11. Students work in groups. Dioramas are three-dimensional representations/paintings of natural habitats such as animals, plants and the environment which are used as learning media for Biology and Culture (Tunncliffe & Scheersoi, 2015). This project of making dioramas from paper mache apart from teaching students about their relationship with subject matter, also teaches about one way of making recycled paper. Learning to recycle paper can train students' critical and creative thinking skills (Amaniati, 2011).



**Figure 8.** Students' Diorama Works

i. Collaborative Compost Making Project Learning

The composting project is a collaborative learning project between Chemistry, Economics and Crafts. This learning activity on making compost is carried out in grades 10 and 11. First, the teachers explain the essence of learning to make compost related to their subject, then give directions. Students worked in groups, making compost and creating a display of information on composting. Composting is the process of decomposing compounds in organic waste such as straw, leaves, cardboard, household waste, and so on through the biological reactions of microorganisms. This process then produces compost (Sekarsari et al., 2020). Students like the application of learning through compost-making practicums, which help attract students' interest in

learning and raise students' awareness of the importance of waste management and protecting the environment (Danang Ardianto & Priyono, 2014).



**Figure 9.** Collaborative Compost Making Project Learning

j. Collaborative Hydroponic Making Project Learning.

Making hydroponics is a collaborative learning project between Biology, Chemistry and Economics subjects. This hydroponics learning activity is carried out in grades 10 and 11. Students work in groups according to the teacher's directions while working on student worksheets. At the end of the activity, students present the results of their work. The development of appropriate hydroponic technology has become widely known, including in education. Currently, schools have hydroponics as a learning medium (Mellisa & Fitri, 2022).



**Figure 10.** Collaborative Hydroponic Making Project Learning

## 2. Students' 21st Century Skills Trained from Collaborative Project Activities

Researchers and practitioners argue that project-based learning has the potential to achieve the level of cognitive processes required for 21st-century careers (Martinez, 2022). In line with this, based on the research results, through collaborative project learning activities carried out at SMA Islam Nurul Fikri Boarding School Lembang, it is proven that it can train students' essential 21st-century skills in terms of critical thinking, problem-solving, creativity, collaboration spirit, communication, digital literacy, environmental care attitude, sustainable lifestyle awareness, which are described as follows:

a. Critical Thinking Skills

Critical thinking skills refer to the ability of students to analyze complex problems, investigate questions for which there is no clear answer, analyze different points of view from information sources, and draw appropriate conclusions based on evidence

and reasoning (Tindowen et al., 2017). Collaborative project learning in this school can train students' critical thinking skills because students are given an explanation by the teacher regarding the learning essence of a particular project that is related to the subject matter, the Adiwiyata program, and sustainable lifestyles and are required to be able to work on several instructions and questions in the Student Worksheet. These activities certainly trigger students to think critically. In line with (De Vivo, 2022), by working on projects that require investigation, analysis and synthesis of information, students are trained to develop the ability to think critically. Critical thinking is an essential skill for various jobs (Van Laar et al., 2020).

b. Collaboration, Communication and Problem Solving

Collaboration skills refer to the ability of students to work together to solve problems, work somewhat in teams, and assume joint responsibility for completing tasks and achieving common goals (Tindowen et al., 2017). Collaborative project learning activities in this school certainly train students' collaboration skills because students learn and work on their projects in groups. Students learn how to position themselves when they have to work in a team, train their responsibility to contribute to taking part in the project and train student leadership to embrace their friends who are less actively involved in teamwork. Then, students are asked to make a project based on the instructions. Working on projects and LKS in groups triggers students to practice communication and problem-solving skills. According to (De Vivo, 2022), by working on projects in groups, students are invited to communicate effectively, share ideas, and resolve conflicts, thus training students' communication and problem-solving skills.

c. Creativity

Creativity skills are related to students' ability to produce solutions and works based on synthesizing, analyzing, and presenting what they have learned (Tindowen et al., 2017). Students are trained to have creative skills because students succeed in making a project and work according to the teacher's direction so creatively. This can be seen from the results of their work. Starting from being required to think critically, then being required to be able to solve problems in the form of difficulties encountered when working on a project, and successfully making a specific product/work creatively. According to (De Vivo, 2022) project-based learning stimulates students' imagination and creativity to find creative solutions, new ideas, and thinking experiments outside the box. Creativity is needed to achieve success (Van Laar et al., 2020).

d. Environmental Care and Sustainable Lifestyle Awareness

The collaborative project learning activities implemented in this school are integrated/collaborated with the Adiwiyata School program. The types of projects carried out are related to environmental issues, so this dramatically trains students' skills in environmental care and sustainable lifestyle awareness. In line with the results of research (Genc, 2015) that project-based learning has a positive influence on students' environmental attitudes, students feel that this project-based learning approach is practical, increases creativity, encourages research, provides contextual

learning and is relevant to daily life issues, and helps train critical thinking skills to find solutions to environmental problems.

e. Digital Literacy

When implementing collaborative project learning, each group is given a tablet to use to explore more information and inspiration. Thus, students' digital literacy skills are trained while working on project challenges and Student Worksheets. Students' digital skills were trained especially in the campaign poster-making project, as they dug for information and inspiration and created posters using digital tools.

### **3. Analysis of Student Learning Motivation Development from Collaborative Project Learning Activities**

Based on the results of observations, interviews, and documents resulting from student questionnaires regarding collaborative project-based learning, there is a development in student motivation from collaborative project learning activities. Students learning motivation increases, they are enthusiastic and enjoy collaborative project learning, they can draw wisdom/meaning from collaborative project learning, and they can produce creative work. This aligns with (De Vivo, 2022) that project-based learning offers several advantages for developing 21st-century skills and increasing student learning motivation. Projects that are challenging and relevant to everyday life capture students' interest and motivation, making them more likely to engage and invest in their learning. Project-based learning is a powerful learning approach that motivates students to become lifelong active learners.

### **4. Supporting Factors in Implementing Collaborative Project Learning at SMAI Nurul Fikri Boarding School Lembang**

a. The role of teacher collaboration

Collaborative project learning at this school can be carried out due to teacher collaboration. The teachers coordinate from the leadership, PJ Adiwiyata School, to subject teachers. This coordination resulted in an agreement that the teachers were ready to create collaborative project-based learning related to the Adiwiyata School program and global issues to meet the skills challenges of the 21st century. Teacher collaboration is essential to improve 21st-century skills (Martinez, 2022). The teacher's ability to organize learning effectively, provide guidance, direction, and support, and balance teaching with aligned assessment is essential in facilitating collaborative project learning to students (Kokotsaki et al., 2016).

b. A well-organized and well-planned program design

This school is a private school under a foundation, so it has a clear vision and mission to create an excellent and competitive school. This allows all foundation leaders, school leaders, and teachers to coordinate and collaborate well in preparing planned programs. School programs that are well-planned and organized have the potential to bring school success in achieving academic and non-academic achievements. (Mukhtar, 2015).

c. Adequate infrastructure and funding

This school is said to have adequate infrastructure and funding. This supports the implementation of collaborative project-based learning activities well. Infrastructure is an integral part of all learning activities and has a strategic function and role in achieving learning activities (Hidayat et al., 2023). Project-based learning often requires funds, so good financial management is required (Adillah, 2017).

#### **D. CONCLUSIONS AND SUGGESTIONS**

Based on research results, the form of collaborative project learning at SMAI Nurul Fikri Boarding School Lembang includes various activities such as making biopores, ecobricks, compost, dioramas from recycled paper, environmental care campaign posters, waste bank learning, recycling, budikdamber, donating decent used goods use, and hydroponics. All project creation activities involve collaborative learning between several subjects in the Adiwiyata School program. This kind of learning activity forms collaborative learning between teachers, students, the Adiwiyata School program team, and other school members.

Collaborative project-based learning at this school is carried out in stages: First, the teacher summarizes the material and essence of project learning related to subject matter and environmental issues. Second, the teacher explains the directions and procedures for working on projects and Student Worksheets. Third, students work on projects and worksheets in groups according to the teacher's direction. Fourth, at the end of the activity, students present the results of the project work, work on worksheets, and learn lessons from the collaborative project. Collaborative project learning at this school significantly impacts the development of students' 21st-century skills in critical thinking skills, problem-solving, creativity, collaborative spirit, environmental care attitudes and awareness of sustainable lifestyles. This type of learning activity is also effective in increasing students' interest and motivation to learn. Students participate in each collaborative project learning with pleasure and enthusiasm. The successful implementation of collaborative project learning in this school is supported by teacher collaboration, well-organized program design, and adequate infrastructure.

Implementing collaborative project learning in this school can be a model other schools can adopt to train students and teachers in 21st-century skills. Suggestions for further development are to expand the scope of project activities to include other aspects relevant to developing 21st-century skills, such as those related to digital literacy and technology. Then, for further research, it is recommended that further studies be conducted regarding the effectiveness of collaborative project learning in developing students' skills to face global challenges in the future. These follow-up studies can be long-term monitoring, correlational, comparative and experimental studies.

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