

# Fostering Students' Creativity through Lapbooking: A Case Study in an Indonesian Primary School Context

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*Received March 25, 2020; Revised April 29, 2020; Accepted May 27, 2020*

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**Abstract** One of the challenges in education in the twenty-first century is to develop students' creativity. Although, generally speaking, students' creativity can be nurtured and encouraged, and although creativity alone can even be taught, fostering the creativity of elementary school pupils in project-based learning is worth investigation. To fill the gap, the present case study was aimed to investigate how learner creativity in project-based learning can be fostered through an assessment called lapbooking. This study was conducted at the Laboratory Elementary School of the Indonesia University of Education. The study involved a fifth-grade teacher and 24 students aged between 10 and 11 years who voluntarily enrolled to this study. Data were garnered from field notes, journals, interviews, and learning portfolios. Furthermore, a descriptive approach was employed to analyze and interpret the data to make meaning of the research findings. The results of the study showcase that the implementation of project-based learning with lapbooking could challenge the student participants to develop their creativity by exploring and creating interesting projects. Therefore, it can be concluded that lapbooking in project-based learning can foster students' creativity.

**Keywords** Learning Media, Lapbook Creativity, Project-based Learning

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## 1. Introduction

Becoming creative individuals, one of the essential skills that students need to develop to survive in life and at work in the twenty-first century, has placed new demand

in many schools throughout the world [1, 2, 3]. Thus, to meet the need, the learning process must be able to foster students' creativity [4, 5]. Generally speaking, learning is a creative process. Creativity alone is not innate, but every individual has the potential to become creative. Myriad research has reported that every individual is creative, can become creative, and can even become very creative [6, 7, 8].

Creativity is the ability based on imagination in undertaking activities to create something new [5, 6, 9]. Researchers believe that creativity can be taught, learned, improved, and changed [10, 2, 11]. Autonomy and structure are both needed for optimal creativity development for children [12], and preschool curriculum has a role in it [13]. Therefore, every teacher should prioritize creating learning that can stimulate learner creativity. In other words, the learning activity planned in the classroom must support and develop learner creativity [14]. It can be started from the application of theory of creativity and creative thinking skills to analyze to all areas of the curriculum [15, 4]. Creativity is a complex phenomenon that involves four main aspects, namely, creative processes, creative agents, creative situations, and creative products [16].

Pedagogically speaking, one learning approach that challenges learners to be creative individuals is the project-based learning (PBL) approach. From various literature studies and research results, it can be identified that the application of PBL helps students experience strong and memorable learning and can teach not only creativity but other skills as well [17, 18]. PBL is anchored in constructive learning theory. It views the importance of teacher's role in providing practical experience so that learners can construct their knowledge [19, 17, 20].

Moreover, the results of various studies also reveal that

implementing PBL in comprehensive ways is more effective in improving the learning outcomes of learners compared to traditional learning [21]. PBL is effective in providing learners with meaningful learning experiences, shaping their creativity, facilitating their collaborations, and building their autonomy. Overall, it can help with exceeding the targets of the curriculum [22, 23, 24, 25]. The final goal of implementing PBL is that learners can make use of their knowledge to produce reports (written or oral), process or product design, research proposals or programs, or computer code and other creative products [26, 25].

These advantages are closely related to learner engagement in PBL in which teachers provide ample opportunities for the learners to conduct detailed investigations of the topics being studied. In PBL, learners are also given more time to learn to apply the knowledge, skills, and attitudes they obtain in real cases in their lives [25, 27, 28]. The projects learners deal with are generally related to real-world topics that deserve their attention and are also appropriate for their cognitive development and age [29, 30, 22, 31].

Given the characteristics of PBL which is considered capable of stimulating student creativity, implementations in both teaching and assessment must be in harmony with the constructivist paradigm. As far as assessment is concerned, a change from a traditional type of examination toward an authentic assessment practice is needed. Authentic assessment aims at increasing student responsibility in the assessment process by using various actions that focus on high-level skills and various dimensions of intelligence, applying authentic and contextual assessment modes, and, finally, integrating assessment in the learning process [32].

Based on these theoretical grounds, the present study aimed at exploring student creativity in PBL implementation through lapbooking tasks (lapbook-based portfolios). Additionally, it also aimed at depicting student creativity as demonstrated in their lapbooking projects.

## 2. Literature Review

### 2.1. Assessment in Project-Based Learning (PBL)

Halverscheid [33] pinpoints that the learning concept promoted by John Dewey known as “learning by doing” derived from PBL. Anchored in this learning-by-doing concept, PBL is defined as a learning approach that creates a constructive learning environment through which students are guided to construct their knowledge [34, 35, 36]. PBL also engages students in various authentic learning tasks actively through project creation that enables them to build inter-discipline knowledge and to contextualize it in the real world and helps shape their creativity and critical thinking [19, 37, 17, 38, 39, 22].

PBL also generally refers to an investigative learning approach through which students are armed with guided questions related to real-life problems so that they can create products that represent their understanding, knowledge, and attitude [40, 23].

As a result of the above, formative and summative assessment are also adapted within the PBL paradigm. Formative assessment, in particular, is used as a technique to assess students' learning progress and achievement. Moreover, Straub, Marsh, & Whalen [23] argue that authentic assessment has greater potential in PBL.

One of the authentic assessment models that teachers can consider to implement is use a rubric. Litz [41] argues that rubric assessment is one of the most popular authentic assessments used in many contexts of learning. The assessment rubric is designed by using constant scale instruments and a set of criteria that can distinguish students' learning performance and skill. Hernandez [42] & Milentijevic, Ciric, & Vojinovic [43] state that while implementing assessment in PBL, teachers can use multi-model strategies such as self-assessment, peer-assessment, and public assessment. Thus, Lin [44] argues that assessment in PBL takes place not only at the end but also in the entire process of learning that includes cognitive aspects, skills, and self-efficacy.

Said-Metwaly et al. [3] state that since the last decades, many instruments have been developed to measure creativity, seen from various constructive aspects, including the creative process, creative product, creative personal characteristics, or surroundings where learning takes place.

### 2.2. Lapbooking (Lapbook-based Portfolios)

Singh, et al. [45] & Afrianto [46] highlight that portfolio is a collection of students learning artifacts that provide evidence of learning development and achievement from time to time. Also, portfolio shows essential and contextual learning that requires complex thoughts and expressive skills so that it encourages students to keep collecting their learning artifacts and reflecting on their works. Baeten, Dochy, & Struyven [32] and Hernandez [42] argue that portfolio-based assessments such as self-assessment, self-reflection, group discussion, individual presentation, and collaboration between students and teacher, put students in the center of the assessment process. Therefore, they can become a springboard for students to demonstrate their learning progress and development.

There is no strict rule in developing a portfolio-based assessment, but it is advisable that the portfolio be used to garner more information on students' learning. A portfolio as a personal learning document can be developed through lapbooks. Rushton [47], Hudson [48, 49, 50], and Lanley [51] define lapbook as a collection of mini-books or booklets organized using graphics related to a particular

topic bond in a file folder. The mini-books contained in the lapbook are packed with various folded papers, filled out with descriptions of topics, graphics, drawings, photographs, and clippings and are visually presented to promote interactive, informative, and interesting presentations [52].

There are various sizes and shapes of lapbooks that teachers can design, and it is suggested that the cover be given a picture that illustrates the subject and topic of the project students are working on. Inside the mini-books, students can detail what they have learned about the topic [48, 50, 49]. Creating mini-books for lapbooks can challenge students to learn to control, present, arrange, and associate the targeted concepts so that every page is filled with the information related to the project theme [53]. Lapbooks can function as fancy scrapbooks that students can use to learn in the future [48].

In the beginning, the teacher can guide students to assemble a lapbook by cutting and collecting each mini-book or booklet as the content of the lapbook. Under the teacher's guidance, students will find out the layout by which to place each mini-book or booklet in the the lapbook. The teacher can inform students what to write or stick to each of the booklets during their experiment [54]. This is in line with Brinkman's statement [55] that teachers can teach and show how students can elicit ideas that can boost their creative expression and risk-taking skills during their project. Moreover, teachers can allocate time for students to develop their project using their creativity.

Learning through lapbooking is very relevant for elementary school students, especially for those who have visual and kinaesthetic learning styles. It is also effective to be implemented in elementary schools in general because it can prompt students' active participation in the learning-by-doing model [47, 54, 48]. When students are lapbooking, they learn to explore the subject being studied, memorize and review the information sustainably, cut, stick, copy, observe, display, present, write, compute, sequence, categorize, compare, and contrast the results of their exploration. All of these activities are considered fun and contributive to the development of students learning skills [47]. Besides, this lapbooking process also challenges creativity. This is as stated by Rubenstein, McCoach, & Siegle [5] that to build creativity, every learning should challenge different types of thinking skills to create something original which is different from others. Furthermore, it also challenges students to carry out complicated problem-solving, do convergent thinking, as well as evaluate things logically to find the best solution from various perspectives.

Bennett [52] explains that lapbook is a fantastic learning model. It mediates students to interact from the beginning of the project to the end of the product creation. Each component of the lapbook provides students with the opportunity to focus on a specific aspect of a larger topic.

Additionally, lapbooking can become a treasure for students even when they review, unfold, read, and touch their lapbooks and relive the memories they experienced during their learning so that they will have a better and complete understanding of the contents of the lapbooks.

### 2.3. Lapbooking and Creativity

Creativity is defined as the process of producing something original and useful as characterized by its originality, expressiveness, and imagination. Traditionally, creativity is often referred to as the four Ps of creativity: process, product, person, and place [56, 1, 57]. These perspectives stress the importance of the environment as an inseparable part of the process of creativity development [57]. According to Toivanen, Halkilahti, & Ruismäki [1], learning about creative people has a focus on creative personality, learning about the creative process emphasizes the ability to transform, while learning about the environment stresses the environment in which creativity occurs. Thus, creativity is also often defined as the results of a process, namely, creative products that can be in the forms of inventions, works of art, theories, skills, or habits. Although creativity does not always manifest certain concrete results, creative ideas can also become creative inventions.

Barbot, Besançon, and Lubart [58] argue that creativity involves a combination of cognitive (information processing), conative (personality traits, motivational aspects), and emotional factors (affective state, trait) that are interacting dynamically with the environment (which stimulates or inhibits the expression of creative potential), resulting in the uniqueness of the creative process and product. Walton [10], Kousoulas [59], and Davies et al. [60] argue that creativity comprises complex and multidimensional phenomena; therefore the assessment of creativity can be very complex. Toivanen, Halkilahti, & Uismäki [1] explain the four components that can be used to assess creativity: (1) fluency, the ability to elicit a great number of ideas; (2) flexibility, the ability to produce a variety of ideas; (3) elaboration, the ability to develop, enhance, or fulfil ideas; and (4) originality, the ability to create unusual, statistically rare, deep, and clear ideas. Kousoulas [59] states that evaluating creativity as a whole is not possible by using only one method or one measuring instrument because it needs several methodological procedures and clear theoretical frameworks. Different measurement methods can be used to evaluate various aspects of creativity from various perspectives.

Portfolio assessment refers to a type of authentic assessment that is systematically designed by teachers to get a comprehensive picture of the development of student learning through the collection of student works during a certain period using systematic and careful analysis tools. Not only is it used for assessment purposes, this collection

is also used to function as a comprehensive report on student development [46].

A portfolio assessment can be designed to assess almost all of the observable skills, processes, or knowledge of the required content area. Portfolio assessment, which is more likely to be authentic and valid, helps teachers to understand how students progress sustainably in their learning. Furthermore, portfolio assessment benefits students because it mediates them to become independent thinkers and autonomous learners. This is triggered by the concept that in the process of completing portfolio assessments, students are assigned to actively participate in selecting which of their works is to be included in the portfolio. They are also encouraged to discuss any progress they have made and set goals for their future learning with the teachers. For this reason, portfolio assessment is appropriate to be used as a tool to assess students' creativity in making lapbooks during PBL.

On these theoretical grounds, it can be stated that portfolio assessment is a promising tool for assessing student learning progress to get a valid and authentic picture of student learning progress and achievement. This assessment not only provides more valid data on student development, but also provides more comprehensive feedback for teachers regarding the overall domains of student learning development, such as, cognitive, affective, and psychomotor development, throughout the text.

### 3. Methods

#### 3.1. Research Method

The present study aimed to empower students' creativity through lapbook-based portfolio assessment in project-based learning. To get the whole picture of how students' creativity is practiced in the lapbooking tasks, this study employed a qualitative descriptive approach designed through a case study [61, 62]. Additionally, the focus of the study was to depict the implementation of PBL which assigned students to create lapbook-based portfolios.

#### 3.2. Participants

The participants of this study were fifth-grade students of a laboratory elementary school of a university in Indonesia. One classroom teacher and 24 students participated in this study. The teacher in this study also acted as the researcher and the second author of this article. The authors gathered the pupils' parents' permissions with the facilitation and complete resources for the research provided by the school under the university provision. The school provided students with textbooks, storybooks, students' magazines, newspaper, encyclopaedia, world maps, and globes. Furthermore, the school also provided a computer laboratory in which

students could access information while learning. Meanwhile, the students could learn outdoors because the school has a green wide yard in which students learned about plants and the environment.

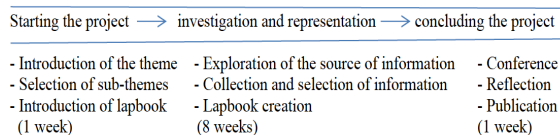
#### 3.3. Research Instruments

To gather the data, observation sheet, interview guide, field note, and students' learning artifacts were used [61, 62, 63]. The observation sheet was used to record students' learning activity while they were looking for and exploring several pieces of information related to their proposed project. It also helped with recording the students' activity while assembling their lapbook-based portfolios, starting from designing, planning, preparing materials for the project, and reporting the progress of the project. Meanwhile, the field note was used to jot down students' activity both as a group and individuals while completing the project, mediated by mobile phone to take pictures of and video-record their activity. The interview guide was used to collect information on both teachers' and students' feelings, motivation, and understanding of the project. It was also used to reveal the opportunity and challenges that teacher and students faced during the study. The fourth research instrument was students' learning artifacts in the forms of lapbook-based portfolios. Several indicators were used in the lapbook-based portfolio, including interesting cover, table of contents, completeness of information, clarity, accuracy, data support, meaningfulness, and originality. These indicators were adopted from Surapranata and Hatta [64], who formulated the portfolio assessment principles, which include data accuracy, time accuracy, completeness of information, document readability, document practicality, planning, filing, and administration. In relation to creative products, Dere & Ömeroğlu [14] argue that each product is obtained from creative thoughts. Lastly, all students' actions, expressions, and products during the project were to be assessed based on flexibility, fluency, originality, and elaboration dimensions and figures.

### 4. Findings and Discussion

#### 4.1. Procedures for implementing Project-based Learning

There are three steps in teaching through PBL: (1) *starting the project*; (2) *investigation and representation*; and (3) *concluding the project*. They are described as follows.



**Figure 1.** Steps in teaching through PBL in stimulating students' creativity to create lapbook based portfolios

### Step 1: starting the project

The learning theme selected in this research was *saving the living creatures*, which was divided into four sub-themes: (1) plants as a source of life; (2) my animal best friend; (3) preserving the plants and animals; and (4) save the living creatures. Under these themes and sub-themes, the core learning materials that students needed to learn was the breeding of living things: plants and animals. From these two living things, every student was requested to choose either one. Upon making their choice, they also were required to choose the type of plants or animals. After that, the teacher discussed with the students the reason why they chose the topic, in which case the discussion should be relevant to their experience and interest. The goal of this learning step was to foster the students' reasoning and decision-making skills while discussing the topic of their project. It also facilitated students' acquisition of first-hand experience dealing with the topic of their project. Furthermore, the teacher guided students with questions based on the selected topic, such as, how do the living creatures survive? How do we preserve plants and animals?

### Step 2: investigation and representation

In this step, the students explored the topic based on their proposed project. For example, they observed real objects such as plants or animals they chose, read books from the library, surfed on the Internet in the computer laboratory, and interviewed farmers or breeders. The information obtained was recorded and written into the descriptions, photo captions, and clippings. All of these were collected and filed into a lapbook-based portfolio. They also reported their progress on the schedule before the small group discussion set up by the teacher so that every student received peer feedback related to indicators to complete their lapbook-based portfolios.

### Step 3: concluding the project

Furthermore, in step 3, the students concluded their lapbook-based portfolios which were written in investigative text model and presented before the small groups or in pairs to give and receive feedback and comments. At the end of the PBL project, the teacher and students organized a project exhibition of the students' lapbook-based portfolios by inviting other teachers and students from different classes, the principal, and parents. In this program, the students disseminated their project before the audience.

All these three steps were implemented in 10 weeks using a combination of various approaches. While the teacher provided the students more time to complete the project which equalled 4 learning hours, she also taught other lessons using a conventional approach.

Figure 1 showcases the implementation of PBL which documented students' activity in their lapbook-based portfolio project. Based on the field note taken, all

students engaged actively and responsibly to complete their projects. The teacher also reported that all students were enthusiastic both when they searched for the information and when they assembled their lapbook-based portfolios.

## 4.2. Students' Creativity Development in Making Lapbook-based Portfolios

Creativity is the process of creating an idea and producing a different product. In other words, the lapbook-based portfolio project during the PBL was considered to be a creative process because the result of the observation shows that student's creativity was challenged during the project. Some challenges that impacted on the students' creative thinking are explained below.

1. The students did the project that suited their interests. In this case, teachers provided them with sub-themes that students could agree with in the group.
2. The teacher used a teaching technique that arouses convergent and divergent thinking which challenged students to explore many sources of information. This could also be seen from the students' summaries written on their lapbook-based portfolios.
3. The individual and group assignments given by the teacher boosted the students' creativity.
4. The learning situation gave the students more opportunities to develop their creativity. The teacher arranged a classroom in a way that gave the students more freedom to self-manage their activity.
5. The students could learn not only in the classroom but also outside. They were allowed to access the computer laboratory, the library, and the school surroundings, as well as to communicate with some informants relevant to the topic they selected.

## 4.3. Classroom as a Venue for Lapbook-based Portfolio Creation

Based on the result of the observation, one of the factors that facilitated the development of the students' creativity was the teacher's ability to create a conducive learning environment. In other words, it contributed significantly to developing the potential of the students' creativity. Furthermore, the PBL developed by the teacher, starting from the project preparation, investigation, and representation, to the project conclusion, also contributed much by providing more opportunities for the students to challenge their creativity.

Some conducive points were caught through the observation. First, when the students started the project,

they were given the freedom to choose sub-themes from the core theme together with their group mates to create their portfolio. Secondly, the questions that they proposed to guide their works helped them develop their project. Thirdly, they were able to document the progress of their project through lapbook-based portfolios. And finally, they could set the target of their portfolio contents.

This conducive learning environment could stimulate the development of students' creativity. In the investigation and representation stage, all students had an opportunity to decide what source of information they could use to explore their project. Besides, they could set their own exploration schedule, make a summaries of the results of the exploration, and choose the place where they could assemble their lapbook-based portfolios.

In the concluding stage, a learning environment that could challenge the development of the students' creativity was created. In this case, the students tried hard to demonstrate and present the progress of their project. Furthermore, the students were also challenged to highlight the creativity of their works.

The result of the continuous observation indicates that the overall implementation of PBL could create a learning environment and atmosphere that challenged the students' creativity. All the learning tasks given by the teacher during the PBL implementation challenged the students to conduct exploration related to their project assignments and engaged them in diverse learning activities. For example, the students could browse information they needed in the class on search engine Google with their personal laptops or Android phones or in the computer laboratory. Some students did the project outside the classroom observing and taking photos of plants according to the project assignments.

Students documented the result of the exploration in their lapbook-based portfolios. This learning task contributed significantly to the development of the students' creativity. This task also helped the students demonstrate the progress of their project promptly as they make the schedule together with the teacher. The following pictures depict the students' activity during the project.

#### 4.4. Students' Creativity Making the Lapbook-based Portfolios

The research found out that, in the conative aspect, the students struggled to become creative individuals as they worked on their lapbook-based portfolios, especially in the following creativity elements:

Perseverance, which refers to the students' ability to carry out problem-solving and accept comments and feedback from their teacher and peers that caused them to be eager to make a revision to their project;

Tolerance of ambiguity, which refers to the attempt to consider a solution without being helped by others;

Open-mindedness, which refers to the ability to accept new learning experience, especially when it dealt with something the students never knew before.

Autonomy, which refers to the ability to seek information that enabled the students to find solutions in flexible and unconventional ways;

Risk-taking, which refers to the ability to express new ideas even though it might risk their project;

Psychoticism, which refers to the ability to associate their background knowledge and the new concept they received over the course of the exploration process that enabled the students to create an eccentric product that differed from their peers'.



**Figure 2.** Learning situation that promoted a variety of learning activities during the PBL

Besides these aspects, it was also evident that the students completed the project eagerly. It could be seen that the students were confident and self-dominant as shown by the way they completed their project autonomously and that they could develop their intrinsic motivation to showcase their creative expression.

#### 4.5. PBL Product: Students' Creativity in Creating Their Lapbook-based Portfolios

Whether the students were creative or uncreative was evidenced by the result of their project. Through PBL, students were required to create lapbook-based portfolios as a tool to document the progress of their project. In this case, the teacher provided the students with basic learning rules that they needed to attend to. However, the teacher also gave the students freedom to use their creativity in completing their project. To measure the level of their product creativity, a modified Likert-scale scoring rubric was used. The result of the product creativity measurement shows that the students were able to reach the creative category. It was measured from the graphic elements of their lapbooks. Below are the students' works.



Figure 3. Students' works

The other examples of the students' lapbook-based portfolios can also be seen from the following pictures.

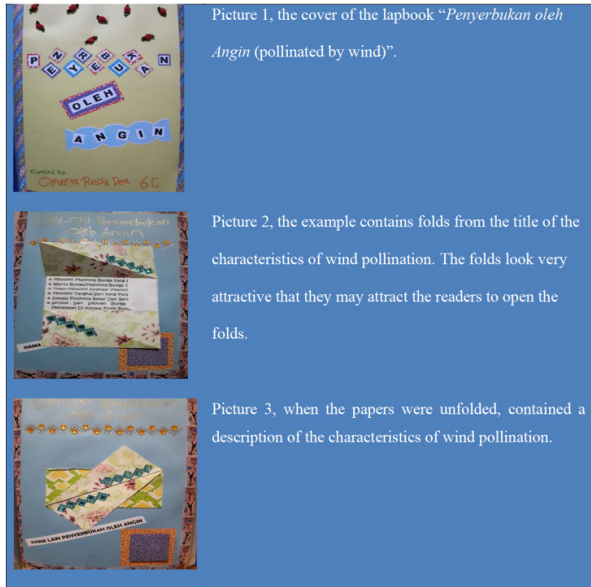


Figure 4. Students' lapbook-based portfolios

Figure 4 shows the first folded papers. When they were opened, the readers could see examples of plants whose pollination was helped by the wind. They also contained interesting folded papers (see picture 2). The types of plants whose pollination was helped by the wind were also included. When the readers kept opening the folds (pictures 3 and 4), there were many kinds of plants with wind pollination.

Based on the review of the PBL implementation, each step of PBL provided the students with a new learning environment that fostered the development of their creativity. It is reasonable because the teacher played a pivotal role in developing the students' creativity through designing the learning tasks and putting the students in a condition that engaged them in the learning process effectively [15]. This is in line with Boss & Krauss [17], Krauss & Boss [24], and Chu et al. [21] that teachers need to be well-organized so that students could meet the target of learning. In addition to this, Lee [65] maintains that teachers need to consider the goal, the implementation (time, content, organization, and interaction), the roles of teachers and students, and the assessment. Therefore, teachers need to put the students in a meaningful learning condition through three steps: starting the project; investigation and representation; and concluding the

project [37, 38, 20].

In the starting the project stage, the teacher provided the students with themes and topics for their project which challenged them to gear their critical thinking and reasoning skills related to their project using organized questioning called 5 Ws + 1 H (Who, What, Where, When, Why, and How). Furthermore, in this stage, the teacher worked with the students to determine their learning focus, topics, and issues to investigate or problems to solve or determine whether the topics were general or specific [39, 20]. Such learning conditions, according to Chu et al. [21], could guide the students to admit the ownership of their works especially when they could accomplish the project by themselves. The result of the study also shows that the students could complete their projects if they had a strong interest in the topic [27, 18].

Furthermore, it is also important to note that the teacher introduced and guided the students to create lapbook-based portfolios to document their learning progress. The teacher prepared the materials the students needed to create and decorate their lapbooks, such as, file folders, art paper, colorful folded paper, glue, scissors, ribbon, paper clips, thread, staplers, stickers, buttons, and color pens. The most important thing was that these tools were prepared to help the students to foster their creativity [54].

In the investigation and representation stage, the teacher encouraged the students to conduct a field work, for example, by doing various exploration activities to collect data, observe the surrounding, read, write, draw, and access the computer. However, before they started the exploration, each student was required to bring an empty lapbook, prepare the tools needed, and record all the activities and the result of their exploration.

In the exploration stage, also, more students chose to access the Internet in the computer laboratory to search for information related to their project under the teacher's guidance [34, 66]. In this case, the Internet was used as a support system that helped them to gain scientific and theoretical information which supported the need of their project [19]. Technological tools were utilized to support learning by improving knowledge acquisition, so the students were expected to use technology wisely to help them investigate and disseminate their knowledge. Technology was infused throughout the project so that the students could develop their soft skills related to academic contents [34, 43, 40]. To support this, technology was used to support students to garner, analyze, and integrate information [34].

Besides exploring information from the Internet, the students also did direct observation over some authentic objects. For example, they observed plants and animals based on the topics of their lapbooks. They also interviewed some informants (owners of flower shops and petshops) they encountered close to the school and their neighborhoods. The information obtained included

conceptual descriptions, pictures, and paintings [67, 37] useful to enrich the data of their lapbooks.

Each student who finished the exploration went on to the next learning stage which seemed to challenge their creativity even more, that is, by documenting the result of their observation in their lapbook. Moreover, in this learning stage, the teacher mediated the students to organize the pieces of information they gained from the exploration. In this case, the students were given more opportunities to design, develop, and manage the pieces of the information [54, 36, 24]. The students wrote, clipped the piece of information, stucked, and glued their paperworks to document their learning progress. All students did these activities in the classroom because it was more comfortable for them.

Based on the schedule, the students were requested to show the progress of their project before the class to receive constructive comments and feedback from their peers [65]. Additionally, the teacher mediated the discussion as well as gave feedback on the students' works [36]. From this, it can be seen that the teacher did not dominate as the only source in learning but, more importantly, became a facilitator for the students when they began their exploration [35, 17] as well as an advisor when the students documented their learning progress [65].

Finally, the concluding the project stage aimed to foster the students' interactions to refine their learning experience. Peer interaction, Liang [36] argue, is capable of motivating students to be more confident, improve their communicative competence, be more aware of their strengths and weaknesses in learning, respect others better, and engage themselves in self-reflection to review their works and others'.

These three learning stages took place within a period of ten weeks. The students learned a four-hour lesson every day during the project. Once a week, they documented their project in their own lapbook-based portfolios. When the students did not work on their project, the teacher taught the lesson outside the PBL implementation in conventional ways [23], in which case the lessons were associated with the project. In other words, the implementation of PBL in the present study was considered effective in engaging the students in meaningful learning, challenging the students' creativity, facilitating collaborations, and developing autonomy. In general, it also helped the students achieve the target of learning stated in the curriculum because it strongly encourages the students to complete the project creatively [25, 27, 28].

Based on the students' learning artifact analysis result, it is evident that most of the students were creative individuals because all of their lapbooks were interesting and artistic. Lanley [51] echoed that lapbooking offers a wider opportunity for students to be creative with colors, papers, graphics and shapes, and concepts. Each of the

students' lapbook-based portfolio depicted the student's creativity. In other words, the assessment given was judged whether they were correct or wrong. And even, they were given the freedom to create the lapbook-based portfolios based on their passions and styles.

Through the three stages of PBL, the teacher helped the students to think, act, and produce something creatively. Additionally, the teacher also contributed much to developing the students' ability to self-evaluate, the students' sense of responsibility, and the teacher-student communication skills. Thus, the lapbook-based portfolio project had given the students more chances to increase their self-esteem by enabling them to value their works and themselves as learners with creative potential.

## 5. Conclusions

The implementation of project-based learning (PBL) in which the students created lapbook-based portfolios and documented their works through three steps—starting the project, investigation and representation, and concluding the project—had become an avenue to provide the students with more opportunities to experience learning authentically and to explore various learning resources from the library, the Internet, and the school surroundings related to the learning materials the students learned and the topics that interested them. Through the lapbook-based portfolio project, the students could create a conducive learning environment that challenged their creativity. The students were found in the creative category because they were able to document their learning and to explore to create interesting and artistic lapbooks. In conclusion, the implementation of PBL which challenges students to create lapbooks as their project can become alternative conducive learning to foster students' creativity. This study had a limitation, that is, the participants of this study were largely homogeneous Sundanese children, reflecting the wider demographic condition at the time of data collection. It would be relevant to consider through future research whether the same findings can be generalized to different social, economic, and cultural backgrounds.

## Acknowledgments

This work was supported by the Indonesia University of Education through a grant and was conducted in collaboration with elementary school teachers at the Laboratory School of the Indonesia University of Education [5773/UN40/KM/2017].

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