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## ECE Educator Training: How to Develop Literacy and Environment Education for Children?

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**ABSTRACT:** Loving the environment is a character that must be instilled in children from an early age. This study aims to describe how efforts to instil love for the environment in preschool. This research uses a collaboration action research method with the intervention of providing information and motivation about the importance of environmental education for ECE educators. The participants were the ECE community represented by eleven ECE teachers in the Tangerang, Sawangan Bogor, Medan, and Batam areas. Data collection was carried out by focus group discussions and interviews as well as the delivery of information related to learning and environmental literacy for children through online meetings. Content analysis was used to interpret the data in this study. The findings of this study indicate that the provision of information and motivation to eleven ECE teachers can make the eleven teachers form the spirit and knowledge of teachers to develop learning and teaching environmental literacy in early childhood classes. The teachers are also trying to green the school environment by planting trees and making various learning activities with the children to get to know and love the environment better.

**Keywords:** ECE educators training, environmental literacy, environmental education

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## 1 INTRODUCTION

The planet is currently facing what is arguably the toughest threat to people collective survival in history, namely climate change. Technology-based solutions have dominated suggested approaches to solve this problem. However, these methods fall short of what is needed to reduce greenhouse-gas emissions. A sustainable future will only be achievable if people's behaviour and lives adapt in ways that reduce consumption. To build a more sustainable future, the public needs to be more inclined to act in a pro-environmental manner (Otto et al., 2014). Various estimates and logical arguments suggest that human actions and decision-making are the primary contributors to global climate change (Gifford & Nilsson, 2014).

Stable environmentally conscious behaviour throughout adulthood becomes very important to be cultivated from an early age (Kaiser et al., 2014). Therefore, understanding how pro-environmental behaviour develops during childhood and into early adulthood, as well as when it begins to become ingrained as a trait, is critical. Otto's et al., (2019) research analyses how children's environmental views and actions develop from first grade to early adulthood at age 18, in the only longitudinal study on the ontogeny of environmental attitudes and behaviour.

The two main tenets that underpin support for environmental education at the early childhood level are preservation of the natural world and the healthy development of children. The first premise holds that young children will not grow up with a regard for and concern for the natural world. They run the risk of never having these attitudes in the future. The value of the early learning years had been greatly undervalued, and that they could end as being crucial for a child's environmental education. The early learning years are a crucial time for the development of environmental views. Early-life environmental attitudes are difficult to change (Wilson, 1996).

Environmental literacy-focused science learning and textbooks may also offer chances to safeguard the environment and encourage its wise use. Additionally, science textbooks and curricula may serve as teaching resources that assist children in understanding and applying ideas of the environment. As a result, effective science textbooks and curricula are some of the elements that contribute to the growth of environmental literacy (Kaya & Elster, 2019). Recent research explores the idea of encouraging environmental literacy through practice-based inquiry. The idea is to effectively provide opportunities for children to engage in activities to promote environmental literacy, but teachers themselves must first acquire environmental literacy. Veisi et al., (2019) argues that the most effective way to build environmental literacy in children has not received enough attention. Environmental literacy has long been recognized as the main goal of environmental education. Another research states that a teacher's environmental literacy is very important for the growth of children's environmental literacy (Kidman & Casinader, 2019).

Recent research has focused on teachers and how their environmental literacy affects children's ability to acquire environmental literacy on their own. It indicates that there is a dearth of studies of the development of teacher literacy, especially environmental literacy, and appropriate inquiry literacy. The findings uncover the notion that a teacher cannot be expected to improve children's environmental literacy unless they have the required literacy (environmental and/or inquiry) (Kidman & Casinader, 2019). Apart from having only the necessary information and abilities, one must also be ecologically literate. To complement the results of the latest research in environmental education, especially for young children, this study intends to show that it is important to conduct a motivational and knowledge training program for teachers about environmental literacy and environmental education for early childhood teachers.

## 2 THEORITICAL STUDY

### 2.1 *Environmental Education for Preschool*

The effects of environmental education last a lifetime (Wals & Benavot, 2017), however, early childhood, which is defined as the ages of birth to eight, is a particularly important period for establishing environmental literacy (Friedman et al., 2021). Positive childhood experiences in nature have been linked in numerous studies to the emergence of adult environmental concerns and engagement in environmental practices (Rosa et al., 2018). Researchers have also investigated the developmental processes that underlie environmental behavior more generally (Evans et al., 2018), as well as its precursors, including ecological awareness (Corraliza et al., 2019), environmental attitudes (Otto et al., 2019), environmental consciousness (Jørgensen, 2016), and nature relatedness.

Preschool children's environmental education programs are typically linked to early childhood education or environmental education programs. In early childhood programs, environmental themes like seeds, backyard animals, trees, or the seasons are typically covered in numerous curricular units. Given its occasional occurrence in the overall curriculum, this technique offers some young children significant nature-related experiences but is likely to have a limited influence (Wilson, 1996).

Early childhood environmental education is envisioned as a distinctive form of environmental education, influencing the emergence of various approaches and philosophical orientations, given the significance of early childhood in laying a foundation for environmental sensitivity, interest, and behavior later in life (Ernst & Burcak, 2019). For instance, nature-based early childhood programs can offer direct, nature-rich experiences with a variety of goals, such as helping young children develop a basic appreciation for the natural world and supporting the developmental advantages of exposure to nature (Larimore, 2016). The latter could include cognitive benefits like improved executive functioning and memory (Schutte et al., 2017); physical benefits like increased activity and improved health (Ulrich Müller et al., 2017); and social-emotional benefits.

## 2.2 *Environmental Literacy*

Common notions like the capacity to observe, interpret, and make judgments regarding environmental challenges, comprehend ecosystems, and comprehend the significances of natural phenomena are all included in the current definition of environmental literacy (Roth, 1992). The definition of environmental literacy is expanded upon in this study, which demonstrates the necessity of including concepts of morals and ethics of the environment, knowledge, understanding, attitude, morals and ethics, and intention and behavior in the environment, as well as the development of skills for evaluating data, drawing conclusions, and forming personal opinions. Environmental attitudes, environmental motivation, environmental morality and ethics, purpose to act like ecologically friendly, environmentally friendly actions, sustainability, and knowledge and comprehension of environmental challenges are further sub-dimensions of environmental literacy (Kaya & Elster, 2019).

The idea of environmental literacy, which refers to knowledge and abilities that transcend beyond scientific notions particular about the environmental sciences, is one of these more recent innovations (Phillipson-Mower & Adams, 2010). Disinger and Roth, (1992), who stated that environmental literacy is essentially the capacity to perceive and interpret the relative health of environmental systems and take appropriate action to maintain, restore, or improve the health of those systems, are often cited as the authors of the first definitions of environmental literacy. To become an environmentally literate citizen who is sensitive to, and who has the necessary knowledge of, environmental concerns, Roth (1992) also claimed that a person required to receive an effective environmental education. The environmentally literate citizen may problem-solve, plan, and participate on ecologically related action methods in addition to having empathy and knowledge.

As a result, to identify a citizen who is environmentally literate, we must talk about their environmental sensitivity, knowledge, skills, attitudes and values, personal commitment and responsibility, and active involvement (Veisi et al., 2019). These qualities are currently the key objectives of a successful environmental education. Various frameworks for environmental literacy have been established over time and ending with description of the environmentally literate person. Because the factors affecting environmental literacy are expected to vary from nation to country, environmental education for developing countries should be distinct from that for advanced countries (Chu et al., 2007). Since the 1960s, environmental education has used the term "environmental literacy," which has since been expanded to refer to environmental knowledge, attitude toward environmental issues, abilities and motivations for resolving environmental issues, and active involvement in maintaining the balance between quality of life and the environment (Roth, 1992).

Environmental literacy instrument refers to the Environment Literacy Instrument for Korean Children [ELIKC], which was created utilizing several categories from the Simmons framework for environmental literacy (Chu et al., 2007). The attitude, knowledge, and ELIKC behavior scales were developed using the Children's Environmental Attitudes Scale, Children's Environmental Attitudes and Knowledge Scale, and Behavioral Inventory of Environmental Action Instruments as recommendations. To identify and define issues related to skills, environmental sensitivity, pollution, conservation, and environmental action, as well as a willingness to recognize and select between various value perspectives related to problems and issues, ELIKC focuses on basic ecological knowledge and environmental issues that are familiar to students (Chu et al., 2007).

Through teacher preparation, this study also aims to increase children's environmental literacy. A teacher who lacks environmental literacy or inquiry literacy will find it difficult to present the desired curriculum, according to Kidman and Casinader's (2019) research. The ideas of educational movements that support the benefits of learning outdoors, near nature, that link schools with the environment through school gardens (Eugenio-Gozalbo et al., 2020), green yards (Spano et al., 2020), and school outings, and that open up new issues and challenges for the training of teachers in general and those of early childhood education in particular (López-Alcarria et al., 2014), are gaining traction in these times of environmental and health crises.

### 3 METHOD

The overarching goals of the research design were based on the theoretical and methodological standards that support the comprehension of reality as a social construction (Denzin & Lincoln, 2012) seen through the eyes of participants in real-world circumstances. Collaborative Action Research (CAR) is a method for everyone to act in professional practices, as a type of professional learning across professions and disciplines, in their personal and social situations with the aim of improving them. It has a strong foundation in education, particularly in teaching and professional environment education (Shallcross et al., 2000). When integrated into teacher education programs, action research on curriculum development, teaching methods, and other topics promotes professional improvement and continuing education (Mills, 2011). The overall objective of this study is to develop teacher inquiry skills in environmental literacy and education in early childhood.

#### 3.1 *Research Design*

This study seeks to convey information about Environmental Education to 11 ECE teachers as respondents or research subjects online with the following materials, Environmental issues, literacy, Education for early childhood. Due to the COVID-19 pandemic, this information was delivered online in the form of an environmental education webinar and because the participants were in different urban areas of Indonesia, in Medan, Batam, Tangerang, Sawangan. Researchers are trying to find out the extent to

which ECE teachers' knowledge and understanding of environmental literacy are related to environmental education, especially how ECE teachers can teach environmental education in this pandemic situation through online and offline learning. The research team then sent open-ended questions to all research subjects and discussed and re-explained information about environmental literacy related to environmental education to eleven ECE teachers as participants. This action research was carried out with a qualitative approach, because the researcher knew the participants and had a dialogue with each other. The data collection period took four months, August-November 2020.

Our research proposes training of teachers that focuses on their professional development and aims to acquire action skills from a comprehensive environmental literacy perspective. Our goal is to empower early childhood education teachers by providing them with instruments that promote their professional development. Participating in this process leads early childhood educators to embark on a theoretical construction-oriented path that serves as the basis for their own professional practice, thereby training them, through the tools available to them, to use the kind of knowledge-based decision-making that supports the incorporation of sustainability in the environment closest to them. This CAR research has four phases, which are interrelated by two transverse actions related to the monitoring process and the process of participation in environmental education in several early childhood education institutions (see figure 1).

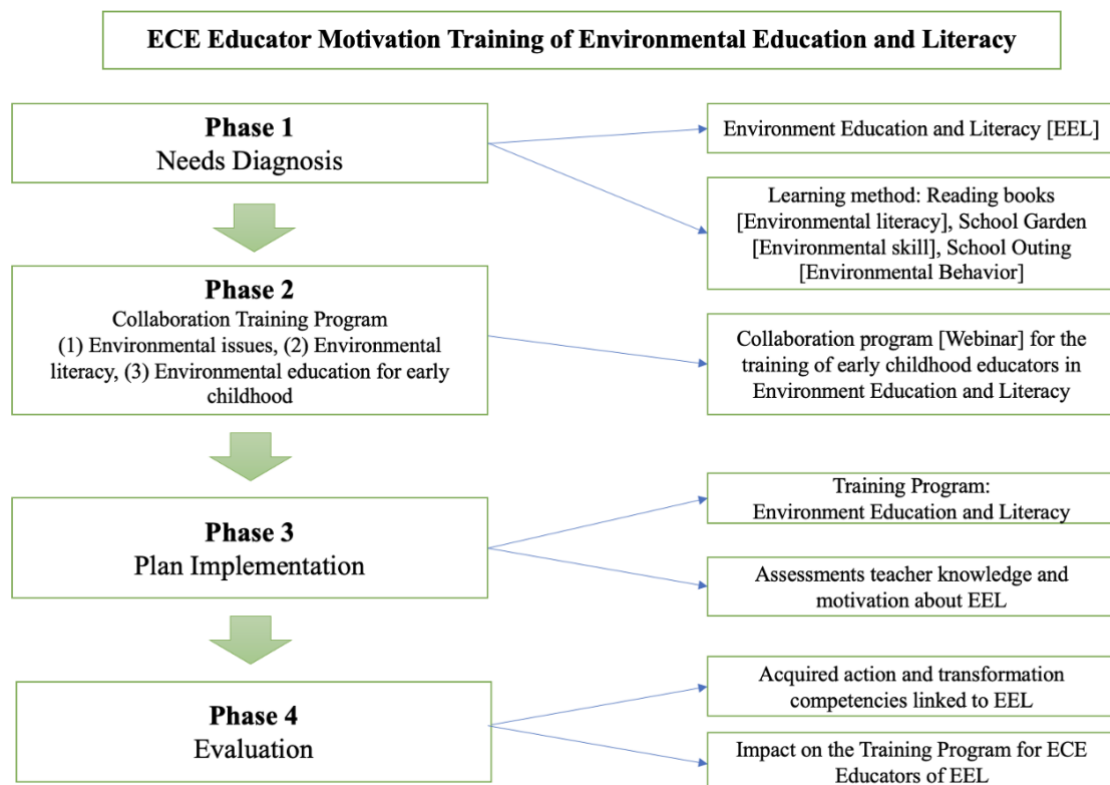


Figure 1. ECE Educator Motivation Training of Environmental Education and Literacy Phases (by Author)

### 3.2 *The Study Context*

The sample of this study consisted of eleven early childhood teachers who were taken from several urban areas. This webinar is a training offered in Indonesian to improve the educational knowledge and environmental literacy of early childhood teachers. The research team provides information on environmental protection and environmental literacy through webinars or online meetings with several resource persons. In addition to delivering information, this activity is also equipped with the provision of motivation and examples from books on environmental education. Examples of teaching strategies carried out by ECE teachers are closely related to themes such as environmental themes or plants, for example, teaching ECE to do several activities such as cleaning the yard, sweeping, and helping mothers clean and tidy the house, watering, and planting.

### 3.3 *Data Collection and Analysis*

This study collects data through interviews with teachers and teacher observation journals regarding children's skills in protecting the environment and children's environmental literacy. Throughout the program as well, teachers as participants are expected to reflect on their retrospective life experiences through autobiographies to truly become aware of their own inner world by relating it to the original experience through investigation. In each reflective report, participants reflect on what they learned or did not learn in the training/webinar process, the instructional factors that influenced their learning, and how these factors influenced their learning. A total of eleven reflective reports were collected for the investigation of the problem being examined. The researcher's own reflection on the group's performance and their learning helps him to see the whole picture from the educator's lens.

The qualitative data collected was analyzed through content analysis, an approach to document and text analysis that emphasizes the creation of predetermined categories to encourage the feasibility of research replication (Bryman, 2021). During data analysis, first, the raw data was organized by assigning numbers to groups and letters to each member in each group. Then, the raw data from the three sources is organized around a predefined code and appears on a matrix (Miles et al., 2014). Subsequently, the processed data were confirmed by two inquiry auditors (Lincoln et al., 1985). Finally, the data is verified through data triangulation.

### 3.4 *Trustworthiness*

The study incorporated the stages of organizing the data, creating categories, themes, and patterns, coding the data, testing the emergent understandings, and looking for alternative explanations to assure the objectivity and reliability of the data created. Inquiry audits were used to make sure the data was reliable and verifiable (Lincoln & Guba, 1985). By revealing areas where the data showed convergence and divergence, triangulating the data improved the conclusions' believability (Miles et al., 2014). The data obtained were validated by senior lecturers at the Faculty of Teacher Training and Education at Universitas Terbuka.



## 4 RESULT AND DISCUSSION

### 4.1 *Result*

Based on interviews with eleven ECE teachers, the results from the study showed that previously, they did not know much and did not know or fully understand what is meant by environmental literacy. However, after being given direction and information from the participants who were the subjects of this research, they stated that they now understood more about the importance of environmental literacy, therefore, they have started to provide learning activities related to environmental education to their students. The eleven ECE teachers also explained that they had implemented several teaching strategies that lead to early childhood learning about environmental literacy or environmental education, for example, inviting children to clean their classrooms and houses, throwing garbage in its place or planting and watering trees. In addition, these eleven teachers also stated that by participating in this activity, they became aware about the importance of developing environmental literacy for their students. Therefore, they started reading story books related to education. The titles on the books were: (1) *The Adventures of Si Botsi*, (2) *Burying, Draining, and Closing*, (3) *Why is there so much garbage?* (4) *Causes flood*.

#### 4.1.1 *Results from Phase 1: Needs Diagnosis/Assessment*

The data collected in the first phase is the diagnosis of existing problems regarding a wareness of protecting theenvironment during early childhood. Data was collected through field observations, theoretical studies, and existinglearning media related to environmental education and literacy. The results from the field note mention several things:

Every year the people of Jakarta and its surroundings as well as people in various regions in Indonesia often experiences major floods. There are also areas that have experienced landslides. Another problem is the disposal of factory waste or garbage. The problem in this country is that many people litter in rivers and flow into the sea. This fact shows the lack of public awareness of environmental problems.

The current challenges in educating the community and children to be more sensitive to environmental problems include the lack of environmental education from children's parents, the community is still not aware of environmental problems so that environmental education must be more intensively carried out through religious education and schools. Therefore, in educating a community, especially ECE, schools must cooperate with parents and the surrounding community. Research seeks to instil awareness in children to love the environment requires support from the child's parents.

#### 4.1.2 *Result from Phase 2: CAR Programs - Motivation Training for ECE Educators*

The information collected form the first phase has enabled us to perform in the development of teacher knowledge through motivational training to improve early childhood environmental skills, which include, school gardening activities, school outings, and relevant reading activities in the second phase.



The collaborative action research (CAR) activity for teachers was carried out for four months, through an online training program [webinar] with various resource persons whose expertise was recognized. [1] The research team provided information on environmental protection, environmental literacy as well as learning methods and techniques that can be implemented in early childhood classes. [2] In addition to delivering information, this activity is also equipped with the provision of motivation and examples from several books on environmental education. [3] This teacher training also provides examples of teaching strategies used by ECE teachers that are closely related to themes such as environmental or plant themes. The results from the training carried out for four months showed changes in teacher attitudes and motivation related to environmental education. This makes researchers need to do the third phase to see the implementation of the knowledge and motivation of teachers in their teaching practices in early childhood classes.

#### 4.1.3 Result from Phase 3: Plan Implementation

Researchers in the third phase made observations on learning in early childhood classes to see the improvement of teachers' abilities in developing environmental education and children's literacy. The activities outlined in this paper are reading activities to improve children's environmental literacy (see figure 2).



Figure 2: children are reading a book about the environment

When reading books, the teacher tries to instil an understanding about the importance of protecting the environment by using interesting storytelling techniques. The teacher is guided by the stages of reading (see table 1).

Table 1. Stages of reading for environmental literacy programs

1	<b>Pre-reading activities</b> The teacher introduces the parts to the book such as the front cover, page, top and bottom, back cover, and the correct way to open a book to children. The teacher tries to attract children's attention by creating a pleasant atmosphere, by commenting on the pictures or words on the cover. The teacher reads the title to the book, the author's name aloud while pointing at the writing. The teacher asks the children about the possible contents of the story about the environment.
2	<b>Complete story reading activity</b> In this activity, the teacher tells the whole story continuously until the end. The teacher asks the child who reads the part of the sentence when he stops at a certain page or asks the child to comment or guess the next story. The teacher also provides additional explanations, gestures. Expressions and intonation must be interesting and lively.
3	<b>Repetition of reading activities</b> In this section, the teacher repeats the reading page by page while pointing at the words spoken clearly and inviting the children to provide comments. The teacher pauses to give the child an opportunity to remember and guess the word

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**4 Activities after reading**

The activities carried out in this section are discussing keywords and connecting a concept with other concepts that the child already knows before. Then the teacher reads the story back together. The teacher emphasizes how to read and corrects how to read, which is fun and comfortable for children. Reading together is very important in developing children's language skills.

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**5 Closing Activities**

At this stage, the activity is filled with various interesting activities that can be adapted to the theme and books that have been read. These activities can be in the form of looking for missing words, matching writing with pictures, colouring-cutting-folding, playing a drama, imitating voices, or movements of characters in books, retelling stories that have been heard or can also be told, stories that are similar, or contradictory with the storyline.

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Of all these stages, with various activities that can be done to increase knowledge, model thinking skills, encourage reading skills and provide creative language activities for all curriculum goals.

#### 4.1.4 Result from Phase 4: Evaluation

One of the activities carried out in this research is to start inviting students to plant trees or watering trees for children whose houses already have plants or asking students to help clean their homes and schools, furthermore, the activity of walking out of school to observe the cleanliness of the nearest environment and to instil a feeling of loving the green environment outside the school and where children live (see figure 3).



Figure 3. Children Environment Education Activities

The results of interviews with are an evaluation of the understanding and attitudes of teachers when participating in motivational and experiences when teaching environmental education and literacy in early childhood classes.

*“With the direction on environmental education for environmental literacy, I as an ECE educator can stimulate children on how to protect and preserve the environment. Children understand that we must maintain cleanliness. Don't litter. Because throwing a garbage can causes floods/natural disasters. Children are very interested when we socialize environmental literacy development” (Participant 1)*

*“Participating in this activity of planting love for the environment in early childhood made me as a teacher tries to invite my students to take a walk around outside school (school outing) and pay attention to a clean and dirty environment then invite children to discuss how to make the environment always clean by throw trash in the trash can. I was even moved to see a student of mine reminding people to throw trash in the trash” (6th participant)*

*“I invited the children to plant and carry out tree-planting activities in the land of one of the students' parents. I also bought and looked for some flowerpots to make my school look greener”.* (Participant 7)

Participants also sent several photos containing environmental education activities in early childhood classes that have carried out environmental love activities. The activities that have been carried out by participants as ECE educators show that although the Covid pandemic makes learning activities not always meet face-to-face, children's learning activities to love the environment can still be carried out. This also shows that the activities of delivering information and providing motivational training to participants have made them aware of the importance of teaching and familiarizing young children to love the environment from an early age.

#### 4.2 Discussion

The answers given by the participants to the questions within the scope of this study were conducted to determine the understanding of ECE educators about environmental education and literacy to apply them in early childhood classrooms. Environmental Education is the key to developing environmental literacy can help empower children to ensure they make pro-environmental decisions and take actions will help ensure environmental behavior in adulthood. Especially in the preschool period, environmental education positively influences children's attitudes towards nature and increases children's level of environmental awareness. Early childhood education instructors view environment education as a current necessity that must be addressed by the curriculum starting in the very beginning of school. The expectation for training and professional development for ECE educators is high and states some general knowledge of the various approaches to curriculum integration that address environment education from a global perspective affecting the curriculum, the management of the school as an educational organization conscious of sustainability, and the involvement of community members in pro-environmental activities. The development of environmental auditing procedures in ECE centers is a clear possibility for future work (López-Alcarria et al., 2014).

As a result of interviews about environmental education in early childhood education, ECE educators emphasized that environmental education is very useful, and a varied training program is needed for children. Dada et al., (2017) stated that educators played a very important role in determining the quality of education, especially in early childhood classes because children who are sensitive to the environment and have positive attitudes can only be educated by educators with these characteristics. Therefore, the implementation of environmental education at all levels of education starting from preschool educational institutions and at universities where teacher training is provided is important and necessary to increase the public's view of nature. During the interview, participants talked about various factors that affect environmental education, problems faced before or during education and made various recommendations for environmental education.

When young children participate in environmental education, especially in a fun way, knowledge becomes much more enduring. The development of children's ecological knowledge and awareness of environmental issues can increase their concern for the environment and make them more easily motivated to engage in pro-environmental actions (Kim et al., 2017). According to research, children who play more in green spaces, where they can engage in more imaginative and unstructured play [96], grow up to be healthier, happier people, and get along better with others, and have a greater understanding of plants and animals (Burdette & Whitaker, 2005). Since it has been found that children who spend a lot of time outside as children have better attitudes towards environmental issues (Ewert et al., 2005), it is imperative to establish a learning environment rich in practical training that encourages children to spend more time outside (Olgan & KahriMan-Öztürk, 2011). At this stage, it becomes clear how important it is for teachers to have knowledge of activities for environmental education.

The subjects to be discussed, the activities to be carried out, the methods and materials to be used, the frequency of application, and the time to be allocated must all be carefully considered in environmental education practice, according to ECE educators, because environmental education is a single unit consisting of the following components: the component. Participants believed that educational activities such as “planting trees”, “examining plants”, “organizing school outings”, “collecting garbage”, “conducting scientific experiments”, “checking recyclable materials”, “watching environmental documentaries”, and "reading a book about caring for the environment" should really be included in early childhood learning because adults' interests and curiosity about learning are more influenced by their early natural experiences. To influence children's environmental attitudes, it is very important to provide them with an outdoor play area, such as a park, farm, or beach. The characteristics as the student population, which are the result of their social, cultural, and physical environment, should be considered in the design of the ECE educator training program, and they should include all the necessary components to prepare suitable future educators to address environmental issues effectively for children's education (Pe'er et al., 2007).

## 5 CONCLUSION

Even though at first, ECE educators did not really understand the concept of environmental literacy, by participating in collaboration action research activities, the research team could help ECE educators understand what environmental literacy is and how to apply it in ECE. Participants have also used several teaching strategies to help their children become environmentally literate. Although the teaching strategies used by educators are different from one another, the point is that educators try to instill a sense of love for the environment for their students from an early age of pleasant atmosphere affecting reading books of the environment affecting students' understanding of the need to in the environment, reading books together in power of text in illustrations in the book developed in this study, allows children to engage themselves as active readers. During the activity of reading stories, educators can present a relaxed in full of jokes and laughter

is possible because the text in the book contains messages that children can do in everyday life in protecting the environment. In addition, the book contains a vocabulary with a few words that are repeated, has the strength and simplicity of the storyline. The text can be hummed/sung and is often associated with humor. While the colorful illustrations of the book, and pictures that match the development of the child's soul, developed immediately attract the child's attention. The Developed book can provide an excellent opportunity for children to be involved in real-life situations with all their problems in a way that makes children comfortable. From the research, it is implied that although early childhood must study at home during the pandemic period, their ECE educators can still teach their students to start protecting and preserving the environment.

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