

USING THE ECOLOGICAL ENVIRONMENT IN ENVIRONMENTAL EDUCATION FOR PRESCHOOL CHILDREN

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Abstract. The article presents three guidelines for preschool teachers about using the ecological environment in the kindergartens in order to direct the children to protect the environment. Three ways started with cultivating children's emotions to enriching their knowledge and then controlling their behaviors, including: 1- Using the ecological environment to elicit emotion, sentiment, and desire to live in harmony with the nature of preschool children; 2- Using the ecological environment as a visual medium to enhance children's understanding of the ecosystem; 3- Using the ecological environment for teaching children to solve environmental problems.

Keywords: Ecological environment, environmental education, preschool, early childhood.

1. Introduction

Vietnam is trying to develop bio-literate citizens from an early age. It is said that Vietnam has all necessary elements to become a global leader in green growth thanks to the abundance and richness of its natural resources (such as water, fertile soil and forest coverage) and biodiversity as well as its ratified international agreements domestic policies, and ancient history of national determination and resilience [1, 9]. However, the eco-citizens at an early age can only be nurtured and matured in a school-rich ecological environment and properly guided by teachers. Today, preschools have focused on building an ecological environment in schools to use as learning facilities for children. The problem is that teachers do not much enough about how to use that ecological environment in implementing environmental protection education goals effectively, for many reasons such as their limited level of environmental ecology knowledge, the little amount of time for outside activities, and the influence of weather conditions on the choice of natural activities. There are many books and documentation that directs the teachers how to educate children to protect the environment [1], [2], [3] but they have not highly considered the ecological environment and using it deeply. Therefore, this study provides specific guidance for preschool teachers to help them effectively use the ecological environment in schools to educate natural awareness for preschool children, improve their emotional capacity and environmental problem solving skills.

2. Content

2.1. The “Ecological environment” and its meaning for the environmental protection education for children

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2.1.1 The “Ecological environment”

According to Clause 1, Article 3 of the Environmental Protection Act of Vietnam (2014), *Environment is a system of natural and artificial physical factors that impact on the existence and development of humans and organisms [4, pp.1].*

The term “Ecosystem” was originally proposed by the British Ecologist “A.C Tansley” in 1935. Today, Ecologists use the term “Ecosystem” to indicate *a natural unit of living and non-living parts of interact to produce a stable system in which the exchange of materials between living and nonliving components follow a curricular path [5, pp. 53].*

From a purely functional point of view Odum (1968) has divided an ecosystem into two components [5, 54]:

(1) Autotrophic component: It consists of green plants which bring about the fixation of solar energy (sunlight) and synthesis of organic compounds (carbohydrates) from simple inorganic substances.

(2) Heterotrophic component: It consists of the decomposers (micro-organisms such as bacteria and fungi) which are concerned with the utilization, rearrangement and degradation of complex food substances.

From structural point of view, the Ecosystem has been divided into four components [5, pp.55 - 56]:

(1) Abiotic substances (nonliving): water, carbon dioxide, oxygen, nitrogen, calcium, phosphorus and their compounds.

(2) Producers (living): plants

(3) Consumers (living): animals

(4) Decomposers (living): bacteria and molds

Founding on the terms “Environment” and “Ecosystem”, we can refer to *“The ecological environment” (in the kindergarten) as an artificial ecosystem in preschools, including living and nonliving components which are meeting the children’s need to live, to learn and to develop.*

2.1.2 Ecological environment’s advantages

The ecological environment in preschools does not only create a beautiful natural landscape for the school but also is considered an effective means to care and educate preschool children. For the child cares, the ecological environment plays the following roles:

- Providing a piece of clean, safe food for children,
- Providing several medicinal herbs that can be used to treat children,
- A safe and convenient space for children to participate in outside activities,
- Contributing to reduction the environment pollution.

In the process of children educating, the ecological environment has the following roles:

- The ecological environment contains objects of nature - which are attractive to children, easily evoking emotions, affection, respect and desire to live in harmony with nature.
- A visual means to enhance children's understanding of the ecosystem
- A place containing ecological issues, from which children have the opportunity to recognize and explain nature's change; Proposing, selecting and implementing solutions to solve simple ecological issues.
- Contribute to the comprehensive development of young personality: physical education, cognition, aesthetics, language, emotional-social skills.

2.2. Approaching perspectives

There are three approaches that preschool teachers should concern about when using ecological environment in environmental education for children, including the followings:

Ecological approach: Integrating ecological content into environmental education content, main focus on the relationship between organisms in the environment (the relationship between living and nonliving things, the relationship between living organisms) [6] [7].

Systemic approach: The content of ecology should be arranged in a system, from simple to complex, from easy to difficult, from familiar to strange [2] [3].

Approach activities: To organize interesting, valuable practical activities with children in the ecological environment to help children feel and understand about the natural ecological environment and be able to solve the environment problems [2] [3].

2.3. Guidelines to use ecological environment in environmental education for preschool children

The three guidelines below use ecological knowledge from several sources as a scientific foundation [8] [9] [10].

2.3.1. Using the ecological environment to elicit emotion, sentiment, and desire to live in harmony with the nature of preschool children

Using the ecological environment to elicit emotion, sentiment, and desire to live in harmony with the nature of preschool children could be started by putting them in a natural environment. It helps children to contact with nature by all their senses. This makes them arise the positive sentiment and they consider themselves as true parts of the environment. That is the foundation for children to have the desire to live in harmony with nature.

Preschool teachers can proceed with the following steps:

Step 1: Teachers organize activities for children to gaze with the beauty of nature

The best thing that contains the most beautiful factor is created by nature. The sight is the sense that helps a person to observe everything and the eyes are the most effective means to help children realize nature's beauty. Everything around a child is new and attractive. The beauty of nature will activate their senses. For example: A story about the beauty of sunlight - a small discovery outside the window. Everything seems to be more beautiful in the sunlight, from foliage to shadows of the trees. A lesson about photosynthetic. A sowing seeds game. All will be endless inspirations for children to feel the beauty of nature.

The step one can be divided into three activities:

- Opening: Teachers lead children to participate in observing environment activity.
- Admire watching: Children observe from a distance then come closer to see the main objects which were chosen.
- Discussing and associating: Children talk about natural beautiful scenery which they have seen before.

Step 2: Children have opportunities to share their feelings

In addition to the need of sharing essential needs such as eating, sleeping, playing, every children wants to share their own feelings with others. The need of sharing of preschool children is intense because, in this period, their language has gradually perfected, their vocabulary has become more seasonable through communication.

- Collective activities: Teachers and all children talk together about the objects being observed.
- Group activities: Children tell the one beside them or in the group of 3 – 5 about own feelings through an experience of the objects in the ecological environment.

Example: While walking and observing flowers in the preschool garden, teachers inspire and encourage children to share their feelings. Teachers may say “Let's go outside for some fresh air, see many trees and flowers. What kind of plants and flowers do you see in our school garden? How do you feel about them? What kind of your favorite flower? What colors do they have?”

Teachers will direct the children's vision to interesting things appear in the school garden proactively such as “Look! There is a flower bud. What kind of flower is that? Let you observe and talk to others! Please tell your friends if you find an interesting thing!”

Step 3: Teachers infuse their emotions to children

Children learn and work through human experience. For children to feel the beauty of nature, those around them need to model first. Teachers are an important factor in stimulating children's love for nature. They can use verbal and non-verbal expression to infuse the children's emotion.

Verbal Expression: Through conversations, teachers need to provide children rich and attractive words about nature, contain many emotions and bring them naturally. For example: “Look at that tree, it has a very soft shape and its body curves up to the truss (or clings to other trees) to climb, what is it? – It is a vine”

Non-verbal Expression: The teacher shows her emotion on her face and gestures. For example: The teacher cosssets the petals, sits down and whispers with the flowers like a friend.

The teachers' language and activities will be models for children to follow. Those have repeated daily, one day the children will receive and turn what is observed into their knowledge and will have behaviors to express their feelings to the environment in the same way that teachers did before.

A Suggestion: After children share their feelings about flowers in the school's garden, the teacher infuses her emotions by talking about her emotions, vibrations, describing the beauty of flowers that she likes. And she may say that “Let's listen to a melodious song for these beautiful flowers. Thank them for making the schoolyard so colorful today! Thank the trees for helping our lives have cool green spaces and oxygen to breathe every day!”

“Are you the same as me? I am touched by the beauty of these flowers. They are so fresh and bright, the petals fluttering make me happy too. Looking at the flowers swaying in the wind, they seem to be smiling and waving at me! How do you feel?”

Step 4: To give the message through art products (songs, poems, stories, visual art products...)

In the child's subconscious, all beauty always exists and is appreciated. Adults need to recognize and help children know how to express it outside. Children have a longing to be expressed their feelings. To do this, they need to have meticulous observations from nature, so that words can turn into physical forms through visual art activities, music, and stories. Children are talented artists, inventors ... in their world. So the artistic activities help them to reveal the color of their souls about nature.

For children, the beauty of nature is not only expressed through a sentence, a work of art but also spread further through association. The song about a raindrop not only expresses beauty through words but also arouses in the young minds a sense of bringing meaning to life for all beings: Rain makes trees lush, there are many young buds and green leaves on the branches (“Mưa roi cho cây tốt tươi, búp chen lá trên cành” – in Vietnamese). Nurturing children's emotions that originate from nature will be the inspiration for children to create art products, expressing their egos. Besides, it also shows the connection of children from life to the ecosystem in a natural way.

Example: After watching the flowers in the school garden, children can express their feelings in many different ways such as painting by the topic “Flowers in our school”; telling

several stories about plants: “Tale of the rose”, “Tale of the cockscomb” or singing the song “Flowers in our school”.

To follow the first instructions, teachers should pay attention to ensure the conditions:

- Nice weather
- Children are healthy and have psychological comfort
- The space is quiet, suitable for sharing emotions
- The objects in the ecological environment are in the best condition

2.3.2. Using the ecological environment as visual facilities to enhance children's understanding of the ecosystem

The ecological environment is used as visual facilities to contribute to the development of children's senses, which is the basis for developing different types of thinking for children; strengthen and expand the children's knowledge about the objects in creative environment and their relationships in the ecosystem; create a sense of closeness, attachment, and dependence on nature, thereby loving and appreciating nature.

Using the ecological environment as a visual medium can be conducted in some activities at preschool as follows:

a) Observation

Preschool age is a period of the strong development of visual thinking. Children acquire information, form symbols, acquire social and historical experiences primarily through observation. Therefore, the ecological environment is considered a vivid visual document for children to learn about the world around them. The ecological environment itself in the preschool has attracted children by the internal relationships between organisms, between living organisms and non-living nature, always urging children to find Search and explore. Through initial observation, children can identify individually what is living, what is non-living, gradually discover the relationship between living and non-living matter, between organisms and together.

+ Observing the relationship between living things and non-living things in nature.

To observe living organisms (animals, plants, microorganisms): Observing flower gardens, vegetable gardens, underground living organisms, fish tanks, and garden plants.

To observe non-living organisms (soil, water, light, air, etc.): Sunbathing, playing with sand, gravel, stone; playing with water.

To observe the relationship between living things and non-living matter: Photosynthesis, germination of plants, etc.

+ Observing the relationship between living things in nature: Through food chains, children can identify the relationships of living things in nature, including the relationships, such as predator-prey, host-parasite, symbiotic.

b) Playing

Playing is the main activity of preschool children. If the teacher can organize fun activities by using natural materials of the ecological environment, it will make children feel comfortable, learn through play. The use of natural materials to create games or applications in children's activities is a way for children to access the ecosystem.

Using natural materials in motor games and folk games:

• Mandarin square capturing: Collect eagles, seeds, longan, stones, and pebbles to make pieces in the game.

• Pulling areca leaf: Pick up the areca leaf and play together (pull and run)

• Shooting soil marbles: Making soil into marbles and shooting.

• Banana petard/gun: Use a vertical banana to make petard or gun

Using natural materials in fine art activities:

- Use leaves to cut and paste shapes
- Use straws to make the bracelet
- Make strings of flowers: Pick the flowers and thread them into a string.
- Puzzle: arrange dry branches, seeds into shapes of numbers and letters
- Print and color pictures by using petioles, leaves, and tubers
- Make the watch by folding the banana leaf
- Knitting
- Draw with chicken feathers

Using natural materials in music activities

- Sac bucket: dried phoenix
- Bamboo beat
- Bamboo flutes

Using natural materials in activities to explore the surroundings

● Plants: Vegetables, flowers, leaves, dried fruits, twigs, seeds, etc. Children can play stringing, sorting vegetables, building puzzles or playing as a shopkeeper, mixing juice, making jam fruit.

● Animals: Birds, fish, chicken, worm, insects, etc. Children can take part in role-plays, like pet stores, animal farms, veterinarians.

● Natural infertility: sunlight, wind, gravel, sand, water, etc. Children can play games to find balls, pinwheels, fly kites, build sandcastles, pump water, drop boats.

c) Making a food chain and food web

❖ *Guiding the preschoolers to set up a food chain:*

For example, a food chain: Humus → Earthworm → Chicken → Microorganism

Prepare picture cards of humus, earthworm, chicken, microorganism, and boards.

Teachers create a conversation combining operations and instructions:

- What animal is this? What do the earthworms eat? Well, so you want to create a food chain, you will put the humus tag first and then attach the arrow, followed by the earthworm card. Looking here, you can tell the earthworms are eating organic humus in the soil (Also known as humus).

- What animal can eat the worms? Where will you put the chicken card?

- I am going to introduce an organism that can eat all the dead creatures. It is a microorganism. This creature usually stands at the end of every food chain. Who can help me put it on the food chain?

Depending on the child's ability and proficiency informing food chains, teachers can ask children to create food chains with more or fewer links. The key things teachers need to help children understand food chains are:

- The food chain shows the nutritional relationship of organisms in the ecosystem, the one standing before the arrow is the food of the creature after the arrow.

- At the beginning of the food chain are usually plants and at the end of each food chain are microorganisms.

❖ *Guiding the preschoolers to set up a food web:*

Once children have established simple food chains, teachers can guide children to set up food webs. Teachers need to help children understand that food chains do not exist independently but linked together by links. One organism may be the food of many other animals, and one organism can also eat many other living things.

The way to make a food web is similar to making a food chain. Suppose that your child has established a food chain:

Grass → Grasshopper → Mouse → Hawk

To help the enfants set up a food web the teachers need more questions such as:

- The grass is not only food of grasshoppers but also the food of any species?
- Do ants eat grass? What animal eats the ant? Besides the frogs, do rats eat ants?
- What does the frog eat? Does the snake eat a mouse?
- Do hawks eat snakes?
- So we have the food web. Who can read this food web?

Food webs should be repeated and risen levels from changing some of the links in the food web to replacing the whole one.

d) Reading and making tables, charts, and diagrams

❖ *Guiding the preschoolers to set up a developmental diagram of a tree*

After children planted the bean seeds, teachers should allow them the opportunity to observe the maturity of the bean tree, and record (Write, draw, tag the card) the tree's development process. And then, the children present the tree development diagram by using images and symbols.

If there is not much time to monitor the tree's development, teachers can use the video and then instruct the children to make a diagram. This mapping is also applicable to animal subjects.

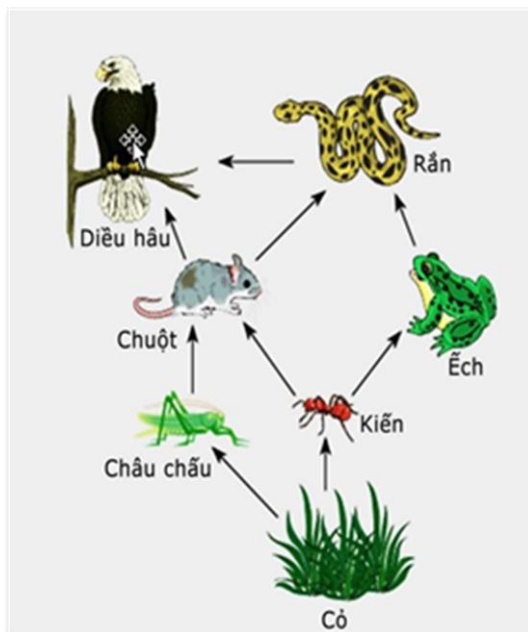


Figure 1. A Food web
(Source: Internet)

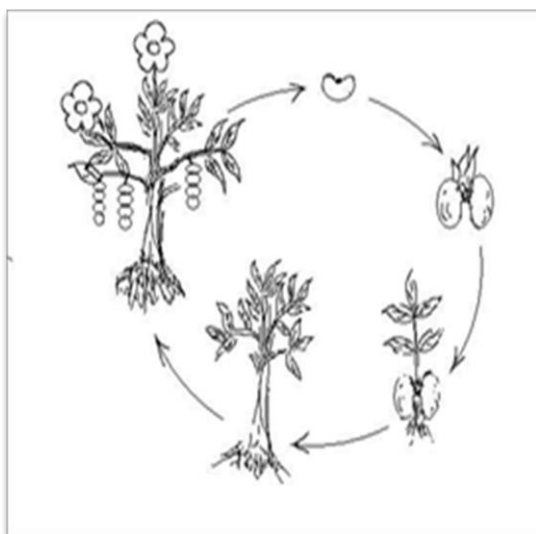


Figure 2. The development process of the bean tree. (Source: Internet)

❖ *Guiding the preschoolers to read the tree's photosynthesis diagram*

To read this diagram, children must have had the symbols and concepts of sun, light, water, air, oxygen and carbon dioxide; trees and parts of plants (roots, stems, leaves). Next, they observe the direction of the arrows and understand the meaning of the arrows. For example: What does the plant absorb from sunlight, what does the tree provide to the air and what does it get from the air? Where does the tree get water? ... Through the diagram, children visualize the carbon cycle that takes place during the photosynthesis of the tree.

❖ *Guiding the preschoolers read the nitrogen cycle in the soil by bacteria*

This is a process of nitrogen fixation that usually occurs in legumes. Legumes are symbiotic with nitrogen-fixing bacteria. Bacteria are protected in plant root nodules and supplied with plant nutrients (carbohydrates produced by photosynthesis). In contrast, bacteria fix nitrogen in the air (which is an unusable form of plant nitrogen) and convert it into nitrogen that plants can use to grow.

Explaining words:

Nitrogen is denoted by the letter N. Plants and animals cannot use nitrogen freely in the air, but plants and animals can use organic nitrogen to grow.

Nitrogen fixation bacteria can metabolize nitrogen freely (plants cannot use).

Symbiosis is the relationship between two mutually beneficial species, their lives often closely intertwined.

❖ *To instruct the preschoolers to make a classification: carbon sources and carbon sinks*

The classification table (carbon sources and carbon sinks) will help the enfants recognize what is the emission of carbon and what can absorb carbon. Then, the enfants can limit carbon emission, grow and protect green trees. Teachers should prepare some labeled pictures when guiding children to make classification table.

Table 1: Carbon source and carbon sink classification

No	Carbon sources	Carbon sinks
1	Factory	Forest
2	Coal and gas stove	Moss
3	Transport	
4	Animal waste	
5	Trash	

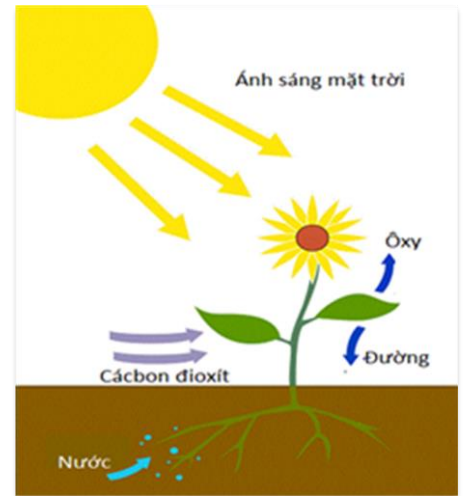


Figure 3. The tree's photosynthesis (Source: Internet)

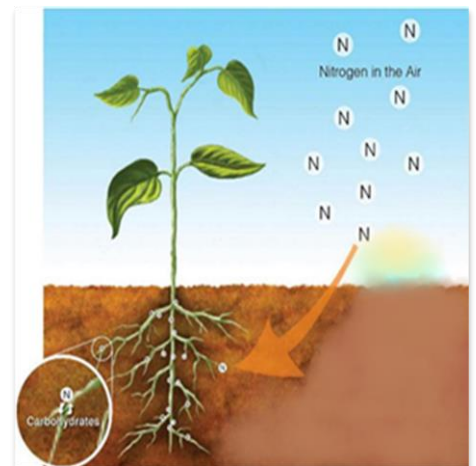


Figure 4. Nitrogen cycle by bacteria in the nodules of legume roots (Source: Internet)

After preparing pictures, teachers ask children:

-Where do you see carbon emissions? What makes carbon emissions? What human activities release carbon dioxide?

- Thus, these objects and the wastes in human activities are considered as sources of carbon dioxide emissions.

- What types of organisms can absorb carbon dioxide to make the air fresh? Forest is a very important carbon sink.

Teachers have children attach picture cards to the classification board.

- What do we have to do to reduce carbon in the environment? Draw what you can do in the promotion picture of “Reducing carbon dioxide emissions”.

Teachers should note some conditions for effective implementation of the second guideline:

- Preschools have enough objects for children to observe.

- Pictures and documents to be used for visual documents must be truthful, clear and beautiful.

- Choosing a convenient and safe observation space and operation

- Teachers have a basic understanding of the ecosystem.

2.3.3. Using the ecological environment for teaching children to solve environmental problems

The use of Ecological environment for teaching children to solve environmental issues towards specific targets, including:

- Children have basic knowledge of natural ecosystems and environmental issues that are familiar to them today.

- Children have skills to solve environmental issues suitable for their age.

- Children learn to respect the natural environment

- Children want to carry out caring activities, protect the environment and have a sense of environmental protection in all daily activities.

Teachers can organize reality activities for children by following these steps:

Step 1: Create opportunities for children to identify the ecological environment issues

Putting children on ecological environment issues: Create ecological environment situations that are familiar to the children’s lives to provide opportunities for them to solve issues in their lives. This is a way to help children improve their ability to solve environmental issues.

Example: Putting on a vase in the room, the flowers are withered and there is no water in it. Holding for children to observe and talk: “What are the flowers like? Why are they withered? Well, we look inside the vase! Is there any water in the vase? So what are we going to do for helping the flowers?”

Children find out the ecological environment issues by themselves: Children are the sensitive entities when the ecological environment is changed, children can feel or discover by their senses and experiences. Providing children with new environmental concepts allows them to name environmental issues charging. It also stimulates children to explore and learn more about issues around them.

Example: A tree is located in the baking sun. What will happen to this tree? Where should the tree be located? If you often leave it in the sun, what will happen?

Step 2: Use the questionnaire system encourages children to show ideas and propose solutions

Questioning is a way to brainstorm, think and explore measures based on analyzing the situations - causes - solutions.

There are some suggested questions as follows:

Situation question:

- What did you find out?
- After one day, what has this tree changed?

Cause question:

- Why does the tree wither?
- Who? What caused the tree to be withered?

Solution question:

- What do plants need to live and grow up?
- Do you see any living conditions for the tree that are not guaranteed?
- What will you do if you want a tree to become lush?
- Is there a better way to do this?

For example: When the children are observing a glass aquarium where aquatic plants are growing up and there are mosquito larvae in it, the teacher may give some questions:

- Do you know what this is?
- What's kind of the plant inside?
- Has anyone found out there is anything inside the aquarium?
- So how do we kill these mosquito larvae?
- Any of you know they are other animals' food? According to you, how to kill them without using insecticide?

Step 3: Organizing experiential practice activities for children to solve problems based on ecological perspectives

❖ **Labor activities:**

Labor is a kind of activities that uses tools to support children and requires them to have skills to care for and protect the ecosystem. Children take steps to build their own ecological environment, research and learn about the characteristics of the ecosystem and make sound decisions when building the ecological environment by themselves.

For children to know how to use labor tools to care for the environment properly, teachers need to guide their children step by step from identifying names, effects and ways to use them such as watering, shovel, bucket, etc. Beside, the teachers should tutor children to take care of trees by hand such as pruning leaves, catching worms and weeding. Then, children will be self-aware and find ways to use the tools to solve problems in specific cases. For example, when some leaves are dusty, children may choose towel to wipe each leaf or use a sprayer to wash leaves gently.

During the labor process, it is necessary to have the safety labor principles of labor that teachers and children determined together. When children take part in labor activities, they need be followed and tutored in safe labor practices likes wearing gloves, mask, hat and length clothes; going in boots or applying mosquito repellent. They also have to understand about what objects they can use or not such as the scissors, a knife and a hoe. By taking care of the environment, children will gain more knowledge about common labor tools, become more flexible when building their own ecological environment.

There are some principles of safety labor: Wear protective or specialized clothes when caring for plants and animals; do not frolic when using labor tools; clean the tools and put them in specified

locations after finish work; keep the place where labor activities are being held clean. Thanks to these principles, children become the subject of activities and self-regulate their behaviors.

❖ **Experimental activities:**

Through experiments, children are involved in learning about the processes, phenomena, relationships in the ecosystem, such as how the beans grow up; the plants depend on living conditions (water, air, light and soil); water pollution and how to refresh it; the decomposition of organic waste. During the experiment, children can apply the solutions by themselves and acquire experience to solve problems in practice. There are some suggestions for experiments in Table 2.

Table2. Some experiments and suggesting teacher to teach children solving environment problems

Name of experiment	What type of waste is decomposable?	Filtering water	Plant need light
Preparation	Banana peels, plastic bags, soil pots.	A glass of dirty water includes sand and some paper crumbs, confectionery cover (symbolizing polluted water). A filter consists of layers: gravel, sand, activated carbon (5-6 alternating layers)	Small soil pots, Black beans were soaked in warm water, Labor tools
Question	- Who can distinguish organic and inorganic waste? - What type of waste can decompose? - We will put these two types of waste into the soil. Can you guess the banana peels or the plastic bags will disappear?	Is this glass of water clean or dirty? Why do you know? What will you do if you want to clean the glass of water	Where will we put the soil pots if we want the bean germinate faster and easier? Where there is a lot of light, where there is little light or a dark place?
How to do	Teachers help children record their predictions in the predictive table results. After 2 weeks, they will dig the soil up and inspect together.	The teachers fill dirty water into the filters and ask the children to observe the change of water after flowing through them.	Teachers divide children into small groups and let them plant the seeds. Children choose the location to put the bean-pot and take care of them daily. After 3 to 7 days, children observe and conclude together.
Concluding	Banana peels are decomposed. Plastic	The filter turns dirty water into clean water.	The bean seeds are sown where there is more light will germinate better

	bags are not decomposed. Organic waste is biodegradable (it is derived from organism such as: plants, animals). This process is caused by resolving organism: bacteria, fungus.	But if the water is full of trash and dirt, it will be difficult to clean.	
Issue	Trash/ waste	Pollution water	Trees die or grow slowly in poor living conditions
Solution	Waste classification Limit plastic waste	Filter water before using Keep the water clean Use water sparingly	Take care of plants regularly Keeping soil, water and air clean will help plants to live and thrive

In order to follow the third instruction, teachers should pay attention to ensure the conditions

- Respect: Teachers and children respect the laws of nature
- Freedom: Children are free to perform activities according to their interests and ideas
- Safety: Teachers ensure children's safety during the children's implementation of issue-solving solutions.

3. Conclusions

In summary, these presented guidelines are suggested basing on making use of the ecological environment as a “realistic lap” or multimedia. They are quite easy for preschool teachers to apply. When the teachers use it, they should perform the methods as a whole to impact the emotions, awareness, and behaviors of a child. Thus, environmental protection education can reach the goals.

REFERENCES

- [1] Ministry of Education and Training of Vietnam and UNESCO, 2014. Biodiversity Conservation and Restoration, Living in Harmony with Nature, Tools for Teachers and Educators.
- [2] Lương Thị Bình, Nguyễn Thị Cẩm Bích, Nguyễn Thị Quyên, Phan Ngọc Anh, Chu Thị Hồng Nhung, 2013. Hướng dẫn thực hiện hoạt động giáo dục bảo vệ môi trường cho trẻ mầm non. NXB Giáo dục Việt Nam, Hà Nội.
- [3] Hoàng Thị Phương, 2017. Giáo dục môi trường cho trẻ mầm non, NXB Đại học Sư phạm Hà Nội.
- [4] National Assembly of the Socialist Republic of Vietnam, 2014. *Environment Protection Act, Vietnam*.
- [5] Shanta Satyanaraya, Suresh Zade, Shashikant Sitre, Pravin Meshram, 2009. A text book of Environmental Studies (As a per UGC Syllabus), Allied Publisher, New Delhi, India.

- [6] Nguyễn Thị Luyên, Nguyễn Hà Linh, 2019. *Tiếp cận sinh thái học trong giáo dục bảo vệ môi trường cho sinh viên ngành giáo dục mầm non*. Tạp chí khoa học trường ĐHSP Hà Nội, Vol. 64, Iss. 7A, pp. 42-49.
- [7] UNESCO UK, 2010. *Range and Animals Sciences and Resource Management - Vol II - Science and the Community: Role of the Ecological Approach in Sustainable Rangeland and Management* - Hugh Milner. EOLSS Publisher, pp 84-101.
- [8] Vũ Trung Tạng, 1999. *Cơ sở sinh thái học*, NXB Giáo dục.
- [9] Joe Snedeker. Med, 2012. *The Every Thing Kids' Weather Book*. F+W Media, Inc. Company, USA.
- [10] Kathiann M. Kowalski, 2000. *The Every Thing Kids' Nature Book*. F+W Media, Inc. Company, USA.