

Application and Effectiveness Evaluation of Environmental Education in Preschool Education



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Abstract: With the increasing seriousness of environmental problems, the importance of environmental education is increasingly recognized, especially in preschool education. Environmental education can not only help children understand environmental issues and develop their environmental awareness but also enhance their environmental skills and behaviors through practical activities. However, how to effectively conduct environmental education and how to evaluate the effectiveness of environmental education have been issues of concern to the education and research communities. Through a review of teaching methods, curriculum design, and assessment methods of environmental education, this paper attempts to explore these issues and provide references for the implementation of preschool environmental education.

Keywords: preschool education; environmental education; teaching methods

Introduction:

The continuing impact of global environmental change and human behavior has highlighted the importance of environmental education, which is particularly evident in the field of preschool education. By introducing environmental education in the early years of education, children can develop a deeper understanding of environmental issues, leading to positive environmental behaviors and attitudes. However, how to effectively integrate environmental education into preschool education and how to accurately assess the effectiveness of environmental education are important issues that need to be addressed by current educators and researchers.

1. The importance of environmental education in preschool education

The importance of environmental education in preschool education cannot be overlooked, and environmental education can cultivate children's awareness of environmental protection. At a time when global climate change is a growing problem,

there is a need to raise a generation of citizens who are responsible and capable of participating in environmental protection. For preschoolers, through learning about and being exposed to the environment, they can learn about the importance of the natural environment to our lives and thus develop a sense of respect for nature and protection of the environment. Second, environmental education in preschool can promote the development of children's diverse skills. For example, observing and exploring the natural environment can stimulate children's curiosity and inquisitiveness, and exercise their observation and thinking skills; participating in environmental activities or projects can develop their teamwork and problem-solving skills; learning and discussing environmental issues can improve their language skills and critical thinking skills. Finally, environmental education in preschool can also help children develop a holistic worldview. Environmental education is not just about learning about nature, it is about learning about life. By learning about the ecosystem and diversity of species in nature, children will understand that everything is connected and that people and nature coexist, which

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is extremely important for them to develop values that respect life and cherish the earth. In conclusion, the importance of environmental education in preschool education cannot be overstated (Yuan, 2022). It fosters children's awareness of environmental protection, promotes their skill development, and helps them to develop a holistic worldview. All these, in turn, are essential elements in their future growth, learning, and life.

2. Application of environmental education in preschool education

2.1 Teaching methods

The implementation of environmental education in preschool education usually employs a series of effective teaching methods to help children better understand and engage with the natural environment. The following are several teaching methods that are commonly used in practice for environmental education. One of these teaching methods is outdoor field learning. This method allows children to engage directly with nature and experience its beauty and its fragility firsthand (Xie, 2018). By instructing children to observe the natural environment, such as trees, flowers, and animals, they can learn about the complexity of the natural environment and the ecological relationships of various organisms. This hands-on approach enables children to learn more deeply and tangibly, thus making them respect and cherish nature more. Then there are art activities with an environmental theme. Through art forms such as painting and crafting, children can create works related to environmental protection. This allows children to use their creativity and imagination but also gives them a deeper understanding and appreciation of environmental protection. This approach makes environmental education more interesting and attractive through art. Next are role-playing and simulation games. This method of teaching allows children to understand and solve environmental problems from the perspective of different characters, such as playing the role of a forest warden or environmental volunteer. This not only allows the children to understand the

importance of environmental work but also develops their sense of empathy and responsibility. Finally, there is the storytelling approach. By telling stories about environmental topics, children can more easily understand complex environmental issues and concepts. Stories can stimulate children's emotions and make them feel more deeply about the environment. Also, children can share their observations and ideas by telling their own stories, which is a good way to improve their language skills and thinking skills (Liu, 2016).

2.2 Curriculum design

In preschool education, the curriculum design of environmental education should be comprehensive, diversified, and practice-oriented. A comprehensive design should cover an understanding of the natural, social, and economic environment. A pluralistic design, on the other hand, should include many forms of activities, such as outdoor exploration, artistic creation, and experimental observation. A hands-on design encourages children to directly experience and learn environmental knowledge and skills through practical activities (Ma, 2015). For example, the integration of everyday activities is a common way to design a curriculum. Teachers can integrate environmental education into children's daily activities, for example, by involving children in activities such as garbage sorting and energy conservation, so that they can understand and practice specific actions to protect the environment. In addition, project-based learning is an effective way to design a curriculum. By designing a series of projects with an environmental theme, children can learn and understand environmental protection through practice. Projects can be in small groups, and through collaboration, children not only learn about environmental protection but also develop their teamwork and problem-solving skills. Finally, innovative teaching activities are also an important part of the curriculum design. These activities can be experiments with new teaching methods or technologies, such as using virtual reality technology to give children a more visual understanding of the effects of climate change or using online platforms to

allow children to discuss and solve environmental problems with children from other places. Take a kindergarten's environmental education program as an example, which designed a series of lessons and activities based on the theme "Exploring our planet. In the program, children first learn about the importance of the natural environment by observing and exploring it. Then, they learn and practice environmental behaviors by participating in environmental activities such as garbage sorting and tree planting, and finally, they express their understanding of environmental protection by making and displaying environmental-themed artworks. The curriculum design of this program is both comprehensive and diverse, allowing children to learn and understand environmental protection at all levels and aspects, thus effectively integrating environmental education into their preschool education.

3. Evaluation of the effectiveness of environmental education in preschool education

3.1 Assessment based on student feedback

Evaluation based on student feedback is an important way to assess the effectiveness of environmental education, especially at the preschool level. It is a way to hear directly from students about what they think about environmental education and what they have learned from it. Student feedback can be collected in a variety of ways, including individual interviews, group discussions, drawing expressions, and writing (Lei, 2020). For example, teachers can find out how the children feel and what they gained from environmental education activities through one-on-one conversations with them. Such conversations can not only obtain feedback from the children but also encourage them to express their ideas and opinions. In addition, children can also be asked to express their understanding and ideas about environmental protection through drawing or writing. For example, they can draw their ideal environment or write down their views on environmental actions. These works not only reflect the children's understanding of and attitudes toward environmental

protection but also encourage them to express their thoughts through creative writing. Assessments based on student feedback can also include observations and records of their behavior. For example, observing whether they can practice environmentally friendly behaviors in their daily lives, such as whether they can separate garbage and save water and electricity. Such observations and records can help teachers understand the effectiveness of environmental education in practice. In short, assessment based on student feedback is a direct and effective way of assessment that helps teachers understand the actual effectiveness of environmental education and also encourages children to participate in reflecting on and improving environmental education.

3.2 Teacher observation and assessment

Teacher observation and evaluation is an important part of assessing the effectiveness of environmental education. This type of assessment provides a teacher's perspective on students' understanding and application of environmental knowledge and behavior. The main forms of teacher observation include daily and task-specific observations. Daily observation is when teachers observe students' understanding and application of environmental concepts during daily teaching activities, e.g., whether children are aware of saving resources in their daily lives and whether they take the initiative to clean up trash. Task-specific observation, on the other hand, is when teachers observe students' participation, problem-solving skills, and cooperation skills during specific environmental education activities as a way to understand their environmental awareness and skills in practice (Zhang, 2014). The assessment can include both formatted and unformatted assessments. Formatted assessments are mainly used to assess students' knowledge of environmental protection and their environmental behaviors through some quantitative methods, such as scoring and testing. Non-format assessment, on the other hand, focuses on recording and analyzing students' performance to understand their feelings and gains about

environmental education. In this process, teachers also need to maintain effective communication with students to keep abreast of their ideas and needs and to make instructional adjustments and improvements based on student feedback. In this way, teachers' observation and assessment can become powerful enablers of environmental education and help to improve the quality and effectiveness of environmental education.

3.3 Project-based assessment

Project-based assessment is an effective method for assessing the effectiveness of environmental education. This assessment method focuses on observing and evaluating students' performance in environmental projects to understand their mastery and application of environmental knowledge. First, project-based assessment allows students to observe their level of understanding of environmental knowledge. When working on an environmental project, students need to apply their environmental knowledge to solve a problem. Teachers can see how well they understand environmental knowledge by observing their problem-solving strategies. Second, project-based assessments can see students' practical skills. During the project implementation, students need to perform a series of practical activities, such as sorting garbage and making environmental products. Teachers can learn about their practical skills by observing their processes and results. Again, project-based assessments also reflect students' teamwork skills. In environmental projects, students are usually required to work with others to complete tasks. Teachers can learn about their teamwork skills by observing their collaborative process. Finally, project-based assessments can reveal students' environmental attitudes. During the project, student's attitudes and behaviors will directly reflect their attitudes toward environmental protection. Teachers can learn about their environmental attitudes by observing their behaviors. Through project-based assessment, teachers can understand students' understanding and application of environmental education from multiple perspectives. This type of assessment is both comprehensive and practical and

is an effective way to assess the effectiveness of environmental education (Zhang, 2014).

3.4 Feedback from parents and the community

Another important way to assess the effectiveness of preschool environmental education is feedback from parents and the community. Their observations and opinions can provide information about children's performance in environmental behaviors from different perspectives and settings. First, parents are the most direct observers in their children's lives. They can share how their children practice environmentally friendly behaviors at home, such as saving electricity, reducing waste, and protecting nature. Parents can also provide feedback on their children's interest and understanding of environmental topics and how they learn about environmental protection in their home environment. Second, community feedback can provide a broader perspective (Ning, 2014). Community members can share their observations of children's environmental behaviors at community events, such as community cleanup activities and park preservation. In addition, community organizations can also provide opportunities for children to participate in environmental projects, which can further enhance their environmental knowledge and skills. Feedback from parents and the community can be collected in a variety of ways, including one-on-one interviews, questionnaires, and family and community meetings. This feedback can help teachers gain a more comprehensive understanding of children's environmental behaviors and attitudes in different environments, and thus provide a more accurate assessment of the effectiveness of environmental education. In summary, feedback from parents and the community is an important part of assessing the effectiveness of environmental education. Their observations and feedback can help teachers to better understand children's learning and to adjust and improve the implementation of environmental education based on this feedback.

Conclusion

In summary, the application and evaluation of the effectiveness of environmental education in preschool education is an important task. Through innovative teaching methods and well-designed curricula, teachers can deeply integrate the educational concepts of environmental knowledge and environmental behavior into all aspects of preschool education. In addition, through diverse evaluation methods such as student feedback, teacher observation, program evaluation, and parent and community feedback, teachers can comprehensively and accurately assess the effectiveness of environmental education. These efforts are important for improving the quality of preschool environmental education and developing children's environmental awareness and behavior.

Conflict of Interest

The authors declare that they have no conflicts of interest to this work.

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