

## Nature Play to Enhance Children's Creativity: A Classroom Case Study of "Bringing Plants into the Classroom"

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### ABSTRACT

**Objective:** This study investigates the implementation and effectiveness of the nature play activity "Bringing Plants into the Classroom" in enhancing the creativity of young children. **Method:** Conducted in a Chinese kindergarten setting with 24 children aged 4-5 and two teachers, the study utilized classroom observations, teacher interviews, and analysis of children's creative works. The activity involved plant classification, observation, and measurement to engage children in hands-on learning experiences. **Results:** Findings demonstrate that well-structured nature play activities significantly promote children's creativity, enhance observational and scientific exploration skills, foster emotional engagement, and support the development of teamwork and hands-on abilities. **Novelty:** This study provides empirical evidence on the educational value of nature play within the early childhood curriculum in a Chinese context, highlighting its potential to support holistic cognitive and emotional development through experiential learning. The research offers a practical model for integrating nature-based pedagogies into structured classroom environments to cultivate young learners' creative and scientific competencies.

## INTRODUCTION

Nature-based play activities originated from European forest education, emphasizing child development through interaction with natural environments [1-3]. With the evolution of educational philosophies, this approach has gradually emerged as a global trend in early education. Research indicates that nature-based play activities, which utilize natural materials, significantly enhance children's cognitive abilities, emotional development, creativity, and social skills, while also strengthening teacher-child interactions [4, 5].

The preschool stage is widely recognized as a critical period for the development of children's cognitive, emotional, and social competencies, as well as a golden age for nurturing creativity [6, 7]. During this phase, creativity not only influences children's academic performance but also equips them with essential problem-solving skills for future challenges [8]. Consequently, how to effectively foster young children's creativity through nature-based play and similar activities has become a key focus in early childhood education research. This paper examines concrete classroom case studies to explore how nature-based play enhances children's creativity, particularly through activities such as "bringing plants into the classroom." By engaging in hands-on tasks like plant classification and measurement, children stimulate innovative thinking and problem-solving abilities. The findings aim to provide valuable insights and references for future educational practices.

## **Literature Review**

As an experiential learning approach that emphasizes interaction with the natural environment, nature-based play has garnered increasing attention in recent years. Educators widely agree that through nature-based play, young children can engage in authentic learning experiences, deepen their interest in knowledge, and foster creative development.

### **Defining Nature Play and Its Developmental Benefits**

Nature play refers to a form of children's play that involves self-directed exploration and interaction within natural settings. Unlike traditional classroom-based instruction, this play model emphasizes direct experience, active discovery, and unstructured engagement with the environment, characterized by openness, sensory stimulation, and child-led inquiry. Scholars Dankiw et al. [9] systematically analyzed the environmental attributes of nature play, highlighting its core feature as the integration of diverse natural elements, including various plants, minerals (such as rocks), terrestrial materials (soil, sand), and diverse ecosystems (gardens, woodlands, ponds, and other aquatic environments). Wilson [10] expanded this concept by proposing that nature play is not limited to outdoor spaces – bringing natural materials indoors can also create play environments that foster children's interaction with nature, offering more flexible implementation approaches in early childhood education.

Extensive empirical research confirms the multidimensional developmental benefits of nature play. Longitudinal studies by Cudworth and Lumber [11] and Ernst [12], among others, demonstrate that nature play significantly enhances children's cognitive development, emotional regulation, social skills, and motor abilities – key domains of early development. A systematic review by Dankiw et al. [9] specifically found that children aged 2–12 exhibited improved physical activity levels and cognitive performance when playing in natural environments. These findings align with Sobko et al.'s [13] research on how nature exposure enhances executive function, collectively forming a robust scientific foundation for the educational value of nature play. Prins's [14] recent study further revealed that the developmental benefits of nature play are cumulative and long-lasting, providing critical insights for integrating nature play into regular educational practices.

### **Creativity in Early Education**

During the formative years of childhood, creative capacity serves as a fundamental element in cognitive growth. Developmental psychologists like Vygotsky highlight how imaginative play and artistic activities function as essential channels for nurturing innovative thinking [15]. Contemporary studies demonstrate the comprehensive benefits of fostering creativity at this stage. Academic investigations reveal that developmentally appropriate creative pedagogy can strengthen young learners' capacity to tackle challenges [16]. Regarding intellectual progress, creative thinking shows strong associations with higher-order cognitive processes including solution-finding skills [17] and analytical reasoning [18].

From a psychosocial perspective, engaging in creative activities aids significantly in children's emotional management [19] and interpersonal skills development [20]. Nevertheless, international research by Kim [21] cautions that conventional instructional

approaches may result in decreased creative performance among preschoolers, underscoring the urgent need for pedagogical innovation in early education systems.

## **RESEARCH METHOD**

In This study employs a qualitative research method, aiming to explore the impact of nature-based play activities on children's creativity through classroom observation, teacher interviews, and analysis of student work. The study has been approved by the University of Malaya (UM) Ethics Review Committee.

### **Research Design**

This study focused on the nature-based play activity "Bringing Plants into the Classroom." The study involved children from a middle class (ages 4-5) at a kindergarten in China, with a total of 24 children and 2 teachers. The activity was designed to promote creativity, observational skills, and teamwork through plant classification and measurement activities. During implementation, the teachers adapted the lesson plan to better suit the children's needs and ensure the activity would stimulate their creative thinking.

To ensure ethical compliance, informed consent was obtained from both the teachers and children before the activity took place. All participants voluntarily participated in the research after being informed about the study. The researchers strictly followed ethical guidelines throughout the data collection process to protect participants' privacy and rights. The activity was designed to last for one hour, but the duration was adjusted based on the progression of the activity. The researchers observed the entire process and interacted with both the teachers and children to ensure the activity ran smoothly and generated valid data.

### **Data Collection Methods**

#### **1. Classroom Observation**

The researcher conducted detailed classroom observations throughout the entire activity. The observations focused on children's behavior during plant classification, measurement, and group discussions, with particular attention paid to their innovative thinking, problem-solving abilities, and performance in hands-on tasks and cooperative activities. The researcher recorded children's independence, creativity, and teamwork skills during the activity. Through these observations, the researcher was able to gain a deeper understanding of how children grasp plant characteristics, how they classified plants innovatively, and how they expressed their thinking process.

#### **2. Teacher Interviews**

After the activity, the researcher conducted in-depth interviews with the 2 teachers involved in the activity. The interviews focused on the teachers' reflections on the activity, their assessment of children's creativity, and the effectiveness of the activity design. The interviews also covered challenges the teachers faced during implementation and their experiences in adjusting and improving the activity. These interviews helped the researcher understand the teachers' roles in the nature-based play activity, their teaching strategies, and their overall impressions and insights into the children's performance.

### 3. Student Work Analysis

During the activity, the researcher also collected children's work, such as plant classification charts, measurement records, and group discussion results. Through analyzing these works, the researcher was able to assess the children's creativity, particularly how they displayed innovative thinking and independent problem-solving abilities in plant classification and measurement. The analysis of student works not only helped evaluate the specific impact of the activity on creativity but also revealed the unique ways in which children thought and personalized their learning processes.

#### **Data Analysis**

The study used qualitative analysis, specifically content analysis, to code and categorize classroom observation records, teacher interviews, and student works. First, the researcher analyzed the classroom observation records item by item to extract key information related to children's creativity, motor skills, and teamwork. Then, by analyzing the teacher interviews, and combining them with the observational data, the researcher identified the main factors influencing children's creativity during the activity. Additionally, the researcher analyzed student works (such as plant classification charts and measurement records) to assess the children's creative expressions. All data were processed thematically and categorized to identify the specific impacts of the activity on children's creativity enhancement. Through photo documentation, the researcher also visually presented children's performance during the activity, serving as a supplement to the data analysis and aiding in a better understanding of the actual impact of nature-based play in the classroom.

## **RESULTS AND DISCUSSION**

### *Results*

This study analyzes the implementation of the "Bringing Plants into the Classroom" nature-based play activity to explore its impact on children's creativity, observational skills, teamwork, and hands-on abilities. The activity design, which involved plant classification, measurement, and observation, helped children better understand the diversity and basic characteristics of plants, while also enhancing their scientific inquiry skills and teamwork abilities.

#### **Activity Implementation Process**

##### 1. Activity Introduction Phase

At the start of the activity, the teacher played a 2-minute video clip from the cartoon *George and Peppa*, which showcased a visit to a botanical garden to spark the children's interest in plants. Through this video, the children began to think about the plants they had seen in real life, which helped increase their engagement and curiosity (see Figure 1). The video not only activated the children's sensory experience but also laid the foundation for the subsequent plant classification and measurement activities.



**Figure 1.** Step1 : Video clip

## 2. Introduction to Plant Types and Growing Environments

Next, the teacher used a PowerPoint presentation to introduce the types of plants from different climate zones and their growing environments, helping children expand their understanding of plants. The teacher introduced tropical, temperate, and other region-specific plants, enhancing the children's sensory experiences through visual displays (see Figure 2). This diverse teaching method not only broadened the children's knowledge of plants but also encouraged them to consider the various plant species and growing conditions, deepening their understanding of plant diversity.



**Figure 2.** Step2 : PowerPoint Displays



### 3. Interactive Questioning Phase

The teacher interacted with the children by asking questions to assess their initial understanding of different plants and guide them to think about how to classify plants. Through these questions, the children demonstrated their thought processes and, with the teacher's guidance, further clarified the classification standards for plants (see Figure 3). This interaction not only strengthened the children's critical thinking but also helped them better understand the logic behind plant classification.



**Figure 3.** Step3 : asking questions

### 4. Group Collaboration and Hands-on Tasks

The children were divided into five groups, each tasked with classifying the plants they brought according to criteria such as color, size, and length. The teacher provided

guidance throughout the activity to ensure each group successfully completed the task (see Figure 4).



**Figure 4.** *Children work in groups classify the plants*

For groups that finished quickly, the teacher demonstrated how to use a ruler to measure plant lengths and provided measuring tools and recording sheets, enhancing the children's hands-on experience (see Figures 5 and 6). Through this hands-on work, the children developed basic measurement skills and improved their communication and collaboration abilities within the group.



**Figure 5.** *Children work in groups measure plant length*



**Figure 6.** Children work in groups record plant length

#### 5. Activity Summary and Presentation

After the activity, the teacher invited each group to present their classification results and measurement data, encouraging other groups to observe and compare. Through these presentations and comparisons, the children not only solidified their knowledge of plant classification but also improved their teamwork abilities through group interactions. This process not only boosted the children's self-confidence but also promoted their social skills. By presenting their findings publicly, the children gained a sense of achievement and enhanced their ability to express and communicate.

#### 6. Activity Extension

The teacher encouraged the children to explore more plants with their parents after returning home, trying different methods of plant classification. This home-school interaction extended the children's learning beyond the classroom, further igniting their interest in plants and exploration. Parental involvement not only strengthened the connection between home and school but also provided children with more practical learning opportunities.

#### Impacts of Nature Play on Children's Creativity

This study explores the impact of the nature play activity "Bringing Plants into the Classroom" on enhancing young children's creativity, observational skills, teamwork, and hands-on abilities. The activity design, involving plant classification, measurement, and observation, helped children better understand the diversity and basic characteristics of plants while improving their scientific exploration skills and teamwork abilities.

During the implementation of the activity, the researcher observed, through classroom observation, that children demonstrated high levels of engagement and creative thinking in plant classification and measurement activities. The children were able to classify plants based on common criteria such as color and size, and some proposed unique classification methods based on plant morphological features. The children also displayed strong teamwork during group collaboration, working together

with their peers to complete tasks and proposing new solutions through discussion. In the measurement phase, children actively used rulers to measure plant lengths and accurately recorded data, demonstrating their strong hands-on skills.

By analyzing students' works, such as plant classification charts and measurement records, the researcher found that most children were able to accurately complete plant classification and exhibited innovative thinking. Some children introduced new classification criteria, such as classifying plants based on leaf shapes and growth patterns. In the measurement phase, the children were able to use measuring tools correctly and record plant lengths, reflecting their attention to detail and accuracy in hands-on tasks. The students' records and measurement data indicated that they not only mastered plant classification methods but also applied this knowledge in practice, demonstrating high levels of creativity and motor skills.

Additionally, in-depth interviews with the teachers were conducted to evaluate and reflect on the effectiveness of the activity. Teachers indicated that the activity had a significant impact on stimulating children's interest and curiosity about plants. Teachers particularly noted that the activity enhanced children's observational and classification skills while fostering their teamwork spirit. During group activities, children exhibited high levels of interest and smooth communication, creatively solving problems together. One teacher mentioned,

*"The children showed great interest in group work, their communication was very smooth, and their problem-solving methods were very creative." (T1)*

Through this collaboration, children not only deepened their understanding of plants but also developed social and communication skills. Teachers also noted that through hands-on tasks and measurement activities, children's hands-on abilities were significantly improved, and many children developed a strong interest in scientific exploration. One teacher stated,

*"By measuring plants, children not only learned how to use scientific tools but also developed their attention to detail." (T2)*

Although the overall results were positive, the teachers also pointed out that some children had difficulty remembering plant growth characteristics and classification methods. For instance, some children struggled to accurately recall the specific features of plants and required more time for repetitive learning and practice. One teacher stated,

*"Some children need more repetitive teaching to help them better understand the characteristics of plants." (T1)*

For future improvements to the activity, teachers suggested incorporating more content on the growing environments of plants to help children better understand plant diversity and growth patterns. Based on the teachers' feedback, the activity significantly promoted children's creative thinking and hands-on abilities while strengthening their teamwork spirit. Teachers plan to continue using this activity model in future lessons and incorporate more hands-on activities to further enhance children's scientific exploration skills and their interest in nature.

## *Discussion*

This study aimed to explore the role of nature-based play activities in promoting children's creativity, particularly in the activity "Bringing Plants into the Classroom." The study examined how plant classification, measurement, and observation activities enhanced children's creative thinking, motor skills, and teamwork. The findings indicate that appropriately designed nature play activities significantly improve children's creativity while fostering hands-on abilities, teamwork, and scientific exploration. This aligns with the existing literature on nature-based play, which demonstrates its positive impact on children's cognitive, emotional, and social development. First, the study found that children showed high levels of engagement and creative thinking during the activity. In the plant classification and measurement tasks, children were not only able to classify plants based on conventional criteria such as color and size but also proposed innovative classification methods based on plant characteristics such as shape. This finding is consistent with Vygotsky's theory, which emphasizes the role of symbolic play and artistic activities in developing creative thinking [15]. Through hands-on activities and group collaboration, children not only improved their motor skills but also enhanced their social and teamwork abilities.

Moreover, the study revealed that children's hands-on abilities and interest in scientific exploration were significantly enhanced through group cooperation and hands-on tasks. This supports Dankiw et al. [9], who highlighted that children's cognitive performance and motor skills are improved when they engage directly with natural materials in nature play. Under the teacher's guidance and through group work, children not only learned how to use measuring tools but also developed an understanding of scientific concepts, laying the foundation for future scientific learning. However, despite the overall positive results, teacher interviews indicated that some children had difficulty remembering plant characteristics, suggesting that while creativity was stimulated, some learning needed further repetition and reinforcement. This finding is in line with Kim's [21] cross-national study, which pointed out that traditional education models could lead to a decline in creativity indicators among young children, emphasizing the need for pedagogical innovation in early childhood education.

Additionally, teachers noted that while the activity effectively sparked children's interest and creativity, the content on plant growth environments was limited. This may have restricted children's understanding of plant diversity and ecological knowledge. Therefore, teachers suggested incorporating more content on plant growth environments to further enhance children's understanding of ecosystems. This feedback aligns with Wilson's [10] view on expanding nature play, which suggests that integrating natural elements into the classroom can effectively enhance children's cognitive understanding and interest in the natural world.

Overall, the findings of this study support the effectiveness of nature-based play in promoting children's creativity and cognitive abilities, particularly in stimulating their scientific curiosity and problem-solving skills. Through nature play, children not only learned basic plant knowledge but also cultivated creative thinking and teamwork

through hands-on activities and collaboration. Consistent with existing literature, early creativity development plays a significant role in children's cognitive, emotional, and social development [16, 17]. However, challenges in the implementation of the activity, particularly in children's memory and understanding of complex knowledge, provide space for further improvements in future educational practices.

### **Research Limitations**

While this study provides valuable insights into the effects of nature play on children's creativity, it has several limitations. First, the sample size was relatively small, with only 24 children and 2 teachers from a single kindergarten, limiting the generalizability of the findings to other educational contexts, especially in different cultural or geographical settings. Additionally, the study was based on a single session of the nature play activity, which captured only short-term effects. A longitudinal study would be needed to understand the long-term impact of nature play. While the teachers' experience may have influenced the results, as more experienced educators could engage children more effectively, future research could benefit from providing standardized teacher training to assess the impact of different teaching methods. Finally, while the focus was on creativity and teamwork, other aspects of children's development, such as emotional regulation and social skills, were not explored in depth. Future research could address these areas for a more comprehensive understanding of the benefits of nature play. These limitations highlight the need for future studies to use larger, more diverse samples and incorporate a more extended observation period to better evaluate the lasting effects of nature-based play activities.

### **CONCLUSION**

**Fundamental Finding :** This study demonstrates that nature-based play activities, exemplified by the "Bringing Plants into the Classroom" initiative, have a significant positive impact on young children's creativity, observational skills, teamwork, and hands-on abilities. By engaging in experiential tasks such as plant classification and measurement, children develop essential cognitive, motor, and socio-emotional competencies. **Implication :** These findings support the integration of nature play into early childhood education as an effective pedagogical approach to foster holistic development and scientific exploration in young learners. **Limitation :** Despite the positive outcomes, challenges such as children's difficulty in retaining plant characteristics highlight limitations in memory retention and conceptual understanding, suggesting a need for more structured reinforcement strategies. **Future Research :** Future studies should consider longitudinal designs to examine the sustained effects of nature play, explore its application across diverse cultural and educational settings, and investigate strategies to overcome cognitive limitations in young children's engagement with nature-based content.

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