



Research Paper

The Effect of Environmental Contexts from Ecological Perspective on Motor Development and Creativity of Children

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Abstract

The purpose of this study was to investigate the effect of environmental contexts from ecological perspective on motor development and creativity of children. This quasi-experimental study with a pretest–posttest design, recruited preschool children aged 4.5 to 6.5 years who were divided into two groups of 15 based on differences in environmental contexts (15 from the Nature School and 15 from kindergarten). To measure motor development, the Bruininks-Oseretsky Test of Motor Proficiency and to assess children's creativity, the Torrance Test of Creativity Thinking was used. Results of mixed ANOVA showed that activity in outdoor and indoor, had a positive and significant effect on the gross motor development ($P=0.0001$) and creativity ($P=0.0001$) of children. Thus, the natural environment is rich from stimulants, which has a remarkable effect on children's development. Therefore, it is suggested that children have more activity in natural environment during their childhood to improve their motor and creativity development.

Keyword: *Environmental Contexts, Ecological Perspective, Motor development, Creativity, Children*

Introduction

The development of motor skills during infancy and childhood depends upon children's growth and development characteristics (morphological, physiological, and neuromuscular characteristics) and environmental factors (play environment, family, school, etc.) (Pereira et al., 2021). One of the important environmental factors, among those examined in this study, affecting children's development, is the use of natural space. Given the increasing prevalence of childhood overweight and obesity due to the extensive time children currently spend indoors, a priority for scientific research is to identify the opportunities and methods of motor learning and to increase children's level of daily physical activities (Tonge et al., 2016; Truelove et al., 2018). Body experience and physical activity contribute to the development of self-awareness and learning different modes of expression, as well as encouraging the acquisition of physically active lifestyles (Ley & Barrio, 2019). Moreover, creative thinking, defined as novel thinking that produces valuable ideas, is a crucial skill in society. The development of these skills in childhood, which is the basis of learning, is very important and valuable (Aini et al., 2020). A recent study found that creative thinking in young children steadily increases until the third grade, then it levels off. The authors suggest this decrease may be due to increased focus on academic success and too many structured activities at the expense of unstructured, free play time (Wojciehowski & Ernst, 2018). Therefore, there is a need to renew efforts to foster creative thinking in young children. Nature school programs may offer a solution to help reverse this trend. Nature schools use nature themes and daily nature explorations as the central organizing concept of their program (Finch & Bailie, 2015). Children can improve gross and fine motor skills through play as they interact with the small and large loose parts in nature (Fathirezaie et al., 2021; Branje, 2021). Play environments where children can take risks promote increased play time, social interactions (Fathirezaie et al., 2021), creativity and resilience (Harper, 2017). Furthermore, children have been found to show a preference for spaces that allow them to explore their surroundings, try new things, accept challenges, and take risks. Therefore, the purpose of this study was to investigate the effect of environmental contexts from ecological perspective on motor development and creativity of children.

Methodology

This research was quasi-experimental in nature and included two groups (15 children aged 5.5–6.5 years in each group) with a pretest–posttest design, conducted with purposive sampling. The first group were children in the

natural space (nature school) and the second group were children who were indoors (kindergarten). Both groups conducted their activities in the specified environments for two months. In the natural space, children were free to explore different ways of feeling, behaving, and interacting with others. There were special spaces in the nature school, which included natural space, adventure space, active play space, quiet play space, and solitude space, which were created to promote and encourage play in nature. These spaces had natural elements such as sand, soil, water, wood, living beings, stone, fire, etc. and The children's activity in the nature school were lack of a definite schedule Because it was done by the children themselves. The second group of the study consisted of children enrolling in the typical kindergarten, those who performed their activities in the indoor space of the kindergarten and the main activities of the children in the kindergarten included painting training, curricula, and crafts. Additionally, the children in this kindergarten did not have any outdoor experiences.

Bruininks-Oseretsky Test of Motor Proficiency was used to measure motor development (gross motor skill) that consists of eight subtests (running speed and agility, balance, bilateral coordination, strength, upper-limb coordination, response speed, visual-motor control, and upper-limb speed and dexterity), with a total of 46 separate items that provide a comprehensive index of motor proficiency, as well as separate measures of both gross and fine motor skills (Flegel & Kolobe, 2002). Also Torrance Test of Creativity Thinking was used to measure children's creativity (Trisnayanti et al., 2019). The data were evaluated in terms of normal distribution using the Shapiro-Wilk test. A mixed ANOVA analysis of variance was used to examine the research hypotheses.

Results

The multivariate test of the mixed ANOVA showed that in nature school group, time (pretest-posttest) main effect ($F=48.74$, $p=0.0001$, partial eta square =0.63), gross motor main effect ($F=32.004$, $p=0.0001$, partial eta squared=0.53), and the interactive effects of time *groups *motor skills were significant ($F=48.074$, $p=0.0001$, partial eta squared=0.62). The multivariate tests showed that the interactive effects of the test stages, intervention groups, and gross motor development were significant ($p=0.0001$). Also in kindergarten group, time (pretest-posttest) main effect ($F=439.39$, $p=0.0001$, partial eta square =0.94), creativity main effect ($F=1158.19$, $p=0.0001$, partial eta squared=0.98), the main effect of the groups ($F=28.80$, $p=0.0001$, partial eta squared=0.51), interactive effect between group and time ($F=307.23$, $p=0.0001$, partial eta squared=0.92), interactive effect between creativity and time ($F=119.27$, $p=0.0001$, partial eta squared=0.75), interactive effect

between group and creativity ($F=12.34$, $p=0.0001$, partial eta squared=0.31) and the effect of the interaction of time *groups *creativity were significant ($F=71.30$, $p=0.0001$, partial eta squared=0.72).). The multivariate tests showed that the interactive effects of the test stages, intervention groups, and creativity were significant ($p=0.0001$).

The size effect values also showed that 77% of changes in gross motor skills, 90% in expansion factor, 80% in initiative factor, 69% in fluidity factor, 79% in flexibility factor and 95% change in total creativity of children were influenced by their activity in natural space.

Results of mixed ANOVA showed that gross motor skills of children in the natural space were more improved than those in the indoor space. Also, activity in outdoor space had a positive and significant effect on the all five factors of creativity (fluency, flexibility, originality, elaboration and total creativity skill) of children. Moreover, the differences between the two groups showed that the children who were active in the natural space made more improvement in gross motor development and creativity factors than kindergarten children.

Discussion and conclusion

Our findings highlighted that natural outdoor activity has positive and significant effects on gross motor development and creativity of children and it is suggested that children need to be active and play in environments that have a lot of variety and challenges (such as nature). Development of motor skills and abilities in young children are associated with motor active behaviors in adulthood (Kohl & Cook, 2013). Studies also report creative thinking scores have been decreasing significantly in recent years in children across all ages. Creative thinking, defined as novel thinking and production of valuable ideas, is a crucial skill in society (Wojciehowski & Ernst, 2018). Therefore, parents and preschool educators should be aware of the importance of the early identification of environmental factors that could improve optimal development in children and provide a healthy effective environment and plenty of opportunities for perceptual-motor experiences to help children's development. However, it should be noted studying the factors affecting children's development cannot be limited to one approach because the environment in which a child is being reared is a multifactorial system.

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