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Reconstruction Of A Learning Ecosystem Based On Pedagogical Space: An Integrative Analysis Of Facilities And Infrastructure Standards In Stimulating Early Childhood Development

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ABSTRACT

Early Childhood Education is the main foundation of human resource development, where the quality of stimulation from the learning environment is crucial for a child's holistic development. This research is motivated by the importance of transforming infrastructure from mere physical facilities into pedagogical spaces that actively stimulate child development. The purpose of this research is to integratively analyze the condition of infrastructure standards fulfillment, its function as a pedagogical space, aspects of child development that are stimulated, as well as supporting and inhibiting factors at Attractive Bunda Tami Kindergarten, Tasikmalaya Regency. The research used a qualitative approach with descriptive methods. Data were collected through passive participatory observation, in-depth interviews with the principal and 6 teachers, and documentation studies. Data analysis followed the interactive model of Miles and Huberman. The results show that the infrastructure at Attractive Bunda Tami Kindergarten generally meets standards and functions optimally as a pedagogical space. This is evident in the arrangement of learning centers, nature-based exploration areas, and the use of multifunctional educational play equipment (APE) that can integratively stimulate cognitive, language, motor, social-emotional, artistic, creative, as well as religious and character values of children. The main supporting factors include teacher creativity and the support of the principal, while inhibiting factors include limited facilities and the administrative burden on teachers. This study concludes that meeting infrastructure standards, managed creatively and sustainably, has reconstructed the learning ecosystem into a humanistic, contextual, and meaningful pedagogical space for early childhood development.

Keywords: *Learning Ecosystem, Pedagogical Space, Facilities And Infrastructure*

INTRODUCTION

Early Childhood Education plays a crucial role in shaping the quality of future human resources. Early childhood is often referred to as the golden age, a period during which children's brain development is rapid and they are sensitive to stimulation from their environment (Suyadi & Ulfah, 2015). The success of PAUD is determined not only by the curriculum or learning methods, but also by the quality of the learning environment, which provides concrete, safe, comfortable, and stimulating experiences. John Dewey (1938) emphasized that education is a process of reconstructing experiences through the interaction of individuals with their environment. In the context of PAUD, the learning environment is an integral part of the pedagogical process itself.

The Indonesian government has established standards for facilities and infrastructure as part of the National Education Standards through Government Regulation Number 57 of 2021, which was updated by Government Regulation Number 4 of 2022, and further elaborated in Minister of Education, Culture, Research, and Technology Regulation Number 22 of 2023. This regulation requires every PAUD unit to provide facilities that are safe, healthy, comfortable, inclusive, and support optimal child growth and development. However, meeting standards is often understood narrowly as physical availability, rather than as an effort to create pedagogical space—a space consciously designed to invite exploration, creativity, and social interaction (Malaguzzi, 1998; Curtis & Carter, 2015).

Based on initial observations at the Atraktif Bunda Tami Kindergarten in Tasikmalaya Regency, it was found that although the school has adequate facilities, their optimal use as a pedagogical space still needs improvement. This research is crucial for bridging the gap between meeting physical standards and creating a learning ecosystem that truly stimulates children's holistic development. Previous research by Atmodiwirjo (2014) and Yufiarti et al. (2022) focused more on the concept of the environment as the third teacher in general, without integratively linking it to the latest national standards and the context of child development stimulation in specific institutions.

Therefore, this study aims to: (1) describe the actual conditions for meeting infrastructure standards at the Atraktif Bunda Tami Kindergarten; (2) analyze the role of infrastructure as a pedagogical space; (3) identifying aspects of child development that are stimulated; and (4) analyzing supporting and inhibiting factors in its utilization.

METHODOLOGY

This research employed a qualitative approach with descriptive methods. This approach was chosen because it aimed to deeply understand the phenomenon of infrastructure utilization as pedagogical space in its natural context (Moleong, 2017). The research was conducted at Atraktif Bunda Tami

Kindergarten, Tasikmalaya Regency, during the even semester of the 2025/2026 academic year.

The research subjects were determined purposively, including the principal and six teachers directly involved in the management and utilization of infrastructure. Data collection techniques used three methods: (1) passive participant observation of the school's physical condition and learning activities; (2) in-depth semi-structured interviews; and (3) documentary study of the school profile, facility inventory, and activity documentation. Data validity was ensured through source triangulation (comparing data from the principal, teachers, and documents) and technical triangulation (comparing the results of observations, interviews, and documentation) (Patton, 2015). Data analysis used the interactive model of Miles, Huberman, & Saldaña (2014), which includes data reduction, data presentation, and conclusion drawing/verification.

RESULT AND DISCUSSION

A. Current Condition of Facilities and Infrastructure and Their Function as Pedagogical Space

The research results indicate that Bunda Tami Atraktif Kindergarten has generally adequate infrastructure. Available facilities include child-friendly classrooms with easily accessible low shelves, learning centers (natural materials, numeracy, faith and piety, art), indoor and outdoor play areas, a playground, educational play equipment (APE), a reading corner, digital media (Smart TV and tablet), animal enclosures (birds, chickens, rabbits), a fish pond, educational plants, and sanitation and health facilities. These conditions meet the basic needs mandated by Minister of Education, Culture, Research, and Technology Regulation No. 22 of 2023.

More than just physical fulfillment, this study found that the infrastructure functions as a pedagogical space. This is evident in several indicators: (a) flexible spatial planning that allows children to choose activities independently; (b) teachers' multifunctional use of APE to stimulate various aspects of development; (c) utilization of the surrounding natural environment (animal enclosures, fish ponds, plants) as contextual learning resources; (d) the existence of habituation programs such as LISA (See Trash, Pick Up) and BeBas KoMiBa, which integrate character values into environmental management.

This finding aligns with Montessori's (1967) concept of a prepared environment and the concept of the environment as the third teacher from the Reggio Emilia approach (Edwards, Gandini, & Forman, 2012). The environment is no longer passive, but actively "talks" and "invites" children to explore, as emphasized by Olds (2001) who argued that good spatial design will influence children's behavior and the quality of their interactions. Vygotsky (1978) also emphasized the importance of mediating tools such as APE and a symbol-rich

environment for children's cognitive development through social interaction.

B. Stimulating Child Development

The use of pedagogical space at Bunda Tami Atraktif Kindergarten has been proven to stimulate all aspects of child development holistically and integratively, in line with the targets of the National Early Childhood Education Standards (Permendikbud No. 137 of 2014).

A. Cognitive Development: Stimulated through puzzles, blocks, experimental media in the natural materials center, and exploratory activities such as observing plant growth and the water cycle. This supports Piaget's (1952) theory that children construct knowledge through the manipulation of concrete objects.
B. Language Development: Reading corners, picture books, conversation activities, and the use of audio-visual media enrich children's vocabulary and communication skills, in line with Vygotsky's (1978) theory of the zone of proximal development (ZPD).
C. Motor Development: Playground areas, slides, swings, and stringing and cutting activities develop gross and fine motor skills. Gallahue and Ozmun (2006) emphasized that the quality of the play environment significantly influences children's motor development.
D. Social-Emotional Development: A safe and warm environment, a culture of queuing, and the practice of the "four magic words" (sorry, please, excuse me, thank you) help children learn to cooperate, share, and manage emotions, which are at the heart of Erikson's (1963) psychosocial development theory at the initiative vs. guilt stage.
E. Religious Values and Character: The practice of prayer, greetings, and daily worship practices, as well as the BeBas KoMiBa program, instill responsibility and caring. Lickona (2012) states that character is formed through habits and role models within the school culture.

C. Supporting and Inhibiting Factors

The success of the transformation into a pedagogical space is inseparable from supporting factors, namely: teacher creativity and competence in utilizing and creating PPE from recycled materials, policy support from the principal, allocation of maintenance funds, and a positive school culture. However, several inhibiting factors were also identified: limited availability of some types of PPE, damage to facilities due to intensive use, limited ability of some teachers to integrate digital media, and administrative burdens that take up teachers' time in designing optimal learning environments. These findings underscore that the quality of a pedagogical space is not solely determined by the sophistication of

the facilities, but also by the capacity of human resources to manage them (Sagala, 2013).

CONCLUSION

This study concludes that Bunda Tami Atraktif Kindergarten has successfully reconstructed its learning ecosystem from merely meeting physical facility standards to a humanistic, contextual, exploratory, and meaningful pedagogical space. The available infrastructure, managed with the creativity of teachers and the support of the principal, is able to integratively stimulate all aspects of early childhood development. Inhibiting factors such as limited facilities and administrative burdens need to be addressed systematically.

This study's recommendations are directed at: (1) Schools, to continue developing a variety of Early Childhood Education (APE), art facilities, and outdoor exploration areas on an ongoing basis; (2) Teachers, to continuously improve their competencies in technology utilization and learning environment design; (3) Parents, to strengthen synergy with schools in building a consistent educational ecosystem; and (4) Future researchers, to quantitatively examine the influence of pedagogical space on child development outcomes or conduct comparative research across PAUD institutions.

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