



OPTIMIZING NATURE PLAYSCAPES FOR PRESCHOOLERS: INTEGRATING AI AND TOPO TOOLS FOR ENHANCED OUTDOOR RECREATION PLANNING

Nurul Aqila Abd Razak¹

Department of Recreation and Ecotourism
Universiti Putra Malaysia, Serdang, Selangor
Malaysia
aqilarzak@gmail.com

Azita Ahmad Zawawi^{2*}

Department of Recreation and Ecotourism
Universiti Putra Malaysia, Serdang, Selangor
Malaysia
azitazawawi@upm.edu.my

*Corresponding Author email: azitazawawi@upm.edu.my

Submitted: 17 June 2025

Revised: 31 August 2025

Accepted: 10 September 2025

Peer-review under responsibility of 9th ASIA International Multidisciplinary Conference (Songkhla, Thailand) Scientific Committee
<http://connectingasia.org/scientific-committee/>

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Office # 6, First Floor, A & K Plaza, Near D Watson, F-10 Markaz, Islamabad. Pakistan,
editor@readersinsight.net

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ABSTRACT

As digital technology becomes increasingly embedded in daily life, the need to balance screen time with outdoor play has never been more critical. In Malaysia, limited research explores how natural playscapes contribute to preschoolers' development, particularly from the perspective of parents selecting optimal outdoor spaces for their children. This study assesses parents' perceptions of nature playscapes and their impact on children's cognitive, emotional, and physical well-being. Using AI-powered analysis and TOPO tools, this research evaluates natural elements that enhance preschoolers' engagement in outdoor recreation. Findings reveal that parents recognize nature playscapes as instrumental in reducing anxiety, fostering resilience, and promoting physical activity. However, key barriers include safety concerns, inadequate access to natural spaces, and unpredictable weather conditions. By leveraging AI for data-driven playscape planning, this study advocates for a future where intelligent design strategies optimize outdoor recreation areas. Future research should explore AI-driven spatial mapping, adaptive playscape designs, and interactive nature-based learning environments to ensure the long-term benefits of outdoor play for future generations.

Keywords: *AI-Powered Analysis; Outdoor Recreation; Playscape; Preschoolers; TOPO Tools*