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EXPLORING SUSTAINABILITY CONSIDERATIONS IN STUDENTS' DESIGNS FOR FUTURE
SPACE SETTLEMENTS: INSIGHTS FROM A NATIONAL SPACE OLYMPICS

Abstract

The Israeli Space Agency's annual "Space Olympics" competition engages children aged 9-14 in space-related challenges. This year, as the leader of the development team, I had the privilege of overseeing the event. The theme of this year's competition was to design a habitat (ages 9-11) or a space vehicle (ages 12-14) for future settlements in the solar system. The competition takes place in a hybrid format, between February and June 2024, and includes three stages, ending with a face-to-face final event. With approximately 300 school teams participating, the competition serves as a platform for fostering teamwork, problem-solving skills, and project-based learning alongside space exploration concepts. While the guidelines for the challenges do not explicitly mention sustainability, the nature of the tasks inherently invites considerations for sustainable practices in space settlement planning. Students are encouraged to explore aspects such as energy resources, resource management, waste management, and environmental impact mitigation within their designs. The central research question of this study is to what extent students incorporated sustainability considerations in their designs? By examining the products of the challenges and analyzing the planning processes, we aim to uncover insights into students' perspectives and their capacity to envision environmentally conscious space settlements. The focus lies on the quality and extent of sustainability considerations embedded in their designs, addressing key aspects such as energy reliance, resource efficiency, waste reduction, and environmental preservation. Through this investigation, we seek to understand how young minds conceptualize sustainability in the context of space exploration and settlement. By evaluating the outcomes of the Space Olympics challenges, we can gain valuable insights into students' awareness, understanding, and application of sustainability principles. Ultimately, this research contributes to fostering a generation of space explorers who prioritize long-term viability and responsible resource management in their visions for the future of humanity beyond Earth. This paper will present a detailed analysis of the competition's outcomes, shedding light on the role of education in shaping sustainable perspectives among young innovators in the field of space exploration and settlement.