

IAF SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)  
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LEVERAGING SPACE AS AN INNOVATION FACTOR FOR STEAM EDUCATION IN EARLY AGES:  
REDESIGNING LEARNING MODULES IN PRIMARY SCHOOL LEVELS IN COSTA RICA BY  
INCLUDING SPACE APPLICATIONS THROUGH THEIR LINK WITH THE SUSTAINABLE  
DEVELOPMENT GOALS.

**Abstract**

The developmental years between ages 5 to 12 are critical, as they signify the foundation for creativity, critical thinking, and conflict resolution. During this pivotal stage, fostering an early attraction to science and technology is crucial. However, the current educational system lacks tools to foster children's logical thinking and passion for STEM careers. There's a pressing need for creative and motivational tools in sciences and mathematics, that can ensure learning will be perceived not only as an academic endeavor but also as an enjoyable experience, preventing trauma or self-doubt. Children's natural attraction to fantasy, science fiction, and imagination realms beyond the visible are often ignited and fueled by the concepts of the universe. Turning space into a valuable tool to be integrated into all STEM subjects, guiding the transformation of professional trajectories while creating stimulating experiences in schools. By reviewing the content of the Primary School Educational Programs of Costa Rica's Public Education System and the teacher's opinion on the proposed approach, kindergarten to 6th grade, this paper provides our initial conclusions for a how-to guide for space-centric STEAM teaching from early ages at schools. Achieved by including practical examples of space applications and their link to the Sustainable Development Goals targets among the discussed topics per academic subject. To test the children's appeal and understanding of the proposed topics a two-day hands-on workshop, for ages 5 to 12, was conducted in December 2023 under the name "Galileo Space Camp". Including several eye-catching science experiments. Attendance and feedback from both parents and children reinforced the value of a stimulating and creativity-friendly learning environment guided by space topics. The need for further technical guidance for teachers was confirmed to be mainly linked to the simplification of the explanation of the space applications to relatable experiences. Therefore as a need to move forward with the analysis of the curricula and the capacitation of teachers, the Orion Outreach Foundation was established aiming to establish a global space education cluster.