

IAF SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)  
Lift Off - Secondary Space Education (2)

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## IDEIA SPACE'S STEAM PROGRAM, AN INNOVATIVE EDUCATIONAL PROJECT IN BRAZIL

**Abstract**

The universe has always been a fascinating subject to humankind. Since the very first time we looked at the stars, we take it in magical, religious, philosophical and scientific ways, and it always gets us to ask more questions about our universe, our world and ourselves. Therefore, because of Space's multidisciplinary potential, it can grasp the attention of anyone who encounters space related subjects at some point. In Brazil, the teaching of school subjects is still very antiquated and there is little incentive for children to follow scientific paths. So, by using Space as a tool to better engage students in their own learning processes, the group Ideia Space created an innovative program that engages middle school students and provides them with scientific experimentation. Through active methodologies such as PBL and gamification, Ideia Space aims to motivate students on learning and getting involved in STEAM. The program consists of a 20-hour course that simulates a space mission using an educational PocketQube satellite model. Students are divided in groups of 4 people and go through the 5 stages of a space mission. The first stage is the Mission Concept, in which they think together what kind of data they want to collect and what experiments they will need to make based on their grade's curriculum. The second stage is the Mission Calculation, where students choose which sensors their satellite requires to perform the mission. The third stage is the Project, where they use a provided kit to assemble the PocketQube for their mission. The kit contains: one 3D printed structure that accommodates the electronics; batteries and solar panels as the EPS; one CPU as the OBDH; altitude sensor, gyroscope and accelerometer as the AODCS; antennas and GPS as the TTC; and a group of different sensors and modules of which the students can choose their payload. After that, the fourth stage begins, which is a drone takeoff with the PocketQube attached so it can collect the data and simulate a satellite in orbit. With all the data collected, the last stage begins with the analysis of these informations. Through the educational program of Ideia Space, students can have a first hand experience of a space mission, work interdisciplinary areas of knowledge, engage in ONU's SDG number 4 and also improve themselves by working with real problems and building data based solutions since school's age.