IAF SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)
On Track: Undergraduate Space Education (3)

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CUBESAT IN AUGMENTED REALITY FOR UNDERGRADUATE EDUCATION

Abstract

At present, Peru has a National Digital Transformation Policy, which includes objective OP4 on digital talent, aimed at strengthening digital skills across all segments of the population, and objective OP6 on digital innovation, which seeks to ensure the ethical utilisation and deployment of exponential technologies within society. Furthermore, in 2025, the National University of Engineering launched the country's first Aerospace Engineering degree programme, with the goal of training professionals with a robust knowledge base in space related topics. Against this backdrop, efforts are being made to advance the digitalisation of fields related to satellites, with the aim of making this sector more accessible and economically viable for the academic community.

This study presents the results of a course that employed emerging technologies, including augmented reality, virtual reality, and open access design software, to teach university students about the full project lifecycle of nanosatellites. These technological tools not only facilitated interactive learning but also enhanced students of understanding, thereby transforming the educational process into a more engaging and didactic experience.

To conduct this study, a practical course was developed, enabling students to assemble a CubeSat and familiarise themselves with the entire lifecycle of a satellite project, encompassing everything from defining requirements to the design, assembly, and integration of systems. Digital tools were utilised to simulate and guide students through these stages. Additionally, participants of progress was assessed through surveys and examinations conducted before and after the course, allowing for an evaluation of the approach's effectiveness and an analysis of knowledge acquisition.

The findings indicate that undergraduate students from various universities across the country were able to develop a profound understanding of the capabilities and processes involved in the creation of nanosatellites. This innovative educational approach not only enhanced their technical expertise but also increased their awareness of the relevance of satellite technology in contemporary society.

Ultimately, the study demonstrates that teaching satellite systems through a low cost, accessible course represents a viable alternative in developing countries such as Peru. This approach not only facilitates the acquisition of critical satellite technology skills but also raises awareness among students of the necessity of integrating these technologies into global solutions. Looking ahead, it is proposed that this model could be replicated in other regions, thereby opening new opportunities for the training of professionals in the field of nanosatellites, while simultaneously contributing public value to satellite technology.