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

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DEVELOPING INNOVATION CAPABILITIES IN HIGH SCHOOL STUDENTS THROUGH HANDS-ON ENGINEERING ACTIVITIES

Abstract

The Australian Science, Technology and Engineering Council's (ASTEC) Foresight Report flagged Innovation and Technacy as a national agenda for all Australians in 1996. Preceding this report by a decade and a half was a manifesto, aptly titled 'Education for Capability', signed by over 140 leaders from education and industry detailing their concerns over a lack of innovation capabilities in the British education system. Fastrack to 2020, and many countries, including Australia, are still grappling with effective strategies to develop the 21st century skills in students across Foundation to Year 12 that were embodied in these two reports. Skills such as the 4Cs of communication, collaboration, critical thinking and creativity are aligned with the development of innovation capabilities that governments, industries and academia are all espousing are needed to help solve the ever-increasing complexity of problems faced by our society. The solutions to many of these so-called 'wicked problems' will be reliant upon future breakthroughs in space technologies, which is very much dependent upon our educators being better equipped with the resources needed to scaffold and develop design innovation abilities in their students. Technacy is the technological equivalent of literacy and numeracy, which provides teachers with a conceptual framework to assist students in developing their technology comprehension skills. This paper will examine the current state of the teaching of engineering in Australian high schools and how this relates to developing innovation capabilities that will better prepare students for undertaking university design and engineering courses, and the benefits afforded to the space economy. Preliminary observations from a mixed method comparative case study involving students from two distinct stages of cognitive development will be shared, and the significance of a conceptual model and classroom methods to allow teachers to implement developmentally appropriate engineering activities will be presented.