IAF SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)
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SPACE & ROBOTS IN TEACHER EDUCATION

Abstract

This paper describes the products of a postgraduate seminar about the integration of robots in education. Some of the students chose to use space content as the context for their projects. The students are educators studying for M.Ed. degree in EdTech. They work in various grade levels and disciplines and study in a special track that focuses on space education and innovative technology. In the seminar students develop their own projects, using robots to solve educational problems, while the pedagogical model leads them through a process of modeling and fading scaffolds. The purpose of this pedagogical model is to train the students to use the same approach with their school students, preparing them to face challenges of the 21st century. Some product examples that will be presented: • A rover that was programmed by elementary school students while learning about the morphology of Mars. • A robot that was programmed by elementary school students to model planetary orbits. The significance of the study is expressed on several levels: At the level of teacher training, the importance relates to the connection between teaching and practice – between the ways of teaching in an academic course, and the teaching methods of the students-teachers in their classroom. At another level this study presents a model for preparing teachers to teach computational thinking and integrate digital code environments and robots of various types in the classroom. Students' reflections indicate that they appreciated the process they experienced and could see its advantages for coping with frustration and failure. For example: "The way was indeed long and full of challenges, but all the knowledge, creativity, and tools we have learnt will serve us in our work as teachers dealing with innovative technology." The final products of all the students show high levels of acquiring computational thinking skills as well as more confidence in teaching with technology. Some insights from the study are that the methodology of modeling learning of educational robotics for students who are educators lead them in a process including authentic challenges. Coping with these challenges combined emotional and cognitive aspects and resulted in a significant experience for the students as learners and as teachers.