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TECHNOLOGY IN SPACE EDUCATION AS A POSTGRADUATE PROGRAM PREPARING TEACHERS FOR THE FUTURE

Abstract

We Present an initiative of a new program for postgraduate students, focusing on technology in space education. The students are teachers or educators, graduated in various subject matters (e.g. language, science, literature, social sciences, arts), who are already teaching K-12 students. The program is part of M.Ed. studies in Educational Technology at the Kibbutzim College of Education in Israel. The goal of this program is to develop students' "space literacy", including preparation to deal with aspects of space in various subject matters, basic understanding of new space issues, and a solid background in computational thinking. Since innovative technology is always part of space missions, we decided to combine the area of space education with technology in education. In every course in this program there are aspects of space included, as well as technological tools used (e.g. sensors, robots, microbit, VR and AR). The pedagogical approaches most appropriate for technology in space education are based on the combination of computational thinking with creative learning and design thinking. For example, in one of the courses students are required to develop creative solutions to challenges related to the design of a new colony on Mars. The solutions must include Microbits, Tinybit robots, and compatible sensors. Students engage in a design process in which they prepare their projects, study the influence on their students, and reflect on their own learning and teaching. The design process usually involves many challenges and unexpected difficulties. Therefore, the learning process is scaffolded, so that the first task is easier than the next one. Nevertheless, since dealing with frustration and failure is one of the main competencies needed in the 21st century, we see this experience as an important part of the studies. Students should understand that failure is a necessary step in any innovative design process, and conclude that with the right mentoring they will be able to overcome any challenge. We will show evidence from students' reflections during the years 2020-2021. During this time covid19 challenges were added to the "regular" challenges of the design process. These reflections indicate that students appreciated the process they experienced and could see the advantages of coping with frustration and failure. E.g. – "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"