Abstract

The aim of this paper is double: (a) to record the latest theoretical considerations (literature review) in the field of STEM (acronym of Science, Technology, Engineering, Mathematics), Educational Robotics and the Educational Robotic Platforms used in their implementation, and (b) to validate the argumentation on the potential contribution of an Action Research implementation on STEM education with the ultimate goal of designing and developing an “open philosophy”, low-cost, hardware and software educational platform for the implementation of STEM and Educational Robotics. This paper is divided into 7 sections: Introduction, STEM Education, Educational Robotics, Problem statement, Action Research, Methodology, and Conclusion. The Introduction introduces the concept and necessity of STEM education approach. STEM Education section reviews recently published scientific literature related to STEM education (literature review) and summarize the pros and barriers of its use in education. Educational Robotics introduces the robotics as an educational tool and presents empirical evidence on its effectiveness. Educational Robot Platforms subsection presents the most
popular -along with their main specs- educational robots for STEM and Educational Robotics use. Problem statement section identifies the scientific gap and composes the necessity to implement research (specifically an Action Research) on designing and developing an “open philosophy”, low-cost, hardware and software academic platform for the implementation of STEM and Educational Robotics. Action research section reviews recently published scientific literature related to action research. Research Methodology section presents research’s proposal development phases and finally, Conclusion summarizes paper’s findings.

References


14. Ioannou M and Bratitsis T, “Utilizing Sphero for a speed related STEM activity in


2013.


in mechatronic education,” 2018.
66. F. Wyffels, M. Hermans, and B. Schrauwen, “Building robots as a tool to motivate
67. M. J. G. Trigo, P. Standen, and S. Cobb, “Why are educational robots not being used in Special Education schools despite proof that they are beneficial for their students?,” in 12th ICVRAT with ITAG, 2018, pp. 1–9.
middle grades students and teachers can benefit from STEM experiences,” Middle Sch. J., vol. 48, no. 3, pp. 15–24, 2017.


Index Terms

Computer Science Information Sciences

Keywords