

## **SYMPP - (18738) - STEM EDUCATION FROM THE PARK TO THE CITY: EDUCATIONAL VALUE OF MOBILE AUGMENTED REALITY GAME-BASED LEARNING APPROACHES**

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### **Short Abstract**

The claim for active learning approaches has been promoting the development of new teaching methodologies. These can integrate innovative elements, such as mobile devices, augmented reality (AR), and game-based learning, which allow learning to move beyond traditional classroom environments to outdoor spaces that students can physically explore. However, the educational value of this approach needs to be studied. Under EduPARK, a mobile AR game approach for contextual and interdisciplinary learning was created and explored in an urban green park by students and teachers. The EduPARK app was used as an illustrative case to analyse the approach's educational value based on students and teachers' perspectives, and on logs of game results. Thus, under a mixed method research, the Educational Value Scale was applied to 924 users of the EduPARK app, from basic and secondary school levels. The results indicate high scores, especially among students and teachers from the 5<sup>th</sup> to the 9<sup>th</sup> school grade. Hence, this particular approach seems to be more suitable for 10–15 years-old students who highlighted motivational features, such as treasure hunting, points gathering, the use of mobile devices in nature settings, and AR features to learn. Stemming from EduPARK's success emerges the EduCITY, which opens the park boundaries to the city, and to other cities. The aim is to enhance sustainable cities through the creation of a disruptive smart learning environment, sustained by a mobile app with active location games based on challenges, with AR educational resources. These games are co-created by the school, academic and wider community, and comprise enjoyable and interdisciplinary challenges to be explored by any citizen while touring the city. Future work involves studying how this STEM education smart learning environment promotes changes in knowledge, skills, values and attitudes in citizens to empower them towards sustainable development.

### **References**