

A Methodological Approach to Informal Learning: A Case Study on Learning Science in a Vr-Based Environment

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Abstract

Students typically struggle with subjects that require the concepts of STEM (Science Technology Engineering Math) topics since they are unable to integrate abstract knowledge with everyday life. Currently, innovative approaches have been adopted not only for the way the educational instructions are implemented but also for the physical attributes of the learning environments for the STEM concepts to be enhanced. In this context, informal learning environments such as museums and science centers enhance students' learning through extracurricular activities by making learning less formal so the students can experience scientific facts through hands-on interactive exhibits. Additionally, new educational technologies equipped with AR and VR have started to be widely used in transforming learning processes into tangible activities. This study presents the introduction of an innovative methodological approach to measure the spatial preferences and their achievements through a case study based on a VR-educational setting. A virtual environment of a science centre that is integrated with human agents as predicted by space syntax theory, is designated for the 7th-grade students to have the opportunity to interactively experience an educational tool about *cell structure*. The main goal of the study is to present the methodological approach of a research project that targets to test the relationship between the *spatial preferences* of the students together with their *learning levels* and the spatial characteristics of the informal learning environment in terms of the syntactic parameters of the science centre.

Keywords: informal learning environment, science learning, space syntax, spatial preference, VR-based education