

ADVANCING ASTRONOMY EDUCATION THROUGH IMMERSIVE LEARNING AND ENACTED ASTRONOMY

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Abstract

Immersive learning technologies have revolutionized education and transformed public outreach. In astronomy education, traditional learning methods (textbooks and lectures) cannot convey the vastness and complexity of the universe and its contents. In the concept of "enacted astronomy," students learn through interactive and experiential engagement with astronomical concepts using advanced technologies and role-playing activities. Using immersive learning techniques, the students can engage in interactive, three-dimensional experiences that bring astronomical concepts to life, enhancing comprehension and helping to retain the knowledge for future reference. Immersive learning techniques include, among others, simulations of celestial phenomena, virtual tours of the observed universe, interactive models of astronomical objects, or a human orrery. These provide students with a sense of scale that is important for understanding concepts such as planetary orbits, or the structure of galaxies, sense of time and presence which can help in gaining perspectives of celestial phenomena such as the life cycle of stars or the vicinity of a black hole. It is also possible to combine these techniques, for instance a Virtual Reality orrery experience, in which case the users interact with an advanced, dynamic model of the solar system that incorporates real-time simulations of the motions of celestial bodies. This can apply to both, classroom settings and public educational programs. In conclusion, immersive learning environments and experiential learning, leverage the power of embodiment and active learning and entail cognitive and motivational benefits, stimulating curiosity and enthusiasm among students and making astronomy more accessible, engaging, and comprehensible to audiences at all levels of education.