SYNERGY OF VR AND 3D PRINTING: EMERGING TECHNOLOGIES FOR INNOVATIVE TEACHING IN MATHEMATICS AND MEDICINE

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Abstract

Virtual reality and 3D printing offer an array of promises, yet the meaningful application of these technologies in the classroom is still elusive for teachers across disciplines. This presentation discusses the empirical findings of action research aimed at establishing innovative teaching strategies for integrating immersive VR videos and 3D printing into mathematics and medicine curricula. The conducted study centers around three pivotal components:

a) classroom intervention that involves implementation of VR/3D printing as an alternative to traditional teaching methods;
b) observation of both students and teachers’ perspective on instructional value of VR/3D;
c) call for action and re-modeling of the current content delivery and assessment strategies in elementary mathematics and anatomy courses.

This study is based on sequential exploratory research design with data collected at a liberal arts college located in the New York metropolitan area during academic 2017/18.

Specifically, the discussion emphasis is placed on examining how VR and 3D printing technology can be utilized to elicit student engagement, transform abstract concepts into the tangible experience and establish an empathic mindset relevant for the given topics. In addition, the presenter will identify essential factors that shape the process of teachers’ preparation for selective adoption of pre-made instructional VR content including 3D models. Finally, special attention will be given to the process of creating authentic VR/3D instructional materials customized to meet the individual needs of students. Challenges and future research directions will be addressed accordingly.

Keywords: Emerging technologies, virtual reality, 3D printing, teaching methods, innovative pedagogy, medicine, mathematics.