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Use of virtual and augmented reality tools to support teaching engineering safety principles and practices

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ABSTRACT

CONTEXT

This paper describes and examines the use and effectiveness of digital tools to support teaching of engineering safety principles and practices; particularly the use of Virtual Reality (VR) and Augmented Reality (AR) to simulate a workplace safety inspection and incident investigation activity.

PURPOSE OR GOAL

AR and VR tools can help provide environments for students to safely examine, investigate and assess issues related to engineering safety principles and practices. The purpose of this paper is to describe and discuss how AR/VR is used to help facilitate learning in a masters unit of study at the University of XXXXXX, and to compare and contrast the student experience of immersive learning equipment (Ocular Rift VR headsets) with 360º videos viewed on a standard two-dimensional screen.

APPROACH OR METHODOLOGY/METHODS

The two tasks discussed in this paper have been included in the unit of study since its inception a decade ago, but the method of implementation has evolved with the availability of VR/AR tools including Ocular Rift headsets. The student learning experience during these activities is examined using student and tutor feedback. In 2022 it is anticipated that the student cohort will be split based on on-campus and online delivery modes, providing an opportunity to examine the effectiveness of Ocular Rift based immersive learning activities (on-campus) in comparison to more common 360º videos viewed on a standard screen (online students).

ACTUAL OR ANTICIPATED OUTCOMES

Anticipated outcomes are that VR/AR tools help increase student engagement with learning activities and enable a more immersive experience when examining safety in engineering workplaces, improving their knowledge and understanding of safety principles and practices.

CONCLUSIONS/RECOMMENDATIONS/SUMMARY

VR/AR is an effective learning tool that can increase student engagement with learning and provide students with greater insight into engineering safety principles and practices.

REFERENCES (OPTIONAL)

KEYWORDS

Safety, Augmented Learning