

Assessment of Holographic Environment for Learning Sensing Technologies in CEM Education

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ABSTRACT

Despite the benefits and suitability of mixed reality as a learning tool for spatial and haptic delivery of educational content, the adaptability of mixed reality for teaching sensing technologies in construction education remains ambiguous. Sensing technologies have potentials to advance construction performance as highlighted by several studies and construction industry reports. To equip future workforce with the required skills, it is important they experientially deploying these technologies on the job site. However, institutions are experiencing different constraints such as weather, schedule, and COVID-19 restrictions to provide future workforce with required hands-on learning. The study argues the pedagogical value of a mixed reality learning environment for teaching sensing technologies through a usability study with construction engineering and management students who are familiar with sensing technologies. The study employed quantitative and subjective users' evaluation through a cognitive walkthrough of the learning environment using a mixed reality head-mounted display. Subjective data were obtained using think-aloud protocol and questionnaires on users' experience. Eye tracking device inbuilt in the mixed reality head-mounted display was employed to monitor the eye gaze movements and provide quantitative data of users' cognitive workload. Results from eye tracking, think-aloud protocol and questionnaires were triangulated to validate findings from the study. The study reveals the ease of use and effectiveness of the environment for learning sensing technologies. The characteristics, benefits, and deficiencies of the learning environment as a pedagogical tool in construction education are further highlighted.