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Implementing AR-assisted visualisation to enhance BIM-based modularisation design for MiC training

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Abstract:

In the Architecture, Engineering, and Construction (AEC) industry, Building Information Modelling (BIM) presents exciting opportunities for prefabrication and modularisation. Using modular construction, the AEC industry can increase productivity, solve housing shortages, lower construction costs, and reduce environmental pollution (Lu and Korman, 2010). Due to its perceived benefits and changing mindset, modular construction has attracted unprecedented investment and interest. As part of its Policy Address 2017, the HKSAR Government promotes using Modular Integrated Construction (MiC) technology to increase productivity in the AEC industry and alleviate labour shortages. Despite this, MiC technology results in a disruptive change to traditional practices. The exponential change also affects tertiary education as existing learning models must be adapted to evolving technology to prepare the next generation. Teaching and learning are made more effective by innovative pedagogical tools (Khairnar, 2015). As a result, instructors should combine innovative tools with emerging learning models to transform education. A significant paradigm shift in the AEC industry is being triggered by adopting augmented reality (AR) technology. AR involves superimposing computer-generated information over a user's real-world view. Previous studies have shown that AR applications in the learning environment can offer students an immersive learning experience based on discovery (Behzadan and Kamat, 2013; Chen et al., 2015; Diegmann et al., 2015). This proposal aims to show how a CityU BIM expert teams up with programmers and modellers to develop a transformative AR app to improve architecture and engineering education. Using the AR app, students can create modularisation design and enhance the efficiency of design reviews by leveraging AR technology. Hence, implementing AR-assisted visualisation in an interactive learning environment can enhance the process of MiC training.