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RoomstoRoam: Using a semi-immersive 3D virtual environment for gamified formative assessment

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Abstract

The Covid-19 pandemic has accelerated hybrid learning. Most educational institutions found they needed to deliver their courses or subjects through different online platforms or via printed modules to achieve learning outcomes. These learning delivery methods were effective to some but not to others as they were not able to reach their desired level of competency or mastery. To improve learning online, some educators have used game-based learning platforms to increase student interaction and engagement as well as inspire students to attain various learning goals. This study explores the use of a semi-immersive 3D virtual environment to conduct formative assessments in a gamified approach. The application used has two main components: The first utilizes an online platform where educators create and curate their assessments. An open-source general-purpose scripting language for the web and an open-source relational database management system was used to design and develop this component. The second component uses a 3D game published on mobile and the web. Students take their current assessments by entering their subject room within the virtual school. They answer each question by locating and collecting the 3D object that is being identified and putting it on its respective placeholder. The result of the activity is presented on the leaderboard. To develop the game and virtual environment, an industry-standard game engine and 3D modeling software package were used, respectively. Moving forward, a semi-virtual environment consistent with the dynamics of a post-pandemic world provides another venue to conduct effective gamified formative assessments.

Keywords: assessment, formative, gamified, semi-immersive, virtual