

Chapter 11

Integrating Augmented Reality Into the Workshop Model Remote Learning Classroom

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ABSTRACT

The global pandemic has forced schools across the globe to go to online learning environments. This chapter describes the potential of integrating augmented reality technologies into a virtual immersive workshop model of instruction. Effective utilization and integration of these immersive tools in the workshop model has the potential to develop learners' 21st century skills to be decision makers, problem solvers, lifelong learners, creators, innovators, and to think critically in solving problems.

INTRODUCTION

Today K-12 educational system are implementing remote learning incorporating an augmented reality (AR) approach and virtualization to supplement the normal face-to-face teaching. The contemporary switch to the use of AR immersive virtual technologies in remote learning Workshop Model (WSM) classroom is crucial to education stakeholders. Earlier on, most large and small school districts across the nation have launched some effective technologies to enhance various instructional programs designed to assist young adults to develop 21st century required skills. Remote learning is a form of distance education or online learning that allows content dissemination for continued education through the application of information technology and Internet technology. The purpose of this chapter is to summarize how the application of innovative immersive technologies into the WSM remote classroom can be used to promote classroom interactive learning within an immersive AR and virtual reality (VR) system. Productive learning depends on how well one understands how immersive resources of AR and VR work to provide quality interactive learning in today's WSM classroom.

The purpose of this chapter is to define the design and implementation of innovative educational programs using AR simulations in today's remote learning WSM classroom. Most K-12 educational

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settings adopted remote or virtual learning as a pedagogical means to continue learning and disseminate content through the application of information and internet technology.

BACKGROUND

Changes from COVID-19 sparked educational settings to adopt a blended or online content delivery approaches. This rapid shift to remote or virtual learning became a prevalent alternative to face to face classroom instruction that is not realistic due to COVID-19 limitations to in person instruction. School districts modified their instructional plan and curriculum to meet the learning standards using new technologies.

As a result of this change, educators in K-12 educational settings were expected to continue the quality and explicit teaching and learning process of all content areas using online or blended classrooms. In response, teachers face the challenges of adopting best practices to foster 21st-century learning for every student. Koh et al. (2017) described twenty-first-century knowledge as the learning experiences that help students to promote the sociocultural, cognitive, metacognitive, productive, and technological competencies to function in a 21st-century workplace. Educators face the task to redesign and implement innovative learning environments that support student development toward a more dynamic, interactive, and global society.

Furthermore, the development of advanced 21st-century knowledge workers is critical in the present economy. Dole et al. (2016a) study found that the U. S. educational system requires new constructivist and differentiated pedagogies to prepare diverse students with required 21st-century skills. To attain this goal, teachers must adopt an innovative approach to change to a constructivist project-based learning environment (Dole et al., 2016b; Fullan & Langworthy, 2013). As a result, educators face the task of shifting their traditional teacher-centered method of instruction to constructivist learner-centered pedagogy to increase their students' readiness to succeed beyond k12 education.

Research by Liang and Akiba (2015) found that students who learn in constructivist environments tend to have more positive cognitive outcomes compared with students learning in a traditional learning environment. A constructivist learning environment is characterized with features such as (a) knowledge is shared between teachers and students; (b) teachers and students will share authority; (c) the teacher's role is one of a facilitator or guide and; (d) learning groups will consist of small numbers of heterogeneous students. This instructional approach allows students to construct their knowledge through investigation, collaboration, and reflection (Liang & Akiba, 2015).

Given that the traditional method of instruction does little in helping students develop confidence, ownership, and beliefs in their abilities and learning, teachers in today's educational settings need to provide student-centered instruction (Bautista et al., 2018). Studies have examined the effectiveness of utilizing innovative student-centered instructional approach in K-12 grade classroom (Casey et al., 2016; Bautista et al., 2018; Calkins & Tolan, 2010; Ciampa, 2016; Hattie et al., 2017; Hemmeter et al., 2016; Leu et al., 2017; Porath, 2016; Russell, 2012; Sand, 2018; Tomlinson, 2017).

The trend has necessitated a change in the instructional approach from traditional or teacher-directed didactic method to a student-centered approach which places the learner at the heart of the teaching process while the teacher designs the instruction to address the students' ideas, interests, and needs (Bautista et al., 2018). Student-centered instruction allows teachers to nurture the autonomy of the learner as well as assist students in developing key 21st century competencies such as collaboration, critical thinking,

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