Virtual and Augmented Reality: Applications to the Field of Adult Education in a Post-Covid-19 Era.

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Purpose of the Study

In a post-COVID-19 era the use of technologies have emerged to maintain physical distancing and continuity in education providing remote access to a myriad of instructional possibilities to engage learners in a more active and richer learning experience. The application of augmented reality (AR) and virtual reality (VR) technologies in education has increased as it has opened new possibilities in the teaching and learning process for adults. However, there has been a few efforts to systematically review the relevant works of literature in AR/VR implementation for adult education. According to the analyses by Fajardo-Tovar (2020) of three literature reviews, and one meta-analysis which were based on extensive literature review performed on articles from 2000 to 2018 on the use of AR in education, from 209 articles analyzed, only seven of them were related to the field of adult education. This literature review provide a broad overview of the augmented reality (AR) and virtual reality (VR) technologies and its applications to the field of adult education.

Methods

A literature review was performed in large databases such as ERIC (EBSCOhost), ERIC (ProQuest), Web of Science, Google Scholar. We searched using the following keywords in the title and abstract sections (("Virtual Reality" OR "Augmented Reality") AND (Adult Education)). The criteria used in locating the relevant papers were a) the application of AR and VR technologies in adult education; b) the article was released within the last five years. The researcher also suggested several recently published papers including prior surveys, which are representative of the field. After analyzing a total of fourteen articles relevant to the initial criteria, their core ideas were extracted, and results were summarized. The collection of these papers is listed in the references section.

Augmented Reality

Augmented reality allows the interaction with the surrounding environment by superimposing computer-generated content to enhance real scenarios (Radu, 2014, Yuen et al., 2011).

Virtual Reality

Virtual reality allows users to fully immerse and interact with non-existent virtual 3-D environments and objects (Allcoat & Mühlenen, 2018).

Augmented Reality

Skills Training

Bosch trains their technicians combining classroom instruction with the mobile AR training approach. This blended training facilitates the employee's reflective thoughts and the development of ideas into their work environments fostering a self-directed learning process (Jihye et al., 2018).

Cultural Integration

AR can be used for discovery-based learning to get immerse on real-world historical places increasing the understanding of different cultures, traditions, and languages (Rosenblum, 2000, Yuen et al., 2011).
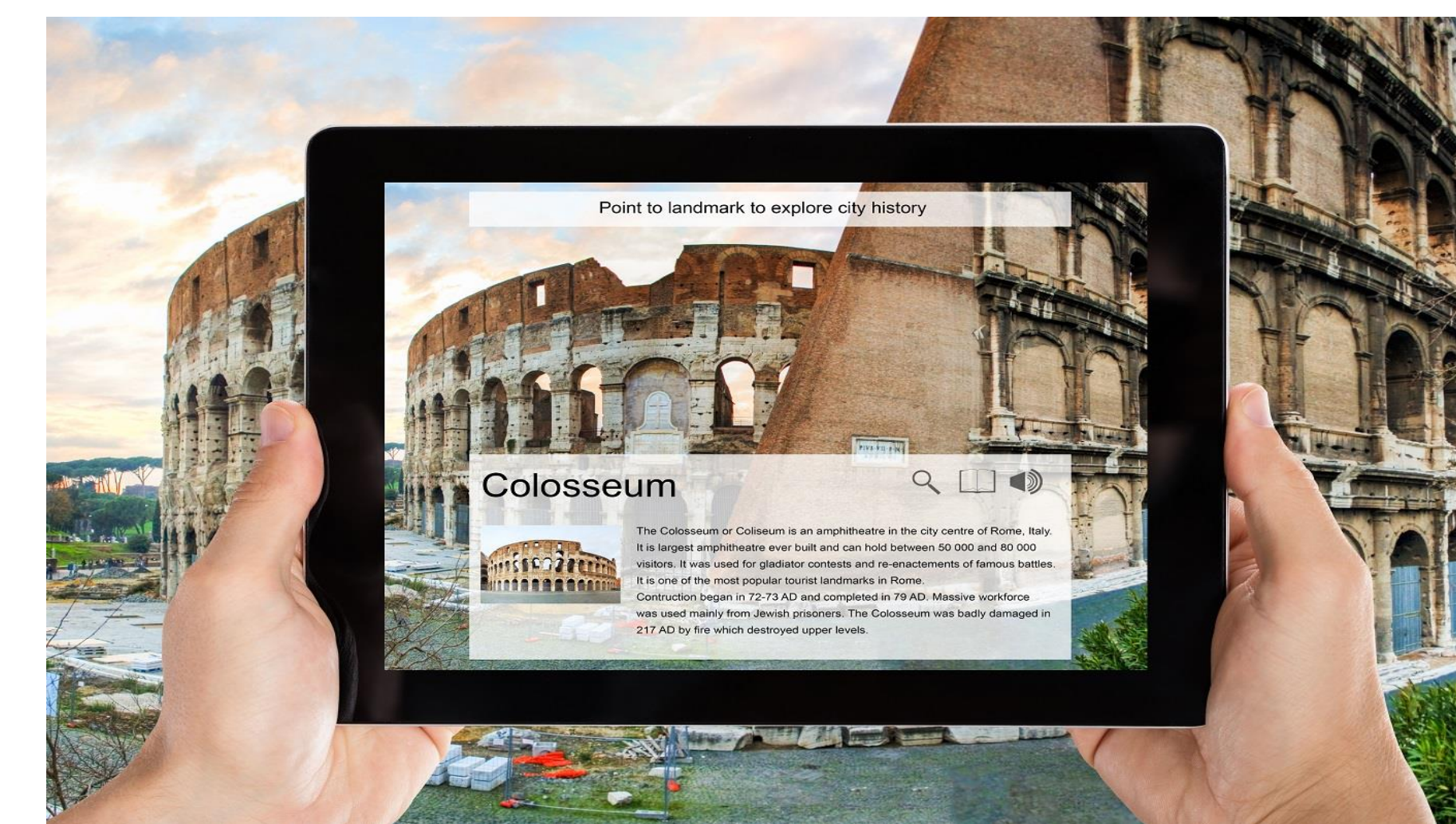
Immersive Learning

AR books can be used to participate in the story, interact with virtual objects, characters, and other readers to create immersive learning and to promote marginalized populations' cultural learning and social heritage (e.g Augmented Fotonovelas) (Hidalgo, 2015; Jones et al., 2017; Yuen et al., 2011).

Virtual Reality

Managerial Training

Walmart provides VR training programs to floor managers and workers with the opportunity to experience in-store scenarios addressing customer complaint situations. This approach has had higher levels of retention of employees' knowledge compared to the traditional training approach (Jihye et al., 2018).

Equitable Interaction

Adult learners can create an avatar to represent them in a VR environment to interact with other adults, to alter factors related to their personal real identity, and to learn and interact in a more equitable environment including situations and roles where they normally feel alienated (Cryss Burner et al., 2002).

Multisensory Learning

VR capacity of visual, audio and movement tracking integration allow three types of learning styles such as visual, auditory and kinesthetic that can be targeted in one application matching a variety of instructional methods and adults' learning preferences (Allcoat & Mühlenen, 2018).

Conclusions.

The use of AR and VR for educational purposes present great potential, not only to supplement or replace traditional learning methods, but to develop novel learning experiences. In a post-COVID-19 era, these technologies comply with the social distancing requirements and provide many advantages for education purposes. Different authors have pointed on the added benefits of using these active learning technologies including the higher rate of engagement, retention and understanding of information and the increase in positive emotions (Allcoat & Mühlenen, 2018), the opportunity to understand abstract models by immersing users on virtual environments without the distractions presented in many other types of educational environments (Salzman et al., 1999), the immersive nature of these technologies that facilitates greater learner involvement, motivation, and absorption of information (Jihye et al., 2018), the opportunity to teach complex spatial concepts that pose challenges to get real-world first-hand experience (Shelton & Hedley, 2002), the ability to provide rich contextual learning and foster self-directed learning (Hamilton & Olenewa, 2010), the capacity to enhance collaboration practice by supporting remote and collocated activities (Azuma et al., 2001), the capacity to understand concepts that required spatial understanding and visualization (Hamilton et al., 2021), the ability to provide customized and private learning experiences increasing the opportunities for experiential learning and fostering social, body, and environment awareness and skills (Scavarelli, 2021), and the potential to increase motivation and collaboration among learners (Malliora, 2018). With the challenges that pose the after-pandemic landscape, the use of AR and VR technologies should be extended to create new learning environments to support adult education.