



VIRTUAL REALITY TECHNOLOGY: WHAT BENEFITS FOR NIGERIAN PRE-SERVICE CHEMISTRY TEACHERS

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Author's Biography



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Research Highlights

This study discussed the recent application of Virtual Reality Technology (VRT) in an educational setting and self-face learning of chemistry in specific considering the need for an effective strategy in learning chemical concepts among the pre-service chemistry teachers in Nigeria. It highlighted some benefits of VRT to pre-service chemistry teachers who are faced with difficulty in content knowledge of teaching abstract chemistry concepts such organic structure, molecular structure, chemical reactions and stoichiometry through scrutinizing existing literature on VRT in chemistry. The paper further presented some empirical studies on VTR in resolving misconceptions among pre-service chemistry teachers in Nigeria. Some of the VRT benefits highlighted include; interactivity, immersibility, and visualizability which are expected to enable the pre-service chemistry teacher to fully understand concepts better for effective and efficient chemistry instructional delivery after their graduation.

Research Objectives

The aim of this research article is to bring to light, the recent technological development in the teaching and learning chemistry otherwise known as Virtual Reality Technology (VRT). In a more specific term, the study aims at; highlighting some of the the abstract concepts that are particularly hard for the learners; shielding light on visualization and immersibility of VRT in chemistry which are necessary to explain the physical and chemical nature of chemistry concepts; removing misconception about abstract chemistry concepts among pre-service chemistry teachers and improving the quality of teaching chemistry in Nigerian school setting using VRT.

Methodology

The methodology adopted in this study involves a review of the existing literature on virtual reality technology in chemistry.

Results

The result of previous empirical studies shows that the abstract nature of some chemistry concepts is one of the reasons for integrating virtual reality technology in teaching and learning chemistry. Some of these concepts include; molecular structure (Garcia-Ruiz, Edwards, Gutierrez-Pulido, & Acosta-Diaz, 2006), chemical bonding, organic chemistry, and stoichiometry (Allinger, 2010; Saidin, Halim, & Yahaya, 2016; Touli, Talbi, & Radid, 2012), chemical equation and molecular structure (Garcia-Ruiz et al., 2006). The inability of pre-service chemistry teachers to differentiate between similar concepts result in misunderstanding and misconceptions. Some origins of students' misconceptions include their inadequate knowledge of the chemical composition of substance; present understanding of the chemical mechanism that explain concepts; over-simplifications of content and vernacular misinterpretations of concepts (González Felipe, Fernández César, Vazquez Moliní, Aguirre Pérez, & Cortés Simarro, 2017; Kay, Yiin, Chu, & Hong, 2010; Vrabc & Prokša, 2016). According to Saritas (2015) meaningful construction of knowledge on molecular geometry by pre-service chemistry teachers has always been a great challenge of chemistry learning leading to misconceptions. However, recently, virtual reality technology (VRT) has been widely proposed to serve as an innovative technology for providing highly immersive and interactive chemistry class with three-dimensional learning environment (Al-Balushi, Al-Musawi, Ambusaidi, & Al-Hajri, 2017; Barrett & Hegarty, 2016) . Therefore, chemistry teacher





candidates possessed positive beliefs about VR technology in enhancing understanding, motivation, and schematic thinking schematically. Visualization is one of the major benefits of virtual reality technology enabling the viewer to observe a concept as in the real (Stenshagen, 2018). Hence, the environment as such VR technology may wipe away the problems of misconception about microscopic aspects of chemistry among pre-service chemistry teachers.

Findings

The findings this study indicated that even though pre-service chemistry teacher encountered a lot of misconceptions about chemistry concepts that are abstract in nature, which may render their content knowledge of chemistry inefficient, the use of VRT provides an immersive and interactive chemistry learning environment for proper visualization of abstract chemistry concepts. Therefore it is imperative to recommend integration of VRT in learning chemistry concepts among pre-service chemistry teachers in Nigeria.

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