

Abstract

To tackle the challenges of teaching chemistry at the high school level, this research employs the User Centered Design (UCD) approach to develop a Mobile Augmented Reality (MAR) app to enhance students' comprehension of hydrocarbon compounds. The main focus is on enhancing the visualization of symbolic aspects of chemistry, which are often perceived as abstract and complex by students. In a series of design iterations involving teachers and students, the project has successfully created a MAR app that showcases ball and stick models of hydrocarbon molecules. The User Experience Questionnaire (UEQ), which assesses six areas of user experience—attractiveness, perspicuity, efficiency, reliability, stimulation, and novelty—was used to evaluate the program. From the first to the last iteration, the results demonstrated notable and comforting improvements in every dimension, with five out of six scales receiving 'Excellent' ratings. The study highlights the potential of MAR technology to address long-standing issues in chemistry teaching. It shows how successful UCD is in producing an exciting and easy-to-use educational tool. Positive user impressions imply that MAR applications can significantly improve high school students' chemistry learning experiences when thoughtfully created with user needs in mind, boosting confidence in the efficacy of our research.

Keywords: *Mobile Augmented Reality, User-Centered Design, Chemistry Learning, Hydrocarbon Compounds, User Experience Questionnaire*

