ChimieAR - Augmented reality-based mobile app for AdvancedLevel students to practice D-Block inorganic chemistry Practicals

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ABSTRACT

Augmented Reality is one of the most potent technologies in the world. Impressive use cases of this technology can see in many fields, such as education, health care, industry, marketing, entertainment, and military. During the last decade, this technology has improved rapidly due to the progress of high-end hardware devices. This rapid growth of AR technology has caused to spread awareness about this incredible technology.

Some Augmented Reality applications related to the educational sector have been developed recently. Especially medical and chemical study fields tend to apply this technology to improve the teaching and learning experience. USA, Spain, and China are the pioneer countries of educational AR applications.

Chemistry is a practical, focused subject. And many diagrams are needed to teach and understand chemistry concepts properly. For example, knowing the 3D structures of organic compounds is vital to a chemical engineering student. Students have a difficult time understanding these structures. Furthermore, once in a while, students have to conduct risky chemistry experiments or come to contact with risky chemicals. Sometimes students don't have the necessary chemicals or lab equipment to conduct the experiments. Augmented Reality technology can solve most of these issues and improve the learning experience.

Advanced-level students who enrolled in chemistry subject also face similar issues. After analyzing these issues, the author of this research has decided to develop an Augmented Reality laboratory for Advanced Level students. This AR Lab is specifically designed to conduct the D-Block element-related experiment.

The prototype has three D-Block-related practicals, and users can conduct each in an AR environment. Using this ChimieAR application, students can get a similar experience to a real world lab. This document provides the step by step discussion about mentioned whole research project.

Keywords

Augmented reality, Virtual reality, Advanced-level chemistry, D-block experiments, Unity game engine, Mobile app, Augmented reality laboratory.