

ABSTRACT

Pharmacy students at Universitas Darussalam Gontor (UNIDA Gontor) study advanced chemistry courses, including organic chemistry, which predominantly involves terminology related to elements from the periodic table. A solid conceptual understanding of the periodic table is essential for these advanced courses. Educational media play a crucial role in the learning process and in enhancing students' interest in studying chemistry. This study aims to develop an interactive and engaging 3D desktop-based learning game focused on Group 1-8A of the periodic table. The game was developed using the System Development Life Cycle (SDLC) methodology, which includes needs analysis, design, coding, testing, and implementation, along with the gamification approach based on the Mechanical, Dynamic, and Aesthetic (MDA) Framework. The game features 3D objects, instructional content, and a quiz section. Functionality testing was conducted using the Black Box method to ensure that all features operate as designed. The expert validation results indicated high-quality outcomes, with a material expert rating of 95.56% and a media expert rating of 85.71%, both of which were classified as excellent. The quiz feature provides feedback in the form of scores, assisting users in assessing students' understanding of the periodic table, with an average of 84.7 with very understood criteria. This game was successfully developed as a learning medium for the periodic table using the First Person Shooter (FPS) genre. Future research could focus on expanding the periodic table content comprehensively and adapting the game for Android or iOS platforms to improve accessibility. This study is expected to serve as a foundation for the development of other innovative learning media in the field of chemistry education.

Keywords: *Learning Media; 3D Game; Periodic Table; First Person Shooter; Unreal Engine.*

ABSTRAK

Mahasiswa farmasi di Universitas Darusalam gontor (UNIDA Gontor) mempelajari mata kuliah kimia lanjutan yaitu kimia organik, mata kuliah tersebut didominasi istilah-istilah unsur yang berasal dari tabel periodik. Mahasiswa memerlukan pemahaman konsep terhadap tabel periodik untuk mata kuliah lanjutan tersebut. Media pembelajaran memerankan peran penting dalam pembelajaran serta peningkatan minat belajar mahasiswa. Penelitian ini bertujuan untuk mengembangkan media pembelajaran berbasis *Game 3D desktop* yang interaktif dan menarik, dengan fokus pada tabel periodik golongan 1-8A. Pengembangan *game* menggunakan *System Development Life Cycle* (SDLC) yang mencakup analisis kebutuhan, desain, pengkodean, *testing*, dan implementasi, dan juga metode gemifikasi yaitu *Mechanical, Dynamic and Aesthetic* (MDA) *Framework*. *Game* ini menampilkan objek 3D, materi, dan halaman *quiz*. Pengujian dilakukan dengan metode *Black Box* untuk memastikan fungsi berjalan sesuai desain yang telah dibuat. Validasi ahli materi dengan presentase 95,56% dan validasi kepada ahli media dengan presentase 85,71% yang mana kedua presentase tersebut menunjukkan hasil sangat baik. Fitur *quiz* memberikan umpan balik berupa skor yang membantu pengguna dalam mengukur pemahaman mahasiswa terhadap tabel periodik dengan rata - rata 84,7 dengan kriteria sangat paham. *Game* ini berhasil dikembangkan sebagai media pembelajaran untuk materi tabel periodik dengan *genre First Person Shooter* (FPS). Saran untuk penelitian mendatang dapat mengembangkan tabel periodik secara menyeluruh dan dibangun untuk *platform Android* atau *IOS* guna meningkatkan aksesibilitas. Penelitian ini diharapkan menjadi dasar pengembangan media pembelajaran inovatif lainnya di bidang pendidikan kimia.

Keywords: *Media Pembelajaran; Game 3D; Tabel Periodik; First person shooter; Unreal Engine.*