ABSTRAK

PENGEMBANGAN MEDIA PEMBELAJARAN BIOLOGI BERBASIS *AUGMENTED REALITY* (AR) PADA MATERI STRUKTUR DAN FUNGSI SEL MENGGUNAKAN *ASSEMBLR EDU*

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Penelitian ini dilatarbelakangi oleh hasil analisis kebutuhan terkait penggunaan media pembelajaran digital di sekolah yang dinilai masih terbatas untuk diterapkan dalam materi struktur dan fungsi sel, yang bersifat abstrak dan sulit divisualisasikan secara langsung. Media pembelajaran konvensional seperti buku teks dan mikroskop belum mampu memberikan pengalaman belajar yang interaktif dan konkret. Di era digital saat ini, pemanfaatan teknologi seperti *Augmented Reality* (AR) menjadi salah satu solusi inovatif untuk meningkatkan kualitas pembelajaran. Penelitian ini bertujuan untuk mengembangkan media pembelajaran biologi berbasis AR menggunakan platform *Assemblr EDU* pada materi struktur dan fungsi sel serta melihat kelayakan dan kepraktisan media pembelajaran.

Metode penelitian yang digunakan adalah *Research and Development* (R&D) dengan model pengembangan ADDIE yang mencakup tahap *Analysis*, *Design*, *Development*, *Implementation*, dan *Evaluation*. Media pembelajaran AR dikembangkan menggunakan platform *Assemblr EDU*. Media pembelajaran AR dapat diakses menggunakan *QR code*. Terdapat nama organel sel dan *bubble* informasi yang menjelaskan fungsi setiap organel. Validasi dilakukan oleh ahli media dan ahli materi, serta dilakukan uji coba kepraktisan pada peserta didik kelas VIII SMP Kanisius Kalasan. Hasil validasi menunjukkan bahwa media pembelajaran yang dikembangkan memperoleh skor rata-rata 0,78 dari ahli media dan 0,78 dari ahli materi, yang dikategorikan "Layak". Sementara itu, hasil uji coba kepraktisan oleh peserta didik menunjukkan persentase rata-rata sebesar 78,82%, yang termasuk dalam kategori "Praktis". Hasil validasi menunjukkan bahwa media pembelajaran yang dikembangkan termasuk dalam kategori "Valid", baik dari segi isi, tampilan, maupun kemudahan penggunaan. Uji coba terbatas menunjukkan bahwa media ini praktis digunakan dan menarik untuk digunakan dalam pembelajaran.

Kata kunci: Media pembelajaran, *Augmented Reality*, *Assemblr EDU*, struktur dan fungsi sel.

ABSRACT

DEVELOPMENT OF AUGMENTED REALITY (AR) BASED BIOLOGY LEARNING MEDIA ON CELL STRUCTURE AND FUNCTION MATERIAL USING ASSEMBLR EDU

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This research was motivated by the results of a needs analysis related to the use of digital learning media in schools, which was considered to be still limited, especially when applied to the cell structure and function material, which is abstract and difficult to visualize directly. Conventional learning media such as textbooks and microscopes had not been able to provide interactive and concrete learning experiences. In the digital era, the utilization of technology such as Augmented Reality (AR) was one of the innovative solutions to improve the quality of learning. This study aimed to develop AR-based biology learning media using the Assemblr EDU platform on cell structure and function material and to assess the feasibility and practicality of the learning media.

The research method used was Research and Development (R&D) with the ADDIE development model, which included the stages of Analysis, Design, Development, Implementation, and Evaluation. AR learning media was developed using the Assemblr EDU platform and could be accessed using a QR code. The media included names of cell organelles and information bubbles that explained the function of each organelle. Validation was carried out by media experts and material experts, and practicality trials were conducted on class VIII students of SMP Kanisius Kalasan. The validation results showed that the learning media developed obtained an average score of 0.78 from media experts and 0.78 from material experts, which was categorized as "Feasible." Meanwhile, the results of the practicality trial by students showed an average percentage of 78.82%, which was included in the "Practical" category. These validation results indicated that the developed learning media was considered "Valid" in terms of content, appearance, and ease of use. The limited trials demonstrated that this media was practical and interesting to use in learning.

Keywords: Learning Media, Augmented Reality, Assemblr EDU, Cell Structure and Function.