

ABSTRAK

**RANCANG BANGUN *GAME* EDUKATIF PADA MATERI IPAS
TENTANG FOTOSINTESIS DI MI AULIA CENDEKIA**

(Muhammad Zaky 2026 : 85)

Materi fotosintesis dalam mata pelajaran IPAS di jenjang sekolah dasar masih sulit disampaikan secara optimal, sebab buku teks yang digunakan umumnya hanya menampilkan ilustrasi statis. Di MI Aulia Cendekia sendiri, upaya pengamatan langsung terhadap tanaman sempat dicoba, namun kegiatan tersebut tidak tuntas karena antusiasme siswa menurun sebelum proses selesai. Kondisi ini menunjukkan perlunya sebuah media belajar tambahan yang bersifat lebih interaktif. Berangkat dari permasalahan tersebut, penelitian ini dilakukan untuk merancang sekaligus membangun sebuah game edukatif berbasis Android yang mengangkat tema fotosintesis, sekaligus mengukur sejauh mana pemahaman siswa meningkat setelah menggunakannya. Proses pengembangan game mengacu pada metode Game Development Life Cycle (GDLC), dengan algoritma Finite State Machine (FSM) sebagai dasar logika sistem yang dibangun menggunakan Unity. Kelayakan sistem diuji melalui dua tahap, yaitu Black Box Testing untuk memastikan seluruh fungsi berjalan sebagaimana mestinya, dan User Acceptance Test (UAT) untuk menilai bagaimana pengguna menerima aplikasi ini. Selain itu, dilakukan pula pretest dan posttest kepada 30 siswa kelas IV MI Aulia Cendekia, yang hasilnya kemudian diolah dengan metode N-Gain. Dari pengujian tersebut diperoleh hasil Black Box Testing sebesar 100%, sementara UAT mencatatkan angka 78,13% dengan kategori Layak. Pemahaman siswa juga tercatat mengalami peningkatan, ditandai dengan nilai rata-rata N-Gain sebesar 0,66 (kategori Sedang), di mana skor pretest yang semula 72,00 naik menjadi 90,67 pada posttest. Dengan hasil tersebut, game edukatif berbasis Android ini diharapkan mampu berperan sebagai sarana belajar tambahan yang membantu siswa memahami keterkaitan antara faktor lingkungan dan proses fotosintesis dengan cara yang lebih menarik dan interaktif.

Kata Kunci: *Game* Edukatif, Fotosintesis, IPAS, GDLC, N-Gain

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RANCANG BANGUN *GAME* EDUKATIF PADA MATERI IPAS TENTANG FOTOSINTESIS DI MI AULIA CENDEKIA

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Teaching photosynthesis within the IPAS subject at the elementary school level still faces obstacles, largely because textbooks tend to present the material through static illustrations only. At MI Aulia Cendekia, a direct plant-observation activity had previously been attempted, yet it could not be completed as intended since students' enthusiasm declined before the process was finished. This situation points to the need for a supplementary learning medium that is more interactive in nature. Based on this issue, the present study was carried out to design and build an Android-based educational game centered on the topic of photosynthesis, while also examining how far students' understanding improved after using it. The game was developed following the Game Development Life Cycle (GDLC) approach, with a Finite State Machine (FSM) algorithm serving as the system's logical foundation, built using Unity. System feasibility was assessed through two stages: Black Box Testing, to confirm that all functions operated correctly, and User Acceptance Test (UAT), to gauge how well users accepted the application. In addition, a pretest and posttest were administered to 30 fourth-grade students at MI Aulia Cendekia, with the results subsequently processed using the N-Gain method. The testing produced a Black Box Testing result of 100%, while the UAT score reached 78.13%, falling into the Feasible category. Students' understanding also showed improvement, reflected in an average N-Gain score of 0.66 (Moderate category), with the pretest average rising from 72.00 to 90.67 in the posttest. Given these results, this Android-based photosynthesis educational game is expected to serve as a supplementary learning tool that helps students grasp the relationship between environmental factors and the photosynthesis process in a more engaging and interactive way.

Kata Kunci: Educational *Game*, Photosynthesis, IPAS, GDLC, N-Gain