

ABSTRAK

Rendahnya minat generasi muda terhadap sektor pertanian menjadi permasalahan serius yang mengancam keberlanjutan ketahanan pangan nasional. Di sisi lain, siswa sekolah dasar pada era digital cenderung lebih responsif terhadap media pembelajaran berbasis teknologi dibandingkan metode konvensional. Penelitian ini bertujuan merancang dan membangun game edukasi tiga dimensi bertajuk Happy Gardening 3D sebagai media pembelajaran materi pertanian bagi siswa kelas V dan VI SDN 4 Panusupan, Banyumas, Jawa Tengah. Pengembangan game menggunakan metode *Game Development Life Cycle* (GDLC) yang mencakup enam tahap, yaitu inisiasi, pra-produksi, produksi, testing, beta dan rilis. Game dibangun menggunakan Unity 6 dengan mekanisme simulasi pertanian mencakup sistem tanam, penyiraman, pemupukan, dan pemanenan sayuran dalam lingkungan tiga dimensi yang interaktif. Pengujian dilakukan melalui *black box testing* untuk memverifikasi fungsionalitas fitur dan *beta testing* untuk perbaikan sebelum rilis. Efektivitas game diukur menggunakan desain *pre-test* dan *post-test* terhadap 36 siswa yang dipilih dengan rumus *jenuh atau sensus*. Hasil *pre-test* menunjukkan rata-rata nilai sebesar 70,74, sedangkan rata-rata *post-test* meningkat menjadi 82,22, dengan peningkatan sebesar 11,48 poin atau 16,23%. Hasil tersebut membuktikan bahwa game Happy Gardening 3D efektif meningkatkan pemahaman siswa terhadap materi pertanian dan berpotensi menjadi alternatif media pembelajaran IPAS yang inovatif di tingkat sekolah dasar.

Kata kunci: Rancang bangun game, game edukasi, pertanian, Unity, *Game Development Life Cycle*.

ABSTRACT

The low interest of the younger generation in the agricultural sector has become a serious issue threatening the sustainability of national food security. On the other hand, elementary school students in the digital era tend to be more responsive to technology-based learning media than conventional methods. This study aims to design and develop a three-dimensional educational game titled Happy Gardening 3D as a learning medium for agricultural material for fifth and sixth grade students at SDN 4 Panusupan, Banyumas, Central Java. The game was developed using the Game Development Life Cycle (GDLC) method, which comprises six stages: initiation, pre-production, production, testing, beta, and release. The game was built using Unity 6 with farming simulation mechanics that include planting, watering, fertilizing, and harvesting vegetable systems within an interactive three-dimensional environment. Testing was conducted through black box testing to verify feature functionality and beta testing for refinement prior to release. The effectiveness of the game was measured using a pre-test and post-test design involving 36 students selected through a saturated sampling (census) method. The pre-test results showed an average score of 70.74, while the post-test average increased to 82.22, reflecting an improvement of 11.48 points or 16.23%. These results demonstrate that the Happy Gardening 3D game is effective in enhancing students' understanding of agricultural material and has the potential to serve as an innovative alternative learning medium for Natural and Social Sciences (IPAS) at the elementary school level.

Keywords: educational game, agriculture, Unity, Game Development Life Cycle.