PENGEMBANGAN MODEL 3D UNTUK APLIKASI *AUGMENTED REALITY* "EDUSAINS KEBUN QUR'AN"

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ABSTRACT

Introducing scientific concepts and Quranic values to early childhood (PAUD) requires interactive and easily understandable learning media. Augmented Reality (AR) technology serves as an immersive visualization solution, but its smoothness on smartphones heavily depends on how lightweight the 3D assets are. Therefore, this report focuses on discussing how the author designed, created, and optimized 3D assets for the "Edusains Kebun Qur'an" AR application. Through the Research and Development (R&D) method using the ADDIE framework, the author produced 3D objects using Blender software. To ensure the application remains stable and visually appealing to 4-6-year-olds, the author applied a stylized low poly modeling technique combined with basic color textures (albedo only). This process resulted in eight 3D models of Quranic fruits with highly efficient sizes, ranging from 500 to 1500 polygons per object. These assets were then integrated into Unity via the Vuforia SDK so they could be projected precisely above the physical markers of the Smart Kids Book. The testing results proved that this 3D work received excellent validation, obtaining scores of 97% from Media Experts, 84% from Material Experts, and 90% from user responses. It can be concluded that the application of low poly techniques and texture optimization carried out by the author succeeded in creating AR media that is not only visually attractive but also runs very smoothly.

Keywords: *3D Model, Augmented Reality, Low Poly, Performance Optimization, Learning Media.*