

***The Effectiveness of Using Augmented Reality to Enhance Science Learning on
the Human Digestive System Material***

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ABSTRACT

This study aims to determine the effectiveness of using Augmented Reality (AR) as a learning medium to enhance the teaching of Science, specifically the human digestive system, at SMPN 2 Tapen Bondowoso. One of the main challenges in science learning is students' limited understanding of abstract biological concepts, as well as the lack of interactive learning media available in the classroom. AR technology was selected as a solution to provide concrete, three-dimensional visualizations that are more interactive and easier for students to comprehend. This research employed the Multimedia Development Life Cycle (MDLC) method, which consists of six stages: concept, design, material collecting, assembly, testing, and distribution. The AR learning media was developed using Unity and Vuforia, featuring 3D models of human digestive organs accessible through Android devices. The research subjects were eighth-grade students at SMPN 2 Tapen Bondowoso. Data collection instruments included media and material expert validation sheets as well as learning achievement tests in the form of pre-tests and post-tests. The results show that the AR learning media was classified as "highly feasible" based on evaluations from both media experts and material experts, particularly in terms of visual quality, interactivity, content accuracy, and ease of use. In addition, there was a significant improvement in students' learning outcomes after using the AR media, as indicated by the difference between pre-test and post-test scores. This demonstrates that AR is effective in enhancing students' understanding of the human digestive system. In conclusion, the use of Augmented Reality as a science learning medium successfully strengthens conceptual understanding, increases motivation, and provides a more engaging and meaningful learning experience for students. This media can also serve as an innovative alternative for teachers to optimize classroom learning.

Key words: *Augmented Reality, Learning Media, Human Digestive System, Science Education, MDLC.*