

***Implementation of MobileNetV2 in Interactive Learning Media for
Mobile-Based Classification of Organic, Inorganic,
and Hazardous Waste***

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ABSTRACT

The awareness of early childhood children in identifying and sorting waste is still relatively low, largely due to conventional learning methods that are monotonous and less interactive. This study aims to design and develop an Android-based interactive learning media named "Sampah Asik" capable of classifying waste into organic, inorganic, and B3 categories. The method employed is a Convolutional Neural Network (CNN) with the MobileNetV2 architecture, optimized through TensorFlow Lite (TFLite) INT8 conversion for efficient execution on mobile devices. The dataset used consists of 11,161 images divided into 13 classes of waste objects. Model training results demonstrated excellent performance with a training accuracy of 95.92% and a validation accuracy of 93.46%. Direct system accuracy testing through 260 trials yielded a success rate of 93.08%. Furthermore, the User Acceptance Test (UAT) results involving teachers and parents showed an average score of 93%. Consequently, this application is highly feasible and effective as an interactive and fun environmental education media for children to enhance their understanding of waste sorting from an early age.

Key words: *Waste Classification, Convolutional Neural Network, MobileNetV2, Interactive Learning Media, Android.*