***Design of a Learning Media for Hijaiyah Letter Recognition Using MobileNetV2 Method for Hijaiyah Letter Classification (Case Study : Madrasah Diniyah in Kemiri Village)***

**Kholis Abdullah Adi Putra**
*Informatics Engineering*
*Department of Information Technology*

# ABSTRACT

*Instruction in hijaiyah letters at madrasah diniyah is generally conducted through conventional methods that rely on textbooks and repetitive writing exercises. While effective to some extent, these approaches often lack interactivity and do not provide immediate feedback on students' handwriting performance. To overcome this limitation, this study develops an Android-based learning application for hijaiyah letter recognition using a Convolutional Neural Network (CNN) with the MobileNetV2 architecture. The dataset comprises 10,534 handwritten hijaiyah letter images divided into 28 classes. Model training was performed in two experimental phases with different hyperparameter configurations to determine the best performance. The second training phase achieved superior results, with an overall accuracy of approximately 93%, an average precision of 0.94, recall of 0.93, and F1-score of 0.93. The validation loss was also lower and more stable, indicating improved generalization capability. Expert validation from pronunciation and writing practitioners yielded an average score of 82.78%, categorized as "Very Feasible". System evaluation using User Acceptance Testing (UAT) involving 14 teachers and parents resulted in an average acceptance rate of 81.00%. Most respondents agreed that the application enhances students' recognition and writing skills while increasing learning motivation. These findings demonstrate that the application is both technically reliable and pedagogically beneficial.*

***Keywords:*** *Hijaiyah Letters, Convolutional Neural Network, MobileNetV2, Android Application, Educational Technology*