

KLASIFIKASI PERILAKU BELAJAR MENGUNAKAN ALGORITMA K-NEAREST NEIGHBOR (KNN)

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ABSTRAK

Penilaian perilaku belajar siswa di SMKN 1 Bengkalis secara manual cenderung subjektif dan tidak efisien. Penelitian ini mengembangkan sistem klasifikasi perilaku belajar siswa jurusan TKJ menggunakan algoritma *K-Nearest Neighbor (KNN)* untuk menghasilkan penilaian objektif. Metode pengembangan menggunakan *Rapid Application Development (RAD)* dengan data 194 siswa berdasarkan 16 indikator perilaku. Data dibagi menjadi training dan testing dengan rasio 70:30. Implementasi algoritma *K-Nearest Neighbor (KNN)* menggunakan nilai $K=3$ dan jarak Euclidean. Hasil pengujian menunjukkan akurasi model sebesar 91,53%, dengan precision 97,06% (Aktif) dan 84% (Tidak Aktif). Sistem berbasis web menggunakan Python Flask dan MySQL memudahkan Guru BK dalam memantau perilaku siswa secara real-time. Disimpulkan bahwa algoritma *K-Nearest Neighbor (KNN)* efektif mengklasifikasikan perilaku belajar siswa secara akurat untuk mendukung keputusan pendidikan di sekolah vokasi..

Kata Kunci: Klasifikasi, Perilaku Belajar, *K-Nearest Neighbor*, *Data Mining*,

CLASSIFICATION OF STUDENT LEARNING BEHAVIOR USING THE K-NEAREST NEIGHBOR (KNN) ALGORITHM

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ABSTRACT

Manual assessment of student learning behavior at SMKN 1 Bengkalis tends to be subjective and inefficient. This study develops a learning behavior classification system for Computer and Network Engineering (TKJ) students using the K-Nearest Neighbor (KNN) algorithm to produce more objective evaluations. The system was developed using the Rapid Application Development (RAD) method, utilizing data from 194 students based on 16 validated behavior indicators. The dataset was split into training and testing sets with a 70:30 ratio. The K-Nearest Neighbor (KNN) algorithm was implemented with $K=3$ and Euclidean distance calculation to determine nearest neighbors for classification. Testing results demonstrate that the model successfully classifies student behavior into two categories: "Active" and "Inactive", achieving an overall accuracy of 91.53%. Precision values reached 97.06% for the Active class and 84% for the Inactive class. The web-based system, built using Python Flask framework and MySQL database, facilitates Guidance and Counseling teachers in monitoring student behavior in real-time through statistical dashboards and classification reports. In conclusion, the K-Nearest Neighbor (KNN) algorithm proves effective in accurately classifying student learning behavior, thereby supporting better educational decision-making and targeted intervention strategies in vocational school environments.

Keywords: *Classification, Learning Behavior, K-Nearest Neighbor, Data Mining*