

**KLASIFIKASI METAKOGNISI MENGGUNAKAN ANGKET
METACOGNITIVE AWARENESS INVENTORY (MAI) TERHADAP GAYA
BELAJAR MAHASISWA POLITEKNIK NEGERI JEMBER (STUDI
ALGORITMA: FUZZY)**

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ABSTRACT

Low educational quality in Indonesia is partly linked to limited adoption of adaptive learning strategies and underdeveloped student metacognitive skills. This study classified the metacognition levels of 2024-cohort Informatics Engineering students at Politeknik Negeri Jember and analyzed how these levels varied across class groups, using the Metacognitive Awareness Inventory (MAI) and the Fuzzy Mamdani algorithm. The fuzzy model was first built and validated on trial data from 10 students from the 2021 cohort, with the system output checked against two education-psychology experts through a ground-check procedure, before it was applied to real data from 81 students of the 2024 cohort selected through proportional stratified random sampling from a population of 141 students across six class groups (A-F). The two MAI dimensions, Knowledge of Metacognition (KM, 17 items) and Regulation of Metacognition (RM, 35 items), were mapped into three fuzzy sets (Low, Moderate, High) using trapezoidal and triangular membership functions, then processed through IF-THEN inference with the AND (minimum) operator and Maximum-method defuzzification. The validated model was embedded in the CogniFy survey website, which passed blackbox testing, user acceptance testing, and rule-consistency verification. The classification results showed that Class A was dominated by the High category (9 of 14 students), Classes B and F showed mixed compositions, while Classes C, D, and E were entirely classified as Moderate. Students generally scored higher on Regulation of Metacognition than on Knowledge of Metacognition. These findings indicate that most 2024-cohort students remain in a transitional stage of metacognitive development, and demonstrate that the Fuzzy Mamdani approach captures ambiguous boundary conditions between categories more flexibly than conventional cut-off methods, providing a basis for designing adaptive learning strategies at Politeknik Negeri Jember.

Keywords: *Metacognition, Metacognitive Awareness Inventory, Fuzzy Mamdani, Classification, Learning Style, Politeknik Negeri Jember, Knowledge of Metacognition, Regulation of Metacognition*