

## Design and Implementation a Platform for Adaptive Online Learning Based on Fuzzy Logic

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**Abstract :** Educational systems are increasingly provided as open online services, providing guidance and support for individual learners. To adapt the learning systems, a proper evaluation must be made. This paper builds the evaluation model Fuzzy C Means Adaptive System (FCMAS) based on data mining techniques to assess the difficulty of the questions. The following steps are implemented; first using a dataset from an online international learning system called (slepemapy.cz) the dataset contains over 1300000 records with 9 features for students, questions and answers information with feedback evaluation. Next, a normalization process as preprocessing step was applied. Then FCM clustering algorithms are used to adaptive the difficulty of the questions. The result is three cluster labeled data depending on the higher Wight (easy, Intermediate, difficult). The FCM algorithm gives a label to all the questions one by one. Then Random Forest (RF) Classifier model is constructed on the clustered dataset uses 70% of the dataset for training and 30% for testing; the result of the model is a 99.9% accuracy rate. This approach improves the Adaptive E-learning system because it depends on the student behavior and gives accurate results in the evaluation process more than the evaluation system that depends on feedback only.

**Keywords :** machine learning, adaptive, fuzzy logic, data mining

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