ARTIFICIAL NEURAL NETWORK MODEL (ANN) TO PREDICT ELECTRICAL STUDENTS' ACADEMIC PERFORMANCE

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5. Report

5.1 Proposed Executive Summary

The failure rates in Electric Circuit 1 (EEE121) and Electronics 1 (ELE232) in Diploma in Electrical Engineering (Electronics), EE111 and Diploma in Electrical Engineering (Power) EE112, are high. This will reduce the possibility of students graduating on time because the subjects are prerequisite to register other courses for next semester and will affect their Cumulative Grade point average (CGPA) result. This research is to propose an artificial intelligent network based model (Neural Network model) method to enable the prediction and classification of Electrical Engineering Diploma students at the Faculty of Electrical Engineering, Universiti Teknologi MARA (UiTM), Terengganu based on their past academic performance to predict their future academic performance. The study will be conducted on electrical engineering part two students. The performance will be based on their cumulative grade point average (CGPA) upon graduation. The students' results for fundamentals subject, Electric Circuit 1 (EE121) at second semester are used as predictor variables (initial values) for predicting the expected final CGPA upon graduation using Artificial Neural Network (ANN). The objective of this study is to investigate correlation between students' results for core subjects, EE121 at semester two the final overall academic performance CGPA and GOT. The proposed ANN model in this research will be built using NN toolbox in MATLAB software. Based on the outcomes of this study, planning of strategic interventions can be planned during their study period to improve their final performance, which can be extracted from this prediction model.

5.2 Enhanced Executive Summary

This research presents a study of correlation between subjects of Diploma in Electrical Engineering (Electronics/Power) at Universiti Teknologi MARA(UiTM) Cawangan Terengganu using ANN. The analysis was done to see the effect of mathematical subjects (Pre-calculus and Calculus 1) and core subjects (Electric Circuit 1) towards Electronics 1, a core subject with a history of high failure rate percentage (more than 25%). This research has been conducted on current final semester students (Semester 5). Seven (7) models of ANN are developed to observe the correlation between the subjects. In order to develop an ANN model, ANN design and parameters need to be chosen to find the best model. In this study, historical data from students' databases were used for training and testing purposes. The Regression Coefficient, (R) values from the developed models was observed and analyzed to see the effect of the subject on the performance of students. It can be proven that mathematical subjects (Pre-calculus and Calculus 1) and core subjects (Electric Circuit 1) have significant correlation with the Electronics 1 subject.

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