**A Course Recommendation Model for Students based on Learning Outcome**

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**Abstract**

How to choose the most appropriate courses to study throughout the learning process remains a question interested in by many students. Students often choose suitable courses according to their interests, needs, and advice from supporting staff, etc. This paper presents the results in developing a course recommendation system that will select appropriate courses for each student studying a major in the following semesters based on his/her current academic performance. We have applied several techniques based on data mining and learning analytics to predict students’ learning outcomes in the next semester and developed a model to select the appropriate courses based on such a recommendation system. Besides, our study has focused on comparing the effectiveness of predictive learning methods based on collaborative filtering. Experiments analyzed the learning results of 510 students who enrolled in the courses from 2015 to 2019 and showed that the Matrix Factorization method is the most effective. Also, the paper has proposed procedures and constraints applicable to different training curricula.

Keywords: Course recommendation, learning analytics, learning outcomes, competency matrix