Early prediction of undergraduate Student's academic performance in completely online learning: A five-year study

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Abstract

This decade, e-learning systems provide more interactivity to instructors and students than traditional systems and make possible a completely online (CO) education. However, instructors could not warn if a CO student is engaged or not in the course, and they could not predict his or her academic performance in courses. This work provides a collection of models (exploratory factor analysis, multiple linear regressions, cluster analysis, and correlation) to early predict the academic performance of students. These models are constructed using Moodle interaction data, characteristics, and grades of 802 undergraduate students from a CO university. The models result indicated that the major contribution to the prediction of the academic student performance is made by four factors: Access, Questionnaire, Task, and Age. Access factor is composed by variables related to accesses of students in Moodle, including visits to forums and glossaries. Questionnaire factor summarizes variables related to visits and attempts in questionnaires. Task factor is composed of variables related to consulted and submitted tasks. The Age factor contains the student age. Also, it is remarkable that Age was identified as a negative predictor of the performance of students, indicating that the student performance is inversely proportional to age. In addition, cluster analysis found five groups and sustained that number of interactions with Moodle are closely related to performance of students.