

Developing an early warning system combined with dynamic LMS data

Danny Green

There is a large body of research that has been emerging regarding the use of admissions and demographic data to develop early warning systems that aim to predict a student's future academic performance (Steele, 2011). Researchers working in an academic student support department in Vietnam are now working to develop a EWS based on their unique context.

This project was initialised mainly because the current at-risk classification system at the university is based on the amount of courses a student fails compared to their course load. Many, including those working on this project, view this as identifying poor performing students after the fact, making teacher interventions and support services ineffective. Thus there was a need to build a timelier system based on a more context appropriate model (Fike & Fike, 2008)

For the project's initial pilot, a total of 78000 student records were extracted from the university Student Record System over six semesters, and a multivariate linear regression model was developed to predict student final grades (Huang & Fang, 2010) in three first-year courses. The analysis suggested that the final scores of students in these three courses are strongly related to their prior learning performance. To further enhance the system, research was also conducted inside courses regarding LMS behaviour (Macfayden & Dawson, 2010) and early assessment results to ascertain correlations to final course grades and thus identify meaningful triggers for intervention and support at appropriate times. A system was then developed combining both the predictive model output with the LMS research to produce a holistic mechanism that combines the predictive "watch-list" with real time LMS data.

This project aims to dramatically improve on the existing university at-risk system and have significant impact on STARS related issues such as student achievement, retention and success. This system has just finished its initial pilot and is to be launched across all first year courses in the first semester of 2017.

References:

Fike, D. S., & Fike, R. (2008). Predictors of first-year student retention in the community college. *Community College Review*, 36(2), 68-88. Retrieved from <https://search-proquest-com.ezproxy.lib.rmit.edu.au/docview/213290732?accountid=13552>

Huang S. & Fang N. (2010). AC 2010-190: Regression models for predicting student academic performance in an engineering dynamics course [PDF File], *American Society for Engineering Education. Age*, 15,1.

Leah P. Macfadyen, Shane Dawson, Mining LMS data to develop an "early warning system" for educators: A proof of concept, *Computers & Education*, 54, 2, Pages 588-599, 0360-1315, <http://doi.org/10.1016/j.compedu.2009.09.008>.

Steele, C. R. (2011). *Evaluating potential predictors of academic achievement and retention among students in a first year seminar course* (Order No. 3487076). Available from ProQuest Central; ProQuest Dissertations & Theses Global. (912020112). Retrieved from <https://search-proquest-com.ezproxy.lib.rmit.edu.au/docview/912020112?accountid=13552>