Advanced Diploma in Mathematical Sciences Student Project Briefs

Siyaphumelela Student Success Initiative 2023

University-Wide Predictors of Academic Performance (Fundani)

Over the past few years, Advanced Diploma in Mathematical Sciences students have undertaken projects where they develop a machine learning model designed to predict students' academic performance in a particular academic programme, based on matric results and other variables available in HEMIS databases (application, registration, and residence data). The aim of this project is to aggregate data from all undergraduate Diploma and Degree programmes ("first qualifications") across the institution to obtain a "big picture" sense of the relationship between certain key variables and academic success, which could be turned into talking points for institutional decision makers. For example, across CPUT first qualifications as a whole:

- What is the relationship between a student's residence status (in res; not in res) and the outcome per subject (passes; fails)?
- What is the relationship between a student's registration date the outcome per subject (passes; fails)? In other words, can we quantify what impact late registration has on student success in terms of the effect of each additional day on the probability of passing?
- What is the relationship between a student's residence status (in res; not in res) and the throughput outcome (graduates in minimum time; graduates but not in minimum time; does not graduate)?

Other predictor variables that could be considered include secondary school quintile, whether the student did secondary school out of province, NSC English results (whether it was Home Language or First Additional Language, and the mark—since all first qualifications at CPUT consider English as an application requirement), and NSC Life Orientation results (since all NSC learners do LO, although it is not considered for application purposes)