Problem: Widening Equity Gaps in Higher Education

Solution: Predictive Analytics at the Tennessee Board of Regents

Access and attainment have increased for low-income, underrepresented minority and first-generation students since the 1960s, but at a rate that is lower than that of the general student population (Denley, 2014). As a result, postsecondary attainment gaps have widened, threatening to undo hard fought gains in social equity. This trend mirrors Rogers' (2003) warning that social innovations often have the unintended consequence of widening gaps, particularly when there are no efforts to engage and communicate with disadvantaged groups both in the design and diffusion of an innovation.

As part of their investigation into this challenge, the Tennessee Board of Regents (TBR) determined: "These attainment gaps appear to be significantly influenced by information gaps ... without knowledge of the structure of higher education they [students who belong to low-income, underrepresented, and first-generation students] are unable to even frame the questions that would enable them to become informed" (Denley, 2014, p. 61). This discovery represented the point of opportunity recognition for Tristan Denley, then the provost at Austin Peay State University (APSU). After identifying information gaps as a problem, Denley and his team at APSU began developing a solution based on providing information to students in customized and intuitive ways. They harnessed principles of predictive analytics and behavioral economics and focused on "finding ways to empower student choices by creating choice architectures that improve the *information available to each student*" (Denley, 2014, p. 63).

This effort led to the creation of Degree Compass, a software program that leverages data on past student choices to anticipate likely student outcomes for each student as they consider taking specific coursework. During the experimentation phase at APSU, the software was connected to the institution's degree audit system, leading to the creation of an algorithm based on hundreds of thousands of student academic records. These aggregated data allowed APSU to make suggestions based on a student's likelihood of success in a course. The Degree Compass system also adds a star rating that is intended to represent courses that best fit a student's program of study and in which the student is likely to perform well. The design of Degree Compass mirrors popular streaming multimedia services, such as Pandora or Netflix, which offer suggestions for what media a specific person might like most. By creating a design intuitive to students, Degree Compass illustrates how intentional design can promote the success of an innovation (Denley, 2013). Integral to the experimentation stage was the creation of a robust assessment system that would allow for continuous refinement of the Degree Compass system. Eventually, further trials were run at three other institutions.

There was clear evidence of impact. Over 90% of students who took highly recommended courses received an A or B. The grades of students after the introduction of Degree Compass were 5 standard deviations higher than those of students prior to the implementation of the system (Denley, 2014). "This was especially true across the populations we hoped would benefit the most from better advice—African American Students (2.1%^) and Pell Grant recipients (3.9%^)" (Denley, 2014). Degree Compass also appears to have reduced gap in earned credit hours between White and minority students. Preliminary evidence also suggests that attainment gaps have closed, albeit slightly. As a result of its effectiveness, $250,000 of non-recurring funding was appropriated by the Tennessee legislature to facilitate statewide adoption of Degree Compass, which became effective on July 1, 2014. Efforts to scale across the TBR campuses have begun in earnest, as part of the Drive to 55 Initiative that is geared toward college completion (Baker, 2014).

References

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