FROM INSIGHT *to* ACTION

A CASE STUDY ON USING PREDICTIVE ANALYTICS TO IMPACT STUDENT OUTCOMES

CIVITAS LEARNING

UMUC
University of Maryland University College

EXECUTIVE SUMMARY

As a leader in higher education focused on the unique needs of adult learners, University of Maryland University College (UMUC) has long been a pioneer in the area of learning analytics. Working from this foundation of continued innovation, leaders at UMUC became intrigued by the potential for advanced analytics to better understand student risk, the variables that contribute most to student success, and, most importantly, how to make such insights actionable to improve student outcomes.

PROGRAM BACKGROUND

Leveraging the Civitas Learning predictive analytics platform and Inspire™ application for administrators and advisors, UMUC ran a pilot program to test the efficacy of using predictive analytics-based interventions to improve successful course completion rates.

Over the course of three terms starting in Spring 2013, UMUC and Civitas Learning built predictive models, tested different approaches to intervention, and evaluated outcomes in detail.

KEY RESULTS

During the Fall 2013 term, across an experimental pool of approximately 10,000 undergraduate enrollments randomly assigned to test and control, UMUC's test group using the Inspire application outperformed the control group in successful course completion by nearly 3 percentage points (287 basis points), which translates to 150 students who passed courses they otherwise would have failed. These overall results, statistically significant at a 99.8% confidence level, were observed consistently for each session of the term.

"We're very encouraged by the early work we've done with Civitas Learning to improve successful course completion rates and look forward to continuing to use data science to identify early, with such great accuracy, which students will need assistance, at which times, and with which intervention strategies. We've seen solid, consistent results thus far and anticipate an even greater impact on student outcomes as we continue to learn and refine the program."

– Dr. Marie Cini, Senior Vice President and Provost, UMUC

PILOT PROGRAM APPROACH

For its partnership with Civitas Learning, UMUC leaders chose to focus on successful course completion, a dimension of student success where concrete results can be measured at a broad scale in a short amount of time. Working with data scientists and domain experts at Civitas Learning, UMUC created a pilot program with test and control groups to empirically measure differences in successful course completion, which is defined as completing a course with a grade of C or higher.

PILOT DESIGNED TO

Evaluate whether predictive analytics, when combined with targeted interventions, can substantially improve student outcomes

Test different types of interventions

Determine how best to scale the use of personalized interventions driven by predictive analytics across UMUC within a Civitas role-based application

Starting in Spring 2013, the University engaged in three one-term pilots. For each one, UMUC faculty and staff used the Civitas Learning predictive analytics platform and Inspire application for administrators and advisors to apply targeted interventions and improve course completion rates.

PREDICTIVE MODELING FOR STUDENT INTERVENTIONS

Leveraging the University's historical student data, UMUC and Civitas Learning closely collaborated to develop UMUC-specific predictive models to evaluate the complex set of variables that contribute to student success. These models provided an individualized risk prediction of each student's likelihood to successfully complete a course — with greater than 80% accuracy before the first day of class. Starting on Day 2, students' day-to-day behaviors were introduced into the models, enabling even more accurate predictions of their likelihood of successful course completion.

The Civitas Learning Inspire application delivers these predictions in an actionable way to UMUC's academic administrators and advisors so that they can understand individual student engagement and risk and apply timely and relevant interventions — specifically, targeted phone and email outreach — to best support their learning journey. Users analyze data, segment student populations, and implement personalized communications directly from the application.

INITIAL PILOT ROLLOUT

The Inspire application for administrators was first rolled out in Spring 2013. UMUC administrators chose test and control sections totaling approximately 5,000 enrollments within ten courses. Based on insights from the application, students were analyzed to determine the variation in their probability to succeed based on a host of predictive data, including GPA, attendance patterns, grades, terms of enrollment, course participation, course credits, and several other factors.

Once the application was deployed, UMUC was able to experiment with different intervention approaches across the Spring and Summer terms. During this period, administrators refined UMUC's operating procedures for interventions. Specifically, the UMUC analytics, advising, and academic teams developed a coordinated outreach effort of email (from academics) and phone calls (from advising) at pertinent times

during the term, focusing on key messages related to specific student risk factors.

After each of the initial terms, actual outcomes were compared with predicted outcomes for each student to determine the predictive accuracy of the models powering the Civitas Learning app. This analysis showed that the predictive models were able to identify with 83% accuracy, before the first day of a course, the students who would successfully complete it. By day seven of a course, the accuracy rate had climbed to 86%. the application.
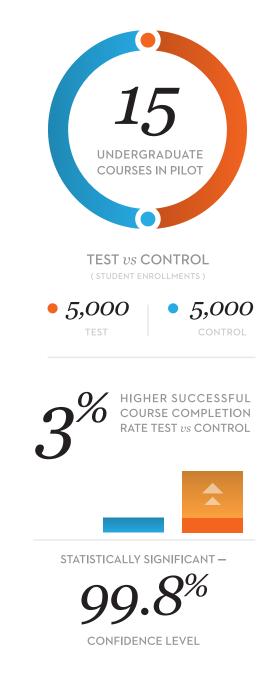
FALL 2013 PILOT

In the Fall 2013 pilot — which focused on approximately 10,000 undergraduate enrollments — UMUC program managers and advisors used the Inspire application to determine which students were most in need of intervention, then pulled from a prepared suite of intervention messaging and approaches tailored to specific areas of student need. This enabled Inspire users to provide support in a timely, empathetic, appropriate way to thousands of students in the test group, while the control group did not receive interventions.

Looking more broadly across the approximately 10,000 enrollments in the Fall 2013 experiment, UMUC and Civitas Learning were able to analyze the difference in successful course completion rates for the test and control groups. **This empirical analysis showed that the test group of approximately 5,000 enrollments successfully completed their courses at a rate nearly 3 percentage points (287 basis points) higher than the control group** — a finding that is statistically significant at a 99.8% confidence level.

LOOKING AHEAD

During Spring 2014, UMUC is continuing to evaluate which interventions are most effective in driving successful course completion through the Inspire application, supporting its longer term goal to scale predictive analytics approaches to more of its 85,000+ students worldwide.

PILOT STATS

15
UNDERGRADUATE
COURSES IN PILOT

TEST *vs* CONTROL
(STUDENT ENROLLMENTS)

● 5,000   ● 5,000
TEST   CONTROL

3% HIGHER SUCCESSFUL
COURSE COMPLETION
RATE TEST *vs* CONTROL

STATISTICALLY SIGNIFICANT —

99.8%
CONFIDENCE LEVEL

UMUC
University of Maryland University College

www.umuc.edu

INSTITUTION FACTS:

- Founded in **1947**

- Public 4-year University

- More than **85,000** students worldwide
  Undergraduates: **69,000**   Postgraduates: **17,500**

- President: **Javier Miyares**

- Provost: **Marie Cini**

- 1 of 11 accredited, degree-granting institutions
  with the University System of Maryland (USM)

- Locations: **Adelphi, Maryland (headquarters),
  Washington D.C area, Europe and Asia**

- Campus in **53 Locations** + **Online 120** Academic Programs

- Provides online classes to students worldwide

- **Global reputation** for excellence as a comprehensive
  virtual university

- Focuses on the unique educational and professional
  development **needs of adult students**