INDIANA UNIVERSITY

Finding the Keys to Success

Proposal for Learning Analytics fellowship for Business X201(Soon to becomeK303)*

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**The course number for X201 will change to K303 in Spring 2015.*

Abstract

As a Learning Analytics Fellow, I hope to better understand the students who take the course, *Business –X201: Technology and Business Analytics*, and how we can help them be successful – in the course, in the university, and in the job market. As such, I plan to analyze student characteristics at three key stages – before the course (incoming skills), during the course (class activities and performance), and after the course (graduation rate, job placement).

Before students take X201, I hope to identify key characteristics that predict success in X201, as well as identify risk factors to help students achieve success in the course. Answering questions like, "what pre-requisite skills are most critical to students entering this course", and "does transferring credit for pre-requisite courses make a difference in the success rate of students"?

During the course, I hope to identify what activities and assignments correlate most closely with realized learning gains and performance on exams and major projects.

Finally, after completing X201, I'd like to evaluate the outcomes of students to see what impact their X201 performance has on their selected majors, their graduation rate and graduating GPA, and potentially, their perceived value on the job market.

While these are lofty goals, I am encouraged by the volumes of data that exist that can shed some light on these questions. While answering all of these questions would be difficult, I believe answering even one of them could provide a valuable insight to the student experience. As a required course for all majors at the Kelley School of Business, and a course focused on technology and quantitative methods, I feel that learning about our students, their success factors and learning styles, will be beneficial to similar courses throughout the university.

Background Information: What is X201?

X201 has been a required course for all majors at the Kelley School of Business since the 1990's. Titled "Technology", it has served as an introduction to current technologies that are most relevant to business students. Through the years, it has regularly evolved to provide students with experiences that will prepare them to succeed in the current world of business.

In its current iteration, the course provides an introduction to Business Analytics, focusing on analytical techniques and strategies to manage and gain insight from large quantities of data. With recent advances in technology, the speed of computing and the capacity for storage has turned the focus of business to the field of analytics. The increasing ability to track and store data from business transactions and operations combined with the decreasing cost of data storage and computer processing speed, means that businesses today are focusing on data-driven decision making. Thus, it is becoming more critical for students coming out of business programs to have competencies in this area.

This course is closely linked with the pre-requisite business technology course, K201: The Computer in Business. Students master spreadsheet formulas and functions in K201, and build upon those skills in X201 as they learn to manage larger datasets, structure their own spreadsheet models, and use analytical techniques to solve complex business problems.

Current course structure:

The 3-credit hour course is offered in every semester. In the Fall and Spring, enrollments average around 700 students, mostly second-semester freshmen and sophomores. During the regular academic year, approximately 20 sections are taught by 5 or 6 faculty members.

- Time: 75 minutes, twice per week
- Format: Computer lab, instructor-led
- Class Size: approximately 40 students per section
- Topics: Data cleansing, statistical analysis, data visualization, spreadsheet modeling
- Student Interactivity: Personalized assistance during class from instructors, teaching assistants and volunteer peer tutors; classroom discussion, hands-on activities

What do we hope to learn?

Through the use of Learning Analytics, I hope to study the X201 students at three critical points: Before the Course, During the Course, and After the Course.

Before the course, some of the questions I'd like to answer are:

- What are the key variables that predict success of students in our course (ex: incoming course work, grade level, GPA, number of transfer credits, Kelley admission status)?
- Does the order of courses matter?
- Are there other courses that should be considered for pre-requisites? (ex: Many students take a statistics course before our course. Are those students more likely to be successful?)
- If students take pre-requisite courses at other campuses or schools, does this impact their success in our course?

During the course, I'd like to learn:

- What activities or assignments correlate most closely with success on exams and projects?
- What learning activities work best for students in these topics?

After the course, I hope to discover the answers to questions like these:

- Is X201 a predictor of success in certain courses later in the academic career?
- Is success in X201 a factor in students' major selections?
- Is success in X201 a predictor of success in the job search or on the job (internship or full-time)?
- Does staying involved with the course (as a tutor or teaching assistant) help students with the job search or improve graduating GPA?

Methodology

The data required for this study will come from a variety of sources.

First, to learn about students before the course, data will need to be collected from student records to learn about our students' incoming characteristics. Things like prior coursework, GPA, number of credit hours, transfer credits, and demographic data will be analyzed with data mining techniques to determine if any correlations exist and if any predictions can be made about student performance in advance of the semester. Ideally, these reports can be

obtained for students from previous semesters and that data can be used to 'train' the model to determine a predictive equation. The model then can be applied to incoming students, and the outcomes can be observed to see if the predictions hold true.

Second, to see how activities and assignments contribute to student success, data from the Learning Management System, Canvas, will be analyzed for each student. Thanks to the built-in analytical tools of the LMS, data can be found on how often students visit Canvas, the number of pages read in the eTextbook, and, of course, the Gradebook. Comparing this data will help identify assignments or activities that correlate more closely with success on exams and major projects.

Third, to learn about how students perform after the course, data from the university on majors, minors, graduation rate, and GPA can be collected. If available, data from the Undergraduate Career Services office could tell us what kinds of jobs former X201 students are taking.

Benefits of this Study

X201 is a large course, serving nearly 2,000 students each year, so I believe that even if the learning from this study were applicable only to the student population of this course, that's no small accomplishment. Sharing these findings with our students about the things they can do to improve their success will most certainly prove beneficial, and this course is a necessary pre-requisite for many courses within the business school, so success in this course will be critical for students who wish to pursue a major in any area of business. Of course, as this is a course on Analytics, being able to apply the techniques that our course teaches, and to demonstrate to students how the outcomes of such analysis can impact them personally, would be incredibly interesting and valuable to our students.

Taking a broader view of the potential benefits of this study, X201 is an analytical, mathematical, and technical course, and as such, learning about student success factors in this course may translate well to other STEM courses at this level, especially those taught in smaller class sizes rather than large lecture halls.