The Factors to and Impact of K303 Success

Proposal for Learning Analytics Fellowship

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Abstract
Building on top of the research conducted by Kari Johnson in 2015, I would like to gather more data about K303, learn the data from different angles, use different analysis techniques, to further study the factors that might have certain predicting power of student performance in K303 and the impact of the course on students’ later academic performance, major selection and career development outcomes.

Brief Introduction of K303
K303, X201 before Fall 2004, has been a required course for all majors at Kelley School of Business since the 1990’s. It was titled “Technology” initially and 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.

At the advent of big data, businesses strive to build competitive advantages using analytics. There has been a talent gap in this area. 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. It provides key concepts and skills for students to build competency in this area.

This course is closely lined with the pre-requisite business course K201. Students learn Excel functions and formulas in K201 and build upon these skills in K303 as they learn to import and prepare data, create data models, present data and build spreadsheet models to solve business problems.

Previous Findings
My colleague Kari Johnson, course coordinator of K303 and a learning analytics fellow in 2015 has conducted research using academic and career outcome data of students who have taken K303 (X201 before Spring 2015). Her research detected the positive correlation between student grades in K303 and student grades in its prerequisite K201. However, this correlation is weak if not nonexistent if K201 prerequisite is met with transferred credits. This finding confirmed the strong curriculum connection between K201 and K303. The correlation might reflect the higher teaching quality of K201 comparing to equivalents used as its substitutes or it might be because of the relevance of skills taught in both courses. It established K201 performance as a strong indicator of success in K303. Johnson also explored the relationship between course performance in K303 and salary levels students acquired at graduation. She found significant differences in average salary levels students secured at graduation across different letter grades. The same finding applies to performance in K201. It is evident that success in K303 and K201, the two basic level technology courses required for all Kelley students, is a strong predictor of job placement with higher compensation.

My Research Plan
Factors affecting K303 performance
Almost two years have passed since Johnson’s research, more relevant data becomes available, curriculum evolved along with changes in technology, market demand for analytics skills is still increasing.
I would like to explore the data again and look into other possible factors that might have some predicting power of K303 success and the impact of K303 on students’ performance in subsequent courses, their retention rate, graduation rate, time to graduation, their career choices, and outcomes. Specifically, I plan to collect the following data points as potential predictors and study how much predicting power these factors have on the success of K303.

1. Demographic information:
   a. Gender
   b. Ethnicity
   c. Domestic or international

2. Academic information
   a. Class standing
   b. Plan codes (majors) entering K303
   c. Primary program (indicating whether a student is in Kelley or other schools)
      i. If a student is from Kelley, whether she is a direct admit or not
   d. Whether a student is a transferred student
   e. Program accumulative GPA, IU accumulative GPA
   f. Number of credits completed entering K303
   g. Number of credits taking in the same semester of K303
   h. K201 grade
   i. Admission SAT, ACT score or high school GPA

If significant predicting power can be found among some of the factors, I will try to develop a model that can produce risk likelihood based on these factors. Hopefully, the risk likelihood will help instructors identify students who might be at risk early in the course and design effective pedagogy method to help them succeed.

**Impact of K303 to students in general**

Another aspect of my plan is to explore the impact of K303 on student performance in subsequent courses and in program in general. I am also interested in learning whether success in K303 encourages students to pursue a technology-related major or minor. Finally, I want to explore the impact of K303 on the performance of students’ career development.

K303 is a required prerequisite for the Integrative Core (I-Core), a block of four core courses and an essential component of Kelley undergraduate curriculum. The analytical skills students learn in K303 plays an important role in their study of I-Core. I would like to explore the relationship between K303 grades and I-Core grades and check whether the hypothesis that there is a positive correlation between K303 performance and I-Core performance holds true. Furthermore, I want to see whether there is significant difference between the program GPA of students who performed well and that of students who did not perform well in K303.

Most students take K303 at their sophomore year when a lot of them are still weighing among different majors and minors. The relevance and importance of the skills taught in the course intrigue strong interest in a lot of students. I suspect that there are a significant number of students decided to take on analytics or technology majors or minors after they completed K303. I would like to verify this hypothesis using the majors and minors of students a few semesters after completion of K303 and at their graduation.
Students’ career development will be measured by whether they get internship after taking the course and get a full-time job at the graduation. Johnson has already found the positive correlation between K303 course grade and full-time job salary in her study in 2015. I would like to further examine this area by bringing in internship data and examine job categories of full-time job data. With two more classes graduated since 2015, there should be more available data to use.

**Impact of K303 to Peer Tutors**

As one of the courses with highest enrollments in Kelley that has been run for over two decades, K303 operates very smoothly and effectively. One important success factor has been a mature peer tutor structure. Students who earned a grade of A- and above can apply to be peer tutors in future K303 courses. Selected applicants are assigned to K303 sections. They attend all the course sessions to help students during the class and serve as exam proctors. Each K303 sections get 5 peer tutors on average. There are over 100 peer tutors each semester. Most of them are dedicated to attend almost all K303 sessions throughout the semester. Peer tutors are motivated students and are important contributors to K303. The program is very popular among students. I would like to think that peer tutors benefit from the experience by retaining and refining the skills through their work. When measuring the impact of K303, I will perform additional analysis to compare the impact on peer tutors as a group and regular K303 students if the data is available.

**Methodology**

I hope to be able to collect relevant data of students who completed K303 between Fall of 2010 and Fall of 2016. Data required for this study will come from the following sources:

1. Student demographic and academic data listed above should be available in university data warehouse.
2. Kelley student career development data should be available from Kelley Undergraduate Career Services Office.
3. Peer tutor information should be available from past course administration archives
4. The learning management system Canvas is another resource that might help provide valuable information not available from other sources.

After data is gathered, I will clean, merge or join data into the format that can be analyzed. Data coding, grouping might also be needed to get the data ready. I will prepare, explore data using Excel, Tableau, and JMP. For data visualization, Tableau will be used. For advanced analytical analysis, I plan to use SAS JMP.

**References**

1. Finding the Keys to Success in Business X-201, Completion Report and Proposal by Kari Johnson, Student Learning Analytics Follows Program 2015