

**Project: Learning Analytics for Students Majoring in Healthcare
Management and Policy**

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Abstract

This proposal seeks to extend and expand the learning analytics project begun in Spring 2017.

Many students enrolled in SPEA's Healthcare Management and Policy degree program (HMP) struggle in our quantitative courses in financial management and economics. SPEA has modified admissions criteria over the years in an effort to identify students who may have difficulty completing the degree, but the faculty is not satisfied that we have addressed this issue effectively. SPEA is revisiting the issues of appropriate admission criteria and prerequisite courses, as well as how to address our students' overall difficulty with quantitative courses. My research question is as follows:

What is the profile of the student who is successful (grade of "C" or better) in healthcare finance and economics courses?

Work completed thus far has been highly valuable in terms of becoming familiar with the data available from IU's student records and in terms of opening the dialogue regarding characteristics that may predict students' success in a particular course. I was able to confirm that there are predictor variables that might be used to recognize students who would benefit from early identification and possible interventions to improve the likelihood of success these challenging courses, as well as increased retention and graduation rates in this major. However, a logistical regression analysis was weak in correctly predicting which students need this additional help. I would like to expand the data set and continue to explore demographic characteristics and prior coursework that may be predictive of success in our Healthcare Management and Policy quantitative courses.

Project Description

Purpose of the investigation, research question, and data

SPEA's degree in Healthcare Management and Policy (HMP) has experienced significant growth, more than tripling the number of majors in the program over the past ten years. Unfortunately, we have also seen an increase in the number of students who struggle in our quantitative courses: financial management and economics. SPEA has modified admissions criteria over the years in an effort to identify students who may have difficulty completing the degree, but the faculty is not satisfied that we have addressed this issue effectively. The opportunity to participate in the Student Learning Analytics Fellows Program is especially timely because SPEA is currently revisiting these issues, in terms of both admission criteria and possible interventions to assist struggling students with development of math and general analytical skills. It would be extremely valuable to create a profile of the successful student in our HMP quantitative courses and use this to identify students who are outside of these parameters. My research question is as follows:

What is the profile of the student who is successful (grade of "C" or better) in healthcare finance and economics courses?

Work completed thus far has been highly valuable in terms of becoming familiar with the data available from IU's student records and in terms of opening the dialogue regarding characteristics that may predict students' success in a particular course. I was able to confirm that there are predictor variables that might be used to recognize students who would benefit from early identification and possible interventions (e.g. appropriate prerequisite courses, a SPEA "math camp", or online math "Modules" in conjunction with appropriate tutoring) to improve the likelihood of success these challenging courses, as well as increased retention and graduation rates in this major. However, a logistical regression analysis was weak in correctly predicting which students need this additional help. I would like to expand the data set and continue to explore demographic characteristics and prior coursework that may be predictive of success in our Healthcare Management and Policy quantitative courses. Toward the end of the 2017 project, I became aware of additional data that could be quite useful in the next round of analyses. In the current data set, individual scores for math and verbal sections of the SAT exam have not been tracked in students' records. I learned that students are required to take a math placement exam upon admission to IU and that these data can be made available. Because my project centers on quantitative courses, I hope to be able to incorporate this new data set.

I would also like to drill down to specific prior courses to examine any relationship to success in SPEA courses. This will likely prove to be challenging since there is much variation in prior courses depending upon instructor, changes in learning objectives, etc., however it could be useful in identifying appropriate prerequisite courses and in developing the curriculum map for the HMP major.

Anticipated outcomes from the work and contribution to the success of student learning

We expect two important outcomes from this research. One, we believe that it can have a meaningful impact on student learning in our quantitative courses. Two, it could provide valuable information regarding curriculum mapping.

Philosophically, SPEA would prefer to assist every student in completing our coursework as successfully as possible, rather than imposing highly rigorous admission standards that discourage students from enrolling in our program. For some students, this has been a disappointing experience. They often delay taking the quantitative courses until late in the program (senior year), partly because of dread or fear of the course material, and partly because of concern over poor grades that may affect their GPA. Having delayed these courses, they sometimes find themselves unable to graduate after three or more years in the program because they could not successfully complete these challenging courses.

The ultimate goal of this research is to use this information to identify students early on who may struggle in the following HMP quantitative courses: SPEA-H352-Healthcare Financial Management I, SPEA-H353-Healthcare Financial Management II, and SPEA-H354-Health Economics. At minimum, these courses assume requisite knowledge in high school algebra and introductory economics, as well as analytical reasoning skill. SPEA would like to develop and/or identify remedial interventions to assist students with deficiencies in these areas, well in advance of the students' enrollment in the courses. Examples of interventions could include appropriate prerequisite courses, a SPEA "math camp", or online Modules that a student could complete with the assistance of a tutoring staff.

If the research and the resulting program implementation strategies are successful, we believe that it would not only improve retention and graduation rates, but would also help to improve student learning and move our "D" students to grades of "C" or higher. This is a worthy goal for any student, but given the high demand for skilled professionals in the healthcare industry – we believe proficiency in this field is a significant opportunity for our students.

Secondarily, the HMP faculty is working to develop a curriculum map for our major. Examining the sequence of courses taken by our most successful students in quantitative courses will provide information that will inform this project.

As we do expect this research to have a positive impact on our students and our HMP program, we would hope to continue and expand this type of study to other courses and majors within SPEA.

Research methodology

Research would continue with an exploration of the available data items described above, identifying correlations between these items and students' grades in SPEA-H352-Healthcare Financial Management I, SPEA-H353-Healthcare Financial Management II, and SPEA-H354-Health Economics.

The second step would be to conduct logistical regression analyses to predict the likelihood of student success in these courses. Practically speaking, we are looking for key variables that we can screen when a student enters our program and then use this information to direct them to appropriate resources.

Measuring the success of the project

In the short-term, we would be able to measure students' improvement in our "math camp" or online Modules via pre- and post-tests. In the longer term, we would hope to track students' grades in the quantitative courses and compare those of students who participated in the intervention programs versus those who did not. We initially expect that the intervention programs would be recommended but not required. If the data reveal significant improvement in students' performance in the quantitative courses, they may provide a basis for requiring completion of such programs going forward.

TERRI L. RENNER

December 2017

EDUCATION

D.B.A. (candidate, ABD) Accounting, Anderson University

M.B.A. Accounting and Management Information Systems, Indiana University-Bloomington, 1985

B.A. French, Indiana University-Bloomington, 1983

PROFESSIONAL EXPERIENCE

ACADEMIC

Senior Lecturer, Indiana University-Bloomington, School of Public & Environmental Affairs. 2009-present
(*Lecturer* 2002-2009). Chair, Teaching and Learning Faculty Group. August 2016-present.

Adjunct Faculty, Indiana University-Bloomington, School of Public & Environmental Affairs. 1989-2002.

Adjunct Faculty, Indiana University-Purdue University at Indianapolis, School of Public & Environmental Affairs. 1987-1989.

OTHER PROFESSIONAL

President, re:Member Data Services, Inc., Indianapolis, Indiana (now a subsidiary of Open Solutions, Inc.). Company offering both outsourced and in-house core data processing and other software solutions, including collections, ATM and Debit Card Processing, mortgage servicing, and disaster recovery, to approximately 100 financial institutions in the United States. 1998-2000. (*Consultant*, 1988-1998).

Executive Manager, Geo. S. Olive & Co. Certified Public Accountants & Consultants, Bloomington and Indianapolis, Indiana (now merged with BKD, LLP). Serving clients on consulting and technology engagements in health care, manufacturing, retail, construction, and financial services industries. 1994-1998.

Owner, Renner & Associates, Certified Public Accountants & Consultants, Bloomington and Indianapolis, Indiana. Serving clients in accounting, tax, consulting and technology engagements, with primary emphasis on health care, manufacturing, and retail clients. 1987-1994.

Senior Analyst, Baxter International, Inc., Deerfield, Illinois. Providing business decision support to consulting division (Travenol Heath Information Services) – for both internal and health care client projects. 1985-1987.

VOLUNTEER

Advisory Council, IU Health (formerly Bloomington Hospital & Healthcare System), Bloomington, Indiana. 1994-present.

Board of Trustees, Bloomington Hospital & Healthcare System, Bloomington, Indiana. 1994-1998.

TEACHING AWARDS

Golden Key International Honour Society – Honorary Member – 2003

Indiana University Trustees' Teaching Award – 2012

SPEA Undergraduate Teaching Award – 2015

PROFESSIONAL CERTIFICATION

Certified Public Accountant (1986), Indiana

PROFESSIONAL AFFILIATIONS

American Institute of Certified Public Accountants

Indiana CPA Society



**SCHOOL OF PUBLIC AND
ENVIRONMENTAL AFFAIRS**

INDIANA UNIVERSITY

December 20, 2017

Student Learning Analytics Fellows Program, Indiana University

I am writing to strongly endorse and support Terri Renner's proposal to continue with the Student Learning Analytics Fellows Program, offered through the Indiana University, Bloomington, Center for Innovative Teaching and Learning. Professor Renner uncovered some fascinating findings regarding the success of SPEA students in quantitative courses. Clearly, demographic explanations are only minor predictors of success in the courses. Professor Renner's work should continue, particularly in order to incorporate additional data and measures of student quality/capability.

I am confident that we can learn more from the new analyses and apply these findings not just to the students in SPEA's Healthcare Management and Policy (HMP) degree program, but to all of SPEA's undergraduate majors. SPEA wants to learn how to contribute to student success in quantitative courses. This is a central issue that requires more data collection, modeling, and a deeper dive into student learning outcomes. I believe Professor Renner is uniquely qualified to do this work.

Sincerely,

A handwritten signature in black ink that reads "Michael McGuire". The signature is written in a cursive style with a large, looped initial "M".

Michael McGuire
Executive Associate Dean for Bloomington
School of Public and Environmental Affairs
Indiana University