

*Determinants of Students' Choices of Undergraduate Majors  
and the Programs' Strategies*

Application to the Learning Analytics Fellows Program

Principal Investigator: Michael Kaganovich, Professor of Economics

Department of Economics , IUB

Contact e-mail: [mkaganov@indiana.edu](mailto:mkaganov@indiana.edu)

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Michael Kaganovich and Manu Raghav

*Abstract*

The project focuses on (i) quantifying the factors that contribute to IU students' choices of majors as well as to the changes in those student decisions in the course of their studies, and (ii) inferring the actions and policies of major programs in effecting those student decisions, such as revealing the moves in curricular and grading standards aimed at attracting and retaining appropriately prepared students. We will also explore (iii) statistical relationship between mid-career salaries associated with IU majors and curricular requirements and grading standards in them, after controlling for effects of student and class characteristics that influence students' decision to major in a particular discipline and performance in particular classes. Finally, we will examine (iv) the patterns of students' "switching" between the programs, in the process of students' exploration of the best fit between their interests and preparation on the one hand, and the content and requirements of the major programs on the other.

## **Project Description**

Besides learning a chosen discipline, student experiences at IU include the process of discovery of a fit between their interests and abilities and available degree programs. In many cases, this process consumes substantial amounts of time and resources, both individual and institutional. This process is often characterized as that of “shopping” for majors and classes by the students, at least implicitly acknowledging that the system’s workings are akin to that of a marketplace. IU schools and departments who offer classes and major programs are active participants as “vendors” in the educational marketplace who often act as competitors for students. Indeed, the departments and their faculty are able to affect the selection of students into their programs by setting degree prerequisites and curricular requirements as well as the grading standards.

The goal of this project is to quantify the factors that contribute to IU students' choices of majors as well as to the changes in those student decisions in the course of their studies. One of the hypothetical statistical relationships the project will explore is the degree of influence the comparative expected job market rewards associated with majors have on students’ revealed tolerance for grading standards and coursework challenges, after controlling for effects of student and class characteristics that influence students’ decision to major in a particular discipline and performance in particular classes. Further, the project aims to use statistical methods to infer the actions and policies of major programs in effecting those student decisions, such as revealing the moves in curricular and grading standards aimed at attracting and retaining appropriately prepared students. An additional part of the analysis will entail the estimation of the cost associated with students’ discovery of their best fitting major, in terms of time and resources, as well as in terms of student retention.

The project will use the Learning Analytics data already collected by OVPUE and in close coordination with the Office. Thus the project will entail the statistical analysis of the existing data, but no new data collection. IRB approved the project as “exempt” on 12/15/2015.

The data to be analyzed will contain:

- fully anonymous and individually unidentifiable student characteristics such as SAT or ACT scores, high school GPA, academic standing (such as the year in the degree program), as well as basic demographic information;
- course characteristics such as class size, course level, class time, and course relation to the major (e.g., pre-requisite, required or elective major course);
- department and major characteristics such as the number of students in the major, curricular requirements, mid-career salary associated with the major;
- anonymous instructor characteristics, such as tenure status and rank, to be used as controls to exclude potential effects of these factors on student outcomes.

Besides potentially making an important academic contribution to the economics of higher education, the statistical analysis to be obtained through this project should help inform campus and unit administrators about the implications of curricular policies as they affect student choices and outcomes, including retention. This may ultimately contribute to improving efficiency of the policies from the standpoint of institutional and student costs.