

Student Learning Analytics Fellows Program  
**Completion Report**

Title of Study: A More Rigorous Evaluation on the Teaching Effectiveness of Principles of Microeconomics Instruction at the IU Bloomington Campus Relative to Other Institutions  
Principal Investigator Name and Department: Dr. Gerhard Glomm, Department Chair, Paul Graf, Economics Department,

Co-investigators Names and Departments: Dr. Nastassia Krukava and Kevin Hawickhorst, Economics Department

Year/Semester Awarded: Fall 2017

Number of undergraduate students who were subjects of your study: 17,766

Estimated number of student records used in your study: 17,766

Number of graduate students who were subjects of your study: 0

**Executive Summary:** Please briefly describe the key findings of your study in one paragraph or less, similar to an abstract for a research article or conference presentation.

The main goal of this study is to understand the relationship between transfer grades for Introductory Microeconomics (E201) and future performance of the students in classes relying on their performance in E201. Therefore, we performed the analysis in three stages. First, we focused on academic performance of students who transfer their E201 grade from an outside institution, specifically IVY Tech, while correcting for a variety of factors. We find student who transfer E201 received significantly higher grades in E201 compared to students taking E201 here at IUB, especially for students with relatively low high school GPAs.

Second, our analysis focuses on understanding characteristics of the students who decide to take E201 or analogous course at other institutions. We find female, domestic, and Indiana resident students are more likely to transfer E201 grades into IUB compared to male, international, and non-Indiana resident students, respectively. In addition, students with relatively lower SAT scores and high school GPAs are more likely to take E201 outside of IUB.

Third, we compared the outcomes in Intermediate Microeconomics (E321) among students who took E201 here at IUB and other four-year institutions versus those who transferred it in from other institutions, while correcting for a variety of factors. We found student who transfer E201 from other institutions performed worse in E321.

**Narrative:** Please discuss the outcomes of your student learning analytics project and any plans you may have for continuing the work. When writing the narrative please consider discussing the following points when appropriate.

Out of 23,854 who chose took Introductory Microeconomics (E201) while enrolled at Indiana University Bloomington from the fall semester of 2010 to spring semester of 2017 (14 semesters), we looked at 4,703 (19.7%) transferred this course from another two-year or four-year institution. Over a six-year period, the results of the OLS regressions with different specifications and different measurements for E201 transfer courses indicate students who transfer their E201 grade into IUB on average receive a grade between 0.7 and 0.83 higher compared to those students who take E201 at IUB. Furthermore, the

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**Completion Report**

results from the Tobit models with different specifications and different measurements for E201 grade transfers indicate, the average marginal effects of taking E201 outside of IUB results in E201 grade between 0.48 and 0.57 higher compared to a non-transfer grade in E201.

We also estimated the Tobit model for different subsamples of the students to understand if students with different levels of high school GPAs benefit differently from taking E201 outside of IUB. We divide the sample into smaller sub-samples corresponding to different ranges of high school GPAs and estimate the Tobit model for each sub-sample. The results show students in the lowest range of high school GPAs benefit the most from transferring their E201 grade into IUB. The effect gradually decreases as the high school GPA increases for the group. More specifically, for the group of students with the lowest high school GPA transfer is associated with an increase in E201 grade ranging between 0.8 and 0.87 depending on the model specification. For the highest high school GPA group, transfer of E201 grade is associated with an increase in the grade ranging between 0.3 and 0.35.

The second stage focuses on understanding the characteristics of the students who are more likely to take E201 outside of IUB by estimating a set of linear probability and Probit models. We find, consistently and across all specifications, SAT, high school GPA, gender, Indiana residency and international student are statistically significant with estimated negative coefficients. However, this is not the case for Indiana residents transferring E201 from all IVY Tech institutions. Interestingly, in every specification, our finding for the estimated effects of different variables obtained with linear probability models are consistent with the average marginal effects predicted with the Probit models. For example, coefficients of linear probability models and the average marginal effects on variables Male, Resident and International show male students are 7-8.7% less likely to transfer E201 compared to female students, international students are 2-3.7% less likely to take E201 outside of IUB, and Indiana residents are 1-3% more likely to transfer E201 compared to non-Indiana residents.

Furthermore, the coefficients on SAT and high school GPA are consistently negative in different specifications, which indicates students who perform better on the SAT and having a higher high school GPAs are less likely to take E201 outside of IUB. In order to understand these effects better, we used the estimated Probit models. These models evaluate the differences between the predicted probabilities of a transfer for the students in different percentiles of SAT scores while fixing high school GPAs at its mean (other variables are fixed to represent a white male Indiana resident student who is not eligible for the Pell grant and is not a first generation student). Similarly, we calculate the differences between predicted probabilities of a transfer for the students in different percentiles of high school GPAs while fixing the SAT at its mean. Our findings indicate students at the median of the SAT score are between 1 and 3% less likely to transfer E201 into IUB compared to the students at 25th percentile depending on model specification. The likelihood of taking E201 outside IUB further decreases by 1-2% as the SAT score is set at the 75th percentile. Ranges of a decrease in the likelihood of E201 grade transfer predicted for different high school GPA percentiles are consistent with those discussed for SAT changes: 1 to 3% depending on the model.

Student Learning Analytics Fellows Program  
**Completion Report**

Finally, our current findings on understanding the effect of taking E201 outside of IUB on Intermediate Microeconomics (E321) indicate there might be institutional differences (for example, differences in the class sizes) and differences in pedagogical strategies with regards to teaching E201 which lead to the differences in student performance. However, a more important question is whether these differences lead to significant differences in student future coursework. Our future work on this project will concentrate on understanding this relationship.