

Are Articulated Courses from Different Institutions Equal?: The Case of Introductory Agricultural Economics in Illinois

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Abstract

Since the 1970s Illinois' post-secondary institutions teaching agriculture have tried to put their transferable courses on a comparable or "articulated" basis. By 1995 33 colleges and universities offered as many as eight articulated first and second year agriculture courses in the state including Introduction to Agricultural Economics (Intro). The question of whether students who have taken a transferable Introduction course at a community college are as well prepared for higher level courses as those who take the required class after they arrive at the four-year institution is tested in this paper. By comparing final grades of transfer and native students in six subsequent higher-level courses we can get some idea of the level of preparation these transfer students have. Only one class showed a clear advantage to native students. We find that in general there is no significant difference in performance between the two groups. Only those students who have had no introductory class tend to perform measurably more poorly in the Agribusiness Economics program at Southern Illinois University Carbondale.

Introduction

In the 1970s college and university agricultural educators in Illinois began working together to coordinate the transfer options of their students among institutions. Because of the growth of community colleges and the number of students seeking four-year degrees after beginning in a two-year institution "articulation" agreements began to formalize which courses were transferable and what content those classes had. Articulation was an attempt not to make all classes in the community and four-year colleges identical, but to make them comparable. Certain core topics were to be taught, an approved textbook was to be used, and a general teaching outline was to be followed. A three-credit "Introduction to Animal Science" class at Lake Land College in Mattoon, for example, could safely be counted on as being equivalent to its counterpart at Southern Illinois University in Carbondale.

Meetings are held annually to update the articulated syllabi, approve textbooks, and handle incidental issues that arose. By 1998 there were eight articulated

outlines for various agriculture courses, including agricultural economics (Annual Illinois Agriculture Articulation Conference, 1998). The Illinois Board of Higher Education (IBHE, 1997) announced a broader program in 1993 called the Illinois Articulation Initiative, jointly with the Illinois Community College Board and the Transfer Coordinators of Illinois Colleges and Universities. This program is designed to do for the university curriculum in general what agriculture had been doing for years.

One measure of the program's success has been the number of students transferring within the state. Consistently since 1990 over 10,000 students have transferred each fall from community colleges to public universities, and over 5,000 to private institutions (IBHE, 1997). In the College of Agriculture at Southern Illinois University Carbondale (SIUC), about two-thirds of the students are transfers (Davis, 1994).

Formal attempts to evaluate the initiative are sparse. No studies were found comparing the eventual performance of students taking particular classes from the community college with those who take the same classes from the four-year colleges. Davis (1994) surveyed 436 SIUC College of Agriculture graduates (288 useable surveys) and found that transfer students made the same grades as "native" students and were at least as happy with their employment upon graduation. Rudd et al. looked only at characteristics of students attending Virginia Tech's Agriculture Technology program, but did not compare them directly with four-year students (Rudd et al., 1996). Helmers (1993) reviews studies that compared community college transfers and four-year native graduates' salaries and found them mixed. His own study found a statistically insignificant increase of \$242 in annual salary attributable to "native" status.

Only one course is articulated in the Department of Agribusiness Economics, Introduction to Agricultural Economics (Intro). Most students have taken this class elsewhere when they begin at SIUC. Were these students transferring to the College of Agriculture at Southern Illinois University Carbondale as well prepared as students who had completed Intro here? In order to get at least a partial answer to that question in fall 1998 and spring 1999 I compared the performance of these students in later, higher-level, classes.

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Methods

Using data provided by agribusiness economics (ABE) instructors at SIUC from fall 1998 and spring 1999 I compared the final grades (calculated on a 100 point basis) of students in those classes, contrasting the scores of native SIUC students who have taken Intro here with those students who have taken its equivalent elsewhere. Another category of comparison, which I had not initially intended to make, was with those students who have had no introductory economics class of any kind.

Tests were done using analysis of variance (ANOVA) and, if applicable, regression analysis. (See for example Koutsoyiannis, 1977.) I first compared the subgroups using analysis of variance (ANOVA) to see if there was any statistical basis for dividing students into different groups. In other words, analysis of variance was used to determine if the groups were statistically distinct. Regression, on the other hand, seeks to assign the degree of impact one or more independent variables (where Intro was taken) have on the dependent variable, in this case final grade. If there was a statistical difference determined by the ANOVA test then a categorical variable was assigned indicating where they had taken Intro. If the first test determined that the groups were not different then there was no point in trying to assign a degree of responsibility to any variable for that difference. But given a significant difference in the first test (ANOVA) I then regressed the final grades on the categorical variables to measure the extent of advantage (or disadvantage) inherent in being a native student.

Results and Discussion

The analysis is given below class by class with a less formal combined analysis at the end. The results are summarized in Tables 1 and 2.

ABE 318 – Agribusiness Statistical Methods

This is an introductory statistics class with an agricultural emphasis. Many of the students taking 318 are non-majors and as a consequence are not required to take an introductory agricultural economics class. Forty-three student records were analyzed: six took their Intro class at SIUC and their final grades averaged 60.3, 19 took the Intro class at another institution and their final grade average was 55.7, and 18 had no Intro and averaged 41.5. Analysis of variance indicated a significant difference among the three groups ($P = 0.0077$). Results of the ANOVA tests are shown in Table 1.

A regression using where the Intro class was taken (including a “no-intro” option) as categorical regressors

showed that taking the class at SIUC added 4.6 points to the final average compared to those who took it at the community college. but the t-value was not significant – there was a 95% chance of being between 19 points higher or 9.8 points lower. Having no Intro class resulted in a 14.2 point disadvantage - again using those with community college Intro as the baseline ($P=0.007$)(Table 2).

Though additional observations would have helped to make more definitive statements, being a native student apparently didn't give an overwhelming advantage in the class. One observation that can be made from analyzing this class is that even though 318 leans more heavily on statistical than economic theory, having had an introductory ag econ class clearly made a difference in performance. The regression shows that students who have had no Intro could expect about 14.2 points less than the transfer student.

ABE 350 – Farm Management

The analysis of 350 was made after removing students who clearly didn't finish the course (no score or scores of 0, 2, or 3) and one graduate student (score of 95). This left 36 student records including, 13 who had taken Intro at SIUC and who averaged 80.2, 19 who had taken its equivalent elsewhere who averaged 78.6, and four who apparently had no introductory class who averaged 35.3. Analysis of variance showed that the groupings were significant (P value $5.18E-07$) if the “no-intro” group was included. Regression again showed a slight advantage to native students, but again it was not statistically significant. If the “no-intro” group was removed the remaining categories, native and transfer, were not significantly different. Since this was the comparison used for the other classes tested, with the exception of the statistics class, this is what is reported in table 1.

This test does not point to an overwhelming superiority of SIUC Intro, but what was again significant (P value $2.62E-07$) was whether or not the students had any introductory econ. In this class, which clearly does rely on basic economic principles, students with no introductory class can expect a grade nearly 45 points below native students.

ABE 351 – Financial Management in Agriculture

Of the forty-one grades analyzed: 16 were from students who took their Intro class at SIUC and ended the class with a final grade average of 80.4, 24 were from students who took the Intro class at another institution and ended the class with a final grade average was 82.9, and one student who claimed to have had no introductory econ class and

Table 1. Grade differences in agribusiness courses sorted according to where prerequisite class was taken.

Class	Mean final grade (percentage of total)		
	Native students	Transfer students	No prerequisite
ABE 318 Agribusiness Statistical Methods	60.3** N=6	55.7** N=19	41.5** N=18
ABE 350 Farm Management	80.2 N=13	78.6 N=19	not used
ABE 351 Financial Management in Agriculture	80.4 N=16	82.9 N=24	not used
ABE 360 Cooperatives and Agribusiness Management	87.1 N=19	90.7 N=15	not used
ABE 362 Marketing and Pricing Agricultural Products	79.8 N=10	81.2 N=19	not used
ABE 450 Advanced Farm Management	92.6 N=6	90.3 N=5	not used
Composite	81.4 N=70	78.2 N=101	not used

*, **, *** Significant at the 0.05, 0.01, and 0.001 probability level, respectively.

Table 2. Regression results for introductory statistics, ABE 318

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept (Intro at Com. Col)	55.689	3.491	15.951	0.0000	48.633	62.745
Intro at SIU	4.639	7.127	0.651	0.5189	-9.765	19.042
No Intro	-14.209	5.006	-2.839	0.0071	-24.326	-4.092

Regression Statistics

R Square	0.216178
Adjusted R Square	0.176987
Observations	43

ended with an 89 average. If significant, these numbers would show a disadvantage to native students, but analysis of variance indicated no statistically significant difference among the groups so a regression analysis was not pursued.

One reason cited by the course instructor for the lack of performance by the native students was what he called a "comfort" factor. The native students were apparently more at ease and confident of a good grade. His observation was that some uncertainty and apprehension, which was more in evidence in the transfer students, contributed to a better student work ethic and a less lackadaisical attitude. These differences in attitude may have been an anomaly that would disappear after observing several year's data.

ABE 360 – Cooperatives and Agribusiness Management

In the cooperatives class there were 34 useable observations, 56 percent (19) had Intro at SIUC. Native students actually averaged a few percentage points below transfer students (87.1 versus 90.6). This difference was not significant however.

ABE 362 – Marketing and Pricing Agricultural Products

There were 19 transfers and 10 native students taking this class in the Spring. The final average of transfer students was 81.2 while native students averaged 79.8. The difference was not significant and regression analysis was not pursued.

ABE 450 – Advanced Farm Management

Being an upper level class, only 11 student records were analyzed: six took their Intro class at SIUC and their final grades averaged 92.6, five took the Intro class at another institution and their final grade average was 90.3. Analysis of variance indicated no significant difference between groups. A regression would not have been meaningful due to the lack of difference between groups. More observations might have resulted in a statistically meaningful difference.

Conclusions

SIUC native students had higher average grades in half of the six classes analyzed but none of the differences was statistically significant (unless the "no intro" group was included). We must therefore conclude that native students have no real advantage over transfers, or conversely, that students prepared at community colleges with an articulated Intro course were adequately prepared for subsequent classes in agribusiness economics.

Several years' data would be helpful since a larger sample would speak with more authority. However, if the final averages from all classes are treated as comparable numbers (a questionable assumption) we can obtain a larger sample size by grouping grades together and thereby obtaining a better chance of telling a "significant" story. What is revealed from such a combined analysis is similar to the individual class stories above. There are 70 total native students, 101 transfer students, and 24 who claim to have had no Intro class. Native students averaged 81.4, transfers 78.2 and "no intros" 50.0. When all three groups are considered together this difference is significant, but when the no-intro group is thrown out the significance falls to a level not generally considered meaningful ($P=0.14$).

More data would certainly help clarify the issue, but there are undoubtedly other complicating factors. One of these may be some self-selection of transfer students — those who do not do well in the community colleges may decide to take their associate degree and go no further.

It is inescapable that having no Intro class is correlated with poorer performance in later agribusiness economics classes. The no-intro students averaged 31 percentage points below the group that had Intro at SIUC. We conclude that students who expect to thrive in the agribusiness program would do well to have some version of Intro.

Summary

Though native students may have some advantage they do not appear to be head and shoulders above the others who have had some introductory course. We conclude that native students do not have an advantage over transfers. Judging by scores in later classes students prepared at community colleges with an articulated Intro course were apparently as well prepared for subsequent classes in agribusiness economics as native students. We also find that students have a greater probability of success in later classes if they have had some version of Intro.

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Relationships Between Student/Course Characteristics and Student Evaluations of Teaching Quality

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Abstract

A relational study was conducted to determine associations among student final grade, class size, course level (undergraduate or graduate), time of evaluation (fall or spring semester), type of course (applied behavioral science or biological/physical science) and student evaluations of teaching and course quality. The student evaluation instrument contained the following measures: (1) overall course quality, (2) instructor's ability, (3) overall instructor quality, (4) exams and assignments, and (5) instruction in the laboratory. The quantitative results of this study revealed that statistically significant positive bivariate correlations existed between class size and student perceptions of the instructor's ability, overall instructor quality, and exams and assignments. Positive but low significant relationships were also found between student course grade and these same teaching quality measures. Grades were also significantly positively correlated with perceived quality of laboratory. Students enrolled in graduate level courses were more pleased with the quality of instruction in three of the five measures. Overall, student evaluations were not drastically tainted by these factors.

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Introduction

Student evaluations of teaching quality provide essential information related to numerous decisions in higher education (Braskamp et al., 1983, 1984b). They provide information to students (in terms of course selection), colleagues (for tenure, promotion, merit pay, etc.), and the instructor (for self-improvement). Increasingly the validity of student evaluations and the quality of evidence that they provide to the personnel function have been questioned. Supporters of student evaluations perceive students as the most reliable evaluators because they are recipients of the instruction on a continuous basis. Frey (1976) stated: "because students are the only regular observers in college classrooms, reports about their classroom experiences provide unique information about the teacher and the teaching environment" (p. 327). Supporters view student evaluations as effectively providing summative evidence related to instructional quality, as well as providing formative evidence for instructional improvement. There are many critics, however, that are concerned about the use of these evaluations (Greenwald, 1997, Greenwald and Gillmore, 1997; Wilson, 1998). These critics feel that the classroom is transformed into a popularity contest. In their view the teacher's role is changed from that of educator to entertainer.

Braskamp et al. (1984a) advanced a model that contained four factors that could have a positive or