Student Performance and Perception of Course Transformation

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The Instruction Matters: Purdue Academic Course Transformation (IMPACT) program at Purdue University was created in 2010 to assist instructors in redesigning their courses to more fully engage students in the learning process and create a more student or learner-centered environment (IMPACT 2014b). The program is a multi-disciplinary effort spanning the entire Purdue University campus and includes the President's Office, Office of the Provost, Center for Instructional Excellence, Information Technologies at Purdue, Purdue Libraries, the Discovery Learning Research Center, and Purdue Extended Campus. Since IMPACT's inception, over 120 courses have been redesigned with the objective of improving student success through student engagement, competence, and increased attainment of course-specific learning outcomes (IMPACT 2014).

Faculty fellows apply for the program and participate in a semester long Faculty Learning Center (FLC) prior to implementing the redesign in the classroom. The approach to the redesign is flexible (i.e. unique to each course and faculty fellow), and the focus of the research below is on one agricultural economics course taught at Purdue University in Spring and Fall 2014.

The motivation for this research came from the desire to understand whether incorporating active learning techniques increased student motivation, and in turn, whether motivation is related to increased performance on a cumulative (i.e. semester long) marketing project. Data was collected prior to the course redesign as well as during the redesign. The specific course examined below was an introductory marketing course designed for agricultural economics majors. The majority of students in the course had no previous marketing experience although some were concurrently enrolled in a sales course. The course provides a foundation for the rest of the agribusiness marketing courses offered in the department.

A key component of this research is recognizing students' motivation to learn and their expectancy to perform well on academic tasks. Paulsen and Feldman (1999) suggest that faculty can increase student motivation to learn by helping students recognize that one's ability to learn is complex and takes place over time; however, the ability to learn can be improved through different methods. In Spring 2014, the course was taught in a traditional method and the 74 students enrolled were surveyed twice during the semester to collect data on student perceptions (motivation, competence, engagement) and to evaluate the extent to which perceptions may or may not change over time, from the beginning to the end of the semester. The same two surveys were given to the 77 students enrolled in Fall 2014 during the first semester of the redesigned course. The faculty instructor did not have access to the results of the student motivation survey at any time during the course transformation.

Prince (2004) defines active learning "as any instructional method that engages students in the learning process" (p. 223). The Spring 2014 course did implement some active learning as students were asked to spend the last 15-20 minutes of a 75 minute class period answering questions with those seated next to them on a daily case study. However, the Fall 2014 redesign was entirely devoted to active learning. Lectures were posted on Blackboard for students to view prior to class as well as a 10-question quiz. In class, the students were engaged from the beginning as they sat at round tables of 3-8 students each and collaborated to answer questions and participate in discussion during the entire 75 minute class period. In addition, the questions and discussion were focused primarily on learning outcomes and applied in many instances to the work the students were doing on their marketing project.

The marketing project assignment was identical in both semesters. The objective of the project was to effectively bring all of the key concepts from the course into a final project where

students apply and demonstrate how all of the concepts work together in analyzing the marketing situation of an agribusiness identified by the students. The requirements for the company chosen was that it must be a registered member of Indiana MarketMaker and each group must select a different business. The students self-selected into groups of 4 (there were two groups of 3 in Spring 2014 and one group of 5 in Fall 2014). Points were assigned for the opening/introduction, current marketing situation, SWOT analysis, marketing strategy and action programs, recommendations, summary/closing, professionalism, and attachments.

Data and Methods

Demographic data for all students was collected by the Registrar's Office at Purdue University. The release of the demographic data is pending and the analysis and results below will be updated subsequently. Course information was collected by the instructor assigned to the course. The Student Perception Survey was administered and analyzed by the Center for Instructional Excellence.

The instructor assigned to the course had five semesters of teaching experience and three semesters experience of teaching this course prior to the spring 2014 semester. All prior semesters including spring 2014, the instructor used a primarily traditional lecture format. In fall 2014 to implement the redesign, the instructor used Video Express to record lectures. Video Express is a self-service video recording site on Purdue University's campus that allows faculty to record high-quality video incorporating video and audio of the presenter as well as PowerPoint slides. Each video was then processed by the instructor, closed captioning was added, and the video was available to all students enrolled in the course through Blackboard Learn, a web-based course content delivery site.

The Student Perception Survey was administered to students during weeks 2-3 and 13-14 of the spring and fall 2014 semesters. The students were aware that they were in a course that was currently being redesigned with the initial implementation of the redesign either occurring in that semester (students enrolled fall 2014) or in the next semester the course was offered (students enrolled spring 2014). The students were asked questions from a validated measurement scale based on self-determination theory (Deci and Ryan 1985; Deci and Ryan 2000; Ryan and Deci 2000).

The questions were in regards to the classroom learning environment and their degree of competence, relatedness, autonomy, and perceived knowledge transfer scale (IMPACT 2015). Learning climate refers to students' perceptions of the student-centeredness of the learning environment. The need for autonomy refers to students' need to feel a sense of volition and self-determination in the course. The need for competence refers to students' need to feel capable in mastering the learning activity of the course. The need for relatedness refers to the students' need to form meaningful interpersonal relationship with people in the course. Perceived knowledge transfer reflects to what extent students perceive that the information learned would transfer beyond the course. All survey questions were on a Likert scale of 1-7, from strongly disagree to strongly agree.

The analysis includes examining whether the average marketing project grade of 82.86 percent after the redesign is significantly different from the average marketing project grade of 84.58 percent prior to the redesign. The average grades for specific components of the marketing project related to learning outcomes will also be compared. The second part of the analysis includes examining the relationship between learning climate and student motivation before and after the redesign.

Results

Anticipated results are no change will be observed for student performance overall for the initial course redesign; however, improvements may be seen for specific learning outcomes such as evaluating marketing strategies and action programs. Additionally, student motivation is expected to increase after the redesign. Full results will be available following the release of data from the Registrar's Office.

Summary results of the Student Perception Survey can be found in Tables 1 and 2. Twenty-one students completed both surveys in the spring semester for a response rate of 28 percent. Nineteen students completed both surveys in the fall semester for a response rate of less than 25 percent. Initial examination shows students' perception of autonomy, competence, and relatedness increased between Time 1 and Time 2 in Spring 2014 prior to the course redesign. While students' perception of relatedness increased between Time 1 and Time 2 in Fall 2014 during the course redesign.

Table 1: Comparison Between Time 1 (Week 2-3) and Time 2 (Week 13-14) Spring 2014

		N	Mean	Std. Dev.
Learning Climate	Time1	24	5.50	1.03
	Time2		5.45	1.09
Autonomy	Time1	21	4.83	0.82
	Time2		4.94	0.72
Competence	Time1	21	4.73	0.83
	Time2		4.78	0.97
Relatedness	Time1	21	4.89	0.93
	Time2		5.11	0.78
Perceived Knowledge Transfer	Time1	21	5.75	0.89
	Time2		5.58	1.18

Source: IMPACT Fellow Report

Table 2: Comparison Between Time 1 (Week 2-3) and Time 2 (Week 13-14) Fall 2014

		N	Mean	Std. Dev.
Learning Climate	Time1	20	5.58	1.05
	Time2		5.34	1.21
Autonomy	Time1	19	4.95	0.81
	Time2		4.62	0.67
Competence	Time1	19	4.94	0.98
	Time2		4.89	0.89
Relatedness	Time1	19	5.25	1.29
	Time2		5.32	1.26
Perceived Knowledge Transfer	Time1	19	5.45	1.04
	Time2		5.41	1.22

Source: IMPACT Fellow Report

Initial results indicate that when all students are included in the marketing project analysis, we fail to reject the null hypothesis that the mean difference in scores between the spring and fall 2014 semesters are equal (Table 3). However, one student failed to participate in the marketing project portion of the course and therefore, received a score of 0. This score is an outlier among the five semesters this instructor taught this course and used the marketing plan project. Therefore, when the score is dropped from the analysis, the null hypothesis that the mean differences are equal is rejected.

Further analysis will be conducted to determine if student's perceptions as well as demographic characteristics impact their score on the marketing project.

Table 3: Marketing Project Comparisons

	Spring 2014	Spring 2014*	Fall 2014
Average Score for Marketing Project	84.58	85.74	82.86
Variance	149.70	51.06	80.20
Standard Deviation	12.15	7.10	8.90
Minimum	0	72	71
Maximum	95	95	95
Observations	74	73	77
T stat (Spring compared to Fall)	0.98	2.18	
P(T<=t) two-tail (Spring compared to Fall)	0.33	0.03	

* One student completed the course (took all 3 exams and completed 3 out of 5 individual assignments; however, they did not participate in their marketing project)

Summary and Conclusions

Active learning has generated heated discussions amongst faculty across our institutions. Advocates view it as imperative to reach and serve our students. Skeptics view it as another educational fad and an unnecessary need to change from traditional lectures. This is a topic that will continue to provide thought-provoking and enlightening discussion in our profession. It is unique to the literature in that few researchers have been able to analyze both student perceptions and student performance given changes in instructional methods. Initial results of this study reveal little to no change prior to and after the course redesign. This may be due to the fact that this was the first semester for the course redesign and the instructor was not yet comfortable with this "new" method of teaching or it may be reflective of differences in student demographics or other unknown variables. Some may argue that the method of instruction has less to do on student performance and motivation than originally thought. Regardless, our students deserve the best quality of education that we can provide to them irrespective of the method of instruction.

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