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Bringing Industry into an Undergraduate Agribusiness Course

ABSTRACT: The current changes in agriculture, often referred to as industrialization, are creating a work environment for agribusiness employees that is more complex than ever before. It is paramount that agricultural economics and agribusiness programs adequately prepare students for this changing work environment. In particular it is essential to help students develop good analytical and communications skills. Specifically students need to be able to integrate ideas from different areas, identify similarities and differences, identify alternative courses of action, analyze the consequences of the alternative actions and communicate the implications of the action. This paper reports on a successful agribusiness capstone course that made extensive use of active learning techniques and brought industry into the undergraduate course. The format of the course as well as the benefits derived for the students, the university, and industry are discussed in the paper. In addition the factors that lead to the success of the course as well as those factors that were a constraint are identified. Readers can take from this example the ideas that will work for them to incorporate into their courses.

INTRODUCTION

The business of agriculture is changing rapidly. During the past decade there has been a movement towards increased vertical linkages and integration, an industrialization mentality, and increased emphasis on efficiency throughout all sectors of agriculture (Boehlje, 1995). With the change in the nature of the business of

agriculture there has also been considerable reorganization of the agricultural businesses in the form of mergers, acquisitions, joint ventures and strategic alliances. With these changes come increased demands on the people who work in the agribusinesses. One group of employees of particular interest is the graduates from agricultural economics and agribusiness programs who are the new employees of the agribusinesses. There is an even greater need for these students to have effective communication skills and good quantitative skills. It is paramount that agricultural economics and agribusiness programs adequately prepare students for this changing work environment. Specifically students need to be able to integrate ideas from different areas, identify similarities and differences, identify alternative courses of action, analyze the consequences of the alternative actions and communicate the implications of the action.

The curricula of agribusiness programs have been evolving in departments across the country for some time in response to the above noted demands. Many innovative and creative approaches to agribusiness courses can be found across the country. An organized symposium at the 1997 American Agricultural Economics Association annual meeting highlighted effective courses in negotiation practice, and quantitative methods, as well as the use of internships and capstone courses (Fulton, Dooley, and Foltz, 1997) in conjunction with the organized symposium a web page was developed that allows users to link to undergraduate agribusiness courses around the country (Foltz, 1997).

The usefulness of internships and capstone courses in a curriculum has been examined in the literature. Harrison and Kennedy discuss how internships help prepare students for positions in agribusinesses by complementing classroom instruction. Within the classroom, faculty are using capstone courses to help students integrate knowledge and skills from all of their coursework and develop higher level analytical skills. Collins and Dunne report on the use of a multilevel capstone course approach at the University of Queensland in Australia. The case method of teaching has become popular among instructors teaching capstone courses and assists in the goal of producing professional managers as opposed to technicians (Harling and Akridge, 1998). The overall objective of these curriculum changes and new teaching approaches is to integrate higher order cognitive skills into courses and enhance student learning (Conley, 1991; Conley and Simon, 1993).

It is interesting to note that although agricultural economics and agribusiness departments have been integrating internships and capstone courses into their curricula little direct attention has been paid to the literature on active learning (Bonwell, 1998), which supports the use of the above mentioned techniques. Bonwell describes active learning as those learning situations where students are "doing things and thinking about the things they are doing" (Bonwell, p. 2). In developing the argument that active learning is more effective, especially when

the objective is to have students develop problem solving and analytical skills, Bonwell quotes Chickering and Gamson who say:

Learning is not a spectator sport. Students do not learn much just by sitting in class listening to teachers, memorizing pre-packaged assignments, and spitting out answers. They must talk about what they are learning, write about it, relate it to past experiences, apply it to their daily lives. They must make what they learn part of themselves (Chickering and Gamson, 1987).

The objective of this paper is to report on a successful¹ agribusiness capstone course that not only made extensive use of active learning techniques but also integrated industry and academia. In addition to reporting on the format of the course and the benefits the students, the university, and industry received from this course format, I will identify the general factors that lead to the success of the course as well as those factors that were a constraint. In this way readers can take the ideas from this example that work for them and incorporate those ideas into their courses.

The following section of the paper describes the capstone course that was developed and implemented at Colorado State University. Section 3 discusses the concerns or challenges associated with teaching a capstone class like the one described here. Some ways to overcome the concerns and challenges are also identified. The final section of the paper describes the outcome of the course in terms of student learning as well as the response from students, university, and industry representatives. The implications of these outcomes are also discussed.

DESCRIPTION OF THE COURSE

The agribusiness course was offered in fall semester of the 1996-1997 academic year in the Department of Agricultural and Resource Economics, Colorado State University. As a capstone course it had the objectives of providing students with the opportunity to:

1. Examine how economic theory, econometrics and business concepts can be used to analyze problems and issues in an industry and/or research environment.
2. Visit agribusinesses, trade associations, and producer groups in order to learn about the rapid changes that are occurring in the agribusiness sectors and to learn about the business challenges and opportunities facing decision makers.
3. Select a problem, opportunity or challenge in agribusiness and perform the appropriate analysis and complete a final report as the term project for the course.

As Westgren and Litzenberg point out, a capstone course has both overt and covert objectives. The overt objectives, as listed above, were provided to the

students at the beginning of the semester on the course syllabus. The covert objective for this course was to have students improve their analytical and communication skills, which were identified as important in the introduction of this paper. In particular, the objectives were to have students learn, through a real world example, how to synthesize ideas from one problem or area to another, to help students see the complexities of issues that decision makers in agribusiness face on a regular basis, and to realize that many decisions that must be made are not black and white.

The course included an agribusiness tour, a current events assignment and a term project that explicitly linked industry and academia. Each of the components of the course will be described in more detail below. The students' grades in the class were determined from performance on the homework assignments, current events assignment, term project, and class participation. Lectures and homework assignments were also utilized to help the students review analytical techniques, and effective communications techniques.

The content for the lecture and homework assignment components focused on data analysis.² The textbook and associated workbook by Goodwin were used. Although introductory statistics and econometrics were prerequisites for this course, there were some students who were taking econometrics concurrently with the course. For those students in particular, the lecture and homework component that occurred at the beginning of the semester were critical. The students were required to perform regression analysis as part of their project.

Agribusiness Tour

The agribusiness tour was two days in length and occurred two weeks into the semester. The dates were deliberately selected to be early enough into the semester that missing class would not be too onerous for students, while at the same time ensuring that all of the students who were going to sign up for the class had done so. In spite of the desire not to interfere with other classes, there were several students who felt they could not participate in two full days of tour and miss too much of their other classes. Consequently, there were a number of students who were only able to participate in one of the two days. The tour included stops at the state department of agriculture office, the producer associations for the corn and beef producers and the state trade association for cooperatives. In addition, to expose students to large and small businesses in the different areas of the agrifood sector tour stops were made at Monforts, Coors, and a locally owned organic vegetable producer. The objective of the tour was to give students a sense that the business of agriculture and food involves activities at many levels, from large to small businesses to trade associations to government departments. Even though there was no assignment or report, linked to their final

grade, associated with the tour the students were very attentive. Some of the students identified internship and job opportunities as a result of the tour stops.

Current Events Assignment

Each student was required to do a current events assignment with the following objectives:

1. Students increase their awareness and understanding of the current issues facing the agribusiness industry,
2. Students relate concepts acquired from college coursework to current issues facing agribusiness,
3. Students prepare and deliver an oral presentation and lead the follow-up group discussion.

The student presentations of their current events took place throughout the semester with the first part of the scheduled class period on each Monday and Friday devoted to that objective. The presentation schedule was determined by a random drawing of names at the beginning of the semester. Although the students were given the opportunity to trade for a different date, all of the students kept the original date assigned. Each student selected a topic that was in the news no more than two weeks prior to his/her presentation date. The students were encouraged to get assistance from the instructor as they selected their topic and undertook the analysis. As might be expected, some of the students took advantage of the assistance to a greater degree than did others.

In preparing for the presentation each student was encouraged to first identify and evaluate a current event to determine the appropriate economic theory to assist in explaining the event. Most of the news items were selected from newspapers like the *Wall Street Journal* or trade publications. The student then analyzed the current event, utilizing the economic theory selected, to determine the prediction or forecast that could be drawn from the analysis. At this point the student was ready to prepare the oral presentation and create the visuals and handout materials. The final step for the student was to deliver the oral presentation and lead the class discussion that followed.

The students were graded on the current events projects according to the following criteria:

1. The importance of the event selected as well as how effective the student was in making the case for the importance of the topic
2. The organization of the presentation
3. The quality of the presentation
4. The quality of the visuals and handout materials

5. How well the student related economic theory to the current event topic
6. The logical consistency of the points made by the student in the presentation
7. How well the student drew conclusions
8. How well the student lead the discussion

The instructor developed a grading sheet, based on the above criteria, that was used to evaluate the student presentations. The instructor took notes during each of the presentations. Following the presentation the instructor formalized the notes to the student and assigned a score for each of the categories as well as an overall grade for the assignment. A copy of the grading sheet was kept with the instructor while the student was given the original. The grading sheet, with the point allocations previously identified as well as specific areas for comments, was a very useful tool. The instructor was assured that all of the students were evaluated consistently. In addition the students received comments that enabled them to identify their strengths and weaknesses.

Term Project

A major component of the course was the term project, and it was at this stage that there was the greatest amount of integration between industry and academia. Each student group selected their own topic for the project. The only restriction on the topic was that it had to be an issue or problem related to agribusiness in the state of Colorado. In the discussion of the project in class, the instructor was careful to point out that the groups consider the requirements for the project as well as the grading criteria when selecting their topic. All groups were strongly encouraged to work closely with the relevant agribusiness or trade group as they completed their project. In this way there was a direct link between academia and industry. In most cases the industry link was established with the assistance of the instructor. However, in a few cases the students had connections from their previous experiences and they followed through on their own. A couple of the groups selected projects that were generic in nature, such as measuring economic and environmental impact, and so there was no industry group to work with. The students found the interaction with industry representatives to be very useful. A list of the topics selected is found in Table 1 and includes considerable variation.

Students worked in groups of two or three persons on the projects. A challenge for any instructor who is using group projects involves selection of the group members and determining the grades since free ridership is always a potential problem. In this case it was decided to have the students select their own groups and assign the same grade to all members of the group. In the handout material the students received about the project, they were informed of the grading criteria and it was suggested they carefully select group membership to avoid free

Table 1. Term Project Topics

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- An Economic Analysis of Conventional vs. Partial No-Till
 - Retail Beef Prices
 - Factors Influencing Organic and Conventional Produce Purchases
 - Machinery Leasing or Outright Ownership
 - Chemical Management in Northeast Colorado
 - Economics of Feeding By-Products
 - Environmental Issues of Pork in Kit Carson and Yuma Counties
 - Economic Effects of Large Corporate Pork Farms on Communities
 - Price Change in Two Major Meat Industries in the US
 - Agricultural Contracts and Financial Accessibility
 - Cattle Hedging Strategy
-

ridership problems. No complaints were received from the students concerning the final grades.

Students were given the project guidelines midway through the semester. This timing was deliberate. It was felt that by focusing deadlines during half of the semester it would be easier to keep students' attention strongly focused on the project. Previous experience shows that undergraduate students often put off term projects until the end anyway. A series of deadlines with progress or interim reports were structured into the project. The final report for the project consisted of two parts. Part 1 of the final report was the traditional written report that was due the last day of classes prior to Thanksgiving break. The second part of the final report was a poster presentation.

Although the focus of the entire course was on having students apply their knowledge and skills to issues in agribusiness, the poster presentation provided the greatest opportunity to link industry and academia. One of the key audience groups for the poster presentation was industry representatives. The poster presentation involved a one-half day session on the Friday morning of the week following Thanksgiving break, which also was the second to the last week of classes for the semester. To ensure there was enough space for everyone to effectively display their posters and allow for easy mingling by the audience members, the livestock pavilion was used. Each student group was provided with an 8 foot table and backdrop board where they presented the results of their research in this second format. Coffee and cookies were provided to create a "this is the place to be" atmosphere and encourage the audience members to mingle around and visit with the students about their research.

Several groups made up the audience that attended the half-day poster presentation session including:

- Agribusiness decision makers (including those from agribusinesses that were recruiting seniors to hire following graduation)
- Faculty from the Department of Agricultural and Resource Economics

- Faculty from other departments in the College of Agricultural Sciences
- Senior administrators at Colorado State University
- Faculty from other departments at Colorado State University
- Undergraduate and graduate students

CHALLENGES

The capstone course described here contained a number of important elements that all combined to contribute to effective student learning. However, there were also a number of challenges associated with a course like this. The term project, and especially the poster presentation component, offered both the greatest opportunities and challenges. In addition, several challenges relating to curriculum design surfaced in the development and implementation of the course. The specific challenges associated with the term projects and suggestions for overcoming the challenges are discussed below. The curriculum design challenges, which are broader in scope and not as easily overcome, are presented at the end of this section.

There are three concerns associated with implementing the poster presentation format. There is the risk that the quality of the student presentations will be weak and be an embarrassment to the students, the instructor, the department, the college, and the university. There is also the concern that there will be a low turnout from the invited audience leaving the students feeling dejected because they had put so much work into the project and nobody cared about it. The final challenge is the workload associated with the projects. The objectives of the project, with respect to student learning, are high and will not be achieved without the students doing a lot of work. The workload for the instructor is also an important factor. The success of the student projects does require the instructor to monitor the student work in a manner that is similar to thesis supervision.

The experiences from the successful course at Colorado State University do provide some suggestions for dealing with the above challenges. To ensure that the quality of the student work was "top rate" the instructor set minimum requirements for the term project. These minimum requirements identified that the students must, in their report, use two references from academic journals, two references from industry publications, the results of two regressions that they performed specifically for this project, 50 data values from at least 3 different sources, and 5 graphs. The establishment of minimum requirements provided guidance to all of the groups as they began work on the project. In addition, the first reaction of several groups was that they felt it would be challenging to meet the minimum requirements. This served as an excellent motivator to ensure that the students did not leave the project until the last minute.

The other factors that contributed to the success of the project included setting intermediate deadlines: project proposal, progress report, written report, poster presentation, and closely monitoring the progress of the groups. It was found that a crucial element was to have the written report due before the poster presentation. Many of the students initially perceived that the poster presentation would be easy to put together and they could do that at the last minute. By having first completed the written report the students had thought through all of their analysis and all of the issues concerning how to report the results. Finally, the fact that representatives from industry were coming to the poster presentations served as an excellent “reality check.” The students were all seniors and most of them were in the job market so they did not need to be reminded of the importance of making a good impression with industry.

The challenge of audience turnout is one that is very manageable. It is important to use a combination of invitations via mail followed up with personal phone calls. In addition, linking the poster presentation with the department’s student placement activities is very useful. The industry representatives that were recruiting seniors for jobs found the event very useful. They were able to see the students’ work directly and through the question and answer component observe the students “in action.” It goes without saying that over the long term the most important thing is to build a positive reputation for the projects.

The final challenges have to do with developing a new course and fitting it into an overall curriculum. There are often demands from various faculty members concerning the content of the course. This is particularly true with agribusiness courses where there is a “debate” as to the type of analytical techniques it is most important for students to master (e.g. regression, programming, budgeting and financial analysis, strategic management). This debate is central to the selection of course content and the type of projects that are assigned to the students. There is often a tendency to try and incorporate too much into a new course in an attempt to have the course solve all of the demands being placed on curriculum. There is the question of whether it is better to develop a brand new course or adapt an existing course. The answer to this question often depends upon the administrative “costs” of new course development at the university in question. Challenges of recruiting students and ending up with an appropriate class size are very real. In addition, there is no single answer to the question of what the best class size is to be able to be small enough to give the students the individualized attention that is so important for completion of successful projects and also be large enough to attract industry to attend. The final challenge relates to instructor time. While extensive term project experience is extremely valuable for the students it is also extremely “time intensive” for the instructor.³ This is a challenge that faculty and administrators will need to address as we continue to find ways to prepare our students to enter the changing agribusiness workplace.

OUTCOME OF THE COURSE

This course made extensive use of active learning techniques and was able to integrate industry and academia through the student projects and poster presentation session. The response from the department chair and dean support the claim that the course was successful. The department head noted in a letter to the instructor that administrators from across campus and people from the production sector of agriculture as well as agribusiness were “uniformly laudatory in their comments” (Gray, 1996). In an e-mail message to the instructor the Dean of the College of Agricultural Sciences described the student projects as “innovative” and indicated that he was impressed with “the students ability to present the research and the research itself” (Knox, 1996). Comments on the student course evaluations at the end of the semester also indicated that the course was successful. These comments included:

- It was a good experience
- I learned a lot
- The current event presentations, term paper, poster presentations and tour made this course great
- Term project was one of the most beneficial things to me during my entire 4 years at CSU
- Poster presentation was a great experience
- I really liked the hands on experience we got in this course, we got to use the skills we have been learning these 3 years
- This course really helped pull everything together.

The course was extremely successful as evaluated by many standards. The students learned a lot and significantly improved their problem solving, analytical and communication skills. Representatives from industry, as well as the students, were particularly pleased with the way that this course helped to “link up” students and businesses for jobs as well as internships. In particular, the industry representatives that came to the poster presentation were able to see the students “in action.” It is not surprising to note that the faculty and administrators of Colorado State University were extremely pleased. The poster presentation allowed the university to “show off” how the students were so knowledgeable - as well as the obvious linking of industry and academia.

NOTES

1. This paper reports on one specific agribusiness capstone course and no empirical measures of success are available. The course is described as successful because of the positive feedback that was received from university faculty and administrators, industry representatives, and the

students. This feedback will be identified later in the paper. Future research needs to empirically evaluate how capstone courses and internships affect student performance in the jobs they take following college.

2. As is often the case with university courses, this course evolved from one that had been “on the books” for some time. Since the original course was a price analysis course the focus of this capstone experience was on the application of statistics and econometrics to a relevant problem for agribusiness in Colorado. Students were required to move beyond the calculation of empirical results to analyze the implications and suggest action plans.
3. It is virtually impossible to measure the amount of extra instructor time is required for this course compared to a “normal course” since there are so many different types of courses. If a department has decided that individualized term project experience is important for students the poster presentation component can be added with very little extra work for the instructor.

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