Teaching and Learning Through Cooperative Research Ventures

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Abstract: Classroom-based learning can be enhanced for advanced agricultural economics and agribusiness undergraduate students by engaging them as partners in an applied research project. The approach described combines research, outreach and resident instruction in a single activity that produces and extends knowledge while educating students. Many of the changes suggested for agricultural, agricultural economics and agribusiness instruction are encompassed by this approach.

Key Words and Phrases: *Teaching methods, Case studies, Land grant mission, Active learning, Outreach.*

In 1991, the National Academy of Sciences and the National Research Council's Board on Agriculture, together with the U.S. Department of Agriculture, sponsored a "landmark national conference to chart the comprehensive changes needed to meet the challenges of undergraduate professional education in agriculture" (National Research Council, p. v). The conference proceedings reflect prevailing views of leaders in government, academia and the private sector. While administrators were exhorted to alter the incentives to encourage a better balance of effort between research and teaching, i.e., to raise the status of undergraduate teaching, it was also made abundantly clear that the reforms need to extend beyond curricular and reward structure changes to encompass fundamentally different teaching approaches within the classroom.

Throughout the volume, classroom teaching recommendations are featured. We are urged to find approaches to learning that emphasize and foster problem identification and solution, cooperation and teamwork, integration, synthesis, exposure to the real world, communication, flexibility and diversity. These needs are not discipline-specific, yet are clearly applicable to agricultural economics and agribusiness. More than one contributor urges a move toward active, problem-based learning, in which the instructor serves primarily as a guide and facilitator, rather than as a lecturer.

The need for change has been articulated within the agricultural economics profession as well. Several recent Presidential and Fellows addresses to the American Agricultural Economics Association membership (e.g., Barry, Beattie,

Houck, Lee and Libby) have emphasized the need for "revitalization in the classroom" (Libby, p. 1004) and a return to a "coordinated approach" to fulfilling the land grant university missions of research, extension and resident instruction. Arguments for requiring students to be involved in pragmatic, applied research projects have been advanced repeatedly (e.g., Blank; Dobson and Luby; Houck; Turner; and Russell, Henneberry and Batchelor) as a partial pedagogical solution to the "pervasive dissatisfaction" with economics education.

Our universities, individually and in combination, are feeling their way toward the future. In one sense we, as faculty members, are receiving a "back to the basics" message: pay more attention to your undergraduate teaching. Yet we are also being asked to do things differently and better, to focus on the output (i.e., learning) and not just the input (i.e., teaching). If, as it would appear, there is widespread dissatisfaction with our existing pedagogy, the question then becomes, "What do we do now?"

This article describes an approach to teaching undergraduate agricultural economics and agribusiness majors that addresses many of the concerns raised regarding prevailing methods. At its core, the approach is a specialized form of education through cases, which is tailored to integrate the major elements of the land grant mission. In contrast with the case study method widely used in business schools, the students work with industry members to conduct actual applied research, thereby making a contribution to knowledge that is communicated through a public presentation. The method is distinguished from typical undergraduate research projects by its breadth, its depth, its outreach component, and because it is fulfilling an industry's need for analytical information. It is real, rather than being simply an academic exercise. This approach evolved through the teaching of a course for senior-level majors in agricultural price and market analysis, and it is described through that application. The learning paradigm, however, is applicable across a spectrum of courses.

Background

Houck proffers that, "We simply ache to be 'relevant'" (p. 1062). This ache is demonstrably no less powerfully felt by students. Perceived relevance can spell the difference between short-term memorization to pass exams and meaningful learning. Students in my department commonly enter their senior-level courses lacking command of even the fundamentals covered in the prerequisites, as revealed through administration of a pre-test at the beginning of each term. When questioned about such deficiencies, students typically admit that the topics have indeed been covered in previous course work, but they did not expect to need to know them (other than to pass the exam).

Over a period of several years my teaching approach has transformed from one that encouraged traditional (passive) learning to one that fosters an active classroom learning environment, including such changes as a conversion of lecture material into a series of in-class exercises, students collecting their own grocery store prices which were then used in a variety of homework and classroom exercises, and simulation games. Yet, while they were necessarily more engaged in their own learning than had been the case when I used a traditional lecture approach, the goal for many students was still to pass the course with some acceptable letter grade rather than to learn. They appeared to need a compelling reason to want to learn.

In the spring of 1994, this reason came from an extension agent who requested that I conduct a price and market analysis of the local blackberry industry. He believed that a profound lack of understanding of their market's fundamentals was leading industry members to make poor choices. The issue had been intensified by the formation of a growers' bargaining association that was about to begin negotiations with processors. This agent felt that if both the growers and the processors were in possession of unbiased market information they would then be empowered, in Lee's words, "to act in their own enlightened self-interests and, ultimately, the public interest" (p. 1020).

Due to other commitments, the resources that I had available were my own expertise and ten weeks worth of a group of senior undergraduates' time. My offer of this resource combination was accepted, and this led to the development of a qualitatively different teaching approach.

Basic Elements of the Approach

The core of the approach is simple in concept: students learn price and market analysis by becoming a research team which conducts a price and market analysis in cooperation with industry members, guided by an instructor experienced in such analyses. At first glance, the differences between this and other approaches may not be apparent. Yet several key elements contribute to its effectiveness and distinguish it from other teaching tools such as historical case studies, decision cases and more ordinary class projects.

Foremost among these is the fact that its cornerstone is authentic applied research, undertaken to fill a gap in knowledge for which there is an expressed need. This element is missing from most standard class projects, decision case and other case study approaches, and is not a necessary component of a senior research paper. The cooperative research ventures approach combines aspects of the case study approaches, such as their complexity and comprehensiveness, with the extended focus of a senior research or term paper, and adds to these the urgency and relevance of industry need.

A second element, related to the first, is the ongoing interaction with a segment of the public and with faculty members in other departments on campus. The insularity that characterizes most classroom-based teaching and learning, whether active or passive, is incompatible with this approach. The focus is outward to society, rather than inward, and the classroom serves primarily as a springboard. This outward focus, a component of extended education, combines with the contribution to knowledge to integrate the teaching, research and outreach functions of colleges of agriculture.

A third distinguishing element is the public presentation and ultimate publication of a subset of the students' research findings. This is both appropriate and possible because the analysis fulfills a need beyond the students' own education. The products are several: education of students, public education, specific research findings, and stronger ties with a local industry. In addition, the instructor gains specific knowledge of a new industry and its members each term.

Putting the Method into Practice

The method is in its third year of application. The course is a four-credit-hour, ten-week-long, senior-level course in Agricultural Price and Market Analysis. Prerequisites include intermediate micro economics, introductory statistics and either econometrics or a statistics course that covers regression. An advanced marketing class, covering the material in Tomek and Robinson's *Agricultural Product Prices*, is now also required in order to foster a more vertical curriculum. The number of students has varied, but in each case has been less than twenty.

Role of Textbook. During the first two years, a textbook was retained as a primary reference and to provide an organized presentation of major components of a price and market analysis together with the associated theory. In the third year a set of detailed research reports related to the market under study were used in lieu of a formal text. Experimentation led this instructor to concentrate reading assignments in the first half of the term.[1] The readings provide a common frame of reference for classroom discussions and exercises, and establish the level of analytical rigor. In order to ensure that the students have read and thought about the material, reading cards must be turned in on the day the chapter or other material is due. On these cards students write down five of their own thoughts or questions pertaining to the assigned material, and they are encouraged to make at least one connection with the industry under study. Repetition of material contained in the chapter or article does not count. Points are awarded only for connections to some other material or knowledge; connections to the market under study; questions; or other observations. This serves two main purposes. First, the students

come to class having read and thought about the assigned material. Second, it gives the instructor a chance to assess students' progress and to give rapid feedback.

Development of Technical Skills. Quantitative and graphical price and market analysis and the presentation of research results requires at least a minimum facility with computer software. Standard spreadsheet software, such as QUATTRO PRO, which is in widespread use and is capable of graphing and multiple regression, is utilized. One to two hours per week is scheduled in the computer lab. In the first part of the term, students are taken through a set of exercises that introduces them to data entry, data transformation, production of graphs and use of spreadsheet software for multiple regression.[2] All students do the same exercises during the first half of the term. Later, each works on his or her own topic area and the instructor moves from student to student during the lab sessions, helping with analysis and technical problems.

Selection of Market. Market selection takes place prior to the start of the term to facilitate preparation. Several criteria are helpful in making the selection:

a. The crop or industry should be sufficiently minor or local that reputable economic analyses are not already available.

b. The crop or industry should be sufficiently large within the state or region and have been in existence for long enough that data are available to support empirical analysis.

c. Leadership of one or more organizations representing the industry needs to "buy in" to the project and be willing to cooperate in the research.

d. Ideally, there will be a pressing problem that needs to be solved, or an issue that needs to be addressed for which economic analysis is a useful input.

e. Geographical proximity to campus of production and/or processing is desirable to facilitate interactions between industry and university.

Extension agents and faculty can be useful allies for initial selection of the industry to be studied, for contacts with industry members and as a relatively unbiased source of knowledge about the industry under study. It is important to make it clear to industry representatives both what you need from them in terms of access to speakers, data and other information, and what you will and will not deliver. The list of candidate crops or products is long in my state (Oregon) and the demand for market and price analysis of specialty crops or products greatly exceeds the supply. Yet, even in states more dominated by production of crops

traditionally included in farm policy programs, it would come as a surprise if there were not a number of overlooked markets meeting the above criteria.

Other Advance Preparation. Once the industry has been selected, the instructor gathers an initial data set from which charts are prepared to present the industry and the research problem on the first day of class. This also ensures that, at the very least, a skeleton data set is available to support quantitative analysis. Additional information about the industry and its challenges – such as newspaper articles or extension bulletins – is also presented the first day of class.

A selection of extension agents, commodity commission members, growers, processors and other relevant experts are contacted in advance and engaged to speak to the class. Extension agents are a good place to start, both as speakers and to recommend other speakers. A more complete understanding of the market issues is enhanced by inviting speakers known to have differing views. This ensures that the talks will not become repetitive and affords opportunities for critical thinking development.

The instructor decides in advance for which portion of the analysis she or he retains responsibility. Particularly sensitive aspects, such as the development of a price forecasting model which may be used in price negotiations, or aspects that require technical sophistication beyond the class members' capabilities, such as development of a simultaneous equations model, are likely candidates. While it is not necessary to directly conduct a portion of the analysis, being a full participant, rather than just the guide and arbiter, adds a valuable dimension to the instructor's role.

Access to a modest amount of money which can be used to defray research expenses such as long distance telephone and fax charges, field trips, production of quality presentation materials and other incidental expenditures is helpful, although not strictly necessary.[3]

Syllabus. The descriptive material contained within the syllabus highlights the course goals, methods, expectations and evaluation procedures and guidelines.[4] In addition, the topic or major activity for each of the scheduled class meetings is included to provide a road map for the students. The structure is dual-tracked. One track follows the standard course topics, in this case such topics as producer supply, consumer demand, seasonality, market structure, graphical and statistical techniques and so forth. This track could consist primarily of lecture material. However, limiting the role of lectures in favor of a variety of active learning techniques, some of which are linked directly to the research project, confers some benefits. The active involvement of students in their learning and with each other helps prepare them as a class to work collaboratively on the project and take personal responsibility. The second track is the research project. Within this track are scheduled guest speakers, field trips, topic selection and other decision making, class discussions, progress reports, work sessions, computer time and other research

activities. It is useful to plan time for the team members to coordinate activities, share information and engage in collective problem solving. Reading assignments related to the first track and intermediate assignments related to the second track are included in the syllabus. The formal presentation of research results is tentatively scheduled for the date and time of the final examination. There is no written final examination.

Student Performance Assessment. Numerous opportunities present themselves for assigning points which can be used to give numeric feedback to students and ultimately contribute to the calculation of course grades. Examples include: assessment of class participation, graded reading cards (covering assigned readings), in-class exercises, homework assignments including intermediate stages of the research project, a mid-term examination, the formal oral presentation to the public and the written research report. Various degrees of assessment are utilized in assigning points for the different elements, with the criteria for each made explicit. Direct rewards for class attendance and participation are particularly useful at the beginning when the group dynamics are developed. Once the class momentum is established, the students' own motivation renders these points superfluous for most students and they function more as bonus points later in the term. Despite the collective nature of many aspects of the course, the mix of activities provides ample opportunity for measurement of differential student performance.

Research Project Organization. Following an initial exploration of the industry, one class session is devoted to identifying the issues to be addressed and the questions the team would like to answer through the analysis. The instructor uses that list in the preparation of individual project topic areas. Topic areas include domestic consumer demand, farm supply, marketing margins, market structure and other topics relevant for the market under study. Each area is described in terms of the relevant questions and issues, the tasks likely to be involved (primary or secondary data collection, regression analysis, etc.), some of the skills needed and the major connections with other topic areas. Students then select the area for which they will take responsibility. In the interest of fairness, students choose their topics in the order established through a random name drawing. Each student is the designated analyst for her or his chosen portion of the project and becomes the resident "expert" in that area, serving as a resource to other team members as needed. In my experience, some students choose to stay within their comfort zone while others deliberately challenge themselves.

The instructor provides ongoing feedback to the analysts as each pursues his or her topic, through formal mechanisms such as grading and written responses on assignments, and through informal mechanisms including questions during and outside class. Graded benchmark assignments, such as description of questions to be addressed, outline of report, listing of data and information sources and specification of an economic model, are intended to encourage steady progress and

to avoid unpleasant surprises. Later in the term, most students' own momentum leads to regular contact with the instructor and one another. Progress reports to the class provide opportunities for others to contribute their ideas, knowledge and perspectives. This component becomes more valuable and valued as the term progresses. Interactions among class members are encouraged through seating arrangements (e.g., use of a large conference table), redirection of questions to the appropriate analyst(s) and direct requests for input from individual students.

About three weeks before the end of the term the class chooses a time and place for the presentation, develops an invitation list including industry members, extension agents and other faculty members, and sends out invitations. As the term draws to a close, we assess what we have collectively learned about the market and price relationships. We also discuss questions raised but not answered. We evaluate the degree of confidence we have in the various findings and identify the main findings that need to be communicated in this forum. We also decide the order of presentations. Prior to the public presentation, a "dress" rehearsal is held. During this rehearsal, class members give and receive feedback to and from one another in addition to the instructor's suggestions.

The course instructor gives the overall introduction and the concluding portion of the public presentation, handles questions from the audience and moderates the discussion. The students, individually or as subgroups, present their own research findings. The presentations are graded, as are the students' written research reports which are due at the end of the term. Publication of research findings is deferred until after the end of the term to allow for peer review, industry response and any additional research needed to complete the analysis.

Findings have included such things as: demonstration of the importance of factors beyond the market under consideration in price determination; discovery of a quasi-black-market phenomenon; evidence pointing toward the need for a storage mechanism to stabilize supply, demand and prices; development of effective short-run price forecasting models; confirmation of the importance of pre-harvest inventories in price determination; confirmation of the hypothesis that prices two years previous have an important influence on current demand and prices; and evidence that there is little scope for supply response in one of the industries due to the lack of production alternatives.

Degree of Success

The importance of student involvement in applied research has been amply argued and documented elsewhere (e.g., Blank; Turner; and Russell, Henneberry and Batchelor) and will not be repeated here. One goal of the research ventures approach was to improve students' motivation and the quality of their learning. A

second goal was to provide useful analytical information to a local industry. A third goal was to accomplish these tasks in a manner consistent with the calls for educational reform. The ensuing discussion addresses these elements.

Student Response. A questionnaire was administered to the first group of students exposed to this approach to learning to obtain more information about their responses than is yielded by the standard student evaluation vehicle. What follows is a summary of the results.

The vast majority, 92 percent, perceived themselves to have learned more with the participatory format than they typically do with a traditional lecture format. The remainder checked the "don't know" box. When asked to what extent the industry analysis contributed to their learning, 75 percent responded that the project contributed "a great extent," with 25 percent responding "somewhat." Every student surveyed indicated a belief that what he or she had learned would "stick" better than other types of learning, and all but one student replied that the class project increased their level of interest and/or motivation for the class. That student checked the "don't know" box and commented that "at least it was a break from the old lecture/test format." Again, all but one student suggested that a suitable industry be found for the next year's class to study, and the remaining student expressed no opinion.

In optional written comments, students typically stressed that the course was difficult and demanding, but also interesting and rewarding. The project and the open discussion were often cited as the favorite part of the course, and many of the students expressed gratitude for having the chance to work on a "real-world" project, to get hands-on experience and to apply what they had been learning in their major. Several mentioned the appreciation they had gained for the complexity and multidimensional nature of the problem studied. A few indicated regret that we could not spend more time on the project, and the motivating factor of the presentation to the industry admittedly spurred some students to take greater care and expend more effort than they would have under other circumstances.

That the cooperative research project appears to be an effective pedagogical device is not surprising. The effectiveness of the cooperative research project as a pedagogical device has yet to be fully explored, although there is a growing body of literature discussing different forms of cooperative learning in economics (e.g., Maier and Keenan) and active learning in agriculture (e.g., Swinton). What is most different about this approach, and apparently highly valued by the students, is that it is an endeavor that has meaning beyond the classroom.

Industry Response. The industry's response to the research project offers evidence regarding whether or not the distinction is valid. The first two research projects have elicited somewhat different responses. In one case the industry has fully embraced the project, and the research results have been influential. In the other case, the results met with acceptance and interest, but do not appear to have

played a major role in industry developments since their presentation. The findings from the third project were well received, but it is too soon to know what role they will play in the industry.

The blackberry market and price analysis achieved a degree of industry acceptance that could be considered an achievement for any academic agricultural economics research. The need for such analysis was so pressing that elements of the research findings were put to use within the industry as soon as they were made available. Two years later, the price forecasting model is still in use. Extension agents and industry leaders have pointed out that because of the analysis, the growers, for the first time, have begun to discuss the market rather than merely their costs of production when negotiating prices with processors. Discussions among the parties now concern the anticipated crop size, with the implications for the price which could be expected to clear the market understood by both buyers and sellers. This represents a fundamental change, and is precisely the type of change sought by the extension agent who initially requested the research.

Not only have the research results been cited by industry members quoted in the major regional agricultural newspaper, but presentation of the results by the instructor at the annual meeting of the state horticultural society was accorded front page coverage. The relevant commodity commission has since funded additional related research following up on one of the findings of the original study. This extended research utilizes an industry model whose component parts were derived from the class project.

It would be unrealistic to expect every class research project to be embraced to the same degree as the blackberry project. Yet it serves as a demonstration that the potential exists for classroom-based research to have the same credibility, influence and value as any other university-sponsored research. The need for economic analysis in the blackberry industry was more pressing than was that of the rye grass seed industry, and this greater demand translated into a higher value being placed on the product.

In the rye grass seed case, the legitimacy of the class analysis was confirmed by those knowledgeable about the industry and our analysis of the price-setting mechanism has pointed the way toward some possible solutions to a problem recognized within the industry. Further, it identified and explained the actions of both growers and distributors as predictable responses to a set of market conditions, laying the groundwork for enhanced mutual understanding. Lastly, the usefulness of economic analysis was conveyed to several former skeptics. One industry leader who had articulated his skepticism before the term (in fact he laughed in derision when the project was proposed) came up after the presentation and admitted with some amazement that the results of the forecasting model were exactly in line with his own expectations and appeared to be completely valid. Others expressed their surprise and pleasure not only that agricultural economists' analyses are so

comprehensive, but also that the students had come to such a thorough understanding of the industry in just ten weeks.

Compatibility with Educational Reform. The cooperative research ventures approach to classroom-based learning is consistent with the reforms suggested for undergraduate education in agriculture, agricultural economics and agribusiness. Clearly, it responds to calls for exposure to the so-called "real world," for active, problem-based learning, for the development of a variety of communication skills and contributes to an appreciation for the role of teamwork. Several tasks associated with the research naturally encourage the development of higher-order thinking skills.

Beyond these elements, which are shared with other case study approaches, the role played by and with the industry under study is central to the broader contributions to educational reform represented by this approach. The existence of an identified group of people beyond the university who need and want to know the research findings, together with the prior commitment to communicate those findings, directly addresses concerns about student motivation, assuages the "ache" to be relevant (Houck), and satisfies Dobson and Luby's point about the need for students to complete applied research projects "on problems important to business" and for university researchers to be responsive to the needs of industry. Further, the two-way street of outreach, in combination with an activity that is simultaneously a research endeavor and a means to facilitate student learning, represents one possible response to calls for reform by leaders in our profession (e.g., Barry; Beattie; Houck; Lee; and Libby).

Faced with the prospect of presentation to experts on production and processing, students are motivated to move beyond economic and business fundamentals in order to understand the biological, agronomic and technical considerations that directly or indirectly affect price and market relationships. Not surprisingly, this helps to shape the assumptions underlying the analysis and the subsequent interpretation of results, while directly addressing the many calls for broader, multi-disciplinary approaches to problem solving.

Other Benefits. As teachers, we all too rarely pose questions for which we lack the answers, while as researchers it is a primary driving force. Extending this privilege to our students allows us to share the excitement we feel as researchers. Consistent with the land grant mission, the creation of knowledge is virtually guaranteed by the analysis of a previously unstudied—or little studied—market, even at an undergraduate level of sophistication. Further, the collective nature of the project expands the scope beyond that possible for an individual student project, thereby discouraging simplistic views of complicated situations and problems. Understanding of the complex forces affecting the market under study can only come through synthesis and, in the end, integration.

These benefits are in addition to those gained from any meaningful analytic activity through which students learn to apply their knowledge of economic theory and statistics to a particular problem. They discover for themselves some of the power, usefulness and limits of economic theory and regression analysis, a feature enhanced by the collective nature of the research as the students witness a variety of approaches applied to different aspects of the problem at hand. The glimpse thus afforded them is both heady and humbling.

Challenges and Costs

The potential for success is accompanied by the risk of failure. Preparation for the class requires that commitments be made before knowing the set of skills, both economic and interpersonal, that will be possessed by the students. The pre-test administered each year has revealed pervasive, alarming deficiencies which span mathematics (simple algebra and calculus), statistics, and economic theory (e.g., the inability to solve for equilibrium price and quantity or to calculate elasticities given the relevant information). Many students in the first two years also began the term unfamiliar with computer spreadsheet software and did not know how to enter data to use standard regression software. These deficiencies have contributed to the set of obstacles that must be overcome to reach a successful conclusion.

It is a challenge for the students and for the instructor to jointly enter a world in which the answers are unknown and the potential exists for much of the analysis to be inconclusive. As in all research, there is no guarantee that markets will be well behaved according to our definitions. There is also every likelihood that at least one student will fail to produce acceptable research results. In a larger class, this risk could be reduced by assigning two-person teams to each topic area, but in smaller classes that option is not available.

Clearly, including a portion of the public as participants in, and recipients of, the research and educational endeavor raises the stakes. The higher stakes serve to motivate the students. They also motivate the instructor, whose reputation as a teacher and as a researcher are on the line. Less directly, the reputations of the department, college and university can be affected by the degree of professionalism displayed by the team members. This is not an activity suited to the risk averse, and it requires the instructor to possess a certain degree of self-confidence as a teacher and as a market analyst.

Conclusion

These pages have described a work in progress. This approach to integrating classroom teaching and learning with research and outreach is offered as one possible way to meet some of the educational and broader professional challenges

we now face. Many of the ideas are directly transferrable to other courses for advanced undergraduate or master's degree students. The approach shares many of the elements and benefits associated with other active and cooperative learning techniques such as decision-case methods, and can be used in conjunction with them.

One innovation represented by the approach is that it introduces the important motivational elements of immediacy and relevance beyond the classroom, which are either absent or are present to a much smaller degree in contrived or strictly historical analytical exercises. A second innovation is the potential for the educational activity to create new knowledge that is valued for its own sake beyond the university and is communicated to those who can use it. In this sense, the outputs are multiple: enhanced student learning and the creation and dissemination of knowledge. These multiple outputs contribute to the empowerment of students and the public through provision of information and the skills to use it. Such empowerment forms an important part of our obligation as faculty members in a public institution (Lee). There is also a positive externality associated with this activity in the form of increased public awareness of the capabilities of our departments' graduates.

Accompanying these educational and other benefits are increased costs, mostly in the form of unavoidable risk. Direct monetary costs are relatively minor. Whether or not more time is required from the instructor is a function of his or her previous teaching style. However, creative and intellectual contributions from the instructor are an essential ingredient.

The author's experiences implementing the approach provide evidence that it is practical, effective and fruitful. They also suggest that, while we are being urged to change the way we approach classroom teaching, the goals are within our reach. Problem identification and solution, cooperation and teamwork, integration, synthesis, exposure to the real world, development of communication skills, flexibility, practicality, relevance, responsiveness, coordination of land grant mission elements, and recognition of complexity and ambiguity are all features of the approach described in this article. Despite the costs, some or all of the elements presented here may thus merit consideration for inclusion as part of an undergraduate agricultural economics and agribusiness curriculum.

Notes

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1. In the first year, the students were assigned roughly one chapter per class period to expose them to the fundamental considerations in the first half of the term, prior to the concentrated research effort. In the second year, textbook readings were distributed throughout the term, and project assignments were made early in the term in response to student feedback from the previous year regarding the need for a longer time period within which to conduct their analysis. In the current year, the required readings were concentrated in the first part of the term and project assignments were made early as well. This ensured that the essential tools and background knowledge were available to all of the students as they worked on their assigned segments of the project, while still receiving their assignments early in the term.
2. John Goodwin's *Agricultural Price Analysis and Forecasting* student handbook was used with mixed results the first two years. The third year, preliminary data relevant to the market under study was used in a set of instructor-developed exercises to accomplish the same purpose. This has proven to be less frustrating for the students and more efficient.
3. In my department, a pool of funds is available and has been used for this purpose. Industry representatives have been surprised and pleased that they have not been asked to provide financial support. The research expenses have not been in excess of $100, although access to additional funds has enabled us to offer a meal to those attending the public presentation of the class findings.
4. Complete course syllabus available from author upon request.

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