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Student Perceptions of Simulation Games and Training Software on Improving Course Learning Objectives and Career Preparedness

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Introduction

Collegiate faculty often struggle with making their courses more realistic in order to help students develop skills that will prepare them for success in the workforce. The rapid pace of changing technology occurring in industries that support agriculture exacerbates this issue. Current college students are technology oriented and they expect faculty to be the same (Litzenberg, 2010). A further contributing issue is what many faculty may perceive as a lack of attention to practical applications by commonly used or out of date textbooks. Instructors therefore are forced to add supplemental material to support their standard course materials.

There are several sources of supplemental material available for instructors depending on the areas of interest. The use of business simulation programs allows students the opportunity to apply traditional classroom information to a competitive simulated business environment with little risk. Research has shown that these activities can improve experiential learning, assimilation of knowledge and motivation (Clarke, 2009). The use of business simulation allows faculty to engage students beyond the traditional classroom lectures to a more active learning method where students are responsible for making decisions. This active participation by students results in increased retention of knowledge and decision making skills (Clarke, 2009). Instructors are not limited to traditional sources of teaching materials as industry often makes available training and software tools that are either free or offer free limited time subscriptions.

For this study, the authors surveyed students that were exposed to two different supplemental training programs. The training programs had two goals. The first goal is they must fit in and reinforce the course learning objectives. The second goal was to expose students to methods that professionals in industry use to help them succeed in their careers. The courses surveyed included an undergraduate agricultural finance course and an undergraduate agricultural futures and options course.

The Simulation Games

One of the primary teaching methods used in the agricultural finance course involves multiple financial formulas and inter-linked decision science tools that help students understand how investment decisions are made and financed. However, it is time consuming to build these formulas and tools in class during lecture when the instructor's time could be more productively spent on teaching students how to understand and interpret the results.

The FAST (Farm Analysis Solution Tools) system provides essential financial formulas and decision science tools and is easily adapted for use in the classroom as several schools currently have active subscriptions. The FAST system supports several facets of agricultural finance including financial analysis tools, investment analysis tools and risk management tools. All of these areas are addressed in the agricultural finance class and when these topics are discussed the FAST system is used to provide applied examples and illustrate how changes in assumptions used in the analyses can affect the final results. Students were also encouraged to use the FAST tools on homework assignments.

A primary teaching focus of the agricultural futures and options class involves getting students to understand and apply several risk management tools that are used by industry professionals in that field. The relative value of these tools for managing business risk often changes on a daily basis as reported live during trading. In order to fully understand and be successful using these tools, students need to be able to react to these market changes quickly and concisely. It is difficult to teach students how to react to and manage these changes using hypothetical examples during lecture. It has been shown that actively engaging students in real time trading scenarios affords a much richer learning experience (Clarke, 2009; O'Rourke, 2001).

The FACTSim (Financial and Agricultural Commodity Trading Simulation) game has been used by similar classes at other schools to allow students a more realistic experience for assessing real time market changes. Students participating in the game are given an online account and may make changes to their trading activities at any time. Students will be able to access their accounts any time during the day seven days per week. The instructor maintains an account as well with access to all the student activities.

Data and Methods

A survey was developed to address the objectives of this study. Survey participants were asked the following general questions:

(1) Did the simulation games help you understand the concepts discussed in class?

(2) Were the game components and financial formulas well updated and organized?

(3) Did you enjoy playing the simulation games?

(4) Did you feel the simulation games added interesting discussion and enhancement to the regular class meetings?

(5) Evaluate a statement regarding whether you believe the simulation game would help prepare you for employment at an organization involved in activities similar to the course material.

A five-level Likert scale of strongly disagree to strongly agree was used in the survey where appropriate. Data was collected and analyzed using Microsoft Excel (2011). Questions one, two, four and five were qualitative in nature and question five allowed students to respond with written comments as well if they desired. Answers to question three could be either yes or no. The surveys were distributed in class near the end of the semester after the simulation projects were completed. A total of thirty-nine completed surveys covering both courses were returned resulting in a one hundred percent response rate. Participation in the survey was voluntary and anonymous. Also, there were no penalties for refusing the fill out the survey or for leaving questions blank.

Results

Chi-Square analyses were performed on all the Likert Scale responses in order to determine if there were significant differences between courses. Since there were in some cases very few responders in the lower levels of the scale, we combined the responses into three groups in order to make the analyses more reliable. The first group combined Strongly Disagree with Disagree. The second group contained only the Neutral responses. The third group combined the Agree and Strongly Agree responses. Figure 1 shows the results summarizing the first survey question by class. A majority of students in both courses rated this question highly with a 4 or 5 ranking. This result is

encouraging for faculty and students, as the simulation activities appear to reinforce the course objectives and help students better understand the material. The results were also significantly different between the two courses as determined by a significant Chi-Square test metric (at the 0.10 significance level). The agricultural futures and options course had a higher majority of students rating this question with either a 4 or 5.

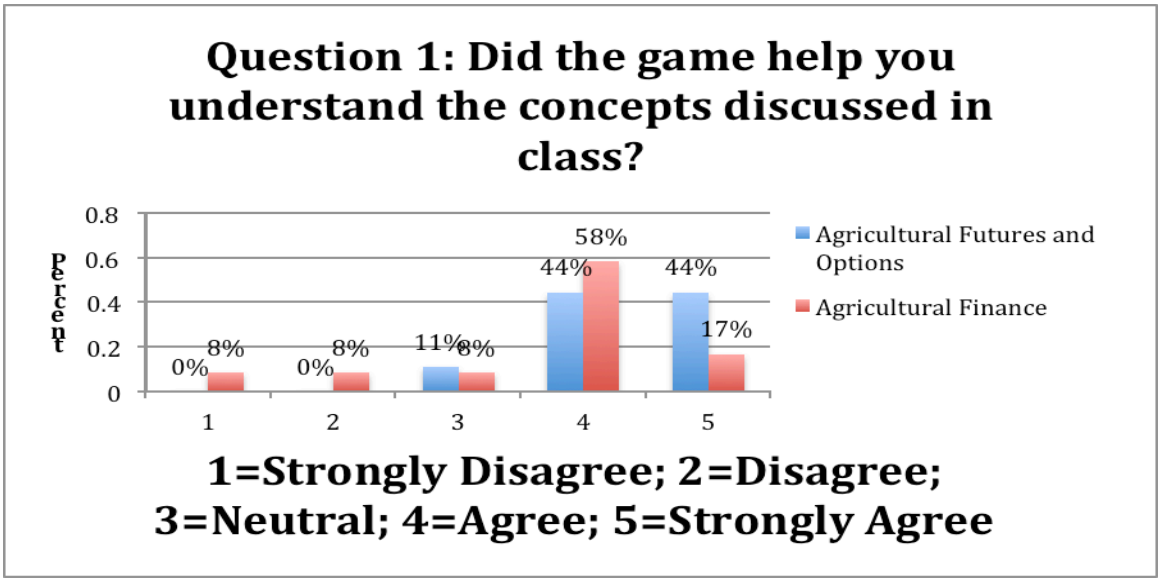


Figure 1. Ranking results from question 1.

Figure 2 shows the results summarizing the second survey question by class. A majority of students in the agricultural futures and options course rated this question favorably. Students in the agricultural finance course did not rate this question as high compared to the other course. However, the Chi-Square analysis led to the inference that there was not a significant difference between the ratings of the two classes. Results from this question can point to areas in which the simulation activities may be improved with further use.

Figure 3 illustrates the opinions of the students with regard to their enjoyment participating in the simulation activities. All of the students in the agricultural futures and options course indicated they enjoyed participating compared to seventy-five percent

in the agricultural finance course. These ratings between students in the different courses were found to be significant using a Chi-Square metric evaluated at the 0.01 level of significance. We should mention that the nature of the simulation activities are quite different between the two courses. The agricultural finance course requires a higher level of rigor and attention to more details compared to the agricultural futures and options course. These points may at least partially explain the difference in results in figure 3.

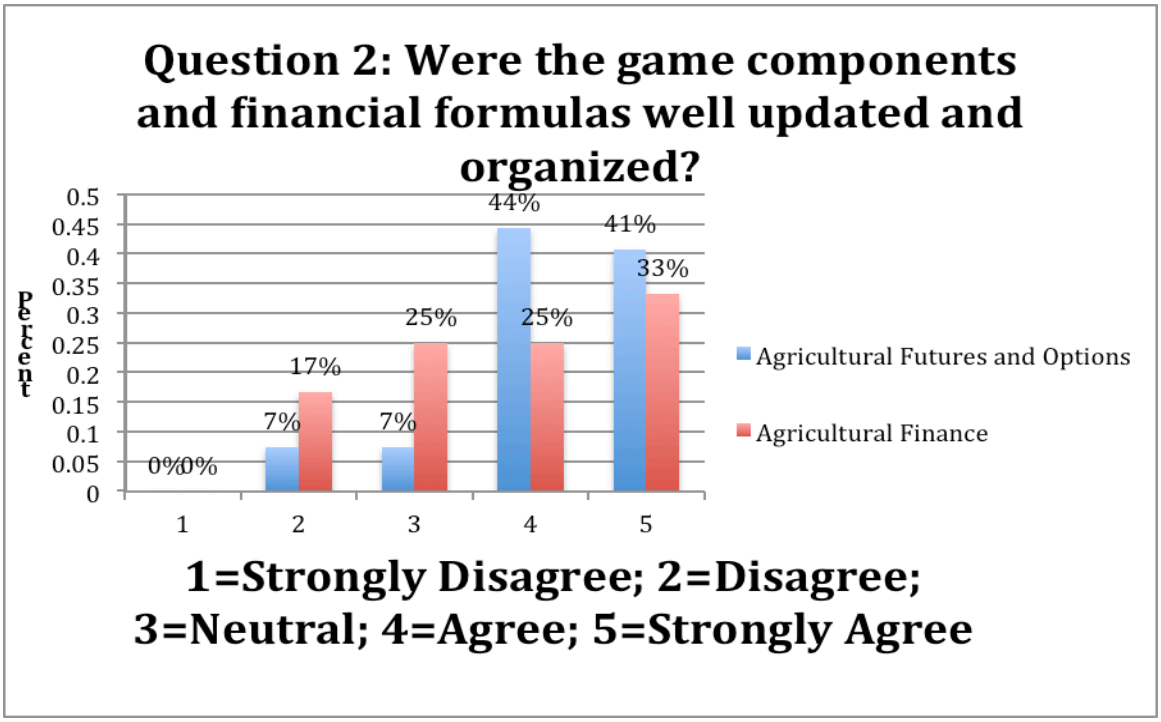


Figure 2. Ranking results from question 2.

Figure 3. Percentage results from question 3.

The ranking results from the fourth question are illustrated in figure 4. Ninety-nine percent of the students in the agricultural futures and options course rated this question favorably, with sixty-three percent strongly agreeing that the simulation activities added value to the regular class meetings. As faculty we often spent several minutes discussing the game activities during class and what changes might lead to improved results. We also noticed a few students who do not speak very often during class getting excited about their recent activities and stepping forward with their strategies.

The students in the agricultural finance course did not view this question as favorably. There is a steeper learning curve involved with this simulation, and it usually

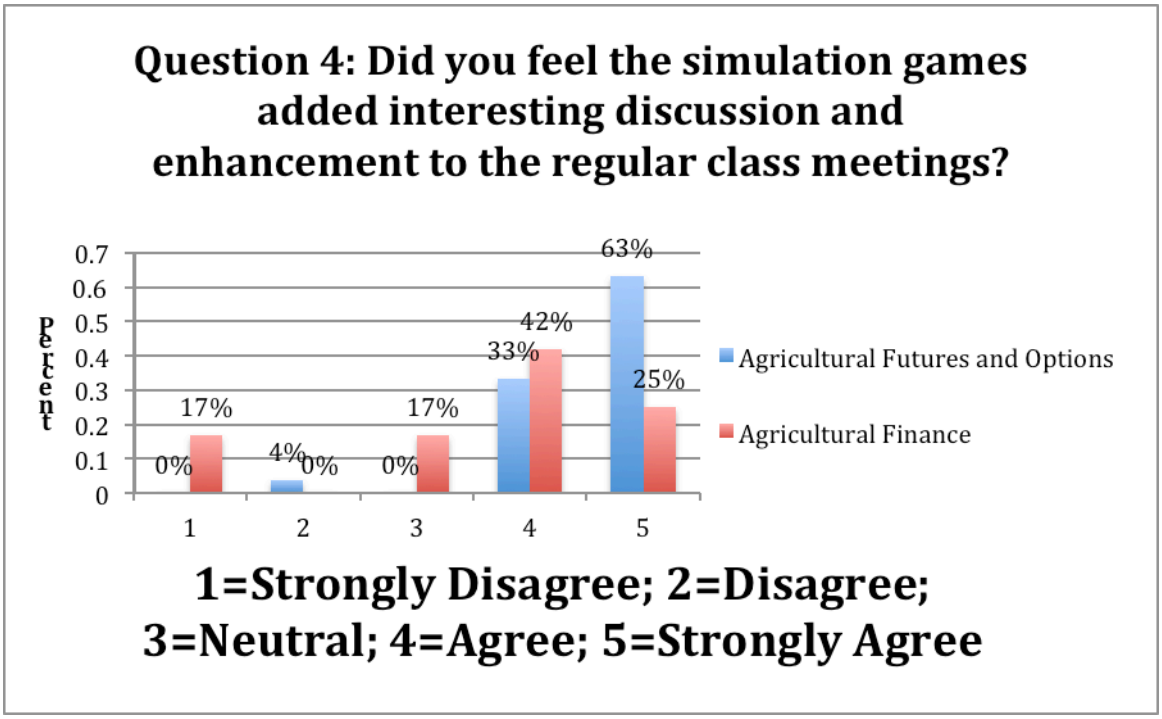
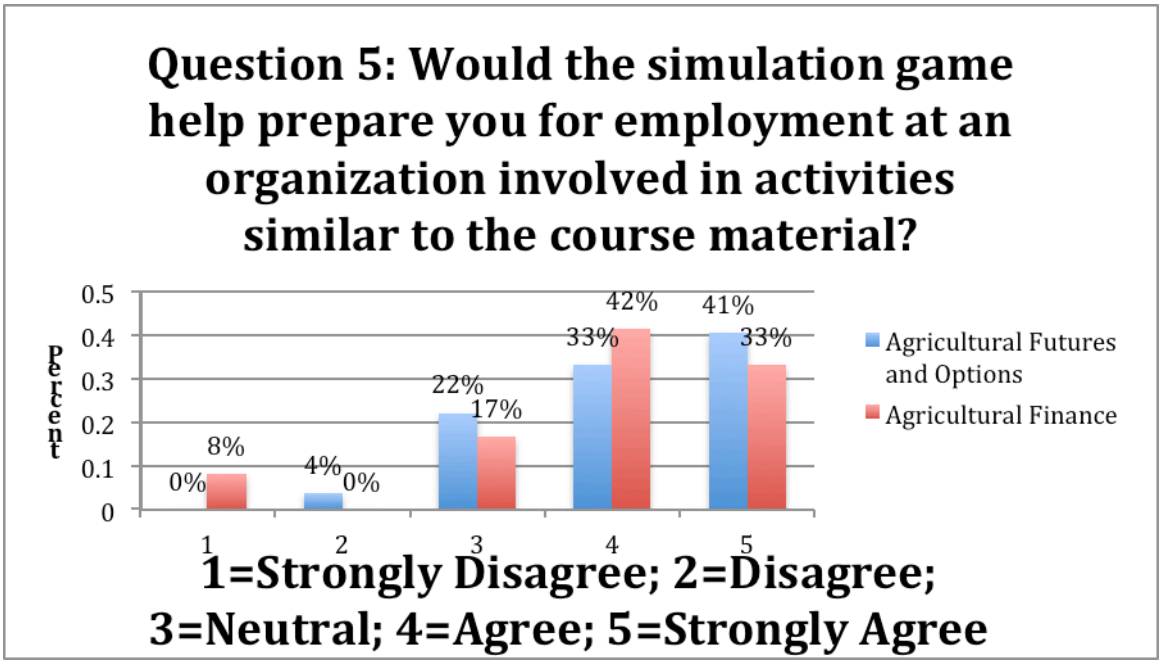


Figure 4. Ranking results from question 4.

took several iterations of practice before the students started experiencing success with the activities. These ratings between students in the different courses were found to be significant using a Chi-Square metric evaluated at the 0.05 level of significance.

The student rankings of the fifth question are illustrated in figure 5. We wanted to understand if the students felt the simulation activities would help prepare them to be more successful once they started their careers. This question is of course more subjective, since many students are not sure about the employment requirements



necessary when they begin working. It is not surprising then that the percentages of Neutral in the Likert scale rankings were the highest compared to the other questions. There were no statistical differences between the two courses as the Chi-Square metric was not significant. Given the high student response percentages of Agree and Strongly Agree, the students still felt the practical experience provided by the training and simulation activities was beneficial in their career preparation.

Discussion and Conclusions

Overall we feel there was a very positive response to the simulation and training games presented in the respective courses. The simulation game in the agricultural futures and options course forced students to understand that agricultural commodity prices are not only driven by domestic factors but by international components as well. The students also learned more about the different intricacies involved with interacting with agricultural markets in risk management situations. Since students can access their trading accounts at any time, many of them have commented on how much time they

spent outside of the normal class meeting times assessing and reformulating their strategies.

The simulation game in the agricultural finance course provided students with the opportunity to better understand the complexities involved in actual financial decisions as well as to learn how to manage financial decision making under uncertainty. Since nearly all the financial formulas and decision rules are built into the software programs, many course lessons can move along at a much faster pace compared to traditional lecture methods. Students also have the ability to install the software on their personal computers which allows more opportunity to interact with the simulation outside of the normal class meeting times.

The response from the student surveys; especially to questions one and four, are very encouraging to faculty and provide initiative to continue to search for new methods that both support learning objectives and enable the classroom experience to be more exciting and rewarding. Faculty should also continue to ensure their classes aid in training students to meet industry standards of adequate preparation for success in the workforce.

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