

**Impacts of University Financial and Academic Support on Student Performance at the SS-
AAEA Quizbowl Competition and in the Classroom**

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Impacts of University Financial and Academic Support on Student Performance at the SS-AAEA Quizbowl Competition and in the Classroom

A 2001 survey of SS-AAEA Quizbowl participants suggested potential benefits of the SS-AAEA Quizbowl Competition to students' academic performance. A new survey of quizbowl advisers is used with the previous data to determine the impact of a university's academic and/or financial support of participants on students' performances at the competition.

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Introduction

The literature is replete with examples of the benefits of games to the learning process. Recent examples in the agricultural economics discipline include Arellano et al. (2001), Delemeester and Brauer (2000), Gremmen and Potters (1997), Lowry (1999) and Popp and Keisling (2001). The Academic Quizbowl Competition (Quizbowl) of the student section of the American Agricultural Economics Association (SS-AAEA) provides students with an opportunity to test their skills across a wide range of agricultural economics topics outside of the university environment. A survey was conducted during the student activities of the 2001 American Agricultural Economics Association (AAEA) annual meeting to investigate the usefulness of the quizbowl competition on academic performance (Popp, 2002).

Results suggest that student participants believe that the quizbowl experience has a positive impact on knowledge retention and academic performance. However, survey respondents did state that they felt that their performance at the meetings was impacted by the amount of support - both financial and academic - that they received from university faculty and administration. The general perception among students is that teams who receive financial assistance and/or university coaching or credit for participating will do better at the competition than those who receive no such assistance. As a result, some students have indicated that they are competing on an uneven playing field.

The purpose of this paper is two fold: 1) to compare students' perceptions of existing "financial and academic support" to actual data collected from quizbowl coaches in the fall of 2001

and 2) to explore possible correlations between levels of support and team performance both in and out of the classroom. The paper will begin with an overview of the quizbowl competition. A summary of results from the student survey follows. Potential impacts of academic and financial assistance on team performance are then presented.

Overview of the SS-AAEA Quizbowl Competition

In the late 1980s, Quizbowl was introduced as a student team activity of the SS-AAEA during the annual meetings of the American Agricultural Economics Association. Each team consists of three students from a US or Canadian university¹. The purpose of the quizbowl game is to test students' knowledge in ten areas arranged into eight categories: agribusiness/finance, agricultural policy/ natural resources, macroeconomics, management, marketing, microeconomics, quantitative techniques, and a potpourri category which is often devoted to general agriculture or questions from the other seven categories. Each university can send a maximum of two complete teams to represent their university. Any additional students who wish to participate will be placed on "mixed"(players from multiple universities) teams.

A windows based software program developed in the early 1990s is used to run the game². Each round of play consists of 40 questions posed at five skill levels worth 5 to 25 points each. During a quizbowl competition, the two teams sit on either side of a moderator and a computer

¹Quizbowl activities were also added to the Student Section of the Southern Agricultural Economics Association meetings in the early 1990s. However, in this competition students are randomly assigned to mixed teams. Each three person team usually includes students from three different universities.

² The latest version of this quizbowl software and sample questions/answers may be downloaded freely from the Student Section of the American Agricultural Economics Association website at <http://www.aaea.org/sections/studentsection/quizbowl.htm> This software can be run on most Windows 95 or Windows 98 based desktop or laptop computers.

operator. Each team member is provided with a quizbowl buzzer. Categories, point values, scores and questions are projected onto a screen and seen by the quizbowl participants, a moderator, two judges and the audience. Two judges are also provided with a laptop on which they can view answers to the questions. The teams have 15 playing minutes to correctly (as determined by the two judges) answer as many questions as possible. The team with the most points at the end of the round wins. During the SS-AAEA quizbowl competition, teams are eliminated from the competition after the loss of two rounds. The last two teams remaining at the end of the one and a half day event compete one last time for the Championship title.

Assessing the Value of the Competition - A Summary of Previous Results

In August of 2001, the 122 students from 22 schools participating in the Quizbowl competition were asked to complete a survey to ascertain the benefits - both in and out of the classroom - of participating in the Quizbowl competition. The survey included questions related to: 1) the usefulness of preparing and competing in Quizbowl for understanding course topics, 2) the methods used and time spent to prepare for the competition and 3) demographic information.³ The response rate was 89 percent. Respondents were nearly evenly split between men (57 responses) and women (51 responses). As of August 2001, nearly 18 percent had recently graduated, 44 percent were seniors, 27 percent were juniors, and 11 percent were sophomores. Eighty-seven percent indicated that their cumulative grade point average (GPA) was 3.0 or greater out of a possible 4.0. Thirty-one percent listed a GPA of 3.8 or greater.

³ See Popp (2002) for complete survey details.

Students were asked questions to determine if they studied, how often they studied, and the length of each study session. Twenty-nine students responded that they did not prepare at all for the quizbowl competition. The remaining students listed total preparation times that ranged from 20 minutes to 40 hours⁴. First, respondents were placed into preparation time categories. These categories were determined by similarities in responses to questions related to preparation time, preparedness and benefit of competition. These resulting categories and their distributions are shown in Figure 1.

Students generally reported that past competitions and practice sessions had helped them to understand concepts and techniques covered in their classes. On a scale of 1 (helping to no extent) to 5 (helping to great extent) the mean response was 3.35. However, statistical analyses revealed a significant difference in responses across study times (Figure 2). In general, the longer the time spent in preparation for the competition, the greater the perceived benefit to overall course understanding.

Students were asked whether Quizbowl preparation and participation aided in understanding individual subjects covered in classes. Most mean scores for the total study group improved⁵. Benefits varied greatly by preparation time. Zero preparation time results can be interpreted as the value of competition participation only. As shown in Figure 3, there is some inherent benefit to course understanding in participation in the Quizbowl competition. However, in most cases, the more time spent in preparation the greater benefit the students felt towards their classes. Overall

⁴A total of 33 different total study times were recorded by respondents. Contact author for complete list.

⁵ There were a number of “non-applicable” responses for the question related to individual subject areas. This was expected as all students have not taken courses in all subject matters.

benefit increased anywhere from 47 to 116 percent with increased study time, depending on course topic. The results actually exceeded the author's expectations, and clearly indicate that the students perceive that their understanding of course materials can be greatly improved by preparing and participating in the Quizbowl competition.

Survey data was also used to identify factors which may contribute to success in the quizbowl competition. The literature has identified a number of factors which can influence academic performance, (experience, intelligence, personality, gender, ethnic background, student effort). Success in the Quizbowl competition was measured as the number of total wins for a respondent's team. Input variables were chosen to include as many of the cited factors in the literature without causing multicollinearity. Intelligence was proxied by GPA. (The author understands that GPA may not be the best proxy but no other was available.) Experience was proxied by both class standing and the number of Quizbowl competitions in which the respondent had participated. Effort was measured by total preparation time. *Gender* was measured as Gender. Attitude was measured by satisfaction with the competition. Four regression models were attempted. Factors that generally found influential in academic performance, such as student level and gender were not significant in any of the models. The best model is presented in equation 1:

$$\text{Wins} = -3.8441 + 0.2910 \text{ Prac} - 0.0083 \text{ Prac}^2 + 0.1.695 \text{ GPA} + 0.7164 \text{Contests} \quad (1)$$

(-3.85)
(7.79)
(-6.81)
(5.76)
(4.05)

$$\text{adjusted } R^2 = 0.5582$$

This model, showed that the number of wins at a quizbowl contest is influenced by amount of total preparation time, student GPA and number of competitions in which the student had competed. All variables displayed the expected sign. As expected, practice time took on the quadratic shape,

showing that maximum benefit occurs with roughly 18 hours of preparation time. Benefits fall dramatically after 28 hours of practice time. The coefficient associated with GPA suggests that higher GPAs can lead to one additional win per competition. Finally the coefficient associated with number of contests that previous Quizbowl experience can increase the number of wins by two or three rounds. Some factors omitted here that are likely to influence wins are related to attitude and personality (e.g., student confidence, coordination - speed at which they can hit the buzzer, how well students respond under pressure). These factors seem to be important in student performance at the competition but were not measured by the survey. Student participants also suggested that academic and financial support can also influence performance at the competition and within the classroom. The remainder of this paper examines possible influences of academic and financial support on student performance in and out of the classroom.

Academic and Financial Support for Quizbowl Participants

While the numbers of undergraduate students participating in the SS-AAEA activities, and in particular Quizbowl, has been on the rise in recent years so have been the costs to attend these meetings. For example, the costs of sending six quizbowl team members from University of Arkansas to the 2002 AAEA meetings in Long Beach, California are estimated at \$658 per student or close to \$4,000 total⁶. This is a conservative estimate that does not include costs of transportation to and from the home airport with the cheapest flight (220 miles round trip) and other incidentals such as team shirts. Costs faced by students from other universities will vary greatly based on

⁶ On a per student basis, these costs include: quizbowl team registration (\$25), early student registration (\$45), 3 nights lodging at special student rate (\$132), 3 days meals at University of Arkansas per diem rate (\$126), lowest available airfare from Tulsa to LAX (\$300), and roundtrip shuttle LAX to Long Beach (\$30)

transportation needs. However, as future meetings cycle through a three city rotation, it is likely that any given university will be faced with extensive transportation costs at least once every three years. In a time of tight academic budgets it may be unreasonable to assume that funding will be available to cover these costs.

The student survey revealed that 27 percent of the 2001 Quizbowl participants did not prepare for the competition. Reasons often stated by students included: 1) they were too busy with jobs, 2) too busy raising money to travel to the meetings, or 3) they formed the teams very close to the event date. Many first time participants stated that they just didn't know what to they were supposed to do to prepare, so they did nothing. These statements suggest that some students may have access to little assistance from university faculty and staff in preparing for the event. On the other hand, nearly one-third of all respondents had prepared 10 hours or more. Some of those students indicated that they received substantial input from university faculty/staff/students in preparing for competition. Earlier results indicated that preparation time did impact overall performance at the competition. However the student survey alone did not provide enough information to determine if there truly was a high correlation between academic support and preparation time.

Survey of 2001 Quizbowl Advisers

In the fall of 2001, a survey of the 2001 Quizbowl team advisers was conducted to ascertain what kind of support, if any, students receive to participate in the annual SS-AAEA Quizbowl competition. Advisers from all of the 22 participating universities in the US and Canada were asked to complete the survey. The brief survey included questions related to: 1) the number of years the

school had participated in quizbowl, 2) degree of faculty/staff involvement in preparation for the competition, and 3) percentages of various costs categories paid by university sources. Advisers from 17 of the 22 (or 77 percent) of the universities responded. As expected, results varied greatly across universities. Unexpectedly, however, respondents indicated in general a greater level of academic and financial support than had been suggested by students. On average, responding universities had participated in the Quizbowl competition six times. However, as seen in Figure 4, actual participation rates varied from 1 to 13 years.

Level of Academic and Financial Assistance

Respondents were asked which of three descriptions best described the coaching assistance they provided to students: 1) none, students must practice on their own, 2) students practice with a coach outside of regular school hours, 3) students can take a quizbowl preparation class. Figure 5 shows that 11 of the 17 universities assisted students to some degree with quizbowl preparation. Eight provided coaching assistance outside of university class hours. Contrary to students' popular belief, only three of the responding schools have courses specifically designed to aid in quizbowl preparation, one of those schools provided both a course and outside assistance. There was some correlation (0.5480) between practice time and preparation assistance offered at the university. Only 5 universities (including the three who offered a course) provided any credit for quizbowl preparation. Students attending the crediting universities could receive a total of one (3 universities), two (1 university) or three credit hours (1 university). There was less correlation (0.3367) between practice time and available university credit.

Respondents were asked on average what percentage of transportation, lodging and meal expenses were paid for students attending the quizbowl competition. Surprisingly, 11 universities covered at least 60 percent all expenses (Figure 6), and of those eleven, nine covered at least 80 percent of transportation and lodging expenses. Only two universities provided no financial assistance whatsoever. However, many respondents indicated that students are expected to find new ways (e.g., fund raisers, sponsors) to cover a larger percentage of the costs themselves each year.

Impact of Academic and Financial Assistance on Competition Performance

Interestingly, there was little correlation between student university assistance and students' perceived benefit of quizbowl to academic performance or students' overall level of satisfaction with the competition. However, further analysis was conducted to determine if academic or financial assistance did impact performance at the competition. Adviser survey data pertaining to academic and financial assistance was paired with relevant student data in order to re estimate equation 1. The sample size was reduced from 108 to 84 (or an overall response rate of 69 percent) due to the non-responses from quizbowl advisers at five participating universities. First, equation 1 was re-estimated using the reduced sample size. All variables were still significant while the adjusted R^2 fell to 0.48. Next, variables related to financial assistance (Transportation, Hotel and Meals expenditures and combinations thereof) and variables related to academic assistance (Preparation assistance and Credit) were added. Not surprisingly, results suggested high multicollinearity across variables. The model was re-estimated and tested for possible common failures (Griffiths, Hill and Judge, 1993). The best model is shown in equation 2:

$$\text{Wins} = -2.858 + 0.1484 \text{Prac} - 0.0046 \text{Prac}^2 + 1.3375 \text{GPA} + 0.4326 \text{Contests} + 0.013 \text{Trans} + 0.4371 \text{Credits} \quad (2)$$

(-2.671) (3.1002) (-3.160) (4.384) (2.370) (3.449) (2.183)

$$\text{adjusted } R^2 = 0.5786$$

All variables displayed the expected sign. This model showed that the number of wins at a quizbowl contest is influenced not only amount of total preparation time, student GPA and number of competitions in which the student competed, but also by the number of credits offered by the university and the percent of transportation costs covered by the university. The total number of wins could increase by 1.3 games for students who have all transportation costs covered compared to those who have none. In addition, students who can earn two to three credit hours may increase their wins by one or two games. Overall this model suggests that students who receive assistance could win two to three more games than those who receive none. This may be because students who earn credits may take preparation time more seriously than those who do not. Students who receive financial assistance to attend may feel a stronger obligation to succeed than those who do not.

While the adjusted R^2 of the model was increased from 0.48 to 0.57 when university assistance was included, the total explanatory power of the model was lower than expected. The data itself might provide one explanation. An earlier study showed that the student survey data was representative of the quizbowl participants. This conclusion was based on statistical comparisons of respondents participants for a number of key variables (Popp, 2002). Similar comparisons show that new smaller data set is no longer representative of participant with respect to one key variable, the number of wins. Fishers exacts test show that there are significant differences in the distribution of wins between the complete student data set and the reduced set. The proportion of students who

competed in three or four rounds of competition is over represented in this data set while the proportion of students who competed in five or more rounds is underestimated.

Summary and Conclusion

The general perception among students is that teams who receive financial assistance and/or university coaching or credit for participating will do better at the competition than those who receive no such assistance. As a result, some students have indicated that they are competing on an uneven playing field. This study provides the first evidence of both the amount of support and the potential impacts of university and financial assistance on student performance at the annual SS-AAEA quizbowl competition. As expected, the amount of financial and academic support varied greatly across universities. Unexpectedly, however, university advisers indicated in general a greater level of academic and financial support than had been suggested by students. Nine out of 17 responding universities cover over 80 percent of student expenses; only two universities provided no financial assistance at all. Eight universities coach students outside of regular hours, three more schools provide a regular class for quizbowl preparation and five schools offer between one and three credit hours for participating in the competition. Preliminary results suggest that both level of financial assistance and availability of academic credit may positively influence performance at the competition. As such there may be some truth to some students' assertion that they are competing on an uneven playing field.

This evaluation provides only a first look at the potential impacts of university assistance on competition and academic performance. Quizbowl participants and their team coaches will be

surveyed again in 2002 in an attempt to gain more insights into the potential benefits of the quizbowl competition and the practicality of financial and academic support.

The author would like to thank the 2001 SS-AAEA, and in particular Dr. Steve Vicker SS-AAEA junior adviser, for their assistance in the development of the survey. Additional thanks to Dr. Dori Comer for providing the history of the quizbowl competition.

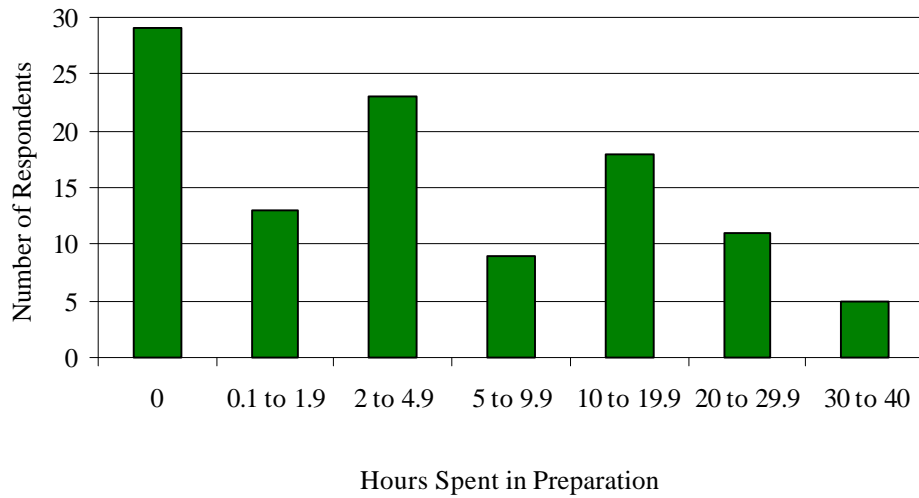


Figure 1 Hours of Preparation for Quizbowl Competition

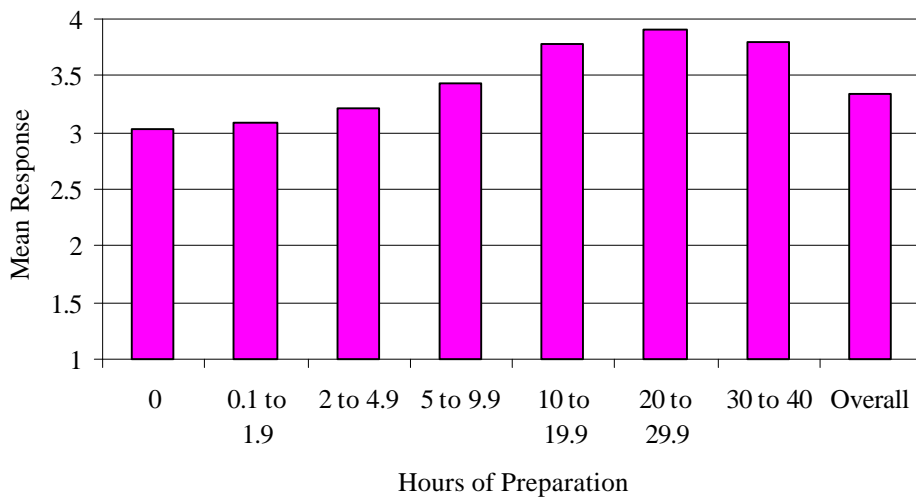


Figure 2 Mean Response to Overall Benefit of Preparation and Participation in Quizbowl to Course Subject Understanding

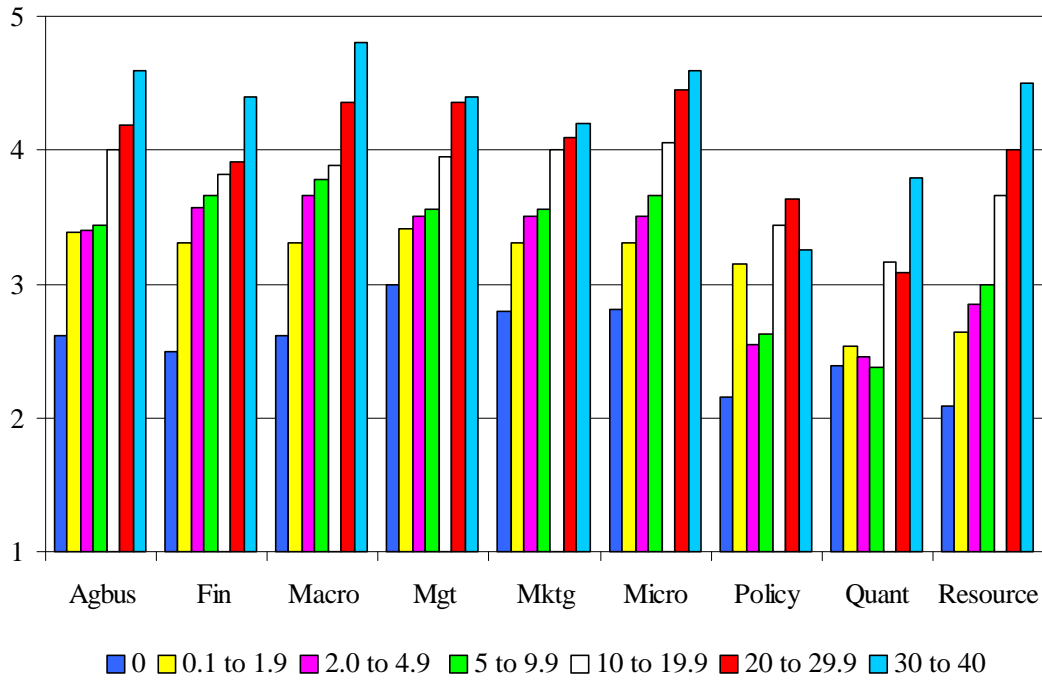


Figure 3 Benefit of Quizbowl Competition to Understanding Course Topics, by Hours of Preparation

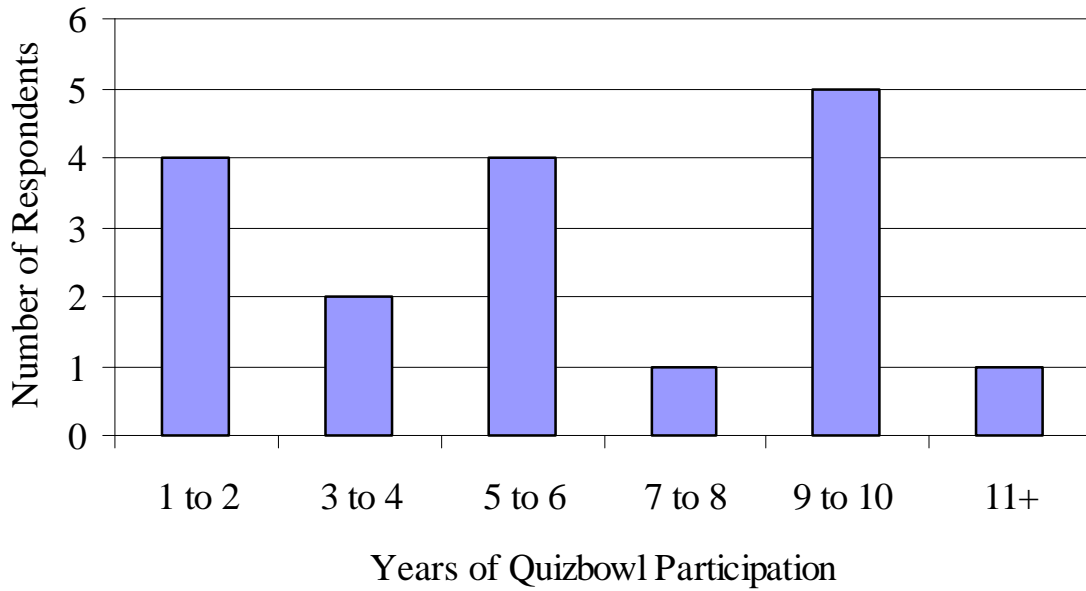


Figure 4 Years of Quizbowl Participation

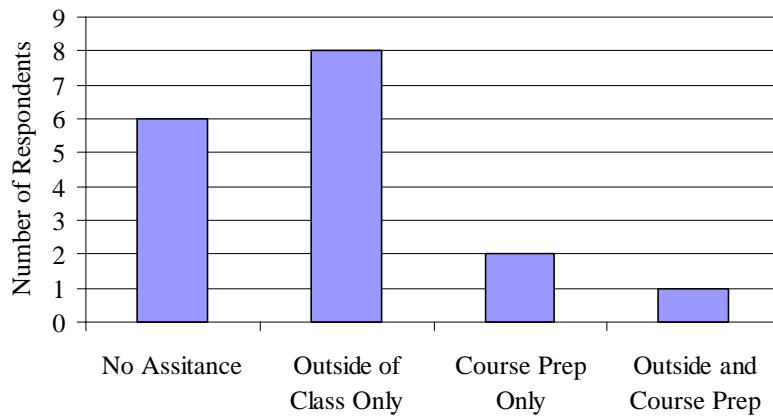


Figure 5 Type of Academic Support to Students

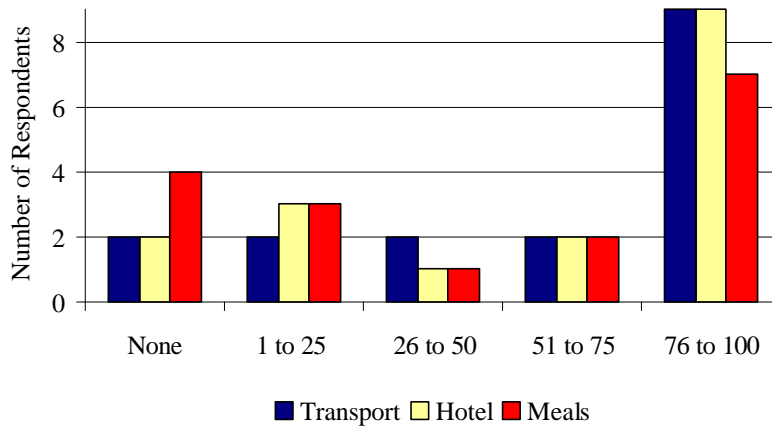


Figure 6 Percentage of Expenditures Covered by Universities for Quizbowl Participants

References

- Arellano, F. , S. Hine and D.D. Thilmany. 2001. Using MANECSIM as a simulation for agribusiness capstone courses. *Review of Agricultural Economics*. 23(1): 275-285.
- Delemeester, Greg and Jurgen Brauer. 2000. Games economists play: noncomputerized games. *Journal of Economic Education*. 31(4) : 406-322
- Gremmen, Hans and Jan Potters. 1997. Assessing the Efficacy of Gaming in Economic Education. *Journal of Economic Education*.28(4): 291-303
- Griffiths, W.E,R.C. Hill and G.G.Judge. 1993. *Learning and Practicing Econometrics*. John Wiley and Sons, New York.
- Huysamen, G.K and L.A. Roozendaal. 1999. Curricular choice and the differentials prediction of the tertiary - academic performance of men and women. *South African Journal of Psychology*. 29(2): 87-93.
- Lowry, Pamela E. 1999. Model GATT: A Role-Playing Simulation Course. *Journal of Economic Education*. 30(2): 119-126.
- Popp, J. 2002. The SS-AAEA Quizbowl: Success In and Out of the Classroom . Selected Paper presentation at the Southern Agricultural Economics Association Meetings, Orlando FL, February 2-6.
- Popp, M.P. and T.C. Keisling. 2001. An economic simulation game with fast feedback for a lay audience: an example of seasonal cash marketing strategies. *Review of Agricultural Economics* 23(2):538-546.