

Transfer of Information Between International and American Students in a University Agricultural Class Environment

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Introduction

With the increased convenience of travel and communications, global information and understanding will become increasingly important for adequate functioning of our agricultural leaders throughout the world. Multi-national conglomerates, increasing international trade, and world wide trading in stocks and securities suggest, if not yet a global economy, at least a greater interdependence of nations and commercial trades. This is of critical importance to agriculture which traditionally has been at the forefront in international trade. If university agricultural graduates are to perform (and possibly survive) in agriculture's future, they must be cognizant of the evershrinking world, a world in which agriculture will play a major role. Agricultural universities must help prepare their students to learn that there is a future beyond the home farm, their home town, their state and the U.S. It is essential that future agricultural leaders have greater international understanding in order to make wise economic decisions. In other words, "you had better know the rules of the game if you're going to play." American agriculture has no choice but to play, and the rules must be understood by the future team members.

It seems that an ideal mechanism for transfer of international information would be a university agricultural course in where both domestic (U.S.) and international students are enrolled. This report describes a university junior and senior level course that contained no international students (used to obtain base-line data) and two senior and graduate student level courses which contained international and domestic students in which student interaction was structured; however, the students were not specifically asked to share international information. A simple survey was given at the end of each course to evaluate student exchange of background information and the exchange of international understanding.

In 1987, a junior and senior level 3-quarter-hour course (A) was taught to 32 students in an 11 week quarter and was surveyed at the end. There were no international students in the course, and the enrollment consisted of 17 males and 15 females.

In the same year, a 5-quarter-hour undergraduate/graduate course (B) was taught to 15 students. Three of these students were male, international graduate students who had been in the U.S. at least one quarter prior to enrolling in the course. These students

were friendly, outgoing and could speak very adequate English. Their home countries were Korea, Pakistan and Saudi Arabia. The class was divided into four laboratory working groups, and one of the international students was placed in each of three of these groups. Each group performed a different mini-research project each week outside of class hours, and a different group member (systematically rotated among members, including the international students) was responsible for organizing the research, was required to orally report on the group's research and was responsible for a written report. All group members received the same grade for the research project for that week, which increased participation and interaction.

After those two courses a graduate level 5-quarter-hour course (C) was taught the following quarter, and students in this course, who had not previously participated in the survey in course (B), participated when the survey was repeated. Course C had the same Korean and Pakistanian students who took course B and also included a Nigerian female student who was also an outgoing class member and spoke English well.

All surveys were given in the tenth week of the respective quarter. In the junior-senior level course (A), students were given a questionnaire to identify the Ohio home town of 3 students selected at random. Evaluation of responses were liberal, and larger cities within 25 miles were counted as a correct response. These same students were also given a blank United States map and asked to locate Tennessee, Michigan, Oklahoma, and Oregon. This was followed by a blank world map, and students were asked to locate countries that have recently been in the news such as Libya, Iraq, France, and Nicaragua. Next, the students were shown photographs of a building that had recently been in the news and asked to identify either the city or country of Hagia Sophia in Istanbul, Red Square in Moscow, the Diet or Congress Building in Japan, or the Government Place in Buenos Aires. Names were not required on the survey, but sex, domestic or international student identification were required. The instructor and teaching assistant also responded to the survey and were identified.

In class B a simple survey was given students requesting information on the international students' home countries. The intent of this survey was to determine whether students had learned from the other students about those other students' home countries. It asked them to identify the country of the international students' origin, the capitol of the country, the size of that country, the hemisphere of that country, the major religion or religions of that country, and the major

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agricultural crops of that country. The same survey used in class B was also given to class C students who had not previously responded to the survey.

Evaluation for this survey (B, C) was also very liberal; for example, size could be given as area or compared to other countries or states, and responses were counted as correct if the area was between one half of the country's size to twice the country's size, naming the hemisphere was multiple choice with two possible answers; for religions in Korea, any one of three was counted as correct; for religions in Nigeria either of two was counted as correct; and for agricultural crops, any one of five to six was counted as a correct answer in all countries surveyed. If a student did not identify the country correctly, then the rest of the questions relating to that country were eliminated which reduced the domestic student sample size 56% (B) and 43% (C). The survey was also given to the international students and was more familiar to them by one third, since this fraction of the questions applied to their own home country. The survey response from the instruction personnel (instructor and technical assistants) was even less enlightening, since the instructor formulated the survey questions prior to answering them, was the advisor to one of the international students and has had another of the international students in a previous course which emphasized international exchange.

Results and Discussion

The survey of the junior and senior level class (A) was designed to obtain base-line data before the students encountered a great deal of exposure to international students in their classes. In the first survey form, the domestic students were asked to identify the Ohio home town of 3 students picked at random from the class. The purpose was to determine how much they had learned about their fellow domestic classmates and to give a bench mark to later determine how similar students compared with respect to how much they had learned about their international classmates. The results of this survey are presented in Table 1. No students were able to identify all 3 of their classmates' home towns correctly and 40-41% could not identify any of the home towns correctly. From 18 to 25% correct responses were obtained from the class.

These results would probably be influenced by how popular the randomly selected students were, but it anticipated that the selection process resulted in an average popularity of selected students. The next survey forms that students were given asked them to locate on a blank U.S. map the states of Tennessee, Michigan, Oklahoma, and Oregon and to locate on a blank world map the countries of Libya, Iraq, France and Nicaragua (all of these countries had been shown on maps on t.v. news many times in the preceding few months). The results of the state and country identification are presented in Table 2. The students were able to identify 93-94% of the states correctly with 60-80% of the students getting all 4 states correct.

However, they were only able to identify correctly 35-40% of the countries correctly, and only 6-7% identified the location of all 4 countries correctly. Nineteen percent of the males and 47% of the females did not place Nicaragua in either North, Central or South America. France was placed by 3 students in Africa, by one in China and by one in Cambodia. Obviously there is much greater familiarity with domestic geography than with world geography. This same class was asked to identify the city or country buildings in four photographs taken in locations that had also been on the news programs several times in the previous few months. The locations have already been named. Only 4-5% were able to identify these photographs correctly, again suggesting a lack of knowledge in the international arena.

Table 1. Survey in Junior and Senior Level Course (A) for Knowledge of Three Selected Domestic Students Home Town.

Category	Domestic	
	M	F
Sex ^{a/}		
Number/Sex	17	15
Correct Identification ^{b/}	18%	25%
Students who identified all 3 hometowns correctly	0%	0%
Students who identified all 3 hometowns incorrectly	41%	40%

^{a/} M = Male, F = Female

^{b/} Percentage of correct responses out of a possible 17x3 = 51 for male and 15x3 = 45 for female category

Table 2. Survey of Junior and Senior Level Course (A) for Knowledge of United States (Location of Tennessee, Michigan, Oklahoma and Oregon) and International (Location of Libya, Iraq, France and Nicaragua) Geography.

Category	Domestic	
	M	F
Sex ^{a/}		
Number/Sex	17	15
State Identification		
Correct identification ^{b/}	94%	93%
Students who identified all 4 states correctly	82%	60%
Students who identified all 4 states incorrectly	0%	6%
Country Identification		
Correct identification ^{b/}	35%	40%
Students who identified all 4 countries correctly	6%	7%
Students who identified all 4 countries incorrectly	18%	47%

Values are percentages except number/category which are the number of responses.

^{a/} M = Male, F = Female

^{b/} Percentage of correct responses out of a possible 17x4 = 68 for males and 15x4 = 60 for females.

Table 3. Survey of Junior and Senior Level Course (A) for Identification of International Photographs (Hagia Sophia in Istanbul, Red Square in Moscow, Diet or Congress Building in Tokyo, Governmental Palace in Buenos Aires).

Category	Domestic	
	M	F
Sex ^{a/}		
Number/Category	17	15
Percentage correctly identified	4%	5%

^{a/} M = Male, F = Female

The results of the survey given the first quarter in the senior and graduate student course (B) after exposure to international students are shown in Table 4. Of the domestic students, 44% could correctly identify the international students' home countries correctly. Females did a better job at country identification than did males. Only one American student out of 12 could identify correctly all three international students' countries. Domestic male students identified only one third of the possible countries correctly; whereas, females were correct 60% of the time. International students, as would be expected, made a score of 100% on country identification, and the instructional group obtained a score of 83%.

Since only questionnaires with the correct country responses were evaluated for the remainder of the survey questions, the potential responses for domestic students were reduced by 56%. The male American students did a better job at identifying capitols (57%) than did the female students (11%). Response on the size of a country was surprisingly low in all categories (0-16%) as was hemisphere identification (33-43% by domestic students) of a country which should have been 50% by chance alone. There is no explanation as to why the international students did so poorly (11%) on this question. Religion responses were also fairly weak in the case of domestic students (33-43%). The domestic male students did a better job (71%) with agricultural crops than did the domestic female students (33%). The students who received the best academic grade in the class could answer none of the survey questions correctly.

Other countries which were identified in addition to the correct answers included Mexico, India, Iran, China, Iraq, Brazil, and Vietnam. Several answers were unexpected and also were interesting, including the fact that students who identified countries such as Iran incorrectly, stated that the size of this country was "too large," the size of Korea was also identified as "too large," while the sizes of Brazil and Vietnam were identified as "too small." It is interesting to speculate if these unexpected answers are related to the students' political evaluation of these countries. Since the three countries represented are also very religiously oriented, it was surprising to find such responses as to the religion(s) of these countries as "communism" and "atheism."

In general, the domestic students did a slightly better job of identifying the home country of international students than they did in identifying the Ohio home town of their domestic classmates. This is as would be expected since the differences are less between Ohio students' hometowns than they are between domestic and international students' home countries. However, in both cases, the success rate was surprisingly low.

To follow up on this survey (B), the same survey was used again the following quarter with another senior-graduate student class (C) containing domestic

and international students. Since some of the international and domestic students were involved in the previous survey, they were eliminated from this one. The results of the second survey are shown in Table 5. The results are only slightly different from the previous survey and give added credibility to the previously described results.

Summary

Transfer of international (or domestic) non-class related information seemed to be poor in an agricultural science course in which international subject matter is not stressed. If, however, a better method is not found to transfer international information, it appears that very little will happen simply as a consequence of proximity of domestic and international college students in the same course. It appears that the current methods used are not internationalizing domestic agricultural students. Are we missing an excellent opportunity, and should deliberate effort to be devoted to promote and encourage greater transfer of information between students?

Drawbar Performance Prediction Using a Microcomputer

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Introduction

Prediction of tractor performance has been a major focus for many researchers over the last twenty years. Several empirically-based equations have been proposed and accepted by many engineers in the profession. The most noted of these is the Wismer and Luth theory (1974). They used dimensional analysis that resulted in an equation relating tire performance to slip, tire dimensions, tire load and soil strength.

Others have modified the Wismer and Luth equation to incorporate tire deflection in the dimensionless term called "mobility number" (Gee-Clough et al. 1978). This work was similar to Wismer and Luth; however, field conditions were more broadly defined as those found in agricultural situations and the theory does not cover extremely hard or slippery surfaces.

Even though these empirical approaches are well founded, it is not easy to present these concepts so that students learn how design parameters affect tractor-implement performance. Zoz (1972) presented a nomograph which was based on measured performance of tractors under field conditions and included soil condition, tractor speed and hitch geometry. Although this was and still is a valuable teaching tool, students still find it difficult to visualize what is occurring.

Personal computers have added a new dimension to concepts which use an iterative approach for the

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