# Using Written and Oral Communication of Field Trips to Enhance Student Learning in an Introductory Plant Science Class

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## Abstract

Agriculture programs include students who have never visited agriculture operations and who do not understand the relationships of this industry with society. To correct this deficiency field trips were incorporated into the lab section of an introductory plant science class and lab reports were used to assess student learning. In the written reports at least 94% of students scored a strong rating (80-90%) on five criteria which assessed the presentation of the ideas and sentence mechanics. Eighty to eighty-five percent received a strong rating on three criteria which assessed subject content and required low levels of cognitive skill in knowledge and comprehension while 52% scored a strong rating on the higher cognitive skill criterion which assessed the relationships between plant industries and society. A student survey indicated that this latter criterion was the most difficult part of the written report. However, all students were successful in making these linkages in the oral cooperative discussions. Students' scores averaged 89% on the field trip reports, 79% on lab and 78% on the course. Eighty-nine percent of students earned a grade of C (70%) or better, an improvement of 10% over the previous class.

## Introduction

Good communication skills are major requirements of agriculture graduates (Erpelding and Mugler,1987; Long et al., 1992). However, educators report that this is an area in which graduates need to improve to compete successfully in the marketplace (Erpelding and Mugler, 1987). Integrating writing exercises across the curriculum improves the writing skills of students (Boufford, 1993). Besides helping instructors to better understand and guide their students, writing helps students develop the analytical and critical thinking skills that will allow them to solve problems (Anderson, 1990; Foulk and Hoover,1993; Fulwiler, 1987; Wehner,1993).

The types of writing used in agriculture classes include newsletters (Boufford,1993), simulated situations which agriculture practitioners encounter (Wehner,1993), mini-essay questions (Berghage and Lownds, 1991), term reports and brief lecture based expressive writings (Foulk and Hoover, 1993) and lab notebooks (Zimmerman, 1992). The transactional writing of term reports generally comprises a three-part process of prewriting, writing, and rewriting (Brumback et al., 1985).

The practices observed and experienced during field trips can provide a valuable complement to reinforce topics covered in the classroom when students make written and oral reports of their experience on these tours. Furthermore, these field trips expose students, particularly those from urban backgrounds, to practices they only know about through television and print. Field trips can help academically underprepared students develop skills in theme writing (Owen and Claxon, 1974), and expand their ability to learn through observation (Ewoldt and Miller, 1990). Journal reports of trips, such as the learning log in geology, allowed students to integrate what they experienced on a field trip with what they had learned in other situations while cultivating the habit and process of writing, and documenting the entire learning process (Stanesco, 1991). Oral and written feedback from students in an introductory plant science class consistently indicated that several were never exposed to agriculture and there was disappointment in the absence of field trips to agriculture operations. This paper describes the use of writing and oral communication of field trip reports for an introductory plant science class in spring semester, 1998. The objectives were to improve student understanding of topics in plant science through writing and oral reports of field trips, to increase the percentage of students who successfully complete the course with at least a C grade (at least 70%), and to survey students for their reactions to these writing assignments and oral discussions.

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## Materials and Methods

"Introduction to Plant Science" is a three- credit hour freshman course which covers history, importance, structure, identification, distribution, production and management of crops. This course is required of all agriculture majors, with areas of emphasis in one of the following: animal science, natural resource, agribusiness and plant and soil science. The course consists of two 1- hour lectures and one, 2-hour lab offered weekly for the semester. No more than 20 students enroll in each lab section. During spring 1998 semester, three labs were replaced with three field trips to agricultural operations outside the University. Prior to this semester, the class included only one trip, a campus tour of the university's facilities for Plant Science research. Support for these field trips was provided through the University's approval of a Funding For Results (FFR) proposal written by the author. In response to a mandate from the Missouri Coordinating Board of Education to develop innovative teaching and learning projects to evaluate student learning and with the board's financial support, the use of communication to improve student learning was selected as the priority area by the University for funding in the 1997-1998 academic year.

Written and oral rubrics were developed to assess the four field trip reports, (one on-campus trip and three off-campus trips), when the proposal was prepared. With the assistance of the University=s writing center, several of the criteria for each rubric were designed to reinforce the objectives of the course. The evaluation criteria for the written rubrics are listed in Table 1. Criteria for the oral rubrics were group cooperation, ability to link field trip experiences to agriculture industries, current issues in society and topics covered in lecture; and delivery of their prepared presentations. Field trips were made to the campus greenhouses and plant research facilities, and three agricultural businesses, which included a garden center and yard waste facility, a commercial horticulture bedding plant operation, and a turf farm operation. In the class preceding the first field trip, copies of the written and oral rubrics were given to students and the criteria explained to them. They were instructed to seek help from the writing center in completing the assignments if necessary. The same criteria were used for all four field trips. One week after each field trip, students engaged in short oral field trip discussions during the last 15-25 minutes of lab while working cooperatively in groups of 4-5. They used the process of Think, Share, Record and Tell. This included brainstorming to come up with (1) relationships between the observations on the field trips and topics covered in the class, (2) linkages between the practices they observed and other agricultural businesses or current societal issues, and (3) assessment of factors common to other trips they took and their opinions on these practices. One group member wrote a summary of the discussions and another presented it to the full class. The oral reports were graded as successful or unsuccessful. The written reports were collected at the end of the lab period. Students' responses to each criterion were graded on a scale of strong (80-100%), adequate (70-79%) and weak (<70%), and the reports then returned to students the next week. Students' performances on each criterion for each succeeding report were tallied and summarized. Assessment of the course components was weighted in the following manner: written exams 67%, written trip reports 13.2%, oral trip reports 3.3% and laboratory exercises and tests 16.5%. For this report, all field trips, laboratory exercises and laboratory tests are included in labs. At the end of the course students completed a 13-question survey to assess their feedback on these reports.

## Results and Discussions

Twenty-five percent of the surveyed students indicated that they had never worked with plants prior to this class. The others had worked in home gardens, nurseries, greenhouses and on farms. For the written report, the percent of students with a strong score increased from 78% in the first report to at least 88% in succeeding reports (Figure 1). This improvement is perhaps due to the writing practice over several reports, as reported by Parrish et al. (1985), and Rice (1998). At least 94% of students scored a strong rating on the following five written rubric criteria which dealt with presentation of ideas and sentence mechanics: responsiveness to assignment guidelines, main point, organization of ideas, clarity of writing and neatness (Table 1). The criteria on crop uses, production, distribution, and factors, which required low cognitive skills were easier for students to understand than the criterion dealing with assessing relationships to other industries and societies. The latter criterion would require higher cognitive skills of analysis, synthesis and evaluation based on Blooms taxonomy of cognitive skills as cited in Elliott et al., (1996). Forty-four percent of students viewed this criterion as the most difficult section of the report, because it was difficult to grasp relationships and "the answer was not clearly given on the trip," thus indicating difficulty in synthesis and analysis of the situation. Grabau and Wilson (1995) also reported their attempts to help students use these high order skills in a plant science class. Following the first written report the percent of students scoring strong for this criterion increased from 10% to at least 46% for succeeding reports (Figure 2). However, in the oral discussions students successfully used this criterion. Foulk and Hoover (1993) reported similar results in improved student ability to perform well on complex questions requiring integration when students used brief group discussions and expressive writing.

Fifty nine percent of the students in this class indi-

Table 1. Percent of students scoring on each evaluation criteria averaged over four written plant science reports

| Evaluation criteria | Overall assessment[Z] | | |
|---|---|---|---|
| | Strong | Adequate | Weak |
| Responsiveness to assignment guidelines[Y] | 94 | 5 | 1 |
| Main point[X] | 94 | 5 | 1 |
| Organization of ideas | 97 | 3 | 0 |
| Clarity of writing | 97 | 3 | 0 |
| Neatness | 99 | 1 | 0 |
| Appropriate use of agriculture terms | 84 | 13 | 3 |
| Content provided to show: | | | |
| Crop uses, production and distribution | 80 | 14 | 6 |
| Factors affecting crop production | 85 | 12 | 3 |
| Relationships between plant industries and society[W] | 52 | 30 | 18 |

[Z]Scores: Strong is 80-100%; adequate is 70-79%; and weak is below 70%

[Y]Focused and thoughtful attention to assignment guideline

[X]Clearly stated thesis or controlling idea that further shows general responsiveness

[W]Evaluating links between plant industry and other agriculture or non-agriculture business

n=28

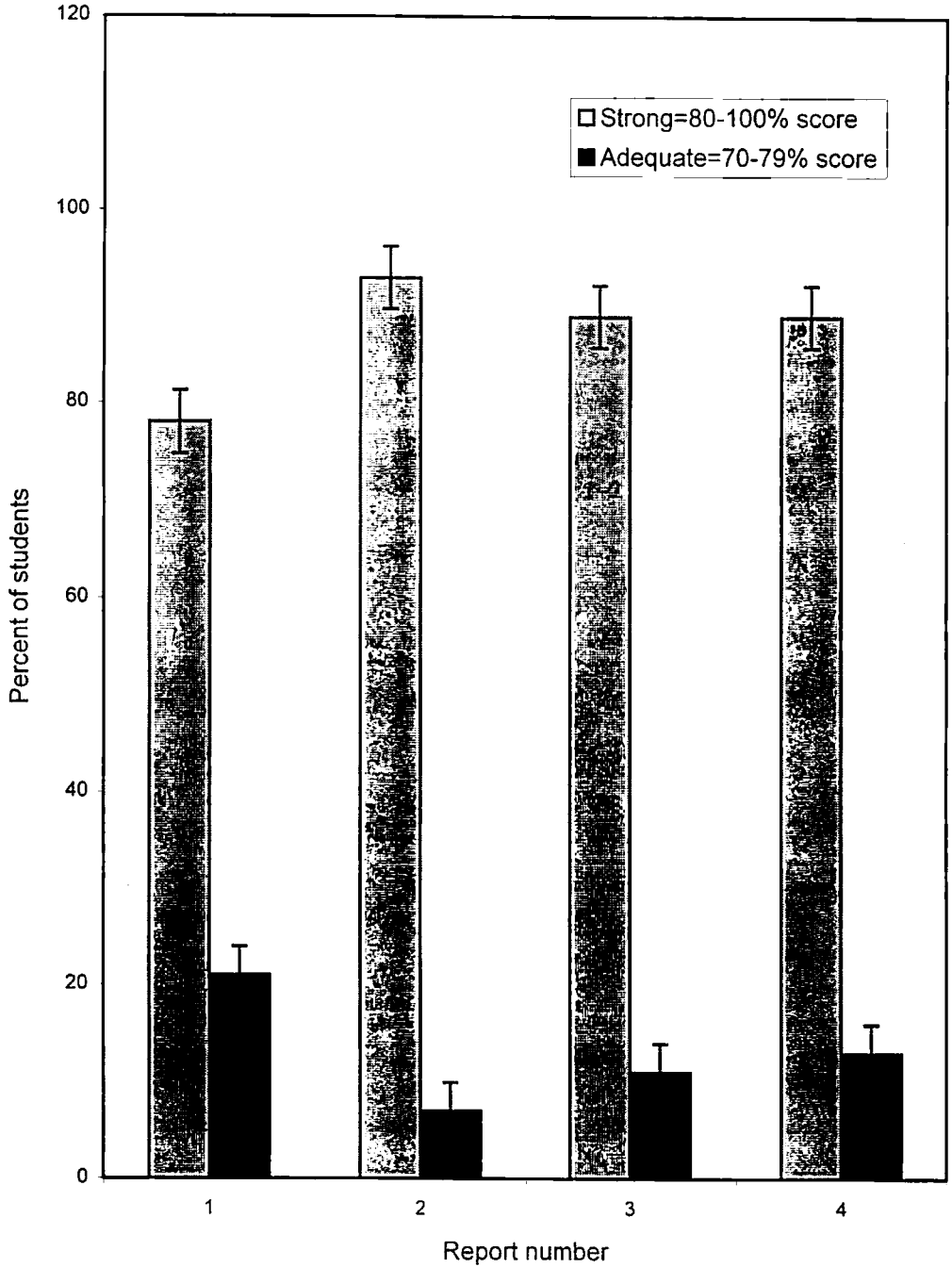


Fig.1 Student performance for each written field trip report each assessed over 9 criteria. (Standard error bars compare similar score groups over reports).

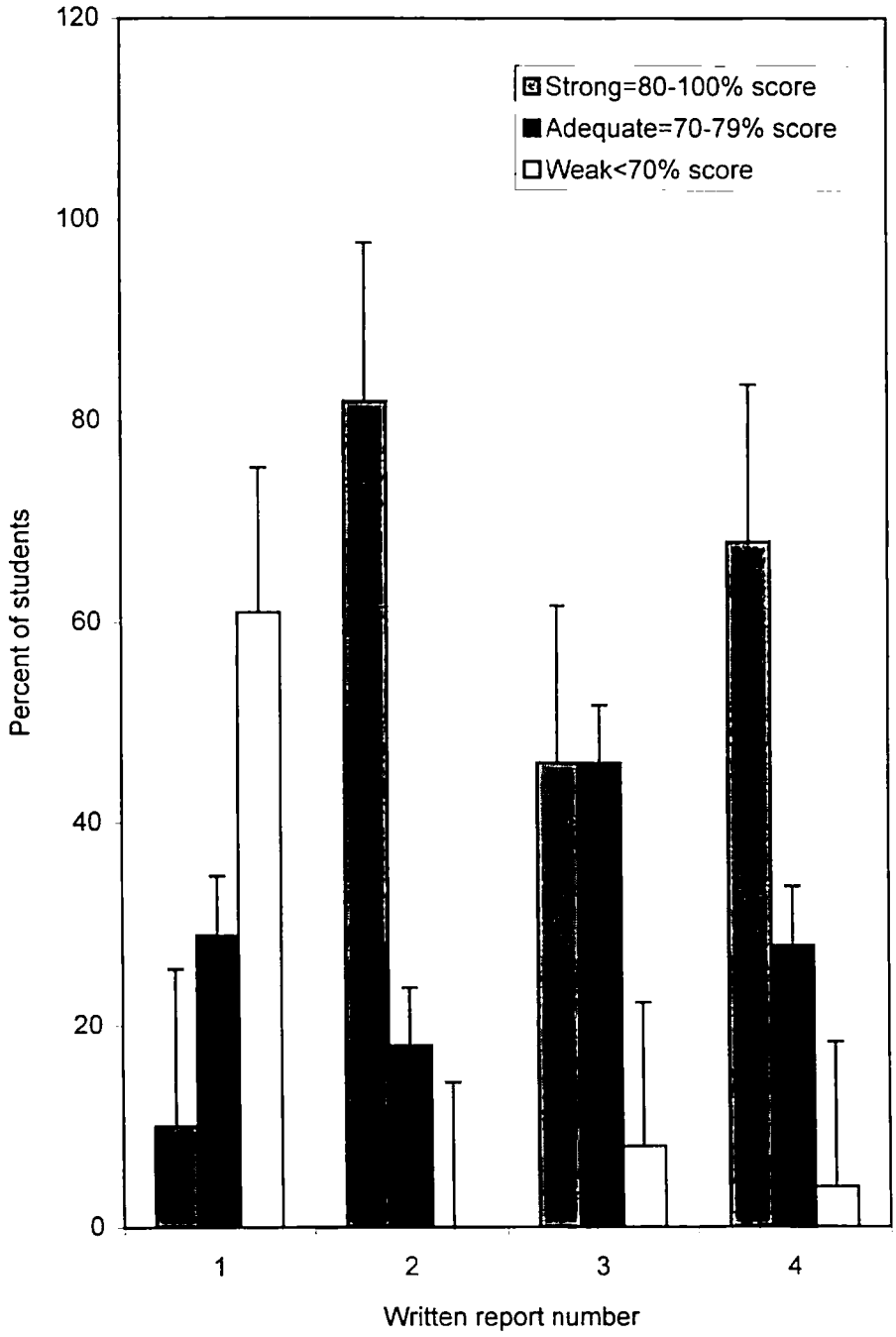


Fig.2 Assessing students' ability to link plant industries and society. (Plus standard error bars compare similar score groups over reports)

cated that the easiest part of the oral rubric was cooperatively working in their groups to brainstorm what topics were related to field trips and other relationships. Their reasons included good group cooperation with each member having something different to contribute and the topic being fresh in their memories since they had just completed the written report. Student's responses on the survey further substantiated the value of their peers in providing advice on writing with 57% reporting assistance from classmates and 11% using the assistance of the writing center. Brumback et al. (1985) also found that a high percent (81%) of students value feedback on their writing from their peers. The students also learn to evaluate whether thoughts and ideas are precisely articulated and they see others struggling with writing.

Making the oral presentation was viewed by students as the most difficult part of the oral report. Their reasons included (1) discomfort with giving presentations, (2) discomfort with presentation by one peer when the group earns only one grade, (3) insufficient time for the presentation and (4) replications of discussions across groups. Students ranked the oral reports low ( 2.8, based on a scale of 1-5 with 1= least valuable and 5= most valuable) and the written reports average (3.2) in helping them understand the course information. They ranked the overall value of the field trips in helping them understand the information provided in the course with a score of 3.8. Their (85%) comments indicated that the field trips were helpful in relating the applications to the topics covered in lectures and that they would like to see them continue. Student's scores averaged 89% on the field trip reports, 79% on lab and 78% on the course. The percent of students which successfully completed the course with a grade of C or better was increased to 89%, an increase of 10% over the previous class which had no field trips to agriculture industries. Much interest and enthusiasm was evident among students as they visited with the operators of these agriculture businesses. The writing exercises and oral discussions helped them to link the course materials with the agricultural practices they observed on the trips. Although it was time consuming to read and grade the trip reports which averaged 2 pages, the reward of improvement in student analysis and synthesis was definitely worth it. Both writing and oral discussions will be emphasized in future field trips. This approach could also be useful in other agriculture courses with lab components to provide practical experience and complement lecture topics.

## Conclusion

These results indicate that the inclusion of field trip reports helped students understand the information in this plant science class. The practice that comes with preparing several of these reports over the semester improved the analysis and synthesis in their writing, the thinking demands most difficult for students. In the oral cooperative discussions they successfully completed these sections. Although they found the presentations of the oral reports most difficult, students viewed the cooperative activity of sharing ideas as the easiest part of the discussion. One lesson learned here is that the time for oral discussions should be increased to allow more time for presentations.

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# Globalization of the Learning Environment: Results of a Baseline Study of Selected Indicators of Globalization at North Central Colleges of Agriculture

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## Abstract

A research project on the globalization of learning environments for students at north central U.S. colleges of agriculture was conducted in 1998. Findings for a one-year period included: 1) over 1,000 students participated in study and work abroad; 2) over $300,000 in study abroad scholarship money was available to students through their colleges of agriculture; 3) over 2,500 international students studied at these colleges; 4) few colleges require the study of another language; 5) 1 college offers a degree and 4 colleges offer a major or secondary major with a significant focus on global dimensions; and 6) over 1,000 faculty and staff traveled to other countries.

## Introduction

In the late 1980s, the North Central Curricular Committee Project brought together senior scholars and those charged with curricular responsibilities to develop an agenda for increasing the international focus in agricultural curricula. One significant output of their work was a conference and proceedings entitled, "Educating for a Global Perspective: International Agricultural Curricula for 2005." Dr. Duane Acker, one of the contributors to the dialogue, set forth a challenge when he stated, ". . . any college of agriculture curriculum today or in the future must be international in concept and content" (The North Central Curricula Committee Project, 1989).

This paper presents some of the results of a research project undertaken in 1998 pertaining to the Globalizing Agricultural Science and Education Programs for America (GASEPA) initiative of the Board on Agriculture, National Association of State Universities and Land-Grant Colleges. The goals of the research were to 1) test a globalization baseline survey instrument; 2) collect data on the current status of globalization at north central region colleges of agriculture; and 3) establish an initial data set as a baseline for monitoring future progress in the globalization of research, extension, and teaching programs. The results reported in this paper focus specifically on the globalization of learning environments under goal two of the research project.

The paper builds on the notion that quality education includes the globalization of students' learning environment. Susan Berresford, President of the Ford Foundation, explains that globalization "describes the rapid and accelerating worldwide movement of technology, goods, capital, people, and ideas" (Ford Foundation, 1997).

Building on the progress of the last decade, U.S. colleges of agriculture need to dramatically expand such offerings to infuse a global perspective into the undergraduate learning experience. Moreover, globalization of agriculture programs may well be a key pathway to continuous improvement of quality at U.S. land grant institutions in the Twenty-first Century (Acker and Scanes, 1998). The GASEPA initiative responds to growing concern that public universities must be more effective in preparing clientele to succeed in a globally interdependent work and living environment.

The vision as outlined by the GASEPA initiative (National Association of State Universities and Land Grant Colleges, 1997) is "to develop globally competent stakeholders, faculty, and students in the U.S. food, agriculture, and natural resource sectors who live, compete, and work well in an ever-dynamic and interdependent world community." Furthermore, the stated mission of GASEPA (National Association of State Universities and Land Grant Colleges, 1997) is that an international dimension is incorporated into teaching, research, and extension programs so that 1) our

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