Incorporating Writing-Intensive Assignments in an Animal Science Production Course

S. Trojan[1], C. Meyers[2] and N. Hudson[3]
Texas Tech University
Lubbock, TX

Abstract

In-class writing assignments were administered to an upper level animal science production class to enhance students' exposure to writing and to facilitate learning and application of course material. Results from pre- and post-survey assessments indicated that these writing assignments gave students more confidence in writing, as they were less nervous about the writing process at the end of the semester ($P<0.05$), had greater confidence in constructing graded compositions ($P<0.05$) and had an improvement in overall self-perceived writing ability ($P<0.05$). Students indicated the writing assignments helped them learn to better express ideas through writing ($P<0.05$) and that they had a better feeling about handing in well-done compositions at the end of the semester ($P<0.05$). Students acknowledged that writing allowed them to more thoroughly think through concepts ($P=0.06$). More than half (58%) indicated that the writing assignments assisted in a more thorough understanding of course material and 65% reported the writing assignments were relevant and useful toward overall learning in class. The in-class writing assignments served as a successful mechanism for improving course content comprehension, as well as increasing students' exposure and confidence with writing.

Introduction

Among employers, communication skills rank among the most highly sought-after aptitudes (Crawford et al., 2011; Hart Research Associates, 2010) and recruiters have identified students' writing abilities as an important consideration in the hiring process (Leggette et al., 2011). In a survey of employers to determine skills necessary for student success in a global economy, 89% indicated that colleges should place more emphasis on effective oral and written communication and 81% believed that a focus on improving critical thinking and analytical reasoning skills was necessary (Hart Research Associates, 2010). Previous studies have found that writing facilitates critical thinking (Condon and Kelly-Riley, 2004; Hanstedt, 2012; Hobson and Schafermeyer, 2004). Despite the recognized need for improved writing skills among college graduates, recent research suggests that they are not meeting employer expectations in competencies for written and oral communication (Fischer, 2014).

Facilitating activities that enhance writing exposure in the classroom can help students improve writing skills and comprehension of course content (Aaron, 1996; Barry and Orth, 2013). Teaching students to write effectively is a process, requiring constant reinforcement and practice (Barry and Orth, 2013; Hanstedt, 2012); thus, students need increased exposure to writing outside of formal English courses. As with the mastery of any skill, repeated, purposeful practice is fundamental to improve writing aptitude (Johnstone et al., 2002; Kellogg and Raulerson, 2007) and writing-intensive courses facilitate this practice. Moreover, scholars have advocated for the integration of writing skills into the agricultural curriculum (Leggette et al., 2011). Leggette (2015) noted that instructors can make changes to their classes to integrate writing and improve students' writing skills. One suggestion was to provide students with feedback on their writing performance several times during the class. This is something students also desire in writing-intensive classes and is pivotal in helping improve students' writing competency (Kellogg and Raulerson, 2007; Leggette and Homeyer, 2015; Pajares and Johnson, 1994).

Faculty understand the benefits of facilitating writing in courses, but many are reluctant to incorporate into classes because of the increased work-load that coincides with providing meaningful and timely feedback. Also, if the writing assignment is given in class, professors may not be able to justify lecture time for the activity. However, Kellogg and Raulerson (2007) encouraged instructors to view writing as a mechanism for facilitating learning and related the writing process to activating knowledge. Scholars have emphasized that effective writing activities do not need to be extensive papers and

[1]Assistant Professor, Department of Animal and Food Sciences, Texas Tech University; 209 AFS, Box 42141 Lubbock, TX 79409-2141; (806) 834-6825; sara.trojan@ttu.edu
[2]Associate Professor, Department of Agricultural Education and Communications, Texas Tech University; (806) 834-4364, courtney.meyers@ttu.edu
[3]Undergraduate research assistant, Department of Animal and Food Sciences, Texas Tech University; neely_h@sbcglobal.net

Table 1. Selected Examples of Writing Prompts and Expected Outcome of Written Response in an Animal Science Production Course at Texas Tech University

Prompt	*Expected outcome*
Why did the 2011 Beef Quality Audit indicate that information sharing among segments of the beef industry is one of the largest issues facing the industry? What are two or three ways you would propose enhance this capability in the industry?	Demonstrate understanding of beef industry segmentation, use of facts to synthesize solutions.
What is the significance of "stepping-up" cattle to feed? Discuss specific methods of how cattle may be "stepped-up" to feed and factors that influence the variation and duration of this management practice.	Evidence of a basic understanding of transition diets and in-field application of process. Overall, responses should biological facts and management implications of the practice
What is implant payout? Discuss time of re-implantation relative to implant payout and explain potential impacts of re-implanting on cattle performance and carcass quality. Also, briefly describe how marketing strategies can influence an implant program.	Generalized understanding of the biology of implants, management of implants and synthesis of how/why implants impact cattle marketing.
What is the most important cause of morbidity and mortality in feedlots? In your discussion, be sure to include information regarding factors that contribute to the onset of the disease, the impacts of the disease on animal performance, and ways to manage the disease. When discussing ways to manage the disease, be sure to define metaphylactic treatment and when this type of treatment would be warranted.	Responses should synthesize factors that contribute to the onset and management of Bovine Respiratory Disease and demonstrate a basic understanding of these factors.
Beta-adrenergic agonists are a class of growth promoting agents approved for use in feedlot cattle. Currently the feeding of beta-agonists has drawn controversy and opposing views from within the industry, resulting in the removal of one of the products (zilpaterol-hydrochloride, Zilmax) from the market. You were assigned to preview material which presented contrasting viewpoints regarding beta-agonist usage. For your writing discussion, indicate why there is concern for beta-agonist administration, discuss the nature of the research that has been conducted since the removal of Zilmax, and be sure to indicate pertinent findings from current beta agonist research (including both viewpoints) For your summary statement, based on the data available, indicate what you think the industry should do regarding the feeding of beta-agonists regarding Zilmax feeding in the future and why you feel your response is sound advice.	The material the students were asked to review presented divergent viewpoints from beef industry leaders regarding the use of beta-agonists. Responses should demonstrate a basic understanding of beta-agonist usage, reasons of concern with usage, and the ability to draw conclusions from evaluating scientific data.

reports, rather, comprehension of course content and critical thinking can be evaluated and facilitated through short writing activities (Barry and Orth, 2013; Hobson and Schafermeyer, 2004). Innovative alternatives to traditional writing assignments include short writings and prompted in-class discussions based-on in-class writings, which increase writing exposure, provide students time to think about course concepts and do not substantially increase instructor workload (Butler et al., 2001; Drabick et al., 2007; Stewart et al., 2010).

Beyond what instructors in writing-intensive classes choose to do to encourage students' writing, another factor may be at play. Many students are anxious about the writing process and may even dread completing writing activities. Daly and Miller (1975) defined this fear or anxiety of writing as writing apprehension. Individuals with high levels of writing apprehension avoid writing whenever possible and when forced to write, they are anxious and expect to do poorly. Those who have low levels of writing apprehension enjoy the writing process and seek out opportunities to write. Writing apprehension can impact students' ability to perform writing tasks in the classroom and has even been found to influence college major choices (Daly and Shamo, 1979).

Overall, effective writing skills are important to enhance students' ability to communicate well, think through concepts and are highly valuable across all disciplines. These skills are becoming increasingly important for students within the agriculture field to master, not only for personal success in the industry, but also to communicate to a growing consumer population that is far removed from production agriculture (Aaron, 1996). Thus, it is important that instructors in agriculture fields emphasize effective communication, particularly through writing, both for student success and for the betterment of the industry. However, instructors must also realize that some students may have underlying apprehension regarding the writing process that may inhibit their writing performance.

In an effort to facilitate writing exposure, improve students' writing ability in an agriculture discipline and enhance critical thinking skills, upper-level undergraduate animal science production classes at Texas Tech University are required to be writing-intensive. To fulfill this requirement and to stimulate in-class learning and critical thinking about lecture material, weekly writing assignments were incorporated into a stocker and feedlot cattle management course, which is an upper-level production course, cross-listed for undergraduate and graduate students. The purpose of this study was to: 1) describe undergraduate and graduate students' writing apprehension scores at the beginning and end of the course and 2) assess students' perceptions of the effectiveness of in-class writing assignments in helping them better understand and apply course material.

Methods

Weekly in-class writing assignments were integrated into a dual-listed, writing-intensive stocker cattle and feedyard management course. Courses designated as writing intensive at the university have a requirement that students "write often." This course had previously been designated as writing intensive and this assignment was designed as one element to help fulfill the writing intensive requirement. The writing assignments described in this paper were based on prompts related to the week's lecture material, represented 25% of the student's final grade and were assessed using a rubric for individualized feedback. Each assignment was evaluated to gauge the student's comprehension of lecture material, ability to synthesize information and competence to apply lecture topics to real-world application. Several writing prompt examples and a summary of expected outcomes for each are presented in Table 1. Procedures conducted

in this study were deemed exempt by the Texas Tech University Institutional Review Board.

Class lectures were Monday, Wednesday and Friday. Writing prompts were administered at the beginning of Friday lecture and students were allowed approximately 25 minutes to complete the in-class assignment. Students were notified of writing assignments the Monday prior to administration. To encourage students to keep current with lecture material and review notes, students were not allowed to use notes or supplemental material during the writing activity. Writing assignments were not administered every week due to scheduling conflicts with guest speakers, field trips and exams.

Writing assignments were evaluated and returned to the student prior to the subsequent assignment. A standardized writing rubric adapted from Fort Hays State University Department of Political Science (n.d.) was used to assess following criteria: 1) overall organization of the paper; 2) logic and analysis (to assess critical thinking ability); 3) use of evidence (accuracy of students' ability to apply class material to prompt response); 4) mechanics. Each criterion was evaluated on a 0-4 scale and students were provided with feedback and suggestions for improvement. For reference, a link to this rubric is provided in the Fort Hays State University citation.

To assess students' attitudes toward writing, a modified version of the Daly-Miller Writing Apprehension Test (WAT) (Daly and Miller, 1975) was administered at the beginning and end of the semester. The instrument was adapted to include 20 items instead of the original 26 (Richmond et al., 2013). An instrument was also completed at the end of the semester for student feedback directly related to the structure of the in-class writing assignment. Responses for both instruments were based on a 5-point Likert scale with 1 = strongly disagree and 5 = strongly agree. There were 36 undergraduate and 10 graduate students enrolled in the course, with 27 and seven, respectively, completing all assessments. To calculate the WAT scores, the following formula was used: WAT = 48 –Total of scores for negatively worded statements + Total of scores from positively worded statements (Richmond et al., 2013). Based on this formula, the possible range of WAT scores can be from 20 to 100. According to Richmond et al. (2013) scores from 45 to 75 are in the normal range of apprehension; scores below 45 indicate a low level of apprehension and scores above 75 indicate a high level of apprehension toward writing. Pre- and post-test mean scores for questions on the WAT were compared using a paired samples t-test in SAS statistical software (SAS Inst., Inc., Cary, NC) with differences in means declared significant when $P<0.05$. Whereas student perceptions of the writing assignment are presented as frequency means.

Results and Discussion

The calculation of overall WAT scores indicated that all students fell within the "normal" range for writing apprehension (Richmond et al., 2013). At the pre-test, scores ranged from 50 to 68 while the post-test scores ranged from 46 to 68. Eighteen students had a decrease in their WAT scores, one stayed the same and 15 had an increase.

Examination of the individual items for the WAT are presented in Tables 2 and 3 for undergraduate and graduate students, respectively. A comparison of pre- and post-test WAT scores revealed that at the end of the course compared with the beginning, undergraduate students were more comfortable with their writing assignments being evaluated, felt they were better able to express ideas through writing, had an easier time beginning a composition, felt less nervous about writing and developed a greater confidence in writing (Table 2; $P<0.05$). Writing is a skill that requires deliberate practice (Kellog and Raulerson, 2007; Hanstedt 2012). The development of competency is related to one's comfort level of that skill. Pajares and Johnson (1994) indicated that student's beliefs about their writing capabilities were significantly related to their writing aptitude in that students who were more confident in their writing skills had higher scores on the writing assignment measured in this study.

As Leggette (2015) suggested, instructors can make changes to improve students' writing skills. The findings of the current study suggest that short, in-class writing assignments were sufficient for increased writing exposure and provided writing practice, which helped students feel more comfortable with writing and improved their perceptions toward writing. In general, there was a positive improvement in student's scores on the in-class writing assignments throughout the semester as well (data not shown). Students were more cognizant of

Table 2. Mean responses of pre- and post- Daly-Miller Writing Apprehension Test for undergraduate students (n=27)

Question[x]	Pre	Post	Significance level[y,z]
I avoid writing	3.19	2.96	NS
I have no fear of my writing's being evaluated	2.78	3.22	NS
I am afraid of writing essays when I know they will be evaluated	3.00	2.63	**
I can better express my ideas through writing	2.85	3.22	**
Handing in a composition makes me feel good	2.52	3.07	*
My mind seems to go blank when I start to work on my composition	3.07	2.56	**
Expressing ideas through writing seems to be a waste of time	2.42	2.26	NS
I like to write down my ideas	3.11	3.26	NS
I feel confident in my ability to express my ideas clearly in writing	2.81	3.30	**
I like to have my friends read what I have written	2.30	2.56	**
I'm nervous about writing	3.19	2.70	**
People seem to enjoy what I write	2.85	3.26	**
I enjoy writing	2.59	3.07	**
Writing allows me to get my thoughts together	2.81	3.52	**
Writing helps me think more critically about concepts	2.92	3.42	NS
I have a terrible time organizing my ideas in a composition course	3.08	2.63	NS
Writing allows me to more completely think through concepts	2.88	3.37	*
I don't think I write as well as most other people	3.35	3.16	NS
I don't like my compositions to be evaluated	3.19	2.89	NS
I'm not good at writing	3.15	2.58	**

[x]Responses based on 5-point Likert scale where 1 = *strongly disagree* and 5 = *strongly agree*

[y]Significance level of change between post and pre-evaluation

[z]NS = non-significant; ** $P \leq 0.05$; * $P \leq 0.10$

writing and those who were struggling with the assignments frequently visited the instructor for tips on writing instruction. The increased writing confidence among undergraduate students observed in this study could have been the result of students' developing a better understanding of the writing assignment throughout the semester, repeated writing practice, feedback incorporation or a combination of these factors.

Although not analyzed, there was a greater magnitude of change brought about by the writing assignments for undergraduate students (n=27) compared with graduate students (n=7), which may be due to the smaller number of responses for graduate students versus undergraduate students. The differences may also be related to a greater overall writing exposure for graduate students, because of the increased writing demands of graduate work. The lack of change in pre- and post-responses among graduate students suggests they were overall more comfortable with the writing process and that the increased writing exposure did not improve or degrade their writing confidence (Table 3).

Table 3. Mean responses of pre- and post- Daly-Miller Writing Apprehension Test for graduate students (n=7)

Question[x]	Pre	Post	Significance level[y,z]
I avoid writing	2.00	2.28	NS
I have no fear of my writing's being evaluated	3.57	3.43	NS
I am afraid of writing essays when I know they will be evaluated	2.14	2.29	NS
I can better express my ideas through writing	3.14	3.29	NS
Handing in a composition makes me feel good	3.29	3.43	*
My mind seems to go blank when I start to work on my composition	2.43	2.29	NS
Expressing ideas through writing seems to be a waste of time	2.14	2.00	NS
I like to write down my ideas	4.00	3.43	NS
I feel confident in my ability to express my ideas clearly in writing	3.71	3.71	NS
I like to have my friends read what I have written	3.29	3.43	NS
I'm nervous about writing	2.14	2.14	NS
People seem to enjoy what I write	3.29	3.57	NS
I enjoy writing	3.43	3.43	NS
Writing allows me to get my thoughts together	3.43	2.86	NS
Writing helps me think more critically about concepts	4.00	4.00	NS
I have a terrible time organizing my ideas in a composition course	2.43	2.14	NS
Writing allows me to more completely think through concepts	3.57	3.86	NS
I don't think I write as well as most other people	2.57	3.14	NS
I don't like my compositions to be evaluated	2.29	2.71	NS
I'm not good at writing	2.29	2.14	NS

[x]Responses based on 5-point Likert scale where 1 = strongly disagree and 5 = strongly agree

[y]Significance level of change between post and pre-evaluation

[z]NS = non-significant; * P ≤ 0.10

To gather additional feedback regarding the use of brief, in-class writing assignments, students completed an additional researcher-developed instrument at the end of the semester. Undergraduate students indicated an improvement in their ability to use writing to more completely think through concepts (pre-test *M*=2.88, post-test *M*=3.37; *P*<0.05, Table 2). Undergraduate students did not show a change in their thoughts regarding the use of writing to more critically think about concepts at the end of the semester (*P*>0.10, Table 2), but did not disagree with this statement (*M*=3.17; Table 2), whereas graduate students agreed with the statement at both assessment times (pre- and post-test *M*=4.0; Table 3). In addition, undergraduate students reported an improvement in their perceptions of using writing to put their thoughts together (*P*<0.10; Table 2) at the end of the semester.

Presumably, with the increased writing expectations for graduate students, they are more accustomed than undergraduate students to the practice of writing to assimilate facts to answer an applied question. Though critical thinking was not measured directly in this study, writing provides the opportunity for critical thinking through the process of logically assimilating thoughts and ideas, which activates higher-level thinking (Condon and Kelly-Riley, 2004; Hobson and Schafermeyer, 2004). Thinking is not an outward process, making assessment of critical thinking difficult; however, Hanstedt (2012) reported that writing is a mechanism for gauging critical thinking skills. Because of the identified need to improve analytical and reasoning skills among college graduates, development of short writing-based activities that lend themselves to critical thinking should be investigated further.

Using a standardized rubric and hand-written comments, instructors provided timely feedback to students to facilitate the writing process and to help them identify knowledge gaps within course material. For all the students surveyed in this study, 60.5% (Table 4) indicated that the feedback they received for the in-class writing assignments was enough for them to make changes in their writing approach (Table 4). Furthermore, one of the reasons behind the implementation of this in-class writing activity was to serve as a mechanism for stimulating class discussion. After each writing activity, time was dedicated to discussing the prompt and encouraging students to share their responses. Through this activity, 51.2% (Table 4) of students indicated that they felt more comfortable discussing course material after completing the writing assignment. Overall, students seemed to have a positive perception of the in-class writing assignments to facilitate learning as 58% (Table 4) indicated that the in-class writing assignments helped them to more thoroughly understand course material and 65% (Table 4) noted the in-class writing assignments were relevant and useful for learning. In activities designed similarly to that described in this paper, others have reported positive student feedback and improved active learning through short, in-class assignments (Butler et al., 2001; Drabick et al., 2007; Stewart et al., 2010).

Although short writing activities expose students to writing and assist students with course content comprehension, instructors may still feel that any activity involving writing is related to an increased workload. Hobson and Schafermeyer (1994) suggested that instructors could reduce the grading burden by using self or peer-evaluation, or by using "formative" evaluation to rank papers as "low" "medium" or "high", without assigning a formal letter grade. Barry and Orth (2013)

Table 4. Mean percentage scores for students' perceptions of in-class writing assignments (N=43)

Question[x]	Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree	
	f	%	f	%	f	%	f	%	f	%
The in-class writing assignments helped me in more thoroughly understanding course material	1	2.3	8	18.6	9	20.9	22	51.6	3	6.9
The in-class writing assignments allowed me to feel more comfortable in discussing course material	2	4.6	6	13.9	11	25.6	22	51.2	2	4.6
The in-class writing assignments helped me to study for exams	1	2.3	10	23.3	15	34.9	15	34.9	2	4.6
I enjoyed the in-class writing assignments	6	13.9	9	20.9	15	34.9	13	30.2	0	0.0
The in-class writing assignments helped me learn to organize my thoughts when writing	1	2.3	7	16.3	11	25.6	21	48.8	3	7.0
I thought the in-class writing assignments were a waste of time	6	13.9	22	51.2	10	23.3	2	4.6	3	7.0
Feedback for in-class writing assignments was sufficient enough for me to be able to make changes in my approach to writing	1	2.3	2	4.6	12	27.9	26	60.5	2	4.6
The in-class writing assignments helped me to better understand components of effective writing	2	4.6	9	20.9	15	34.9	14	32.6	3	6.9
The in-class writing assignments enabled me to become more confident in my writing ability	6	13.9	4	9.3	14	32.6	16	37.2	3	6.9
The in-class writing assignments were relevant and useful toward my learning in this class	1	2.3	2	4.6	12	27.9	23	53.5	5	11.6

[x]f = frequency of response; % = frequency of the response divided by the total number of student responses for each question

mentioned incorporating guided peer-review for assignments requiring multiple drafts. Through this approach, student-reviewers are provided a list of questions to provide direction in focusing on key points and components of the paper. The application of these methods for writing review and revision are dependent on the nature of the course and writing activity; however, these and similar ideas merit consideration for instructors wishing to facilitate writing in courses.

Summary

Short, in-class writing assignments, administered periodically throughout the semester in an upper-level, animal science production course, were effective in fulfilling course writing-intensive requirements and were beneficial for increasing students' writing exposure and comprehension of course content. Students gained confidence with the writing process and were more willing to discuss course material after completing a writing assignment as they felt more comfortable with their understanding of course content following the writing activity. Drawbacks of this assignment are increased instructor workload through reading and evaluation; however, non-traditional approaches to grading writing, such as peer-evaluation, may be applicable to in-class writing assignments. Based on positive student feedback through this assessment, as well as comments to the instructor on course evaluation forms, this activity has continued to be administered in this class.

Literature Cited

Aaron, D.K. 1996. Writing across the curriculum: Putting theory into practice in animal science courses. Journal of Animal Science 74: 2810-2827.

Barry, T.T. and M.W. Orth. 2013. Designing effective writing assignments for students in the animal sciences. Natural Sciences Education 42: 137-144.

Butler, A., K-B. Phillmann and L. Smart. 2001. Active learning within a lecture: Assessing the impact of short, in-class writing exercises. Teaching of Philosophy 28(4): 257-259.

Condon, W. and D. Kelly-Riley. 2004. Assessing and teaching what we value: The relationship between college-level writing and critical thinking abilities. Assessing Writing 9: 56-75.

Crawford, P., S. Lang, W. Fink, R. Dalton and L. Fielitz. 2011. Comparative analysis of soft skills: What is important for new graduates? Washington, DC: Association of Public and Land-grant Universities.

Daly, J.A. and M.D. Miller. 1975. The empirical development of an instrument to measure writing apprehension. Research in the Teaching of English 9(3): 242-249.

Daly, J.A. and W. Shamo. 1979. Academic decisions as a function of writing apprehension. Research in the Teaching of English 12(2): 119-126.

Drabick, D.A.G., R. Weisberg, L. Paul and J.L. Bubier. 2007. Keeping it short and sweet: Brief, ungraded writing assignments to facilitate learning. Teaching of Philosophy 34: 172-176.

Fischer, K. 2014. A college degree sorts job applicants, but employers wish it meant more. The Chronicle of Higher Education. Retrieved from http://chronicle.com/article/The-Employment-Mismatch/137625/#id=overview

Fort Hays State University Department of Political Science. n.d. Writing grading rubric. Retrieved from http://www.fhsu.edu/polisci/Grading-Rubrics/

Hanstedt, P. 2012. Reforming general education: Three reasons to make writing across the curriculum part of the conversation. Liberal Education 98(4): 48-51.

Hart Research Associates. 2010. Raising the bar: Employers' views on college learning in the wake of the economic downturn. Washington, DC: Association of American Colleges and Universities.

Hobson, E.H. and K.W. Schafermeyer. 1994. Writing and critical thinking: Writing-to-learn in large classes. American Journal of Pharmaceutical Education 58: 423-427.

Johnstone, K.M., H. Ashbaugh and T.D. Warfield. 2002. Effects of repeated practice and contextual-writing

experiences on college students' writing skills. Journal of Educational Psychology 94(2): 305-315.

Kellogg, R.T. and B.A. Raulerson, III. 2007. Improving the writing skills of college students. Psychonomic Bulletin & Review 14(2): 237-242.

Leggette, H. 2015. Faculty define the role of writing in the social sciences of agriculture. NACTA Journal 59(2): 104-110.

Leggette, H. and M. Homeyer. 2015. Understanding students' experiences in writing-intensive courses. NACTA Journal 59(2): 116-121.

Leggette, H., S. Sitton and C. Blackwell. 2011. Perceptions of agricultural industry recruiters on writing in the workplace. NACTA Journal 55(3): 61-66.

Pajares, F. and M.J. Johnson. 1994. Confidence and competence in writing: The role of self-efficacy, outcome expectancy, and apprehension. Research in the Teaching of English 28(3): 313-331.

Richmond, V.P., J.S. Wrench and J.C. McCroskey. 2013. Communication apprehension, avoidance, and effectiveness (6th ed.). Upper Saddle River, NJ: Pearson Education.

Stewart, T.L., A.C. Myers and M.R. Culley. 2010. Enhanced learning and retention through "Writing to Learn" in the Psychology classroom. Teaching of Psychology 37: 46-49.

Join us next year!

63rd Annual NACTA Conference

Purdue University