

# Engaging Agriculture Students in the Publication Process through Popular Press Magazines

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## Abstract

Traditional lecture based courses may not be the most effective in incorporating all the concepts of higher order thinking. Therefore, an alternative teaching method was created and incorporated into an upper division animal science feeds and feeding class which challenged students to obtain peer reviewed data and present it in a popular press type format. The objectives of this classroom assignment was to: 1) incorporate the concepts of Blooms Taxonomy into the teaching method of class and 2) assist undergraduate students in their understanding of core concepts discussed in class and 3) transform scholarly research into a popular press writing format. There were three phases of this assignment: 1) assignment of writing clusters based upon student interest, 2) edit and selection of papers, 3) publication of paper. In each of the three phases, students were graded by the instructor. This project has been conducted for three years, accounts for between 13-19% of the final grade, with five papers authored and edited by students published in popular press journals across three states. Popular press magazines can be a critical link between the scientific, university, and agriculture communities.

Keywords: popular press, Blooms Taxonomy, writing skills

## Introduction

A major dimension of Bloom's taxonomy consists of the cognitive domain which therein is comprised of knowledge, comprehension, application, analysis, synthesis, and evaluation. Knowledge and comprehension are considered *lower-order* and the remainder *higher-order* learning/teaching objectives (Bloom et al., 1956). Promotion of higher-order thinking/skills has been the focus of university teachers in order to improve the thinking skills of students (Ball and Garton, 2005).

Strong agricultural curricula must ensure that students are proficient in communication skills including reading, writing, speaking, and listening. In addition students must also have the ability to cooperate and work with others (Kauffman, 1992). Implementing writing exercises in agricultural classes enhances the learning process by incorporating critical thinking strategies, dialog between instructor and pupil, and engagement in thought

provoking exercises (Cobia, 1986). While lectures are essential for the dissemination of facts, they are less effective in assisting students with overall analysis, synthesis, or integration of course material (Verner and Dickinson, 1976) and therefore utilization of non-lecture based alternative teaching methods could enhance the overall learning process. Writing in college animal science courses is an important means to teach students the language of the discipline and assists students in learning the designated material outside of class lecture (Aaron, 1996).

Material taught in class can be emphasized with a writing assignment and in doing so; educators who encourage writing in their classes will improve the thinking and writing skills of their students (Haug, 1996). Students should be responsible for segments of their own learning in a college environment. Therefore, if less of their energies are centered upon simple information recall and more on integration of their own learning experiences with the lecture material, their educational experience may be enhanced (Kauffman et al., 1971).

A study completed by the National Assessment of Educational Progress in which high school seniors participated in writing tasks to measure the three purposes for writing: narrative, informative, or persuasive. In this study, only 25% of participants from across the country demonstrated competency at writing (Salahu-Din et al., 2007). With many of these students entering higher education, there is a need for colleges and universities to teach writing skills as part of the overall curriculum. Therefore, the objective of this classroom assignment was to incorporate the concepts of Blooms Taxonomy into the teaching method of class in order to better assist undergraduate students in their understanding of core concepts in animal science courses by transforming scholarly research into a popular press format suitable for publication in a popular press magazine.

## Methods

The overall premise of the discussed project is that student engagement in reviewing scientific literature and using this information to write a popular press article will increase their writing skills and their understanding of animal science while at the same time enhancing higher order learning. It was also important as part of this project to introduce students to the peer-review process in an attempt to

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increase their editing, writing, and team building skills. In order to accomplish the above, students were allowed to select a topic of their choice (within the scholarly goals of the particular class), write, edit classmates work, and be a part of the publishing process in an attempt to engage them in higher order thinking. An example of the project outline is provided in Table 1.

**Formation of the Peer Writing Cluster**

Junior and senior level students enrolled in AGS 311 Feeds and Feeding starting spring of 2007 and later students taking AGS 301 Farm Animal Physiology starting spring 2010 participated in the writing exercise. On the first day of class, all students were introduced to the methodology of the project and were asked to bring popular press magazines to the next class meeting to facilitate the discussion of the differences between popular press and scholarly publications. Examples of scholarly and popular press articles were provided and differences between the two as related to scholarly writing, citation methods, audience, and format were explained. Suitable topic areas were discussed and possible topics provided. Topics provided in the syllabi were broad so that students could get ideas, but not a specific question to explore. Students were assigned to writing clusters based upon their topic interest of choice (i.e. beef cattle nutrition, sheep and goat health, etc.). Peer writing clusters comprised a minimum of three and a maximum of five students.

**Working within a Peer Writing Cluster**

The project was divided into three main phases. In the first phase, students worked within their individual writing clusters to develop their individual papers. Within these writing clusters, students were encouraged to discuss their topics and assist one another to determine a subject most applicable to that particular writing clusters subject area. Communication within the writing cluster was accomplished via the internet and through direct contact in class. Students were required to prepare an outline of the material they wished to research and email it to their writing

cluster as well as the course instructor. Each student in a writing cluster was required to evaluate and edit each outline in their writing cluster. Edited outlines were emailed back to the original author and to the instructor for grading purposes.

Upon outline approval, first drafts were completed and distributed to the writing cluster. Students within each writing cluster were then required to provide detailed edits of each cluster member's paper. The instructor also edited, graded, and returned first drafts to the authors. While some students simply "Ok'ed" papers, others took careful consideration and made excellent editorial suggestions.

Students completed final drafts and sent them to their instructor and writing cluster for final review. Students were required to evaluate and rank their writing cluster papers and email the instructor those evaluations and rankings based upon the paper they felt was most likely to get published. Individual rankings were kept confidential. Low score was determined and the author of the best writing cluster paper received 20 points of extra credit. Responsibility of selecting the most publishable paper within each cluster was relegated to the students.

**Table 1. Example Project Outline and Timeline used in AGS 311 and AGS 301**

Item	Delivery Date	Method	Points
Topic selection	Jan 13th	Discussion in class	0
Assign to writing cluster based on topic selection	Jan 20th	Please exchange email addresses, phone numbers etc to aid in cluster communication	0
First draft due	Feb 3rd	Email to writing cluster & teaching assistant	40
Edits of papers due	Feb 10th	All edits from writing cluster and teaching assistant will be handed back by this time	5 points per paper reviewed up to 15 points
Final draft due	March 3rd	Email writing cluster and instructor	100
Final draft returned after grading	March 15 <sup>th</sup>		5 points when you send me ranking of cluster papers – Due: March 13 <sup>th</sup> . Winner of each writing cluster gets 20 points of extra credit
Writing cluster reads and ranks all cluster winning papers	March 17th		5 points when you send me your ranking of papers
Winner is announced	March 22		Winner gets 20 points, and writing cluster gets 20 points extra credit
Winner and instructor work towards getting paper ready for publication			Upon acceptance for publication, entire class receives 20 extra credit points.

### Selection of the Best Paper

The second phase of the project took place when the winning writing cluster papers were submitted to the class as a whole to review and be edited by the class. Students emailed edits of each paper to the instructor and then ranked the papers (most likely to get published to least likely to get published). Rankings were sent to the instructor and kept confidential. The author of the paper with the lowest rank then received an additional 20 bonus points and the writing cluster from which this paper came also received 20 extra credit points for their part in editing and selecting the paper.

The final phase occurred when the selected paper went through a final class review. The author of the final paper made necessary edits as determined by their classmates and then sent the paper to the instructor for final edits. After the paper was complete, it was sent to the chosen magazine for consideration for publication. The class as a whole had a stake in this process because if the editors agreed to publish the paper, the whole class would receive a 20 point bonus which meant that the original author received a total of 60 points, members of the original writing cluster received 40, and the class as a whole received a maximum of 20 bonus points. A complete list of points awarded as part of this project is presented in Table 1.

### Results and Discussion

In each year this project has been completed, the top papers have been published in a popular press magazine though not necessarily in the first choice of the author. The authorship of the paper was as follows: individual student author, instructor, 20XX Class. As a side project in 2007, the second place author was approached and the second place paper was revised and published in a popular press magazine. This was done outside of class and the students did not receive any additional class credit for the paper. However, it was encouraging that the student took pride in getting their work published and took the extra effort to make it happen. For a list of all

published papers since this project began, please see Table 2.

### Challenges and Benefits

As part of the Missouri State University William H. Darr School of Agriculture commitment to distance education, both AGS 311 and AGS 301 are taught via live interactive television to up to five off-campus locations. One challenge of incorporating this project involves the communication between on and off-campus students who are in the same writing cluster. However, assignments are completed via email so issues around classroom location are negated. Distance students have performed as well as on-campus students.

Another challenge is helping students work in a cooperative and collaborative way. Students are given oral guidance when the project is first discussed and time is allowed at the beginning of each class so students can establish lines of communication within their group. Further guidance is provided by the instructor if students have problems with their writing cluster or if members of the writing cluster fail to engage in productive communication. Unfortunately, not all students are equally motivated and some will not be engaged in this assignment as others.

Since 2007, 113 students have completed this project. Grades both with and without this writing cluster assignment were compared. Overall, 87% of the students increased their grade by a numerical percentage and 40% of those students increased their grade by at least one letter grade. Only 1.7% of the students lowered their letter grade as a result of this project. Since some students differ in test taking abilities and tests can over assess student knowledge and under assess student know-how (Wiggins, 1984), this project allows students to earn points not associated with test taking. Over the years, the writing cluster assignment has accounted for 13% to 19% of the student's final grade, not including bonus points. Differences in percentages are partially due to moderate changes in points for the project as it was

changed and improved upon over time. Additional point differences are due to points accumulated per number of quizzes, exam points, homework, etc.

### Areas of Learning within the Project

#### Autonomy

Educators in agriculture hypothesize that students learn best when their learning experiences are hands-on/minds-on (Parr and Edwards, 2004). The writing cluster project

Table 2. Title of Student Paper and Publication Source for Student Papers Published as a Result of the Engagement of Undergraduate Students in the Publication Process

Title of paper	Date	Publication Source	Class
Beef up your bottom line by combining fat supplements.	August, 2007	The Oklahoma Cowman <a href="http://www.okcattlemen.org/">http://www.okcattlemen.org/</a>	AGS 311
Supplementing Your Weanlings: An evaluation of the nutrient requirements and the potential deficiencies of your weanling colts.	September, 2008	Ozarks Farm & Neighbor. <a href="http://www.ozarksfn.com/">http://www.ozarksfn.com/</a>	AGS 311
Urinary Calculi in the herd – causes and prevention of urinary calculi in sheep and goats.	September, 2009	Ozarks Farm & Neighbor. <a href="http://www.ozarksfn.com/">http://www.ozarksfn.com/</a>	AGS 311
Forage Analysis – Hay mistakes could cost you – understanding a forage analysis report	December, 2009	Ozarks Farm & Neighbor. <a href="http://www.ozarksfn.com/">http://www.ozarksfn.com/</a>	AGS 311
Testicular Temperature.	June, 2010	Ozark Farm and Neighbor <a href="http://www.ozarksfn.com/">http://www.ozarksfn.com/</a>	AGS 301

allows students to determine their own research path for the project which puts the responsibility on them to select a topic they want to learn about. Inquiry based educational exercises can “turn-on” the minds of students if instructors allow them some control of their assignment while providing guidelines and advice on an as-needed-basis. By providing students the opportunity to select both the popular press journal they would most like to get published in and by allowing them to select their subject material, it was hoped that autonomy of the project would help compel students towards success.

*Teamwork*

The importance of working with others has been demonstrated as a necessary component of the college experience when preparing agriculture students for employment in the agricultural sector (Bekum, 1993; Carter, 2005). When students are comfortable with their peers and with the instructor, they are more likely to challenge themselves and their creative side regarding their writing style (Cobia, 1986). By requiring students to depend upon their writing cluster and their classmates for assistance and for possible grade advancement, students were exposed to the challenges of working in groups.

James Watson, the co-discoverer of the double-helix DNA molecule stated, “Nothing new that is really interesting comes without collaboration” (Johnson et al., 1998). Cooperative and collaborative learning occur as a result of students working together in unstructured groups. Cooperative efforts are the result of the interaction of the individuals to encourage and help each other's efforts whereas collaborative learning occurs when students work together in unstructured groups to create their own learning opportunity (Johnson et al., 1998). The discussed writing assignment provides students both the opportunity to learn in a cooperative manner i.e. students must assist those in their writing cluster to have the best chance at obtaining bonus points and the opportunity to work in a collaborative effort as they work in an unstructured group to obtain similar educational goals.

*Communication Skills*

Agriculture students need a variety of skills for success after graduation including skills associated with technical agriculture and skills related to communication, data collection, and time management. As reviewed by Ball and Garton (2005) problem solving, critical thinking, and higher order thinking skills are critical for students to acquire. As we move into a “knowledge-based” economy, we must prepare our students with the skills necessary for acquiring more information (Thurow, 2000) and as new ideas shape the field of agriculture, the need to communicate will cause businesses to seek individuals who contain both the basics in agriculture and who are also creative and

can effectively communicate ideas to a non-agrarian society. Production methods in agriculture will constantly evolve as new basic and applied science is generated and it is critical that agricultural students have the skills necessary to read and comprehend basic science, interpret it, and reproduce the knowledge via applied terms. By the nature of the project discussed above, where students had to locate, read, and comprehend research articles and then had to transform them into layman's terms, coupled with communicating with their writing cluster mates, student were engaged in a variety of communication skills and engaged in higher-order thinking.

*Writing skills*

Students often feel that writing assignments are only for the benefit of the teacher and have little relevance for the student (Aaron, 1996). In order to try to overcome this negative perception, student papers were graded on a first draft and final draft basis. The first draft was graded to show the students their major weakness areas and to assist the student in the development of proper writing skills. Another aspect of turning in a first draft was to ensure that students were progressing on their paper at a reasonable pace. The final paper was graded more rigorously for content, format, creativity, and grammatical and spelling errors (Table 3).

Businesses desire strong writing skills by both their applicants and their current employees. Students need to develop strong writing skills in their own disciplines' style and format to enhance their opportunities in the job market. Writing can be an indicator to companies as to the potential of a job applicant and a major skill desired by American businesses is writing accuracy and understanding of subject material (National Commission on Writing, 2004). Teachers in the agriculture fields should incorporate writing assignments into their classes and emphasize correct grammar, sentence structure, thought progression, and critical thinking. The written assignments in the classes discussed above gave students a chance to practice not only their written skills, but also learn the proper ways of editing others written work.

**Table 3. Grading Rubric for Writing Cluster Paper**

Items Graded	Percentage of total points
Content	50
Punctuation/Spelling/Sentence Structure	30
Citations & format of citations	10
Length	10

*Formulating a Research Problem*

Some students just beginning their junior and senior level courses may not have enough information to begin to ask thought provoking questions, or if they do, their questions may be either written too broad or too narrow and more guidance may be needed in the form of detailed instruction or one-on-one meetings with the instructor or teaching assis-

tant. Students who generate their own questions related to a specific topic have increased overall comprehension and retention of the specific material (Davey and McBride, 1986).

By incorporating real world writing assignments such as editorials, position papers, non-technical notes, scientific papers, etc. into agricultural science courses, students can be taught that the most important part of research is often the formulation of the question and the only way to properly formulate a proper question is in thoroughly understanding previous published research. Broad topics for student papers are provided by the instructor as students may not have the necessary background information to develop a topic, much less a question. Topics; however, provide the student a starting point and help lead them in a direction they choose to pursue.

### *Critical thinking*

There are two prominent learning theories in agricultural classes – authentic and experiential learning (Knobloch, 2003). Activities which promote solving problems, thinking critically, formulating knowledge, and applying skills in a “real-world” context are most often used to augment authentic learning activities. Conversely, experiential learning occurs via real-world experiences and supports educational principals of practice and student inquiry by applying knowledge and solving problems in real-life settings (Knobloch, 2003). In the discussed writing project, students are encouraged to select topics which have meaning to them and they are interested in learning more about. Often times, instructor editing is focused not just on the grammatical aspects of the paper, but also in making the paper readable by a non-academic audience. While students have practice writing research papers geared towards college instructors, they often lack experience writing for a non-academic “real life” audience.

Learning in a classroom is typically different from the way we learn in life which may cause students to disengage from the formal learning process. Meaningful experiences in which students are actively engaged tend to enhance the learning process (Reardon and Derner, 2004). What needs to be stressed in agriculture is that while lectures are important in presenting key facts related to a specific topic, a key element of overall academic learning and understanding is the ability to locate, select, evaluate, synthesize, and cite outside sources of information (Burton and Chadwick, 2000). However, some educators may feel that the responsibility for teaching the process of interpretation of literature used for writing rests with the English program of the University, and not in the more technically geared fields such as agriculture which may leave students with a diminished ability to locate sources, interpret their meaning, and write appropriately in agriculture (Howard et al., 2006). Also, if the instructor does not emphasize the importance of these skills by requiring

outside reading, comprehension, and writing, perhaps the students will not understand the importance and relevance of these skills. In order to address this possible issue, the significance of the paper is emphasized (not just with points but also with the prestige of being published and having that publication on their resume) and time is spent in class helping students develop their questions and in finding research papers geared towards their question.

### *Lifelong learning*

As reviewed by Carter (2005), lifelong learning is three dimensional and encompasses a mindset wherein individuals are willing to learn when placed in an environment that encourages learning and teaches skills which allow “self-directed” learning. Teachers should incorporate self-learning opportunities into their agricultural classes to encourage a pattern of lifelong learning by using teaching methods that require students to reflect, interact, and work independently and interdependently (Carter, 2005). Furthermore, teachers should help students find and properly interpret and use information while also challenging the techniques used to provide student feedback and reinforcement (Carter, 2005). One of the goals of the current project is to attempt to provide students with learning skills necessary to continue their education outside the classroom.

### *Motivation*

Motivation can be defined as “the degree of desire to learn, to study, to participate, and to cooperate in the overall teaching-learning process” (Campbell, 1977; p. 889). Along these lines of thought, a “student is not a student until someone or something turns him or her on” and one cannot force a student to be motivated to perform to the best of their ability “they can only be inspired to do it” (Campbell, 1977; p. 889). For a student to learn at their maximum potential, they must be in a relaxed environment where they are encouraged to take risks and where they feel psychologically safe, an environment which is positive yet challenging, respectful yet engaging (Reardon and Derner, 2004). Students in the current writing project work with their peers on formulating their question, their research, and their papers. One of the goals the instructor has set forth is that the writing assignment is done in a relaxed, yet challenging manner, by using a peer support model. In the current project, motivation is stimulated both via grades and by the possibility of their paper being selected amongst their peers for publication.

### **Summary**

Students of agriculture must be versed not only in the basics of their particular field, but must also be effective communicators. If students come into agricultural departments with a lack of skills in any of the areas within the field of communication, it is

imperative that instructors in the agricultural sciences (animal science, agronomy, soils, education, communication, etc.) convey not only the necessary skills themselves, but the reason behind why they should obtain those skills in the first place. Agricultural teachers must not only be well versed in their area of expertise but must strive to motivate students into wanting to become better communicators within the field of agriculture. Incorporating "out-side the box" writing assignments coupled with positive reinforcement with the peer support model and through intrinsic (opportunity to get published) and extrinsic (grades) motivation may be key element towards this goal.

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