Using Journal Articles to Integrate Critical Thinking With Computer and Writing Skills

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Abstract

A critical review is an effective method to develop critical thinking in the classroom. From an identified subject area, students select a refereed journal article and review it. In their own words, students are required to identify the objectives of the research, explain the materials and methods, summarize results and discussion, and give their opinion on the value of the research both to them personally and to agriculture as a whole. Specific grading criteria is provided. Students are required to submit the review in a printed format and use good writing skills.

Introduction

Developing critical thinking in the classroom is a necessary but sometimes difficult goal to accomplish. Critical thinking requires the use of higher levels of cognition, such as analyzing, synthesizing, and evaluating (Bloom, et al., 1956). However, research (Boyer, 1987; Johnson and Birkenholz, 1990): Newcomb and Trefz, 1986) has indicated that college coursework generally places the greatest emphasis on lower level cognitive skills (i.e. knowledge and application).

Ruggiero (1987) suggested that teaching students how to think can be accomplished by designing learning activities which require students to operate at higher levels of cognition. While agriculture faculty believe in the importance of developing critical thinking skills, they often do not have the time or the training necessary to integrate these skills into their curriculum (Foster and Pikkert, 1991).

One learning activity, the critical review, develops the higher cognitive skill of evaluation, as well as integrating computer and writing skills.

Critical Review

Overview

The critical review has been used in both lower (freshmen and sophomore) and upper level (junior and senior) crop science courses. Because of the nature of the assignment, however, the critical review could be used for any area of study in agriculture.

The critical review involves the reading of a current research article and then the preparation of a written explanation of the research and more importantly the student's opinion of the value of the research both to them personally and to agriculture in general.

Undergraduates are seldom exposed to scientific research, especially if there is no graduate program at the university. Unfortunately, this gives the impression that research is only for scientists and is not understandable by individuals not specifically trained in that area. Therefore, students have little appreciation for how advances are made in agriculture or how this information is disseminated. Additionally, the critical review provides an opportunity to explain the difference between basic and applied re search and the importance of each.

Procedure

From an identified subject area, students are asked to select a refereed journal article published within the past five year s and review it. Since agriculture is continually evolving, it is important that students read about recent advances. A list of acceptable journals is provided to students to aid them in the selection process. Depending upon the subject area, as well as the availability of the journals at the library, this list could include just a few to many journal titles.

Students are cautioned against selecting an article that is beyond their level of comprehension. Judging the complexity of the research based upon the length of the article is a common mistake made by students. By allowing students to select the article themselves, hopefully they will choose research that they want to learn more about or at least have some familiarity with. In order to prevent review of an inappropriate article, the instructor may wish to approve articles prior to review. For example, the identified subject area could be oil crops and a student selects an article on dry beans.

After reading the article the students are asked to explain the research in their own words, not those of the author(s). Finally, students are required to determine the value of the research to themselves and to agriculture. Is this information a student might be able to apply to a situation at home and does it make an important contribution to agriculture?

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Organization

For many students this may be their first exposure to scientific research, so instructions on what to evaluate is given as w ell as how to organize the review. The critical review should be organized as follows:

1. **Title** • students are given a format to follow to insure that the article is properly referenced.
2. **Introduction** • students must explain why the investigator(s) conducted the study and what the specific objectives were.
3. **Materials and Methods** • students should identify where the study was done, what the treatments were, describe how the treatments were tested and the type of data collected.
4. **Results** • students report the findings of the research.
5. **Discussion** • students explain what the results mean.
6. **Comments** • students should verify if the objectives of the research were accomplished, and give their opinion of the value of the research to themselves and agriculture.

Grading criteria

In order to insure that students do a thorough review, a grade sheet with criteria is given to each student (Table 1). Point values are assigned to each item giving students an idea of what areas are most important.

Students are asked to include the grade sheet when submitting their review. This will serve as a reminder of what items should have been covered in the review. Students must also include a xeroxed copy of the journal article in order to allow the instructor proper grading of the review.

Computer literacy is a very important skill of today's college graduates and at Fort Hays State University a computer course (word processing, spreadsheets and data base applications) is required of all graduates. It is often one of the first courses taken by freshmen. Unfortunately, limited use of these computer skills is required in other college courses beyond the initial computer course taken. With this in mind, the review must be done on a word processor with both a hard copy and the computer disk submitted . Computers allow students the ability to make changes easily, therefore the final hard copy should exhibit a professional appearance (no erasures, handwritten changes, etc.).

All Fort State Hays University graduates must demonstrate competency in written English. Therefore, this competency is also expected and evaluated in the critical review. Being able to effectively communicate ideas in a written form is essential to the success of all students.

Table 1 Critical Review Grading Criteria

Item	Possible points	Your points
1. Grade sheet included	5	_____
2. Article included	5	_____
3. Appearance	5	_____
4. Title format	5	_____
5. Introduction	10	_____
6. Materials & Methods	10	_____
7. Results	10	_____
8. Discussion	10	_____
9. Comments	20	_____
10. Punctuation/ Spelling	10	_____
11. Grammar	10	_____
Total	100	_____

Conclusion

A critical review provides students an opportunity to integrate critical thinking with computer and writing skills. In the process students are exposed to scientific research and an opportunity to gain an appreciation of how agricultural knowledge evolves . Because of the nature of the learning activity, the critical review may be used in any area of agriculture and at any level of undergraduate instruction.

References

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