Department of
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UNIVERSITY OF MISSOURI-COLUMBIA
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Effect of Problem-Based Learning on Critical Thinking Ability and Content Knowledge of Secondary Agriculture

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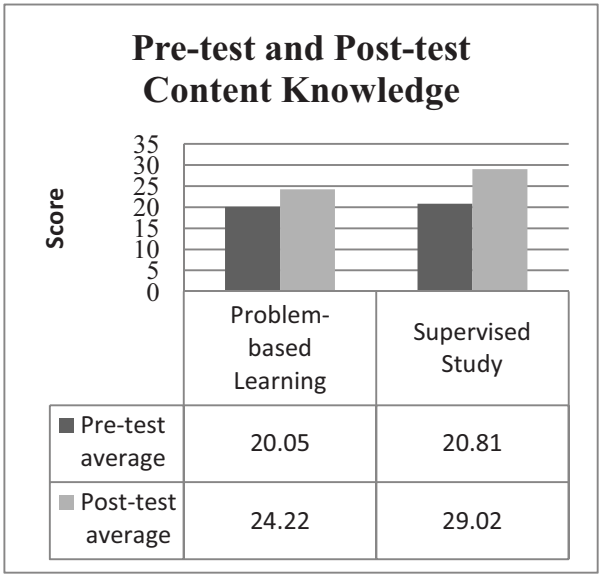
Secondary Agriculture teachers at twelve schools were randomly assigned to supervised study treatment or problem-based learning (PBL) groups for a total sample (n = 140) with 77 students in the PBL treatment group and 63 in the supervised study comparison group. The purpose of the study was to determine the effect of problem-based learning on critical thinking ability and content knowledge. The study used both pre-tests and control groups along with post-tests in assessing critical thinking ability and content knowledge acquisition. Students were tested before and after a Quail Management Unit to determine content knowledge as well as given Watson-Glaser Critical Thinking Appraisal (WGCTA) to measure the critical thinking ability of secondary agriculture students.



Key Findings

- Students in the sample performed at a similar level of achievement as students across the state of Missouri. They had scores consistent with the state average on standardized tests, with approximately 44% categorized as nearing proficiency or higher and 56% falling in a lower category.
- As measured by the WGCTA, little difference was found in the pre-test and post-test scores on critical thinking ability. Therefore, it was concluded that critical thinking ability did not change as a result of instruction type.
- Following the quail management unit, students in both groups reported a similar range of scores within the group, with the students in the supervised study group averaging slightly higher scores, thus rejecting the null hypothesis that the PBL group would score higher.
- The correlation between content knowledge and critical thinking ability was found to be positive and low for both groups.

Conclusions and Implications

- Secondary agriculture students in Missouri are performing at the level of students state-wide on the science portion of the MAP.
- While supervised study was found to be more efficient for increasing content knowledge in the area of comprehension, it may not be to most efficient method for higher levels of cognition such as analysis, synthesis and evaluation.
- Gains in content knowledge for the supervised study group were nearly double those of the PBL group, suggesting that more time should be allowed when teaching a new strategy before benefits can be accurately measured.
- The low correlation between content knowledge and critical thinking ability of students suggests that strategies efficient at achieving one educational goal may not lend themselves to the other.

Burris, S. (2005). *Effect of Problem-Based Learning on Critical Thinking Ability and Content Knowledge of Secondary Agriculture Students.* http://edt.missouri.edu/Summer2005/Dissertation/BurrisS-071505-D2932/research.pdf