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A PRETEST/POSTTEST MODEL FOR DEVELOPING NEW TOPIC TEACHING MATERIALS IN AGRICULTURE

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Introduction

The study reported here was designed to determine the impact of two delivery modes on the effective transfer of new knowledge to high school students. Two often-used delivery methods for introducing new materials to high school vocational agriculture students are (1) audio-visual materials and (2) teacher-led discussions. It is typical to have a supervised study session accompany these methods. The objective of the study was to compare the ability of audio-visual and teacher discussion in effecting a transfer of new agricultural information to high school vocational agriculture students. The subject was Illinois Livestock Waste Regulations.

Importance of the Study

Writing instructional materials is only a part of curriculum development. Evaluation of materials prior to dissemination is a critical phase. Work by Gliem (1976) and Kaas (1976) stressed the importance of material evaluation prior to final development.

Both changing technology and an increased emphasis in preparing students for off-farm agricultural occupations has increased the content available to vocational agriculture teachers. Gregg (1971) determined that the amount of teaching time devoted to production agriculture in vocational agriculture programs has decreased. As new topic materials are developed, they need to be prepared for use by personnel who may not have studied or taught the subject matter.

In Illinois, new topic materials have been introduced using self study, supervised study, or programmed instruction methods. Herman (1977) determined that programmed instruction did not improve traditional teacher taught topics.

This study compared the results of (1) programmed audio-visual aids with supervised study and (2) expert teacher discussion with supervised study. The purpose was to determine if a teacher who was not familiar with a new topic could use audio-visual materials to replace the traditional teacher-directed discussions which accompanied the supervised study method of presentation.

For the experiment, the teacher discussion/supervised study sessions were considered to be the control group, while the audio-visual/supervised study sessions were considered to be the experimental group.

Methodology

Livestock waste management to meet new regulations can be a lengthy and highly technical topic. With input from a teacher and industry advisory committee, a five-hour unit of instruction was developed. Content was validated by on-site industry visits and by university and state regulatory staff.

In preparation for a student pretest-posttest determination of learning, the material was divided into five parts.

I. Introduction to livestock waste regulations
II. Terminology of livestock waste regulations
III. Collection and storage processes
IV. Application procedures
V. Optional management systems

Unit IV, Application Procedures, was selected for the test. Ten of 42 Southern Illinois University student teaching cooperating schools were randomly selected as test sites. A livestock production class was used as the test class in each school. They responded to a ten question short answer pretest and posttest. This design is based on findings by Elkins and Lybecker (1974) who tested the effect of using one instrument for pretest and posttest.

Both control and experimental groups received 50 minutes of instruction. The control group activities consisted of a five-minute pretest, a 15 minute teacher-lead discussion, a 20 minute supervised study, and a ten minute posttest and summary. The same person was used to lead all discussions. The experimental group activities were a five minute pretest, a 15 minute slide/audiotape presentation, a 20 minute supervised study, and a ten minute posttest and summary. There were 90 students in the control group and 78 in the experimental group.

Analysis and Results

Results obtained from 168 students indicated a significant increase in knowledge level from both treatments. The pretest control group average score, N=90, was increased from 26.1 to 60.2 percent. The pretest experimental group average score, N=78, was increased from 23.8 to 62.4 percent (See Table 1 on following page). An analysis indicated that the experimental group's increase in cognitive level was nearly 10 percent greater than the control group.

Conclusions

The conclusions were:

(1) Both processes, use of audio-visual aids and supervised study, contributed to the cognitive level of the learners.

(2) The audio-visual method resulted in a significantly higher level of cognitive increase than did the supervised study technique.

Recommendations

(1) Both supervised study (written materials) and audio-visual techniques should be considered when planning to disseminate new agricultural information to high school students.

(2) Efforts should be made to test other methods of dissemination of new agricultural information.

References

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Table 1

A COMPARISON OF PRETEST AND POSTTEST SCORES BY STUDENT GROUP
LIVESTOCK WASTE CURRICULUM

Student Group	N	Pretest Score Avg.[1]	Posttest Score Avg.[2]	Posttest Score Increase[3]
E-1	13	2.76	7.92	5.16
E-2	11	2.18	6.27	4.09
E-3	13	2.46	6.69	4.23
E-4	17	2.17	5.41	3.24
E-5	24	2.37	5.67	3.30
C-1	18	3.39	6.83	3.44
C-2	19	2.31	6.05	3.74
C-3	11	2.45	6.09	3.64
C-4	15	2.27	6.00	3.73
C-5	27	2.55	5.44	2.89
Experimental	78	2.38	6.24	3.86
Control	90	2.61	6.02	3.41

[1]Pretest score comparisons of experimental and control groups were not significant. t value: 1.56
Probability: .12

[2]Posttest score comparisons of experimental and control groups were not significant. t value: 1.38
Probability: .14

[3]Posttest score increase comparison of experimental and control groups was significant. t value: 2.01
Probability: .05