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**EDUCATIONAL EFFECTIVENESS OF TWO SEQUENCES OF SCHEDULING
CLASSES AND OF TWO TECHNIQUES OF TEACHING AN OFF-CAMPUS
INSERVICE TEACHER EDUCATION COURSE**

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This replicated inservice education study employed a 2 x 2 factorial design to compare the effectiveness of (1) three-day summer workshops with weekly classes taught during the regular school year and (2) teacher-centered instruction with student-centered instruction. The students who attended the inservice classes were teachers of agriculture in Pennsylvania.

The unit of study was Dairy Cattle Nutrition. A teacher's guide and a student handbook were prepared and used. The subject matter was divided into four problem areas:

1. Classifying feeds
2. Utilizing and digesting feeds
3. Evaluating forages and formulating feed rations
4. Feeding dairy cattle

A multiple-choice achievement test was used to measure the subject-matter knowledge of students (1).

The hypotheses tested were:

1. The workshop sequence of scheduling classes is superior to the weekly series of scheduling as measured by student test scores (a) immediately following the course, (b) six months after the completion of the course.
2. The student-centered method of instruction is superior to the teacher-centered method as measured by student test score (a) immediately following the course, (b) six months after the completion of the course.

Procedure

From the twelve inservice centers for teachers in Pennsylvania eight were randomly selected for the study. Four centers were randomly assigned to each of two replications. Figure 1 illustrates the sequences of scheduling classes and the methods of instruction. Sequence and scheduling order employed in replication one were reversed in replication two to equate the effects of repetition on the quality of instruction.

<u>Sequence of Scheduling</u>	<u>Order of Instruction</u>	
	<u>Teacher-centered</u>	<u>Student-centered</u>
Replication 1		
Workshop	First	Second
Weekly	Third	Fourth
Replication 2		
Workshop	Fourth	Third
Weekly	Second	First

Figure 1. Order of Instruction by Class Sequence and by Method of Instruction

The three-day workshop consisted of fifteen hours of instruction on three consecutive days during the summer. The weekly classes consisted of six, two and one-half hour class sessions conducted weekly during the school term.

In the teacher-centered classes instruction was planned and presented by the course instructor. In the student centered classes instruction was planned by the instructor and students.

A fifty-question multiple-choice achievement test was developed and used. This test was administered at the beginning and again at the conclusion of the course. In replication one the test was again administered after a six months interval. A record of class attendance and years of young farmer teaching experience was made.

Results of the Study

The test scores of the students were the dependent variables. The treatment groups were compared by analysis of covariance. The covariates used for adjusting test scores were pretest scores and class attendance.

A comparison of the mean test and retest scores of teachers in the treatment group is presented in Table 1. The mean scores of the randomly drawn sub-sample (80 students) used in the analysis and the mean scores of the total group (112 students) are not significantly different. Results of Replication one and two are both presented.

The test scores of students immediately following the course were significantly higher in the workshop sequence than test scores of students in the weekly sequence for both replications one and two. On a retest six months later of the students in replication one, some difference still existed in favor of the workshop sequence but it was no longer significant.

Table I. Attendance and Mean Scores of Students by Sequence of Scheduling, by Method of Instruction, and by Replication

Treatment	N	Mean Scores					
		Attendance	Pretest	Test	Adj. Test	Retest	Adj. Retest
Replication One							
Sequence of Scheduling							
Workshop	20	6.0	31.8	40.0	40.8 ^a	36.9 ^b	35.6
Weekly	20	5.5	28.7	33.7	34.9	33.9	35.1
Method of Instruction							
Student-centered	20	5.6	30.6	37.7	37.6	34.7	34.6
Teacher-centered	20	5.8	30.0	38.0	38.0	36.1	36.1
Replication Two							
Sequence of Scheduling							
Workshop	20	5.9	31.7	38.1	37.1 ^a		
Weekly	20	5.7	28.9	32.9	33.9		
Method of Instruction							
Student-centered	20	5.9	30.1	35.0	35.0		
Teacher-centered	20	5.8	30.5	36.0	35.9		

^aDifference between sequences of scheduling significantly different at the .01 level by analysis of covariance.

^bDifference between Test and Retest Scores significant at the .01 level by correlated t test.

Differences observed in the comparison of teacher-center with student-centered methods of instruction were not significant for either replication. No significant differences existed between methods on the retest six months later for those students in replication one.

Conclusions

The workshop sequence of scheduling was superior to the weekly sequence when student test scores immediately after the course were compared. However, the difference between the retest scores six months later was not significant. On the basis of the retest it may be concluded that the two sequences of scheduling are equally effective. On the other hand, the time

lapse between the end of an in-service course and when the information is to be taught by teachers is a very important consideration in the selection of a scheduling sequence. Other factors such as convenience may also determine which sequence of scheduling to use for off-campus in-service classes.

Differences observed between the mean test and retest scores of students in the student-centered and teacher centered treatments were not significant. The study did not show either method to be superior for teaching in-service classes. As in previous studies (2,3) the evidence is inconclusive in determining which method is more effective. The nature of the subject matter and the choice of test (cognitive, affective, or psychomotor) are important variables in evaluating learning.

BIBLIOGRAPHY

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3. Ruja, Harry. "Outcomes of Lecture and Discussion Procedures in Three College Courses." Journal of Experimental Education, (22:369-394). 1954.

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INFORMATION WANTED

At the request of the Executive Committee, G. F. Ekstrom, Emeritus Professor, University of Missouri, is compiling information on the development of AATEA. He is quite anxious to obtain copies of Constitutions and Bylaws for the Ten-Year Teacher Trainers dated 1929, 1941, and 1946, and minutes of annual business meetings held by the Teacher Trainers in Agriculture at AVA Conventions for the years 1929 to 1950. His address is Department of Agricultural Education, University of Missouri, Columbia, Missouri 65201.