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The Relationship of Instructional Practices to Student Learning in Rural Schools

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This paper describes the results of a study conducted to assess improvement in knowledge, attitudes and behavior of elementary school students in rural schools toward good nutrition. A stratified random sample of 150 elementary teachers was selected from a group of 468 who participated in a summer nutrition education program. Students from the teachers' classrooms served as subjects ($n = 3600$). Data were collected on the types of instructional activities used by the teachers (traditional vs. nonraditional) and the relationship to students' knowledge, attitudes and behavior. Correlations showed no significant relationship among teacher activity scores and student performance. ANOVA showed teachers who used fewer traditional instructional methods had students with the largest gains.

This paper describes the results of a study designed to assess the impact different instructional practices had on the knowledge, attitudes and behavior of rural elementary school students toward good nutrition.

There are data available which tend to support the notion that using a variety of instructional techniques can facilitate student learning. Data on aptitude-treatment interaction demonstrate that students with different characteristics learn more effectively under different instructional methods [1; 4; 6]. This would seem to indicate that, in large group instruction, teachers who use a variety of techniques should provide students a greater opportunity to learn material presented.

Research quoted by Gage and Berliner [2] supports the concept of increasing the variation in the stimuli presented to students as a technique to help them attend to the material being taught and to increase student learning. Rosenshine [5] reviewed eight studies in which teacher variability was measured by observers' or students' ratings or reports, rather than by observers' counts of behavior. The ratings in these studies were made on such dimensions as: variety vs. nonvariety; the number of books and the amount of equipment, displays, and space in the classroom; the number of kinds of reading materials, audiovisual activities, different research materials, maps and globes, and class activities. In all but one of these studies, the measure of variability was positively (but not always significantly) related to student achievement.

Although there are data to indicate variability in instructional methods should facilitate student learning, none of the studies focused on the learning of nutrition-related information.

While most of the studies in the literature have examined variety of teaching method, there has been very little distinction made between traditional and non-traditional methods used by teachers. This study examined both variety of teaching method and type of teaching method (i.e., traditional activities vs. nontraditional activities).

METHODS

Subjects

A stratified random sample of 150 elementary teachers was selected from a group of 468 rural educators who had participated in a summer nutrition education and training program sponsored by a state department of education located in the southeast.

The teachers had participated in a week long program in which they were provided knowledge about good nutritional practices and were given training in the use of a variety of techniques that can be used to teach nutrition related information. Thirty teachers from each of five grade levels were randomly selected to participate in the project. After reviewing the data on the students, 30 first grade teachers and their students were eliminated from the study. The data sheets indicated that the first grade students were unable to read or respond to the items when read to them by their teachers. This left 120 teachers in the final pool for the study. The students in these teachers' classrooms served as the subjects from which these data were taken. Data were collected on 3600 students in grades two through five.

Instruments

Two instruments were administered to the students: the Nutrition Assessment Inventory (NAI) [3] and a student questionnaire. The NAI is a commercially prepared instrument consisting of multiple-choice questions concerning nutrition-related knowledge, attitudes, and behavior. Mean subscale scores were determined for each

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TABLE 1

Means, Standard Deviations, and *F*-ratios for NAI Subscales by Number of Traditional Instructional Activities

	Group						
	High			Low			
Scale	*N*	Mean	*SD*	*N*	Mean	*SD*	*F*
Knowledge	35	9.19	3.39	47	11.05	3.45	4.40*
Attitude	35	10.18	4.93	47	11.57	4.23	4.97*
Behavior	35	12.41	6.35	47	16.35	5.95	7.04*

*$p<.01$

of these areas for each class. The instrument was reviewed by two experts in nutrition for the appropriateness of the items, approximately 10% of the items were eliminated due to their poor wording or lack of a clear answer. The readability of the test was reviewed by two researchers with a background in reading and it was determined that the test was appropriate for grades two through five but was not appropriate for the first grade students.

The student questionnaire contained a list of 25 nutrition-related activities. The questionnaire was rewritten several times until a version was developed that was readable and understandable to a group of elementary age children. The students were asked to indicate in which of the activities listed they had participated. Two subgroups of activities, traditional and non-traditional instructional activities, were identified. Within the training program for teachers, specific activities were taught which were designed to increase the variability of instructional methods they could use in their respective classrooms. Two researchers with a background in instructional development and two with backgrounds in nutrition education reviewed all activities used by the participating teachers and determined whether or not they were to be classified as traditional or nontraditional. Examples of traditional activities were routine lectures on good nutrition, use of bulletin boards to display items related to good eating habits, and classroom discussions about nutrition. Some examples of nontraditional activities were cooking foods in class and having students taste them, visiting farmers' markets or grocery stores, visiting cafeterias and restaurants to see how food is prepared. Mean numbers of traditional and nontraditional activities were established for each teacher from student questionnaire responses.

Design

Two strategies were used to assess the relationship between teacher activities and student scores. First, Pearson product-moment correlation coefficients were computed between the teacher activity scores and the student scores on the knowledge, attitude, and behavior scales. Second, from the mean activity frequencies, teachers in the upper and lower thirds of each activity category were identified. For example, those teachers using a variety (five or more) of nontraditional activities were compared with teachers using three or less nontraditional activities. The same type of comparison was made between teachers who used a variety of traditional instructional activities and teachers using only a few traditional activities. The students of these teachers were compared on their mean knowledge, behavior, and attitude scores.

RESULTS

No significant correlations were found between the activity scores and the knowledge, behavior, and attitude scores. Analyses of variance were computed to examine differences in the NAI subscale scores between the high and low activity frequency groups.

Traditional Activities

Significant differences between the high and low frequency groups were found in all three NAI subscales. In each case the low frequency group had the higher mean scores.

Nontraditional Activities

There were no significant differences between the high and low nontraditional activity frequency groups on any of the NAI subscale scores.

Total Number of Teacher Activities

While there were no significant differences between the high and low total frequency groups on their knowledge and attitude scores, there was a significant difference on their mean scores on the behavior subscale. Again, the low group had the higher mean scores.

CONCLUSIONS

The significant findings tend to indicate that teachers who use fewer traditional activities had students who per-

TABLE 2

Means, Standard Deviations, and *F*-ratios for NAI Subscales by Total Number of Instructional Activities

	Group						
	High			Low			
Scale	*N*	Mean	*SD*	*N*	Mean	*SD*	*F*
Knowledge	27	9.28	3.57	57	10.60	3.46	2.31
Attitude	27	10.10	4.90	57	10.86	4.46	1.71
Behavior	27	12.35	6.40	57	15.38	6.20	3.76*

*$p<.05$

formed better on all three scales. The number of nontraditional activities used had no relationship to student learning. Students in the low nontraditional group, however, did exhibit more positive self-reported behavior.

The reasons for the results obtained are not clear. Perhaps teachers who use fewer traditional activities are using the activities they are familiar with and experienced in using, resulting in more quality instruction. The teachers using a variety of methods may be concentrating so much on the process of instruction that they became more concerned with variety rather than the type of instruction that is most effective with elementary school students. The teachers in the traditional group also concentrated on instructional techniques that emphasized knowledge about good nutrition. The implication in the literature is that a variety of instructional activities will positively influence student learning. This study failed to support that assumption.

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