

A PRELIMINARY INVESTIGATION OF ENERGY EDUCATION/CONSERVATION ATTITUDES OF A SELECTED GROUP OF EAST TENNESSEE EDUCATORS

RONALD B. CHILDRESS
*West Virginia College of Graduate Studies
Institute, West Virginia 25112*

AND
JACK RHOTON
*Kingsport City School System
Kingsport, Tennessee 37662*

ABSTRACT

A major responsibility for changing present energy resource utilization and conservation attitudes and practices rests with the public education system. To date, few research efforts have been focused on determining the attitudes of public school elementary and secondary teachers in the area of energy education/conservation.

In the spring of 1975, seventy-five elementary and secondary school teachers from the Kingsport City School System were surveyed concerning their attitudes relative to six major aspects of energy education/conservation. Conclusions pertinent to each area are presented.

INTRODUCTION

The energy crisis is real and will continue to be a problem for the foreseeable future. Such a situation mandates the development of new habits and attitudes of living, working and recreation. A major responsibility for changing existing attitudes and practices must rest with the public educational system. Implicit in consideration of such a role for public education are attitudinal changes, not only for students—important as they may be—but for teachers as well.

PURPOSE AND DESIGN OF THE STUDY

Purpose of the Study

The purpose of this study was to determine the attitudes of a selected sample of public school teachers in the area of energy education/conservation. Specifically, the study sought to answer the following questions:

1. Is there a need for energy education/conservation in the public schools?
2. In what ways is the present educational system involving students in the study of energy education/conservation problems?

3. What changes in the present educational system would teachers support in order to facilitate an increased emphasis on energy education/conservation?
4. What are the major difficulties in teaching about energy and its conservation?
5. What disciplines should receive primary emphasis when integrating energy education/conservation into existing school curricula?
6. At what educational levels should new energy education/conservation programs be directed?

Methodology

The study sample consisted of 75 elementary and secondary teachers from the Kingsport City School System, Kingsport, Tennessee. Of the total sample, 20 percent were secondary level teachers and 80 percent were elementary level teachers. This sample represented approximately 15 percent of the total number of teachers within the system.

The primary methodology utilized was the administration of a questionnaire to the study sample during the spring of 1975. Of the 75 questionnaires administered, 61 (81.3 percent) were returned; 15 (100.0 percent) of the secondary level teachers and 46 (76.6 percent) of the elementary level teachers returned completed questionnaires.

Study participants were requested to respond to six sets of questions. Two types of responses were requested. Question sets one, two and three requested the subjects to respond to a 6-point scale with "0" being the lowest negative response and "5" being the highest positive response. Question sets four, five and six requested respondents to rank order three different sets of items.

DISCUSSION OF FINDINGS

Need for Teaching about Energy Production, Use and Conservation

Fifty-five percent of the respondents indicated the highest possible response (5) when asked about the need for teaching about energy production, use and conservation in public education (Table 1). The mean score response was 4.47 (standard deviation of .65) and no subject responded less than three on the scale.

TABLE 1: *Need for teaching about energy production, use, and conservation in public education.*

Item	Negative Response		1		2		3		4		Positive Response		Standard Mean Deviation	
	0										5			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
Does the energy crisis indicate a need for teaching about energy production, use, and conservation in public education?	0	0.0	0	0.0	0	0.0	5	8.3	22	36.7	33	55.0	4.47	.65

Present Educational System Involvement of Students in Energy Education/Conservation

When questioned concerning the degree to which the present educational system is involving students in selected aspects of energy education/conservation, more than 83 percent of the subjects responded positively (either 3, 4, or 5) to the questionnaire item related to reading about energy problems. This same item also had the highest positive mean response (3.08) within question set two (Table 2).

No respondent indicated a high (either 4 or 5) positive response to the item related to learning about the

energy crisis and conservation measures. However, the mean response of 2.78 was the second highest mean score reported in this question set.

Fifty-five percent of the respondents indicated a somewhat positive attitude when questioned concerning the present degree of student involvement in independently investigating energy problems. However, the overall mean score (2.57) for this item was the lowest positive score recorded in question set two. Overall mean scores for all other items fell below the mean score of 2.50 necessary for inclusion as a positive score.

TABLE 2: *Present educational system involvement of students in energy education/conservation.*

Mode of Involvement	Negative Response		Positive Response										Mean	Standard Deviation	
	0		1		2		3		4		5				
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%			
Is your present educational system involving students in:															
1. Learning about the energy crisis and conservation measures?	2	3.3	0	0.0	7	11.7	51	85.0	0	0.0	0	0.0	2.78	.61	
2. Working on energy problems and experiments?	4	6.6	11	18.8	41	67.2	2	3.3	3	4.9	0	0.0	1.82	.81	
3. Reading about energy problems?	1	1.6	1	1.6	8	13.1	36	59.0	12	19.7	3	4.9	3.08	.86	
4. Independently investigating energy problems?	4	6.7	1	1.7	22	36.7	23	38.3	10	16.7	0	0.0	2.57	1.02	
5. Evaluating alternatives to energy problems?	6	9.8	1	1.6	33	54.1	14	23.0	7	11.5	0	0.0	2.25	1.03	
6. Acting on alternatives to energy problems?	12	19.7	30	49.2	15	24.6	2	3.3	2	3.3	0	0.0	1.21	.92	

Teacher Support of Educational System Changes

In response to question set three, all respondents indicated a positive response (3, 4, or 5) to changing school programs to require studies out in the community (Table 3). Two additional mean score responses (3.88 for adding a separate course on energy problems and conservation to the curriculum and 3.87 for having teachers guide students in the discovery and investigation of energy problems) were near the 3.89 mean score obtained for changing school programs to require

studies out in the community.

The lowest mean score response (1.66) and the greatest percentage (86.9 percent) of negative responses (0, 1, or 2) were reported for the item related to focusing the curriculum of all disciplines on energy education/conservation. Two other items (changing school schedules to combine disciplines and having teachers tell students about energy problems) received mean score responses approaching the midpoint of the scale.

TABLE 3: Teacher support of educational system changes to facilitate energy education/conservation.

Proposed System Change	Negative Response		Positive Response										Mean	Standard Deviation
	0		1		2		3		4		5			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
1. Focusing the curriculum of all disciplines on energy/conservation education	15	24.6	3	4.9	35	57.4	5	8.2	2	3.3	1	1.6	1.66	1.14
2. Changing school schedules to combine disciplines	7	11.5	1	1.6	36	59.0	13	21.3	1	1.6	3	4.9	2.15	1.09
3. Changing school programs requiring studies out in the community	0	0.0	0	0.0	18	29.5	18	29.5	32	52.5	11	18.0	3.89	.69
4. Teachers guiding students in discovery and investigations of energy problems	0	0.0	0	0.0	6	9.8	8	13.1	35	57.4	12	19.7	3.87	.85
5. Teachers telling students about energy problems	0	0.0	4	6.6	13	21.3	33	54.1	9	14.8	2	3.3	2.87	.87
6. Adding a separate course on energy problems and conservation to the curriculum	4	6.7	0	0.0	2	3.3	8	13.3	25	41.7	21	35.0	3.88	1.30

Difficulties in Teaching about Energy and Its Conservation

Survey respondents felt the major difficulty in teaching about energy and energy conservation was with the preparation of teachers (Table 4). More than sixty

percent of the subjects identified this as the number one problem. This item also had the lowest mean score response (2.38) recorded.

Difficulties felt to be of lowest priority were confinement of students in the classroom and the rigidity of

TABLE 4: Major difficulties in teaching about energy and energy conservation.

Difficulty	Major Difficulty								Minor Difficulty						Mean	Standard Deviation
	1		2		3		4		5		6		7			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
1. Structure of the curriculum	11	18.0	12	19.7	4	6.6	24	39.3	3	4.9	4	6.6	3	4.9	3.33	1.68
2. Preparation of teachers	38	63.3	5	8.3	1	1.7	1	1.7	6	10.0	5	8.3	4	6.7	2.38	2.13
3. Availability of curricular materials on energy and its conservation	0	0.0	17	27.9	33	54.1	1	1.6	2	3.3	8	13.1	0	0.0	3.20	1.26
4. Methods/techniques of teaching	7	11.5	9	14.8	9	14.8	6	9.8	25	41.0	1	1.6	4	6.6	3.85	1.69
5. Confinement of students in the classroom	0	0.0	8	13.3	3	5.0	13	21.7	2	3.3	15	25.0	19	31.7	5.17	1.77
6. Rigidity of the school schedule	3	5.2	6	10.3	2	3.4	3	5.2	15	25.9	16	27.6	13	22.4	5.09	1.78
7. Availability of alternatives to the present curriculum and schedules	1	1.7	5	8.6	7	12.1	13	22.4	8	13.8	11	19.0	13	22.4	4.85	1.69

the school schedule. These items had mean score responses of 5.17 and 5.09, respectively. All other mean score responses in question set four fell between the lowest mean score of 2.38 (the highest priority) and the second highest mean score of 5.09.

Disciplinary Emphasis When Integrating Energy Education/Conservation into the Curriculum

Science was the discipline teachers felt should receive the primary emphasis when integrating energy

education/conservation into the curriculum (Table 5). More than 80 percent of the respondents indicated science as the discipline which should receive primary emphasis. The mean score response (1.23) to this item was also the lowest mean score recorded. Biology as a discipline received the second highest mean score (2.37). Mean scores for all other disciplines fell between 3.88 (vocational home economics) and 5.25 (industrial arts).

TABLE 5: *Disciplinary emphasis when integrating energy education/conservation into the curriculum.*

Discipline	High Emphasis								Low Emphasis						Standard Mean Deviation	
	1		2		3		4		5		6		7			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
1. Biology	10	16.7	38	63.3	5	8.3	0	0.0	2	3.3	4	6.7	1	1.7	2.37	1.39
2. Economics	0	0.0	4	6.6	6	9.8	2	3.3	20	32.8	18	29.5	11	18.0	5.23	1.42
3. Industrial Arts	1	1.6	3	4.9	2	3.3	19	31.1	2	3.3	17	27.9	17	27.9	5.25	1.59
4. Science	49	80.3	11	18.0	0	0.0	1	1.6	0	0.0	0	0.0	0	0.0	1.23	.53
5. Social Studies	0	0.0	1	1.6	15	24.6	10	16.4	16	26.2	6	9.8	13	21.3	4.82	1.50
6. Vocational Agriculture	0	0.0	1	1.7	23	39.0	18	30.5	4	6.8	13	22.0	0	0.0	4.09	1.19
7. Vocational Home Economics	1	3.0	0	0.0	11	33.3	13	39.4	7	21.2	0	0.0	1	3.0	3.88	1.05

Educational Level At Which New Energy Education/Conservation Programs Should Aim

When questioned concerning the educational levels at which new energy education/conservation programs should aim, 89.7 percent of the respondents felt new

energy education/conservation programs should be directed primarily at elementary schools (Table 6). Secondary schools, colleges and adults followed in a decreasing order of emphasis.

TABLE 6: *Educational level at which new energy/conservation education programs should aim.*

Educational Level	High Priority				Low Priority				Mean	Standard Deviation
	1		2		3		4			
	No.	%	No.	%	No.	%	No.	%		
1. Elementary Schools	52	89.7	4	6.9	0	0.0	2	3.4	1.17	.60
2. Secondary Schools	4	7.0	51	89.5	1	1.8	1	1.8	1.98	.40
3. Colleges	1	1.8	0	0.0	53	96.4	1	1.8	2.98	.30
4. Adults	0	0.0	2	3.6	1	1.8	52	94.5	3.91	.40

CONCLUSIONS

Analysis of the data gathered in the process of this study was sufficient to support the following conclusions concerning the energy education/conservation attitudes of the study population:

1. The energy crisis does indicate a need for teaching about energy production, use, and conservation in public education.
2. The present educational system is to some degree involving students in reading about energy problems.
3. Changing school programs requiring studies out in the community, adding a separate course on energy problems and conservation to the curriculum, and having teachers guide students in

discovering and investigating energy problems are acceptable changes in the present educational system necessary to facilitate energy education/conservation.

4. Focusing the curriculum of all disciplines on energy education/conservation is an educational system change which would not be supported by teachers.
5. The major difficulty in teaching about energy and energy conservation is related to the preparation of teachers.
6. Confinement of students in the classroom and rigidity of the school schedule do not represent major difficulties in teaching about energy and energy conservation.