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ABSTRACT

In an effort to better describe the environmental education needs of the secondary schools in the State of Ohio, this thesis sought to determine whether or not Ohio high schools were incorporating environmental education into their curricula. Educators from 100 randomly selected high schools were administered questionnaires in 1982-83, and again in 1986. The responses were analyzed with regard to possible relationships between school size, type of school district, geographic location of the school district, and the number and type of courses offered that contained environmental education topics. The study indicated that there were no relationships between any of the variables studied except for the environmental education courses and their curricular headings. Schools tended to offer environmental education courses under the curricular headings of science, social studies, vocational education, physical education/health, and home economics. Three environmental education topics were taught in at least 50 percent of the courses. Appendices include a list of high schools in the study and the survey instrument. (TW)

# CURRENT ENVIRONMENTAL EFFORTS IN OHIO SCHOOL DISTRICTS





A Thesis

Presented in Partial Fulfillment of the

Requirements for the degree Master of Science

Graduate School of The Ohio State University

by

Timothy Alan Taylor, B.S. Ed.

* * * * *

The Ohio State University

1986

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## VITA

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# CHAPTER 1

## INTRODUCTION

Education in the out-of-doors has been around since the beginning of time. It was first practiced with the cave men living in their caves and teaching the ways of the land to their children (Knuth, 1976). The great philosophers and teachers of the ancient Roman and Greek Empires did all their teaching in the out-of-doors through public forums and in arenas. These learned men had large followings and they were thought of highly (Sharp and Partridge, 1947).

During the westward expansion of the United States, the people learned to survive off the land. The early settlers learned the ways of the land from the Indians and earlier settlers. They had to learn in order to make a living, to support their families, and to survive.

In 1861, Frederick Gunn sponsored the first school camping program that was part of the regular school program and school day at the Gunnery School(Hammerman, 1960).

The roots of present day environmental education began as a part of reactions against the university school ideal of a required curriculum and no free choices of courses (Nash, 1976). In 1891, Wilbur Jackman's Nature Study for the Common School started a program that took students out-of-doors to explore the environment (Nash, 1976). They started by studying nature.

Nature study education flourished at Cornell University between 1895 and 1910 (Hammerman, 1980). The Cornell Nature Study Bulletins and Anna Botsford Comstock's book, The Handbook of Nature Study, appeared during this time period (Hammerman, 1980).

The 1930's with their Dust Bowl gave rise to conservation education (Nash, 1976). This came about because of the importance of conserving our natural resources and making Americans aware of our environmental problems.

From 1930 to 1939, a few school districts sponsored summer camping programs. However, schools were not ready to support camping on school time (Hammerman, 1980).

In 1940, an experimental community school camping program was started by the W. K. Kellogg Foundation at Clear Lake (Hammerman, 1980). Groups of ninety

students in grades five through seven spent two weeks at the camp throughout the academic year. In addition to the Kellogg Foundation's program, other experimental programs began in different parts of the United States.

During the period from 1952-1960, more school camping programs were started (Hammerman, 1980). These programs became more widely accepted and schools started to develop camp programs that followed the school curriculum.

Environmental education came into being in the 1960's (Nash, 1976). Environmental education is an "umbrella" over the learning of students. It is not meant to take over a subject area or become one of its own. Environmental education brings together the academic disciplines in such a way that the interrelationships of the disciplines are readily seen (Nash, 1976).

In 1970, the Environmental Education Act (Public Law 91-516) was important in the field of environmental education. The purpose of this act was:

> to encourage and support individual states during the ensuing three years in initiating and developing environmental education programs to improve the quality of the environment and maintain ecological balance. (Rocchio and Lee, 1974).

## The Need for the Study

With the encouragement of the Environmental Education Act, only twelve states were granted money; Ohio was not one of them. Rocchio and Lee (1974) also state that at the time of their writing, four years after the Environmental Education Act was enacted, Ohio still did not have a master plan in effect.

Conversations with Dr. John Hug, Consultant, Office of Environmental Education for the Department of Education in the State of Ohio, and Donna Szuhy, former Education Supervisor, Public Information and Education Section, Ohio Department of Natural Resources, and a search of the literature indicate the need for a study of Ohio high schools' involvement in environmental education.

This study seeks to determine whether or not Ohio high schools are incorporating environmental education into their curricula.

Secondly, the study seeks to determine any changes within environmental education curricula in Ohio high schools (among those reporting an environmental education component over the past 5 years) and

speculate on their causes. Does it appear that the current state of the economy or enrollments in these classes were the causes for these changes?

A study such as this could provide valuable information to assist environmental educators to better determine the environmental education needs of the secondary schools in the State of Ohio .

## Definition of Terms

Conservation Education - the development of concepts and attitudes in human beings which are reflected in their behavior relative to conservation. (Smith, 1963)

Environmental Education - process aimed at producing a citizenry that is knowledgeable concerning the biophysical environment and its associated problems, aware of how to help solve these problems, and motivated to work toward their solution (Stapp as cited in Rocchio and Lee. 1974)

Outdoor Education - applies to a wide variety of learning experiences that take place in an outdoor setting and to the skills, appreciations, and attitudes needed for maximum satisfaction in outdoor recreation and activities (Smith. 1963)

Primarily - (As dealing with courses in environmental education) Those courses taught in the high school that dealt with environmental or conservation education topics more that fifty percent (50%) of total class time.

Secondarily - (As dealing with courses in environmental education) Those courses taught in high school that dealt with environmental or conservation education topics less that fifty percent (50%) of total class time.

## Limitations of the Study

There were several limitations to this research project.

The first limitation was that the original survey was conducted in late 1982 and early 1983. Eighty-six (86) surveys were returned from this original request. The study was not completed until 1986. In order to make sure the information was still correct in 1986, a copy of the original survey was sent back to the participating schools. They were asked to update the information on the copy and return the survey to the researcher. There were some changes in the results of the surveys but not many.

The second limitation was that the survey only requested information from one hundred (100) of the eight hundred fourteen (814) public and nonpublic high schools in the State of Ohio.

The survey not being representative of the types and percentages of the Ohio high schools was another limitation. The survey did not include nonpublic high schools although they had an equal chance of being

selected for the survey. It also did not reflect true percentages of the types of public high schools found in the state.

The cover letter was addressed to principals, science department chairpersons, or science teachers, but the survey was designed to address all high school teachers within the selected high schools. If the survey was filled out by all high school teachers within the building, a true representative answer to the survey would have been received. With the inclusion of "science department chairperson" and "science teachers," on the address, it is questionable if the other departments within all high schools saw the survey.

Another limitation was the titles of the courses reportedly taught by the various responding high schools. Several of the titles reported sounded as if they dealt with the same information, but since different titles were placed on the courses they had to be listed separately.

## Problem Statement

This study was designed to survey randomly selected high schools throughout the State of Ohio to

determine what high schools are doing in environmental education. Specifically, the number of environmental education courses and topics included in selected Ohio high schools were identified from reports by selected school personnel.

In addition, the study was designed to identify relationships between:

1. school size and
   (a). number of environmental education courses offered to students.
   (b). topics included in the environmental education courses
2. geographic location of the school district and the number of environmental education courses offered to students.
3. type of school district and the specific topics in environmental education course(s)
4. environmental education courses offered and the curricular headings of the courses.

## CHAPTER 2

Environmental Education's integration into the people's lives was once commonplace. During most of human existence, the out-of-doors has been home. Most people would immediately agree that it is good to spend time in the outdoors to participate in activities that will help a person enjoy, understand and appreciate nature's phenomena (Link, 1981). However, with all of society's advancements this is sometimes forgotten. Modern living denies people many desirable experiences that were the heritage of their forebearers. According to Smith (1963), with most of the adult population two generations removed from the land, there is a noticeable lack of skills, appreciations, and attitudes about the land and the outdoors. Since people are not born with the skills and knowledge for using the natural resources of the land wisely, children and adults of this day must have educational experiences in the outdoors before they can make the greatest use of the natural physical endowments of the land (Smith, 1963). A child's mental, emotional, and spiritual health does not depend solely on relationships with

other people, but also on experiences with things, with objects in the world, and with nature (Hein, 1966).

One major cause of our present crisis with the exploitation of our resources is this ignorance of how to live 'with' the land instead of 'against' it. If we are to overcome this ignorance and develop informed active citizens, we must begin with excellent early training. The school should be a major instrument and model in this development. (Sale and Lee, 1972).

School children in the United States started early training in their education out-of-doors when Frederick William Gunn in 1861 took his students on overnights and two or three day adventures because they wanted to live like soldiers (Kirk, 1968). He justified doing this by including such excursions under his regular curriculum and outdoor recreation.

The movement of outdoor education formally began in the United States in the 1920's and 1930's. Some schools started school camping programs. In 1929, L.B. Sharp did the first doctoral study on Outdoor Education at Teacher's College, Columbia University in New York City (Kirk, 1968). He demonstrated the potential and value of an Outdoor Education experience for school children at the time. At the same time, the Kellogg Foundation was starting three school camps where the

model was developed and refined for others (Kirk, 1968).

In the 1950's, Outdoor Education was recognized as a segment of the school curriculum. This was usually found at the fifth or sixth grade level and was a five day experience (Kirk, 1968). Learning was said to be better because more senses were involved and a different situation than the classroom was utilized. Manuals, guides, and handbooks started to appear in various school systems for use in outdoor education (Hammerman, 1980). These materials were developed to aid the classroom teacher in planning the outdoor experience. In 1955, the National Outdoor Education Project was initiated (Hammerman, 1980). This project's main purpose was to promote outdoor recreational activities. The workshops that they sponsored also help to disseminate information pertaining to resident outdoor education.

During the 1960's the topic of outdoor education diversified (Hammerman, 1980). This diversification of emphasis of programs ranged from pre-school to college, one day field trips to cross country expeditions. According to Hammerman (1980), the most significant development in outdoor education happened during the 1960's.

The passage of the Elementary and Secondary Education Act of 1965 saw the growth of outdoor education programs through the funding of Title III. During 1966 and 1967, the act funded eight-nine projects in outdoor education.

In 1970, the Environmental Education Act (Public Law 91-516) encouraged states to initiate and develop programs to "improve the quality of the environment and maintain ecological balance" (Rocchio and Lee, 1974). There were four hundred seventy-four (474) project grants and one hundred seventy-five (175) minigrant requests received for money for projects to be funded under the Environmental Education Act in the fiscal years of 1971-1977. These projects showed a relationship of people to natural and manmade surroundings and the interrelationships between population, pollution, and resource allocation and depletion. During Earth Week of 1977, President Carter stated:

> ... In particular, I ask all educators to consider introducing an ecological perspective into every scholastic or academic discipline to encourage further application by graduates to protect the wealth of our planet. (Perkins, 1978)

In 1978, the Environmental Education Act was extended because people saw a need and education was the best tool (Perkins, 1978).

On April 13, 1970, the minutes of the State Board of Education of the State of Ohio show a resolution recommending:

> that Ohio encourage elementary and secondary schools to take appropriate means to incorporate in the school curriculum a study of the inter-relationships between all forms of life and the environment, with an emphasis upon the immediate necessity for reversing the present trend as well as repairing damage already done to the environment.

In January of 1977, The Ohio Academy of Science Executive Committee established an Environmental Education Committee to develop implementation strategies for environmental education in Ohio. The committee defined environmental education, developed a goal, objectives and strategies. The definition of environmental education that The Ohio Academy of Science (1977) developed and used is:

> Environmental Education is a continuous process of learning which emphasizes interrelationships within and among systems.
>
> * process of learning -implies that many different ways of learning are equally valid as opposed to one learning process.
>
> * environmental education is concerned with interrelationships, but it is also concerned with other facets - the emphasis is in regards to interrelationships.
>
> * all systems - include both human and natural components on a local, regional, state, world, and/or universe level.

In 1980, the minutes of the Board of Education of the State of Ohio again recommended that the Ohio Department of Education

> continue to provide informational and consultant services to the elementary and secondary schools in Ohio and encourage the expansion of instruction and student experiences in environmental education which are known to include such themes as energy, population, transportation, natural resource conservation, marine and aquatic education, environmental economics, environmental quality, food production, ecology, and similarly interrelated themes. (The Ohio Academy of Science, 1977)

In December of 1982, the State Board of Education adopted new minimum standards. In these standards, it provided a list of topics to be covered in all new Courses of Study. "Energy and Resource Conservation Education" was included.

Studies to determine the extent of environmental education in the curriculum and teacher training have been conducted in several areas of the United States. They include Northern New York (Newksbury and Harris, 1982), Indiana (Hamm and Spear, 1975), Virginia (Pettus and Teates, 1983), and Wisconsin (Wilke, 1985).

## CHAPTER 3

### Sample Selection

To initiate the study, a list of all Ohio public and nonpublic high schools, listed by counties, was obtained from the Ohio Educational Directory, 1980-1981 edition. Within each county, the high schools were further divided into four categories: city, exempted village, county or local, and nonpublic. Ohio had 615 public school districts, containing 741 high schools and 126 nonpublic high schools in the state at the time of the study. The researcher selected only one hundred schools for the study because of constraints of limited time and budget. A method was needed to randomly select the high schools for the study.

The map of Ohio's ten Cooperative Extension Service Areas was obtained from the State Cooperative Extension Service Office at The Ohio State University. (Appendix A). This map divides the state into ten service areas with approximately the same number of counties in each service area. The areas were set up

according to road accessibility, type of agriculture and samples within each area which show a good cross representation of the characteristics of the population (Gist, 1982). Largely for the last reason, the researcher used this guide to select the one hundred high schools for the study.

All public and nonpublic high schools had an equal chance to be chosen for the study by the use of the following random selection process (Guilford, 1978). The high schools were chosen by flipping a quarter. The first school listed in the directory was always the 'head' and the second school was the 'tail.' Whichever side of the quarter came up, determined which high school remained in the study. This selection process continued through several rounds until only ten high schools were left in an extension area. This procedure was used in all ten extension service areas for a total of one hundred schools (Appendix B).

Instrument

A one page, double sided questionnaire was developed by the researcher. The questions were designed to elicit the information from the responding high schools needed for the study and for further use

by the Department of Education. The questionnaire was then sent to Dr. John Hug, Consultant, Office of Environmental Education for the Department of Education in the State of Ohio, for further revisions and to comply with Department of Education format for questionnaires. The questionnaire sent back to the researcher from Dr. Hug was used in this study.

The questionnaire was not pilot tested, because it was in the form of other questionnaires sent out from the Department of Education that had met with satisfactory response rates. Once approved, no changes were permitted. The questionnaire was sent out on Ohio Department of Education letterhead because it was predicted that a better response would be received if inquiries were initiated from the state government. A sixty per cent or better response rate was determined to make this study valid (Guilford, 1978). A cover letter (Appendix C) was sent explaining the study and respectfully requesting responses. This cover letter was addressed by using the general greeting of 'Dear Principal, Science Department Chairperson or Science Teacher' at the high school. The researcher wanted to reach any teacher in the high school who might have been teaching environmental or conservation education topics. The cover letter was signed by both the

researcher and Dr. Hug. The questionnaire (Appendix D) requested the name of the high school, school code number, name of the school district, type of school district, grades served, type of students served (where more than half of students live), names of courses primarily dealing with the environment, a chart asking for percentages of time spent in the primarily environmental courses on listed topics, and names of courses dealing with the environment in some way secondarily. The survey was developed in this manner to give the researcher information necessary for the study and to give the Ohio Department of Education information to further investigate the results for its own purposes.

All questionnaires were sent out on the same date in November of 1982 with a self-addressed, stamped envelope addressed to the researcher. A response rate after one month was so low that another questionnaire was sent to the high schools that had not responded with a new cover letter requesting that they respond. (Appendix E) After the second mailing had been out for one month, the researcher tried to contact by telephone the fourteen (14) high schools that had not replied. After having contacted four (4) of the fourteen (14) nonresponding schools, the researcher stopped trying to

contact the schools for the missing questionnaires. Responses indicated the high school administrators contacted had no idea what the researcher was talking about or where the questionnaire may be.

To complete the study in 1986, the researcher sent photocopies of the 1982/1983 completed questionnaires to the high schools that had previously responded with the request that each respondent review the completed questionnaires and make changes that would reflect any changes that had occurred since the 1982/1983 responses.

## Data Analysis

The results of the questionnaire in addition to the information in the Ohio Educational Directory were used to answer the the questions posed by this study. All the information received was hand tabulated and recorded.

The researcher used the school enrollment numbers from the Ohio Educational Directory, the primary courses involving environmental education, and the percentages concerning the components of these primary courses to develop any comparisons between them. The study further explored relationships between school

enrollment numbers and the courses listed in the section involving only limited environmental education to detect a trend between school size and what type of courses were being taught and the number of such courses. The Cooperative Extension Service Area Map and location of the high schools on this map. and the number of courses both primarily and secondarily involved in environmental education were used to detect any trend as to where environmental education course topics are more widely taught. The type of school district and types of courses offered were identified. Finally, the researcher compared the subject headings and the environmental education courses listed detect any trends in this area.

## CHAPTER 4

Eighty-six out of one hundred (86%) surveys returned after the two separate mailings to the schools identified in the random selection process.

The responses were received from twenty-six city school districts, five exempted village school districts, and fifty-five local county school districts. The survey did not include any Nonpublic high schools because of the random selection process. This is a close representation to the true percentages and relations between the number of the different types of high schools in the state. The total number of nonpublic and public high schools in the state at the time of the study was 867. Twenty-six percent (26%) of schools in the study were city schools. The true percentage is thirty-four and four tenths percent (34.4%) and without the nonpublic high schools the rate is forty and two tenths percent (40.2%). The exempted village sample size was five percent (5%). The true percentages were five and seven tenths percent (5.7%) including all high schools and six and six tenths percent (6.6%) without

the nonpublic schools. The local school districts made up fifty-five percent (55%) of the responses. The state percentages are forty-five and four tenths percent(45.4%) with the nonpublic schools and fifty-three and two tenth percent (53.2%) without the nonpublic high schools as indicated in Table 1.

In 1986 the number of high schools located in the State of Ohio had declined. The 1986 revisions showed a total of 838 public and nonpublic high schools with a breakdown of 715 public high schools and 123 nonpublic high schools (Table 1).

High schools in the State of Ohio were found to be in three different categories. The categories differ in the grades that are housed at the building: Grades Seven through Twelve, Grades Nine through Twelve, and Grades Ten through Twelve. The study included three schools housing Grades Seven through Twelve or three and four tenths percent (3.4%), seventy-nine schools housing Grades Nine through Twelve or ninety-two and one tenth percent (92.1%), and three schools housing Grades Ten through Twelve or three and four tenths percent (3.4%). The study, however, identified another type of high school. One response was returned with only Grade Nine at the high school. This is a

Table 1. Types and percentages of high schools found in Ohio and the study.

| School Type | Ohio Totals/% 1982 | Ohio Totals/% 1986 | Sample Totals/% 1982 | Sample Totals/% 1986 |
|---|---|---|---|---|
| City | 298/34% | 273/33% | 26/26% | 26/26% |
| Exempted Village | 49/6% | 49/6% | 5/5% | 5/5% |
| Local | 394/45% | 393/47% | 55/55% | 55/55% |
| Total Public | 741 | 715 | 86 | 86 |
| Nonpublic | 126/15% | 123/15% | 0/0% | 0/0% |
| All Ohio High Schools | 867 | 838 | | |

specialized high school because of its location, on Kelleys Island, and the number of students attending the high school, one. The percentage for this type of high school was one and one tenth (1.1%). Table 2 shows the grades housed at the high schools in the study.

The survey requested information about the type of population the high school served. To determine this, the high schools were to indicate where most of their students lived according to the categories set up on the questionnaire. The five categories were: city of 100,000 or more, city of 50,000 - 100,000, city of 5,000 - 50,000, suburb of a metropolitan area (any size), and rural town or areas of less than 5,000. The responses to this section were: one school district in the city of 100,000 or more for one and one tenth percent (1.1%), no schools in the city of 50,000 - 100,000, twenty-three schools or twenty-six and seven tenths percent (26.7%) in the city of 5,000 - 50,000, thirteen responses or fifteen and one tenth percent (15.1%) in the suburb of a metropolitan area (any size), and finally rural town or areas of less than 5,000 with forty-nine responses for fifty-seven and one tenth percent (57.1%) (Table 3).

Table 2. Grades housed at high school buildings in the study

| Grades | Number | Percentage |
|---|---|---|
| 7 - 12 | 3 | 3.4% |
| 9 - 12 | 79 | 92.1% |
| 10 - 12 | 3 | 3.4% |
| 9 | 1 | 1.1% |

Table 3. Type of population - where most of the students lived.

| Category | Number | Percentage |
|---|---|---|
| City of 100,000 or more | 1 | 1.1% |
| City of 50,000 - 100,000 | 0 | 0% |
| City of 5,000 - 50,000 | 23 | 26.7% |
| Suburb of Metropolitan Area (Any Size) | 13 | 15.1% |
| Rural Town or areas of less than 5,000 | 49 | 57.1% |

School districts having courses whose primary focus was environment, conservation education, or outdoor education concerns or topics are in the minority. The responses show that fifty-six out of the eighty-six high schools (65.2%) do not offer classes they consider to be in this area. This means that only thirty-four and eight tenths percent (34.8%) or thirty high schools offered courses that deal primarily with environmental topics.

The 1986 revised questionnaires still showed the high schools having courses whose primary focus was environment, conservation, or outdoor education were in the minority. There were four (4. high schools that added courses, but eight (8) high schools dropped courses with the primary focus. The 1986 totals then were twenty-six (26) high schools or thirty and two tenths percent (30.2%) offering courses with a primary focus of environment, conservation, or outdoor education. The 1986 totals showed sixty (60) high schools or sixty-nine and eight tenths percent(69.8%) do not offer such courses.

The questionnaire asked if any courses of primary focus on environment, conservation or outdoor education were offered within the past five (5) years and are now

discontinued. There were fifteen (15) responses to this question. The reasons why the courses primarily dealing with environmental topics are no longer offered were drop in enrollment, staff reduction, textbooks not in the field, budget cuts, teachers not certified in the coursework, and requests from the local Board of Education to drop the courses. There were also forty-four schools that listed no reason for the courses being dropped or not being offered.

A study was made of the high school populations of the schools requested to turn in responses. High schools were arbitrarily divided into groups with populations of less than 299, 300-400, 401-500, 501-600, 601-700, 701-800, 801-900, 901-1000, 1001-1500, and over 1501. The high school populations are found in Table 4.

The curricular headings and names of the courses that dealt primarily with environmental or conservation education topics were few. All the courses fit under the following five headings: Science, Social Studies, Physical Education/Health, Home Economics, and Vocational Education. The courses that fit under each curricular heading and the number of responses are given in Table 5.

Table 4. School populations of the one hundred high schools selected for the study.

| School Population Size | Number of Schools |
|---|---|
| Less than 299 | 12 |
| 300-400 | 12 |
| 401-500 | 16 |
| 501-600 | 11 |
| 601-700 | 7 |
| 701-800 | 10 |
| 801-900 | 12 |
| 901-1000 | 5 |
| 1001-1500 | 11 |
| Over 1501 | |

Table 5. Curricular headings and courses primarily dealing in environment or conservation education topics.

| | |
|---|---|
| **SCIENCE** | |
| Earth Science | 11 |
| Biology | 10 |
| Ecology | 6 |
| Environmental Science | 5 |
| General Science | 4 |
| Advanced Biology | 3 |
| Botany | 2 |
| Chemistry | 2 |
| Life Science | 2 |
| Animal and Plant Science | 1 |
| Environmental Concerns | 1 |
| Exploratory Science | 1 |
| Field Biology | 1 |
| Fish, Waterfowl and Furbearers | 1 |
| Forest and Farm Game | 1 |
| Horticulture | 1 |
| Independent Studies (Andros Island) | 1 |
| Local Plants and Animals | 1 |
| Management | 1 |
| Modern Science | 1 |
| Natural Resources | 1 |
| Nature Studies | 1 |
| Plant Science | 1 |
| Physical Science | 1 |
| Probing the Natural World | 1 |
| Science II | 1 |
| You and the Environment | 1 |
| TOTAL | 63 |
| **SOCIAL STUDIES** | |
| Civics | 2 |
| Social Problems | 1 |
| Sociology | 1 |
| World Geography | 1 |
| TOTAL | 5 |
| **PHYSICAL EDUCATION/HEALTH** | |
| Physical Education | 2 |
| Health | 1 |
| TOTAL | 3 |
| **VOCATIONAL EDUCATION** | |
| Vocational Agriculture | 9 |
| **HOME ECONOMICS** | |
| Home Economics | 2 |
| Housing | 1 |
| TOTAL | 3 |

The 1986 update reflected the same information except for the following changes: three schools dropped Earth Science, one school each dropped Civics, Ecology, Horticulture, Exploratory Science, Life Science, You and the Environment, Environmental Concerns, and Sociology. It is unclear whether dropping the course means the course is not taught any more or just does not deal primarily with the environmental topics. (They were not added to the other listing on the questionnaire.) One school each added Physical Science, Environmental Science on an alternate year basis, Field Ecology and Conservation.

Responses to the questionnaires indicated that many different concepts are covered in both the primarily and secondarily environmental and conservation topics and that the topics differed even within the same course name at different schools.

Responses to the questionnaires reported that courses secondarily concerned with environmental and conservation topics are just as widely found under curricular headings and course names as courses concerned with such topics. Table 6 lists the responses under the seven curricular headings.

Table 6. Curricular headings and course names of the courses not primarily concerned with environment or conservation topics.

| | |
|---|---|
| **SCIENCE** | |
| Biology | 58 |
| General Science | 30 |
| Chemistry | 29 |
| Physical Science | 18 |
| Earth Science | 16 |
| Physics | 13 |
| Advanced Biology | 10 |
| Zoology | 6 |
| Life Science | 5 |
| Advanced Chemistry | 4 |
| Botany | 3 |
| Biochemistry | 2 |
| ISCS Level III | 2 |
| Advanced Sciences | 1 |
| Biology (BSCS Green) | 1 |
| Earth Processes | 1 |
| Geology | 1 |
| Natural Resources | 1 |
| Nature Study | 1 |
| Ornithology | 1 |
| Physiology | 1 |
| Science Seminar | 1 |
| Science Survey | 1 |
| Space Science | 1 |
| **SOCIAL STUDIES** | |
| Sociology | 8 |
| World Geography | 7 |
| Government | 4 |
| United States History | 4 |
| Civics | 2 |
| Cities, Crisis and Crime | 1 |
| Contemporary Problems | 1 |
| Economics | 1 |
| Political Science | 1 |
| Social Living | 1 |
| Social Studies | 1 |
| World History | 1 |
| **HOME ECONOMICS** | |
| Home Economics | 5 |
| Foods | 4 |
| Family Living | 2 |
| Housing | 1 |
| Interior Design | 1 |
| **PHYSICAL EDUCATION/HEALTH** | |
| Health | 13 |
| **VOCATIONAL EDUCATION** | |
| Vocational Agriculture | 15 |
| Agriculture | 1 |
| Production Agriculture | 1 |
| **BUSINESS** | |
| Consumer Education | 1 |
| **MATHEMATICS** | |
| Algebra | 1 |
| Consumer Math | 1 |

The 1986 surveys did not reveal any reduction in numbers of courses offered. Three schools added Chemistry, two added Physics, two added General Science, one each added Life Science, Vocational Agriculture, Social Studies, and Advanced Chemistry.

## DATA ANALYSIS

QUESTION 1. Is school size related to the number of environmental courses offered to the students?

ANSWER 1. No, there is no relationship. Table 7 shows the average number of courses taught within each high school population. The 1982 standard deviation was 0.85. The small standard deviation shown in this study indicates that school size is not a determining factor when it comes to the number of environmental education courses offered. All schools offered courses that they considered to cover material on environmental and conservation topics. These were courses that were offered to everyone at the school with grade restrictions only. The courses were similarly titled and the only difference was whether the course dealt with the topics primarily or secondarily.

Table 7. School populations and the average number of environment or conservation courses taught.

| School Population Sizes | Average Number of Courses with Environmental Topics | |
|---|---|---|
| | 1982 | 1986 |
| Less than 299 | 3.2 | 3.2 |
| 300 - 400 | 3.8 | 3.2 |
| 401 - 500 | 2.6 | 2.6 |
| 501 - 600 | 5.0 | 5.25 |
| 601 - 700 | 4.6 | 4.6 |
| 701 - 800 | 4.6 | 4.7 |
| 801 - 900 | 5.6 | 5.5 |
| 901 - 1000 | 4.6 | 4.6 |
| 1001 - 1500 | 4.5 | 4.5 |
| Over 1501 | 3.6 | 3.6 |

The 1986 data showed only a slight change in the standard deviation with an overall total loss of only seven (7) courses. The 1986 standard deviation was 0.93. Again school size was not a determining factor as to the number of environmental education courses offered to the students.

QUESTION 2. Is there a relationship between school size and topics taught in the environmental educati courses?

ANSWER 2. No, an average of ninety percent (90%) of the topics listed on the questionnaire were taught by the high schools, as a group within each high school population, somewhere in the courses listed on the questionnaire. In addition, some schools added topics they felt did not fit under the topics listed on the questionnaire. There were Outdoor Laboratory, local ecology field trip, local trash drive, resource planning, backpacking principles, wildlife conservation, forestry, indoor pollution, ecological concepts, outdoor education, and solar energy.

The 1986 data again showed an average of ninety percent (90%) of the topics listed on the questionnaire were covered somewhere in the courses listed. Architectural preservation and aesthetic pollution were the courses most often left out in both the 1982 and 1986 surveys.

QUESTION 3. Is there a relationship between the geographic location of the school district and the number of environmental education courses offered to students?

ANSWER 3. No, since all schools listed courses of some type on the survey. Table 8 shows the average number of courses taught and whether they dealt with the courses primarily or secondarily in each Cooperative Extension Area. The standard deviation was 0.52. This small standard deviation indicates that geographical area did not determine the number of environmental education courses taught.

The 1986 data showed that there was an overall gain of 11 courses throughout seven of the ten extension areas. The 1986 standard deviation was 0.57. This small standard deviation continues to support the 1982 information.

Table 8. Average number of courses in each extension area.

| Extension Area | Average Number of Courses Offered | |
|---|---|---|
| | 1982 | 1986 |
| Defiance | 4.2 | 4.33 |
| Eaton | 3.33 | 3.55 |
| Fremont | 4.0 | 4.0 |
| Wapakoneta | 3.85 | 4.0 |
| Washington Court House | 4.44 | 4.66 |
| Jackson | 4.0 | 4.0 |
| Belle Valley | 5.2 | 5.44 |
| Canfield | 3.44 | 3.44 |
| Wooster | 3.77 | 3.88 |
| Mt. Gilead | 4.5 | 4.75 |

QUESTION 4. Is there a relationship between the type of school district and the specific topics in environmental education courses?

ANSWER 4. No, all topics were covered in the courses listed by the school district on the questionnaire. Ninety percent (90%) of the topics listed on the questionnaire were covered by the high schools. The types of high schools were found throughout several of the various high school
population sizes. Some topics were taught in more than one course.

The 1986 data showed the same information as the 1982 responses.

QUESTION 5. Is there a relationship between the environmental education courses offered and the curricular headings for the courses?

ANSWER 5. Yes, there is a relationship. Tables 5 and 6 in Chapter 4 show that schools offered environmental education courses under the curricular headings of Science, Social Studies, Vocational Education, Physical Education/Health, and Home Economics. These courses were usually offered under the same subject headings in every high school.

# CHAPTER 5

Educators in one hundred randonly selected high schools in Ohio were questioned to determine the extent of environmental education in their curricula. Responses were examined for relationships between school size, type of school district, location of school district, and the number and type of courses offered that contained environmental education courses.

The study showed that there were no relationships between any of the items studied except for the environmental education courses and their curricular headings.

Three environmental education topics were taught in at least fifty percent of the course with infusion of topics in several other courses.

## IMPLICATIONS

1. Since school size does not affect the number of courses taught that contain environmental education topics, students in the State of Ohio will be exposed to these topics no matter where they attend high school. This will permit a common and basic pool of

knowledge for all Ohio graduates in this area. The graduates should be able to make knowledgable decisions concerning environmental matters.

2. Without a relationship between school size and topics taught in the environmental education courses, all of Ohio's students should receive a common basic pool of knowledge. The research showed that Ohio high school students are getting similar information no matter what the size of their high school.

3. The school's geographical location does not affect the number of environmental education topics offered to the students. Ohio's students receive similar information no matter where their high school is located. A different emphasis may be placed on the topics but the topics are present throughout the State of Ohio.

4. The type of school district (city, local, or exempted village) did not affect the topics covered in environmental education. City school districts did not have an unfair advantage over the smaller local school districts when it came to offering information to their students. Different topics of environmental education were offered throughout the curricula of the different categories of high schools.

5. The relationship found between the environmental education courses offered and the curricular headings for the courses may be significant. It may be that environmental education topics are more readily adaptable to the subject headings found in the survey or that they have always been there and are now just being discovered. If the latter is true, teachers should not be hesitant to teach environmental education when they have been teaching it all along under a different name.

## RECOMMENDATIONS FOR FURTHER STUDY

The researcher feels that if this study were to be repeated, the person doing the research would need to do a stratified random sampling based on the percentage of the four types of school district in the State of Ohio. This study did not include nonpublic high schools even though they had an even chance of being selected. A stratified random sampling based on the percentages found in this study would have included thirty-four city high schools, six exempted village high schools, forty-five local district high schools, and fifteen nonpublic high schools.

The researcher feels that any new study would get more accurate results if the researcher visited every high school in the study. Problems arose when identifying information on the questionnaire was filled in by the high school principal or teacher(s). This information did not match the information listed in the Ohio Educational Directory. An example would be the number of grades served in their building. Several of the local high schools only listed Grades Nine through Twelve when they actually have Grades Seven through Twelve. This might have been solved by also listing the Grades of Seven and Eight on the questionnaire.

Some of the percentages under the topics covered in a course added up to more than one hundred percent. The word 'Primarily' was not defined on the questionnaire by the researcher. The researcher felt that 'primarily' meant courses that took fifty percent or more of their time to cover the topics listed. Some of the responses reflected that the courses only were concerned with the topics comprising less than twenty-five percent of the total class.

By visiting a sample of the high schools while doing the study, a future researcher could already have the information about the school district written down and just verify it with the principal. A look through

the Course of Study would alert the researcher to the teachers he/she needed to talk to about the amount of time they teach the various topics. This information could later be compared to the amount of time allotted in the Course of Study and any differences noted.

Also by the researcher filling out the surveys, the names of courses could be grouped together better and the information would be more standardized.

The study may also focus on the elementary school or a specific grade level.

Environmental education is an important tool in the education of our people whether they are young or old. Environmental education concepts can be emphasized in the existing curriculum thereby teaching us to be good stewards of our planet and its resources, in addition to teaching us about ourselves and the way we make decisions. Ohio schools are including some of the environmental and conservation education topics, but they have some changes to make in order to include these topics in all subject areas and get them into the Courses of Study.

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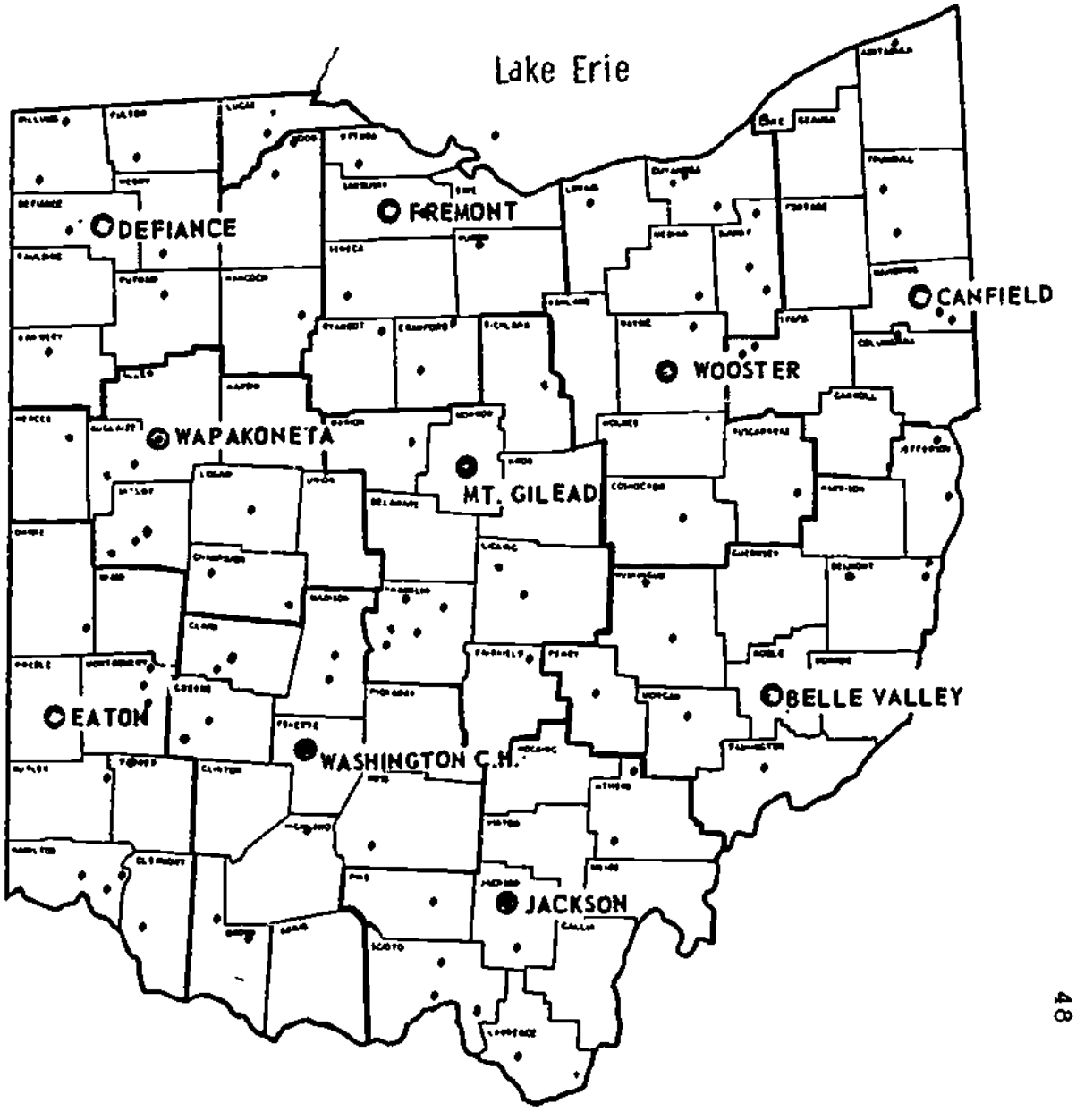
APPENDIX A

MAP OF EXTENSION AREAS AND SCHOOL LOCATIONS


Lake Erie
DEFIANCE
FREMONT
CANFIELD
WOOSTER
WAPAKONETA
MT. GILEAD
EATON
WASHINGTON C.H.
BELLE VALLEY
JACKSON

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APPENDIX B

LIST OF HIGH SCHOOLS IN STUDY

EXTENSION AREAS AND THE HIGH SCHOOLS FROM EACH AREA

1. DEFIANCE CENTER

Defiance County
a. Fairview High School-Center Local

Fulton County
b. Archbold High School-Archbold Area Local

Hancock County
c. Vanlue High School-Vanlue Local

Henry County
d. Holgate High School-Holgate Local

Paulding County

Putnam County
e. Miller City High School-Miller City-New Cleveland Local

Van Wert County
f. Crestview High School-Crestview Local

Williams County
g. Edgerton High School-Edgerton Local
h. North Central High School-North Central Local

Wood County
i. Perrysburg High School-Perrysburg Exempted Village
j. Rossford High School-Rossford Exempted Village

2. EATON CENTER

Butler County
a. Lemon-Monroe High School-Middletown City

Clermont County
b. Amelia High School - West Clermont Local

Darke County
c. Franklin-Monroe High School-Franklin Monroe Local

Hamilton County
d. Finneytown High School-Finneytown Local
e. Madeira High School-Madeira City
f. Sycamore High School-Sycamore City

Miami County

Montgomery County
g. Butler High School-Vandalia-Butler City
h. Northridge High School-Northridge Local
i. Oakwood High School-Oakwood City

Preble County

Warren County
j. Carlisle High School-Carlisle Local

3. FREMONT CENTER

Crawford County
a. Buckeye Center High School-Buckeye Center Local
b. Wynford High School- Wynford Local

Erie County
c. Kelleys Island High School-Kelleys Island Local

Huron County
d. Monroeville High School-Monroeville Local

Lucas County
e. Springfield High School-Springfield Local
f. Sylvania Southview High School-Sylvania City

Ottawa County

Sandusky County
- g. Clyde High School-Clyde-Green Springs Exempted Village
- h. Woodmore High School-Woodmore Local

Seneca County
- i. New Riegel High School-New Riegel Local

Wyandot County
- j. Mohawk High School-Mohawk Local

4. WAPAKONETA CENTER

Allen County

Auglaize County
- a. Memorial High School-St. Mary's City
- b. Wapakoneta High School-Wapakoneta City
- c. Waynesfield High School-Waynesfield-Goshen Local

Champaign County
- d. Graham High School-Graham Local
- e. Mechanicsburg High School-Mechanicsburg Exempted Village

Hardin County

Logan County
- f. Bellefontaine High School-Bellefontaine City

Mercer County
- g. Mendon-Union High School-Mendon-Union Local

Shelby County
- h. Fairlawn High School-Fairlawn Local
- i. Russia Local High School-Russia Local
- j. Sidney High School-Sidney City

Union County

5. WASHINGTON COURT HOUSE CENTER

Adams County

Brown County
- a. Eastern Local High School-Eastern Local
- b. Western Brown High School-Western Brown Local

Clark County
- c. Greenon High School-Mad River-Green Local
- d. Shawnee High School-Springfield Local

Clinton County

Fayette County

Greene County
- e. Bellbrook High School-Sugarcreek Local
- f. Xenia High School-Xenia City

Highland County
- g. Fairfield High School-Fairfield Local

Madison County
- h. London High School-London City
- i. Madison-Plains High School-Madison-Plains Local

Ross County
- j. Paint Valley High School-Paint Valley Local

6. JACKSON CENTER

Athens County
- a. Alexander High School-Alexander Local
- b. Trimble High School-Trimble Local

Gallia County

Hocking County

Jackson County
- c. Jackson High School-Jackson City
- d. Oak Hill High School-Oak Hill Local

Lawrence County
- e. Fairland High School-Fairland Local
- f. Rock Hill High School-Rock Hill Local

Meigs County

Pike County
g. Piketon High School-Scioto Valley Local

Scioto County
h. Clay High School-Clay Local
i. Valley High School-Valley Local
j. Wheelersburg High School-Wheelersburg Local

Vinton County

7. BELLE VALLEY CENTER

Belmont County
a. Bellaire High School-Bellaire City
b. Martins Ferry High School-Martins Ferry City
c. Union Local High School-Union Local

Guernsey County

Harrison County

Jefferson County
d. Jefferson Union High School-Edison Local
e. Steubenville High School-Steubenville City

Monroe County

Morgan County
f. Morgan High School-Morgan Local

Muskingum County
g. Maysville High School-Maysville Local
h. Tri-Valley High School-Tri-Valley Local

Noble County

Perry County
i. Sheridan High School-Northern Local

Washington County
j. Fort Frye High School-Fort Frye Local

8. CANFIELD CENTER

Ashtabula County
- a. Ashtabula Harbor High School-Ashtabula Area City

Carroll County

Columbiana County
- b. Salem High School-Salem City

Geauga County

Lake County
- c. Wickliffe High School-Wickliffe City

Mahoning County
- d. Boardman High School-Boardman Local
- e. Springfield High School-Springfield Local

Portage County
- f. Field High School-Field Local

Stark County
- g. Northwest High School-Northwest Local
- h. Tuslaw High School-Tuslaw Local

Trumbull County
- i. Bristol High School-Bristol Local
- j. Lordstown High School-Lordstown Local

9. WOOSTER CENTER

Ashland County

Coshocton County
- a. Riverview High School-Riverview Local

Cuyahoga County
- b. Brecksville High School-Brecksville-Broadview Heights City
- c. Lakewood High School-Lakewood City
- d. Rocky River High School-Rocky River City

Holmes County

Lorain County
e. South Amherst High School-South Amherst Local

Medina County
f. Wadsworth High School-Wadsworth City

Summit County
g. R. B. Chamberlin High School-Twinsburg City
h. Woodridge High School-Woodridge Local

Tuscarawas County
i. Claymont High School-Claymont City

Wayne County
j. Rittman High School-Rittman Exempted Village

10. MT. GILEAD CENTER

Delaware County

Fairfield County
a. Millersport High School-Walnut Local

Franklin County
b. Bexley High School-Bexley City
c. Franklin Heights High School South-Western City
d. Grandview Heights High School-Grandview Heights City
e. New Albany High School-Plain Local
f. Worthington High School-Worthington City

Knox County

Licking County
g. Granville High School-Granville Exempted Village
h. Johnstown-Monroe High School Johnstown-Monroe Local

Marion County
i. River Valley High School-River Valley Local

Morrow County

Richland County
j. Madison High School-Madison Local

APPENDIX C

1982 COVER LETTER

STATE OF OHIO
DEPARTMENT OF EDUCATION
COLUMBUS
43215

DIVISION OF ELEMENTARY
AND SECONDARY EDUCATION

Dear Principal, Science Department Chairperson or Science Teacher,

Since the late 1960's and especially after Earth Day in 1970, Ohio high school, have recognized the need to help students better understand the complex environmental issues that have become front page news. In some schools new courses have been developed, while in other schools existing courses have been modified to devote more time to environmental problems or issues.

We respectfully request that you answer the three questions on the enclosed survey. The information Provided by a carefully selected sample of Ohio schools will be summarized and analyzed and the results will be returned to you. Further, the results will help all Ohio high schools meet their obligations to provide students the opportunity to understand environmental issues. When you return the survey, you are encouraged to send supplementary information concerning your environmental education efforts.

Thank you for your cooperation. Please return the survey in the enclosed envelope by November 17.

John Hug

Dr. John Hug, Consultant
Environmental Education
Ohio Department of Education

Timothy Taylor

Mr. Timothy Taylor
Graduate Student
Ohio State University

Encl: Questionnaire
Envelope

# APPENDIX D

# QUESTIONNAIRE

Identification Information

Name of high school_____ IRN #_____

Name of school district _____ (City, Ex. Vil., Local)

County_____ Check grades in H.S. ___9 ___10 ___11 ___12

Type of students served: More than half of students live in: (Please check)

___ city of more than 100,000 population
___ city of 50,000 to 100,000
___ city of 5,000 to 50,000
___ surburb of metropolitan area (any size)
___ rural area or towns of less than 5,000

Ohio high schools have chosen different ways to help their students understand the complex interdisciplinary environmental concerns that have come to the attention of the general public in the past 10 to 15 years. Since these concerns do not fit easily into the traditional high school subject areas the following questions may be difficult to answer. Explanatory notes in the margins are acceptable and appreciated. Please read all three questions before you begin writing your answers.

1. Please list names of those high school courses that deal PRIMARILY with environment, conservation education, or outdoor education concerns or topics

| Code # | Course Name | Subject Area (e.g., science, soc. studies, voc. agric., home econ.) | Open to Students in Grades, (circle) |
|---|---|---|---|
| 1 | | | 9 10 11 12 |
| 2 | | | 9 10 11 12 |
| 3 | | | 9 10 11 12 |
| 4 | | | 9 10 11 12 |
| 5 | | | 9 10 11 12 |
| 6 | | | 9 10 11 12 |

Check here if no such courses are offered: ___

Check here if such courses were offered within the last five years but are not currently offered: ___

Why were they discontinued?

2. Please indicate the approximate % of the course (that you listed in Question 1) devoted to the topics listed: (Be sure to enter a number in each space - a zero (0) if the topic is not covered.)

| | % of Course #1 | % of Course #2 | % of Course #3 | % of Course #4 | % of Course #5 | % of Course #6 |
|---|---|---|---|---|---|---|
| a. air pollution | | | | | | |
| b. acid rain | | | | | | |
| c. water pollution | | | | | | |
| d. hazardous waste | | | | | | |
| e. human population dynamics | | | | | | |
| f. energy education | | | | | | |
| g. mineral extraction | | | | | | |
| h. endangered species | | | | | | |
| i. aesthetic pollution | | | | | | |
| j. urban decay | | | | | | |
| k. architectural preservation | | | | | | |
| l. estuary preservation | | | | | | |
| m. escalating consumption | | | | | | |
| n. land use management | | | | | | |
| o. food production and distribution | | | | | | |
| p. environmental quality | | | | | | |
| q. environmental health issues | | | | | | |
| r. soil erotion | | | | | | |
| s. nature study | | | | | | |
| t. noise pollution | | | | | | |
| u. marine education | | | | | | |
| v. other | | | | | | |
| w. other | | | | | | |
| x. other | | | | | | |

3. Almost every high school course contains one or more environmental topics. Please list the names of a few of those courses that include a moderate treatment of one or more of the topics listed above.

| Course Name | Subject Area | Environmental Topics Treated (please use code letters from Question 2) |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

APPENDIX E

REMINDER COVER LETTER

STATE OF OHIO
DEPARTMENT OF EDUCATION
COLUMBUS
43215

FRANKLIN B. WALTER
SUPERINTENDENT
PUBLIC INSTRUCTION

MARY J. POSTON
DIRECTOR
DIVISION OF ELEMENTARY
AND SECONDARY EDUCATION

January 3, 1983

Dear Principal, Science Department Chairperson or Science Teacher,

Since the late 1960's and especially after Earth Day in 1970, Ohio high schools have recognized the need to help students better understand the complex environmental issues that have become front page news. In some schools new courses have been developed, while in other schools existing cources have been modified to devote more time to environmental problems or issues.

In early November of 1982, a survey was sent to you and we made the request that you answer the three questions on the survey. The information provided by the carefully selected sample of Ohio high schools was to be summarized and analyzed and the results will be returned to you. Further, the results will help all Ohio high schools meet their obligations to provide students the opportunity to understand environmental issues.

We never received a completed survey from your high school. Your answers to the questionaire are important to the study. An additional survey is enclosed in this letter in case you did not receive the original request or you have misplaced it.

Thank you for your cooperation. Please return the survey in the enclosed envelope by January 14.

John Hug

Dr. John Hug, Consultant
Environmental Education
Ohio Department of Education

Timothy Taylor

Mr. Timothy Taylor
Graduate Student
Ohio State University

Encl: Questionaire
Envelope

APPENDIX F

1986 COVER LETTER

397 W. Myrtle Ave.
Newark, Ohio 43055
May 23, 1986

Dear Principals and Teachers,

Three and one half years ago I asked for your input for a study that I was conducting. The study was looking at the amount of Environmental Education in the High School (grades 9-12) curriculum and in what courses the content was in. Since the time of the original request, state minimum teaching standards have changed to include more environmental education in the school curriculum. Therefore, I would like to update my information that I received from you. The results of the original survey, the corrections and a comparison of the two will allow Ohio high schools to better meet the new state minimum requirements.

I have enclosed a copy of the survey that you returned to me with your school's information. I would like you to look over the information on the survey and make any corrections or additions that you may have.

I have enclosed a self-addressed, stamped envelope for the return of your survey after the corrections. I would like to have the corrected surveys back by June 2, 1986. I realize that this does not give you much time with school ending, but I need the corrected information before the summer.

Again, thank you for your cooperation.

Sincerely,

Mr. Timothy Taylor
Graduate Student
Ohio State University