ISSN-2230-7540

AWARENESS, KNOWLEDGE, AND ATTITUDE ABOUT ENVIRONMENTAL EDUCATION

HARIOM RAWAT *

Research Scholar, Jodhpur National University,

Jodhpur, INDIA

ABSTRACT

Over the last 30 years, environmental education has been part of the curriculum in Southwest Florida public schools. Curriculum objectives, such as, environmental attitude, knowledge, and awareness (AKA), have been investigated in the literature as ways to improve the overall behavior of future citizens toward the environment. The purpose of this study was to evaluate the aforementioned objectives among the following groups: environmental specialists, high school instructors, high school students, and the parents of the corresponding students in Bhopal during the 2009-20010 school year. An instrument was developed to measure the groups' levels of awareness, knowledge, and attitude as well as their levels of self-efficacy. The returned surveys represented responses from: 27 environmental specialists, 15 high school instructors, 224 high school students, and 222 parents. This study found statistically significant differences among the groups regarding the levels of awareness, knowledge, and attitude as related to environmental issues. The

ISSN-2230-7540

environmental specialists scored highest for all AKA components as compared to the lowest levels presented by parent awareness, parent attitude, and high school student knowledge. In addition, factors such as socioeconomic status, ethnicity, and preference of leisure activities resulted in differences among the groups regarding their levels of environmental AKA. This study supports the evaluation of AKA levels among participants as an appropriate approach to the evaluation of environmental curriculum objectives. In addition, the study suggests a simplified measurement of AKA as an attempt to unify the parameters measured by numerous instruments found throughout environmental education literature. The results of this study may assist environmental specialists, instructors, and school districts in the evaluation of environmental education curricula.

Questions of the Study

The questions of this study are:

1. What are the levels of awareness, knowledge, and attitude (AKA) of environmental specialists and high school instructors who teach components of environmental education (EE) in their curriculum?
2. What is the level of AKA in high school students, and the parents of these students, enrolled in classes where EE components are incorporated in the curriculum?
3. How well do socio-economic, demographic, and personal backgrounds factors account for differences in the levels of AKA of the environmental specialists, high school instructors, high school students, and parents?

ISSN-2230-7540

4. What is the self-efficacy level of AKA among the different groups studied?

Definitions of Terms

For the purpose of clarification, the following definitions were used throughout the study. As presented by Gough (1997) and Athman and Monroe (2000), the UNESCO Intergovernmental Conference on Environmental Education defines the following environmental education terms as:

Environmental education: a process of developing a world population that is aware of and concerned about the total environment and its associated problems, and which has the knowledge, skills, attitudes, motivations and commitment to work individually and collectively toward solutions of current problems and the prevention of new ones.

Awareness: to acquire concern and sensitivity towards the environment and its problems.

Knowledge: to gain experiences and a basic understanding of the environment and its problems.

Attitude: to acquire values, feelings of concern, and motivations towards the participation of environmental improvement and protection.

The following terms used throughout the study are defined as:

Self-efficacy: a construct of Bandura's social-cognitive learning theory. As summarized by Gredler (2001, p. 328), "perceived self-efficacy is the learner's belief in his or her capabilities to successfully manage situations."

Environmental specialist: An educator that coordinates the EE program in

ISSN-2230-7540

his/her school district and represents their school in meetings with the school board as the EE coordinator.

Instructor: An educator that implements a portion of the environmental curriculum in their class. The educator may or may not be a science instructor.
Student: A volunteer participant chosen from the population of students in the 12^{th}

grade in Lee, Charlotte, and Hendry County public high schools.
Parent: A parent is the corresponding authoritative representative, female or male, responsible for the student.

Instrument: The evaluative questionnaire used to study the participant groups.

METHODOLOGY

Research Design

This study compared the levels of awareness, knowledge, and attitude (AKA) in four different groups, environmental specialists, H.S. instructors, H.S. students, and the parents of the students, using an evaluative instrument. The study followed a causal- comparative research design with volunteers from selected groups of related instructors, students and parents.

Participants

ISSN-2230-7540

The participants of this study consisted of four different groups of people involved in EE programs in Bhopal. The first group consisted of a population of environmentalists, referred to as the environmental specialists, who were representatives and coordinators of EE programs in their Saket Nagar, met regularly throughout the school year to discuss curriculum, activities, and field trips in Saket Nagar. The second group, the H.S. instructors, consisted of volunteer instructors of senior level courses, who have introduced an environmental curriculum component into their discipline. The third group, the H.S.students, consisted of students from the instructors' classes. The fourth group, the parents, consisted of the parents of the participating students. These last three groups were selected from a population of high schools located in the other areas of Bhopal.

Instruments

The following instruments were selected for the development of the evaluation tool. The New Ecological Paradigm (Dunlap, Van Liere, Mertig, & Jones, 2000), New Environmental Paradigm / Dominant Social Paradigm (NEP/DSP) (La Trobe & Acott, 2000); and the ecological knowledge questionnaire developed by Morrone, Mancl, and Carr (2001) with amendments to incorporate the Florida Environmental Literacy Survey of high school students by Bogan and Kromrey (1996). These instruments were selected because of their contemporary and recent content and their reported reliability.

The instrument developed in this study consisted of a questionnaire using a four point Likert – type response scale, an agree/disagree response section, and a series of questions to determine demographic characteristics (e.g.,

ISSN-2230-7540

socioeconomic status, gender, ethnicity, education, leisure activities, etc.).
The inclusion of leisure activities was used to determine if persons involved in outdoor activities had different perceptions than those who preferred indoor activities. Southwest Florida is an area that attracts many individuals who enjoy outdoor activities and has historically been an agricultural community.

The questions that focused on self-efficacy in environmental education and environmental issues were derived from Marcinkowski (1997) and were adapted to Southwest Florida. Some issues from the original documents were edited and others were added to conform to a realistic regional instrument.

A pilot was conducted with a selected small group of environmental participants. This representative group of the target population was used to conduct a trial to observe consistencies and to refine the survey.

Data Collection

The survey was conducted during the spring semester of the 2009-2010 school year. Surveys were distributed after the corresponding school board authorities granted permission. The study was conducted by recruiting volunteers from the participant populations. The distribution of the surveys and collection of data followed the methodology recommended by Dillman (2000).

Summary

Awareness, knowledge, and attitude are important components mentioned frequently in EE literature. This study will examined the levels of AKA in

ISSN-2230-7540

participants of EE programs, as well as, their levels of self-efficacy. An instrument was developed to survey representative groups in Southwest Florida as ways to evaluate some aspects of their EE programs.

Research Design

This study compared the levels of awareness, knowledge, and attitude (AKA) in four different groups: environmental specialists, H.S. instructors, H.S. students, and the parents of the students, using an evaluative instrument. The study followed a causal- comparative research design with volunteers from selected groups of environmental specialists, and related H.S. instructors, H.S. students and parents.

Data Collection

After receiving permission from the county school boards, the surveys were distributed to the participants in the study. Packages containing an explanatory letter, the instrument, and a self-addressed stamped envelope were distributed through the mechanisms of distribution for each county. Each package was labeled individually with a code that described the participant type (E= Environmental specialist, T= H.S. Instructor, S= H.S. Student, or P= Parent), the high school, the class of the H.S. instructor, and the H.S. student number which corresponded to the same number as the parent. The explanatory letter was addressed to the parent of the student requesting permission and collaboration in the study. The letter also requested independent responses between family members. Confidentiality and anonymity were warranted as well as no penalty for lack of participation. There was no monetary compensation for

ISSN-2230-7540

the participants, although in some cases, students were given extra credit in their courses for returning the surveys.

Several trials of the instrument were conducted with a group of expert environmentalists to refine the instrument to its final version. The participant expert group consisted of Dr. Edwin Everham (committee member for this study), research biologists, environmental educators, resource managers, and university students of environmental studies. The results and comments from this group were used to evaluate the instrument, to observe consistencies, and to refine the survey.

Data Analysis

Data were entered into a research database utilizing the Statistical Package for the Social Sciences: Graduate Pack 11.0 for Windows (SPSS, 2001) for the purpose of analysis. Each case was entered into a database assigning a code to identify each participant. Data were sorted to analyze the characteristics of all four participants in regard to the study questions. Significance for all statistical measures was determined at the 0.05 level.

Variables

All four categories of participants (environmental specialists, H.S. instructors, H.S. students, and parents) had the following variables as scores in levels of: (a) awareness, (b) knowledge, (c) attitude, and (d) self-efficacy. In addition, the following descriptive variables were asked in the instruments: (a) urbanicity, (b) urbanicity growing up, (c) years living in Southwest Florida, (d) field of

ISSN-2230-7540

instruction (for instructors only), (e) field of interest (for students only), (f) career orientation (for parents only), (g) entertainment preferences, (h) gender, (i) ethnicity, and (j) socioeconomic status (for parents only). For the purpose of this study, only urbanicity, entertainment preferences, gender, ethnicity, and SES were used to analyze comparisons with respect to AKA among the groups.

For the analysis of the level of awareness, scores were added in each subcategory of awareness: (a) influences (questions 1 to 5), (b) perception (questions 6 to 14), and (c) concern (questions 15 to 20). The sum of the scores was divided by the maximum scoring points possible for this group of questions (80 points) and the result multiplied by 100. This formula provided a score in units of percentage.

For the analysis of the level of attitude, using the questions from the NEP 2000 instrument, scores needed some manipulation. The questions were arranged in an alternating pattern describing pro-environmentalist attitude (questions 21, 23, 25, 27, 29,31, 33, and 35) and anthropocentric attitude (questions 22, 24, 26, 28, 30, 32, and 34). Scores were inversed in values for questions regarding anthropocentric attitude since from the environmental point of view these items were regarded as low value or a degree of disagreement. Scores were added and labeled as “NEP scores”. The “NEP score” was divided by the maximum scoring points possible for this group of questions (60 points) and the result multiplied by 100 to provide a score in units of percentage.

For the analysis of the level of attitude towards social responsibility (questions 46 to 49), the questions were ranked by a degree of social support needed to resolve an environmental problem. The questions were arranged as follow: (a)

ISSN-2230-7540

"chance determines the resolution" (question 48), (b) "you as an individual" (question 49), (c) "collectively working with others" (question 47), and (d) "by aristocratic means" (question 46). The scores remained separated per question and were transformed to units of percentage.

For the analysis of the level of attitude in political actions taken by the participants of the study (questions 50 to 62), frequency and a score of effectiveness were used.

For the analysis of the level of knowledge in the section of true/false format questions (questions 63 to 70), the questions answered correctly were assigned a score of one point. For questions of knowledge in a multiple-choice format (question 71 and 72), a score of one point was assigned if the answer corresponded to the three most important environmental issues facing Southwest Florida. The correct answers for this section of the instrument were predetermined by submitting the same questions to a panel of research biologists, environmental educators, government planners, and officials who collectively scored the correct answers. The sum of scores for this section was divided by the maximum possible score (10) and the result multiplied by 100. This formula provides a score in units of percentage for the knowledge level.

For the analysis of the level of self-efficacy (questions 36 to 45), subcategories were created regarding: (a) knowledge (questions 36, 37, and 39), (b) one-person impact (questions 40, 44, and 45), (c) level of self-awareness and taxation (questions 41, 42, and 43). For question 37, it was necessary to invert the score since the question was written with a negative environmental implication by scoring high. Scores were added and labeled as self-efficacy scores. The score

ISSN-2230-7540

was divided by the maximum scoring points possible for this group of questions (36 points) and the result multiplied by 100 to provide a score in units of percentage.

For the analysis of the demographic nominal variables (the last eight questions), a series of descriptive statistics accompanied the analysis of the variables with tables of frequencies describing the participant groups.

Statistical Analysis

Descriptive statistics were used to describe the levels of awareness, knowledge, attitude, and self-efficacy of the participant groups. An independent-sample t-test was performed to evaluate differences in the levels of AKA for questions with two-group comparison. The analysis of variance for the means of score per each group was used to determine the differences among the participants for each variable in the study. Post-hoc analysis was conducted when variables presented statistically significant differences at the .05 alpha level. A series of analysis of variance tests determined differences among nominal variables, such as socio-economic, demographic, and personal background factors, with respect to the score level of awareness, knowledge, and attitude, for all the groups.

CONCLUSIONS

Overview of the Findings

The purpose of this study was to evaluate the levels of awareness, knowledge, and attitude (AKA) as curriculum components in environmental education

ISSN-2230-7540

programs among schools in Bhopal. The levels of AKA for the participants: environmental specialists, H.S. instructors, H.S. students, and parents, were analyzed with regard to the four research questions of the study. In addition, secondary findings, such as the overall comparison of AKA levels and levels of environmental action for all the participating groups of the study are discussed in this chapter.

Research Question Number One: What are the levels of awareness, knowledge, and attitude (AKA) of environmental specialists and H.S. instructors who teach components of environmental education (EE) in their curriculum?

For the purpose of this study, both environmental specialists and H.S. instructors were considered as educators because they shared a mutual interest regarding environmental education programs. However, the statistical analysis revealed some differences as well as similarities between these groups. The analysis of the mean percentage for AKA in the environmental specialists showed higher percentage scores in all three aspects when compared to the scores of the H.S. instructor group. The higher scores for environmental specialists were attributed to attitude (M= 78.2%), knowledge (M= 70.4%), and awareness (M= 69.4%). The difference in the level of awareness between the two groups showed to be statistically significant; however, there were no statistically significant differences for the percentages regarding knowledge and attitude. These results imply that H.S. instructors possess the knowledge and attitude necessary for implementing the environmental curriculum. Educator knowledge and attitude have been suggested as the crucial components to an effective EE program (Mosley, Reinke, & Bookout, 2002).

ISSN-2230-7540

Research Question Number Two: What is the level of AKA in H.S. students, and the parents of these students, enrolled in classes where EE components are incorporated in the curriculum?

The number of surveys returned by the H.S. student and the parent groups were relatively high and similar giving power to the statistical analysis. The comparison of the mean percentage between H.S. students and parents revealed that there were no statistically significant differences between the scores for knowledge. However, parents' scores were significantly different when comparing their lower scores for awareness (M=58.8%) and attitude (M= 63.8%) with the higher scores of the H.S. students' awareness (M= 63.6%) and attitude (M= 69.0%). These results might suggest that H.S. students' attitudes are influenced to a greater degree by H.S. instructors than by the parents.

Research Question Number Three: How well do socio-economic, demographic, and personal backgrounds factors account for differences in the levels of AKA of the environmental specialists, H.S. instructors, H.S. students, and parents?

All, demographic and personal background factors, such as income, gender, urbanicity, and preferred leisure activities, were analyzed regarding the differences in the levels of AKA for all groups. The analysis of socioeconomic factors (income) was only conducted for the parent group because it was the only group with the question about income in the surveys. The results of the analysis of parents' income as a factor accounting for the difference in the levels of attitude was significant among parents with an annual income of less

ISSN-2230-7540

than $15,000 (M= 59.3%), when compared to parents with incomes ranging from $15,000 to $30,000 (M= 70.3%), parents with incomes of $30,000 to $45,000 (M=70.1%), and those with incomes above $60,000 (M= 72.7%). Income did not appear to be a factor accounting for the differences in attitude levels for parents with incomes ranging from $45,000 to $60,000. There were no statistically significant differences in the levels of awareness and knowledge among the participating parents who answered the survey's questions as related to income.

Gender and urbanicity did not present significant differences regarding AKA among all the participating groups. Ethnicity, however, did show significant differences in the level of knowledge and attitude among some of the groups. Caucasians scored higher levels for knowledge (M= 64.0%) and attitude (M= 71.6%) when compared to the scores of African Americans in regard to knowledge (M= 53.0%) and attitude (M=63.1%).

The comparison of entertainment activities among all the participants revealed no statistically significant difference in the levels of awareness. However, there were significant differences with respect to the levels of knowledge and attitude. Those who preferred outdoor activities (M= 67.7%) showed higher scores than those who preferred social activities (M= 59.3%) as forms of entertainment. Similarly, significant differences were found in the levels of attitude among individuals that found gardening (M= 76.8%) the choice of entertainment scoring higher attitudes levels than those who chose sports (M= 68.9%).

Research Question Number Four: What is the self-efficacy level of AKA among the different groups studied?

ISSN-2230-7540

The self-efficacy level was measured with questions from the instrument that measured a personal perception of effectiveness regarding awareness, knowledge, and attitude. Results from the statistical analysis revealed a significant difference in the higher levels of environmental specialist (M= 78.9%) and for H.S. instructors (M=68.3%) when compared to the lower levels presented by the H.S. student group (M= 63.7%) and even lower levels for the parent group (M= 60.7%). Among the items measuring self-efficacy were: (a) There is a lot I, as an individual, can do to protect the environment in my community; (b) One person can influence how environmental problems and issues are resolved; and (c) Personally, working as an individual and on your own, can influence the solution of environmental issues.

According to Bandura (1997), there are four influences upon a person's self-efficacy. These include mastery experiences, vicarious experiences, social persuasion, and physiological/emotional states. Given the ranking of self-efficacy results across study groups from experts to parents, it may be interpreted that individuals having more mastery and vicarious experiences had higher self-efficacy as related to environmental issues, while students self-efficacy may have been based upon the social persuasion of H.S. instructors.