Journal of Environment and Earth Science
ISSN 2224-3216 (Paper) ISSN 2225-0948 (Online)
Vol. 3, No.5, 2013

Perceptions of Students on Environmental Challenge Issues

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Abstract
The purpose of this study was to investigate student's perception of environmental challenge issues and its implication for science education.
A standardized ROSE (Relevance of Science Education) survey questionnaire related to environment on 4-Point Likert-type scale was administered to 500 form three students of Sekondi-Takoradi Metropolitan Authority (S.T.M.A) Senior High Schools. The data were subjected to descriptive statistical analyses and an independent sample 2-tailed *t*-test was used to explore the statistical significance at $p \leq 0.05$. The findings revealed that although young people were overwhelmingly optimistic about the future, environmental issues are clearly of concern to them. The results also revealed that students in S.T.M.A. believed that they had a role to play in protecting the environment. The major findings of the study were that most boys and girls in this study strongly agreed that learning about the environmental challenge issues would prepare them for the future and that people should care more about the protection of the environment. They also agreed that something can be done to curtail the drastic alteration of the environment. Both boys and girls agreed that science and technology can solve environmental problems. The responses to this statement appear to show that the respondents have a high level of confidence in the ability of science and technology to solve environmental problems. They disagreed with the statement that threats to the environment were not each and everyone's business and also disagreed that environmental problems should be left to the expert as can be seen from the low agreement level to both statements. There was a significant difference between boys and girls views on I know the earth is in trouble but don't really care with a p-value of 0.031.
Keywords: Environment, challenge, management, education, earth

Introduction

It is a fact that the earth's climate has not always been as it is today. Over the years, human alteration of the earth has been substantial. Almost half of the land surface has been transformed by human activities, the carbon dioxide (CO_2) concentration in the atmosphere has increased by nearly thirty (30%) percent, (Vitousek, Mooney, Lubchenco, &Melillo, 2000).
However, some of the changes that occurred to the environment seem to be inevitable since they were effected to satisfy basic human needs continuous demand for modern amenities, convenience, the move towards high technology for industrialization and economic development have created growing environmental crisis (Metcalf,1977).
Over-population and waste are some of the major challenges facing our generation (Pickering & Owen, 1994).
There are large numbers of people who will not agree (through religious beliefs) that over-population is a problem. These people believe that the real problem is the management of the resources on the earth surface and not the number of people. (Pickering & Owen, 1994).
Ghana is endowed with abundant natural resources from which many of its inhabitants derive their lively-hood. In the process of exploiting these resources to meet social and economic needs, adequate care is not taken to guard against the depletion of the resources resulting in environmental deterioration (EPC, 1994). Environmental deterioration involves changes in the natural resources and these changes are due mainly to human action rather than some natural catastrophe. Deforestation, air pollution, degradation of marine and coastal resources, declining availability and quality of fresh water, loss of biodiversity and industrial pollution are the result of development without environmental accounting (UNEP, 1991). This has given rise to a host of environmental challenge issues. In addition, solid and liquid waste disposal have not been adequately controlled and managed. The result is that our towns and cities have piles of refuse in addition to blocked drainages. There is the urgent need to protect the environment while at the same time exploiting these natural resources judiciously for social

and economic growth to avert any environmental crisis. These problems are likely to intensify during the lifetime of students still at school and will affect their lives (Carson, 1978).

If students are to participate fully in solving environmental problems today and the future, then they are to be involved matters. Environmental education is to make individuals and communities understand the complex nature of the natural environment and how to behave responsibly towards it. Government and educational institutions have jointly been initiating environmental education programmes aimed at teaching individuals and communities to respect their environments. Some of these initiatives are aimed at sensitizing society on the dangers of environmental degradation. This is meant to empower the citizenry to take individual and collective actions to protect the environment and ensure that the responsible authorities take appropriate action. Environmental education has been recognized as the most promising approach to eradicate ignorance and to provide a logical basis for making intelligent choices among alternatives in environmental protection (Bennett, 1974; Disinger, 1982).The purpose of the study was to investigate students' perception of environmental challenge issues and its implication for science education. The outcome of the study will contributes to the knowledge base about pupils understanding of environmental education and also to identify pupils' perception about the environment (Payne, 1998). It is hoped that students in the Sekondi-Takoradi Metropolitan Assembly may achieve the development of informed opinions that respect the values of sustainable development.

Research Methodology

Sample

The sample for the study consisted of fifty (50) third year science students from each of the ten (10) senior high schools selected from the 11 schools in Sekondi Takoradi Metropolitan Assembly. The total number of students in the sample were therefore 500. Third year science students were selected because at that level, the students would have covered part of the syllabus which deal with environment and are likely to appreciate the question better. The eleventh school was not included because it was used in the trial- testing of the instrument.

The stratified random sampling method was used to select students within the sampled schools. In all the senior high schools three (3) science students were assembled and grouped according to gender. Each class was made to count serially and the subjects for the study were selected using systematic sampling method. The stratified random sampling ensured a fair gender representation.

Research instrument

The main instrument used was a questionnaire. The questionnaire was adopted from Relevance of Science Education (ROSE) instrument (Schreiner & Sjoberg, 2003). One of the questionnaires of the ROSE instrument which focused on issues of the environment was adopted. The ROSE instrument was constructed for an international research project for which Ghana was part.(Anderson, 2006).

The ROSE instrument was designed for exploring the variations in affective domains of science educational objectives, such as variations in interest, experience, perception and attitudes towards science learning.

Data collection and Analysis

The data were collected over a period of two weeks in September 2008.

The instrument was administered to 500 students of which all the items were responded to and the data was statistically analysed using SPSS for windows 10.0 and excel.

An independent sample 2-tailed was conducted to explore the statistical significance of the difference in the item mean for boys and girls. The conventional P<_ 0.05 level of probability was used as the basis for reporting the difference in means between boys' and girls` scores. The mean scores for each variable were calculated for all the groups. This gave a better insight of students` engagement with environmental protection and challenge issues.

Results

Mean scores were considered for each item. Therefore a mean value less than 2.5 showed some level of disagreement with the item and a mean value of 2.5 represents a neutral position for an item. Table 1 presents the descriptive statistics summarizing the responses to the 16 statements relating to "Me and the environmental challenge" and additional four items relating to the environment were also included. Gender differences in these responses, together with an indication of this statistical significance (Mean, Standard deviation and P-Value) are presented in Table 1.

The results showed that, girls disagreed more strongly than boys that environmental problems are exaggerated (item3).They also agreed more than boys that science and technology can solve environmental problems (item 17). Responses from both girls and boys to item 17 appear to show that, the respondents have a high level of

confidence in the capability of science and technology to solve environmental problems. Girls also disagreed more strongly than boys that "people worry too much about environmental challenge issues" (item 6). On the other hand, boys disagreed more than girls that "environmental problems can be solved without a big change in our way of living" (item 9). However, both boys and girls in this study were in agreement that "environmental problems make the future of the world look bleak and hopeless" (item16). But they also believe that "We can still find solution to environmental challenge issues" (item 4).

Table1. Students Perception towards the environment

Items	Girls	Boys	Mean Difference	
	Mean(SD)	Mean(SD)	Girls-Boys	p-value
3.Environmental problems are exaggerated	2.08(0.402)	2.50(0.686)	-0.42	0.27
4.We can still find solutions to our environmental problems	3.91(0.424)	3.75(0.615)	0.15	0.92
5.People worry too much about environmental challenge .	2.49(0.794)	3.31(0.754)	-0.83	0.39
6.Environmental problems can be solved without a big change in our way of living.	1.94(0.764)	1.90(0.926)	0.04	0.65
16. Environmental problems make the future of the world look bleak.	3.32(1.133)	3.26(1.255)	0.06	0.27
17. Science and technology can solve all environmental problems	2.78(1.048)	2.69(1.224)	0.09	0.77

Table 2 Gender differences in pupils' views about environmental challenges

Environmental concern	Girls	Boys	Mean Difference	
	Mean(SD)	Mean(SD)	Girls-Boys	p-value
1.I can play part in protecting the environment	3.87(0.154)	3.42(0.515)	0.45	0.57
2.Threats to the environment are not my business	1.33(0.365)	1.30(0.512)	0.22	0.18
3.Environmental challenge issues are exaggerated	2.08(0.402)	2.50(0.686)	-0.42	0.09
4.We can still solution to environmental challenge issues	3.91(0.424)	3.75(0.615)	0.15	0.92
5.I am concerned about the environment and reusing is one way that I can make a difference	3.68(0.621)	3.54(0.669)	0.14	0.91
6.People worry too much about environmental challenge problems	2.49(0.794)	3.31(0.754)	-0.83	0.39
7.I know the earth is in trouble but don't really care	1.50(0.739)	1.86(0.664)	-0.35	**0.031**
8.I take steps not to damage the environment	3.69(0.746)	3.76(0.664)	-0.07	0.87
9.Environmental problems can be solved without a change in our way of living	1.94(0.764)	1.90(0.926)	0.04	0.65
10.It is the responsibility of rich nations to solve environmental challenge issues	1.47(0.852)	1.77(0.494)	-0.30	0.31
11.I consider environmental				

challenge issues as a serious problem	3.71(1.040)	3.50(0.988)	0.20	0.93
12.Environmental problems should be left to the expert	1.34(1.034)	1.37(0.869)	-0.02	0.64
13.Nearly all human activities are damaging to the environment	3.10(1.132)	3.26(1.050)	-0.16	0.67
14.I am willing to have environmental problems solved even if this means sacrificing much of my time	3.55(1.302)	3.66(1.109)	-0.112	0.94
15.Learning about environmental challenge issues prepares me for the future	3.87(1.280)	3.82(1.164)	0.05	0.81
16.Environmental problems makes the future of the world look bleak and hopeless	3.320(1.133)	3.256(1.255)	0.06	0.27
17.Science and technology can solve all environmental problem	2.78(1.048)	2.69(1.224)	0.09	0.77
18.I can personally influence what happens to the environment	3.37(0.914)	3.14(1.146)	0.23	0.68
19.People should care more about the protection of the environment	3.98(0.840)	3.88(0.780)	0.09	0.83
20.I am optimistic about the future	3.79(0.757)	3.54(0.740)	0.24	0.96

From Table2 both boys and girls were in agreement with all the statements apart from "Threats to the environment are not my business", "I know the earth is in trouble but don't really care", "Environmental problems can be solved without a big change in our way of living", "It is the responsibility of rich nations to solve environmental challenge issues", and "Environmental problems should be left to the expert".

Most boys and girls in this study strongly agreed that learning about environmental challenge issues would prepare them for the future and that people should care more about the protection of the environment. They also agreed that something can be done to curtail the drastic alternation of the environment.

They disagreed with the statements that threats to the environment were not each and everyone's business and also disagreed that environmental problems should be left to the experts as can be seen from the low agreement level to both statements. However, boys disagree more than girls that the threats to the environment are not their business. There was a significant difference between boys and girls views on I know the earth is in trouble but don't really care with a p-value of 0.031.

Discussion

The results in Tables 1 and 2 make it clear that both boys and girls think they have role to play part in protecting the environment. They also say they can take steps not to damage it and even want to preserve it for future generation. These findings are in line with results from Malaysian students' perception of environment. (Thang, 2006). The Malaysian study reveals that both boys and girls are concerned about the environment. Schreiner & Sjoberg also confirmed pupils' general concern about the environment (Schreiner & Sjoberg, 2003). Furthermore, results indicated that both male and female students showed a considerable measure of agreement with the statement that, we can find solution to environmental concern. However, the mean value describing female environmental responsibility is higher than their male counterparts. These results supports the survey report by Uitto, and associates (2004) that Finnish 9th grade comprehensive school student girls' attitudes towards environmental responsibility were higher than their boys. It appears environmental challenge issues are cross-cultural (Szagun & Pavlov, 1995) and hence environmental matters are a global concern for the young learners.

Anderson (2006) also indicated that both boys and girls in the Central Region of Ghana would want to practice good environmental behaviour and appear to associate themselves with the statement that people need to care more about the protection of the environment.

Students were also in disagreement with the statements that it is the responsibility of rich nations to solve the environmental problems of the world and also to leave environmental problems to the experts. This finding is

in agreement with a study involving elementary school children of United Kingdom aged between 11 and 13 years. All the children stated firmly the individual's responsibility for the environment and not others or the government (Bonnet & Williams, 1998). But students in this study showed a higher level of confidence in the capability of science and technology to solve environmental problems.

Moreover, the present study suggests that both boys and girls agreed with the statement that the earth is in trouble but were optimistic about the future of the planet. Hence they were willing to contribute their quota to the protection of the environment. This agrees with Thang (2006) that students in his study are concerned about the earth and therefore would like to take steps not to damage it and to conserve it for future generation.

Conclusion

Environmental challenge issues in Ghana deserve great attention. The problem is complex and cannot be solved and tackled from one perspective. Education on the subject and sensitization of the people especially the younger generation is one of the key ways to address some of the environmental problems. It is important that school children be trained to practice and transfer what is acquired in the classroom to their homes in every day activities. It is believed that this study would be of use to policy makers, as they make policies concerning the environment. Educationists and curriculum developers may find the findings of this study useful in planning environmental education programmes for schools.

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