
ANALYSIS OF PUNJAB TEXTBOOK OF GENERAL SCIENCE IN CONTEXT OF ENVIRONMENTAL EDUCATION AT 8TH GRADE

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ABSTRACT

The current research was carried out to analyze the content and to assess teachers' perception regarding content of general science textbook at the elementary level for grade 8th in the environmental education context. For content analysis general science recommended by Punjab Textbook has been taken. For getting teachers perception, five-point Likert scale was utilized which consisted of 27 statements under the consideration of three components of Palmer's teaching and learning model a) education about the environment b) education in or from the environment c) education for the environment. The outcomes of the research showed that activities of the content related to environment are more emphasizing towards psychomotor domain instead of equally focusing all domains. On the other hand, teachers' perception indicate that more improvement is needed in textbook in relation to providing opportunities to boost the skills, knowledge, attitudes among students in order to protect the environment. For instance, an environmental day can be organized in which awareness, knowledge, skills related to environment are provided.

KEYWORDS

Environmental Education, Textbook, General Science, Grade 8th

INTRODUCTION

Different people have different perspectives and different definitions regarding the origin of the word “environment”. Usually, whenever the word environment is utilized, we suddenly think about the nature and outdoor but actually these two are the elements of environment. Environment is beyond these two components. The word “environment” comes from the French word “Environner” which means surroundings (Brennan & Withgott, 2007). According to Igbokwe (2012), environment is totally based upon our surroundings which include living things (a biotic factor) and non-living things (biotic factors) and these things contribute to construct environment and cities. In a very comprehensive sense, the environment based upon a complicated network of relations in terms of political, social, ethical, economical that form our lives on a daily basis. Education regarding environment is different from other form of education. It is very comprehensive and long lasting process of learning through which a responsible individual who investigate and classify different environmental problems and then indulge himself in problem solving process and find solutions in order to improve the environment is created. By virtue of this, deeper understanding and awareness is built in individuals regarding environmental problems and for this purpose, making responsible decisions to resolve the environmental issues he utilized his valuable skills (Abbud, 2018).

According to Designer (2005), in terms of definition environmental education, it is such a challenging field that no one definition shows harmony or unity. There is difference occurring among environmental education definitions and approaches from culture to culture and it shows different relationship with their environment (Russell, Bell & Fawcett, 2000). For example, some definitions explained the goals and aims of EE. In Tablisi Declaration, the goals of environmental education are to promote awareness about environmental education and provide opportunities to individuals to get knowledge, skills, values, and attitudes through which they save and improve the environment and formulate the new behavior models towards environment. The declaration also classified the objectives of environmental education in terms of awareness, knowledge, attitudes, skills, and contribution (Shalash, 2015). According to North American Association for environmental education (NAAEE, 2001), environmental education is a broad process that produces a person who is knowledgeable regarding environment and also helps people to recognize and solve the environmental issues.

There are many reasons which create environmental problems in which most important are lack of awareness, information and understanding about the environmental issues. Most of the people don't have knowledge that they are affecting and generating environmental issues by themselves (Yousoff, 2018). According to Yousoff (2018), the Stockholm Conference which was held in 1972 emphasized that a mid of environment and society there is a strong relationship exist. In this situation education plays his role to foster new behavior pattern. By virtue of education, a man utilizes his capacities in order to bring positive modification in environment. So, for this purpose, environmental education and training is important to create awareness regarding poor degradation of environment. According to Hasslof (2015), the content of environment should provide awareness to students. By doing this, students not only contribute to avoid the injurious environmental consequences, besides this education should highlight that how can students modify their society and living standard for creating sustainable development.

Now a days, efforts are going in every country to combine environmental distress with education. With the help of environment, it is very easy to teach students about pollution, disappearance about animals and plants, reducing resources etc. So, here environmental education appears as an investment which will give tremendous results with passage of time. Moreover, due to modern technology children stick to stay home and don't interact with nature and explore the issues about environment. So, in this scenario, it is very important to give environmental education to buildup children environmentally knowledgeable because it is the duty of the whole society to save and care environment and this duty is not related to just particular group (Koner, 2017).

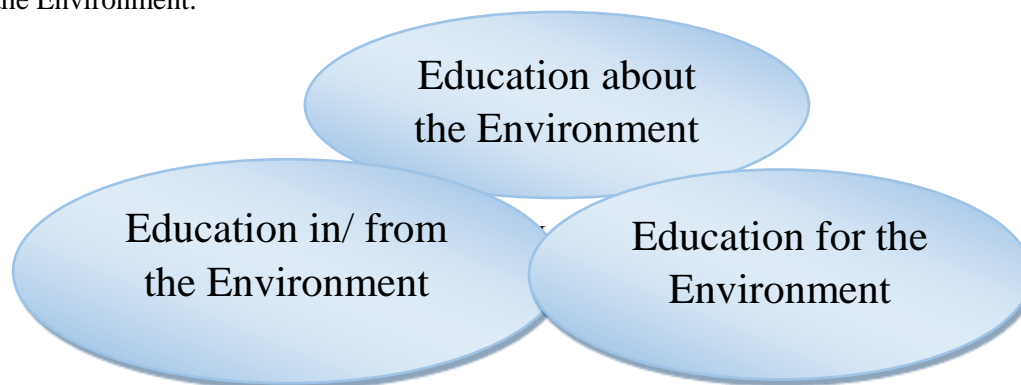
According to Erten, Sen & Yuzuak (2015), today's different sort of modern instruments are used in educational field like smart boards, tablets etc. but among all of these, the books in printed form are the most favorite instrument by teachers or educational organizations. The textbook must fulfill the eligibility criteria in terms of their task regarding environmental education, and must have the proper figures and contents in terms of environmental education. As Bekiroglu (2007) and Unsan & Gunes (2003), said that textbook is such an influencing instrument that is used by the teachers which explained the topics and objectives related to that topic briefly. According to Erten, Sen and Yuzuak (2015), for the textbook assessment, two features are considered firstly content analysis and secondly, visual assessment. For content analysis, it is checked that content must be relevant to the objectives. It provides the relevant information to students' etc. and for visual assessment, we evaluate the size, font size, pictures description, color etc.

According to DSO (2012), at every level of education science is considered as one of the most important components of curriculum. With the help of science, students are able to get knowledge and awareness regarding environment or surroundings. For this purpose, they should get that knowledge which is related to their practical life. In the teaching of the science the principles of environment are the most important standard of it.

In south Asia region, Pakistan population is considered highest among others. By virtue of pollution health of human and standard of life has affected dangerously. For instance, diseases like asthma, cancer are being occurred due to this. In Pakistan, the major environmental challenges are air pollution, shortage of drinking clean water, unhygienic conditions etc. In urban areas, approximately 35% population is being lived in which people who are poorer, they suffering the air pollution at highest level (Maryam, 2018).

In society, young people are considered as a role model because they are very responsible, socially energetic, and passionate and have well command on technology as well (Salahuddin, 2014). In Pakistan, the population of youth based upon 35% (Iqbal, 2017). In the context of environment a change can be brought with the help of youth because their participation and concern towards environment protection would bring great impact in society (Ahmed, 2017).

The study is based upon the model which is related to the Palmer's idea which was published in 1998 and it is called a model for teaching and learning in an environment education project. This model is based upon three components which are (1) Education about the Environment, (2) Education in or from the Environment (3) Education for the Environment.



LITERATURE REVIEW

The development of environmental education occurred in the era of 1960 when the awareness regarding environmental issues emerged whereas some people believed that environmental education developed by virtue of the movements that were emerged at the start of the last century, for instance, nature study, conservation, and outdoor education etc. Generally, different authors have given different interpretations regarding history of the emergence of the word Environmental education and its definitions (Bartosh, 2003).

Designer (1983) said that international union for the conservation of nature and natural resources was held in 1948 where the term environmental education was first time introduced. Whereas, according to Gough (1983), Palmer (1997, 1998) and Sterling Copper (1992) that in the last of 1960, the definitions about environmental education come in to view when on the international platforms, environmental education as a term was utilized and talked about. As Stapp *et al* (1969) said the process of environmental education involves creating a citizen who has environmental knowledge and problems associated to it and has awareness how to sort out them. Moreover, has motivation or dedication for solving them. The most famous definitions about environmental education among others was given by Tbilisi Declaration in the international conference on environmental education which was conducted by United Nations Education, Scientific, and Cultural Organization (UNESCO) with the association of U.N Environment Programme (UNEP). As this declaration said that environmental education is the process of learning which expand the knowledge and awareness of people regarding environment and different issues linked to it and build appropriate capabilities and skills to tackle these issues and promote dedication, passion to formulate appropriate decisions and take steps with full responsibility (Bartosh, 2003).

In Pakistan, environmental education is very important because due to increase in population, number of environmental problems are being emerged day by day. For instance, insufficiency of water occurred. Only 58% people get facility of fresh and clean water. Due to over population, traffic has been increased in cities which create air and noise pollution. Moreover, there is lack of awareness among people of Pakistan regarding how to protect environment, which may also contributing factor for environmental problems. So, environmental education is very important in this regard which generates awareness among people that what sort of consequences would occurred due to our actions. For this purpose, Ministry of Education get authority by Federal Supervision of Curricula, Textbook Maintenance of Standard of Education Act 1976 to monitor the curriculum and textbook and constructed according to the

academic and social demands. Due to 2010 Act, it is responsibility of all provinces to include Environment Education Separately as a subject in order to sort out the problems of environment (Ijaz, 2015).

Models in the Context of Environmental Education

There are number of environmental education models in which most well-known models are:

The 3-Dimensional Model, which was advised by UK council of school in 1974, which was included by different researchers in their work for instance Palmer (1998), Uzzel (1999) etc. This model based upon three elements education about environment, education for environment and education through/ in environment.

In 1997, Giolitto *et al* had given a model which was called static model which is based upon three elements i.e. cognitive, ethical and action. Cognitive relates to the development of knowledge and awareness regarding environment. On the other hand, ethical elements based upon the emergence of values and the action element based upon to develop the behavior and optimistic attitudes regarding environment.

In 1992, Sterling and Cooper had given model which is called linear model. This model starts from awareness then, moved towards understanding and knowledge then values, attitudes, and skills and finally reached on the action.

In 1994, Kilmov and Ukolov had presented another model which is related to ecological education. This model was based upon four elements i.e. cognitive, normative, values and action. The cognitive element related to the basic knowledge and understanding about that how man interacts with the environment, what are the aims and goals in order to protect the nature and what are the environmental issues globally and how to tackle them. Whereas, values related to the persons capability to control the activities by human and to predict what sort of different changes emerged by virtue of these activities. Normative element based upon the norms in order to use the environment in terms of ethically, aesthetically and ecologically. The element of action supposed to build such type of skills among students they are able to assess the situation and select the solution and to develop the personal characteristics of student.

In 1998, Palmer proposed that in order to develop the environmental education, it is very important to utilize the dynamic model instead of static model. The main difference in this model as compared to other one is that this model is based upon “formative influences” which is the blending of academic education and personal experiences. Without this element it would be difficult to see emerged knowledge

skills and values which will develop ethics and awareness in terms of environmentally because it is ought to consider as a fundamental part for the thriving of the environmental education process.

Number of studies conducted in terms of environment and content analysis of textbooks in the perspective of environmental education. For instance, a study was conducted by Sultan Alam in 2017, titled *Environmental education: Role of physical environment in students learning in Gilgit Baltistan, Pakistan*. The study had presented a report which is conducted in one of the school managed by community in Gilgit Baltistan, Pakistan. The focus of the study is to discover the impact of the activities for creating awareness about environment. The study illustrated that school conduct small based activities which bring drastic change in students, teachers, and participants of community. These activities include celebrating environment day, plantation day, and campaigns which builds awareness etc. With the help of these activities, realization emerged among students regarding to give importance to environmental education. This study also showed that there is also change occurring in the attitudes of teacher, students and community members. The study suggested that the active participation of school stakeholders and community must be take place in order to expand the process of learning.

The study named *Environmental Education improving student achievement* conducted by Oksana Bartosh in 2003. The study moved around to see to what extent environment education program would have impact on the achievement of the students. Under this study, comparison occurs between two schools. A one school was that one where for three years programs of environmental education fully executed whereas on the other side, a school where no any sort of the program of Environmental education was conducted. The data was analyzed under this study statistically. The results showed that students got higher score where the fully environment education program was implemented, as compared to that school where no Environmental education program implemented. The study concluded that there is relationship exist between environment education and achievement of students.

The study of *Analysis of Environmental Education components in the existing textbooks from class V to VII developed and adopted by the state council of educational research and training, Assam* was conducted by Siddhartha Sarmah and Dr. Sailendra Bhuyan in 2015. This study emphasized on the analysis of the textbooks about environmental education which were constructed for class V and VII at the elementary level by State council of educational research and training Assam. This study was actually based on content analysis. The content material was studied by the researcher

very carefully and he had given more focus towards those topics which were related to the environment with the association of environmental education curriculum. The study outcomes showed that in the school, environmental education content is not enough in order to achieve all environmental education objectives. The textbooks of Social science, science, and language had more focus towards cultivating the mental abilities among students and partially, the affective and psychomotor domain objectives have been focused.

A comparative survey of Environmental Education goals between the UNESCO framework and the 10th grade Palestine Curriculum was another study which was conducted by Muneer Jebreel Karama in 2016. The purpose of the study was, with reference to the international perspective, analysis of the objectives of the environmental education in the 10th class Palestinian textbook or to make a comparison between UNESCO goals about environmental education and the Palestinian 10th grade curriculum. In this study, the standard instrument was framework by UNESCO and the analysis of the books was conducted in the light of this instrument. The results of the study showed that there is consistency existing between few objectives of UNESCO framework and the 10th class Palestinian textbook but in some objectives, there is not any sort of consistency exist between both of them. So, the researcher suggested that there is need to bring modification in the 10th class environmental education for improving it, according to the environmental framework, which was given by UNESCO.

The study named *Content Analysis of Environmental Education textbook of primary stage in school of Rajasthan* conducted by Shivendu Prakash in 2011. The study was based on the content analysis in which researcher at the primary level form the grade III to grade V in the school of Rajasthan, search out the environmental education textbook pattern. Researcher analyzed each chapter themes and sub themes, chapter representation in the context of diagrams and analyzed the practical exercises as well. The outcomes indicated that there is much modification is needed in terms of showing diagrams, quantity of examples, content nature, and allocation of questions on the basis of domains when doing exercises.

The study named *Environmental Education in Iranian school curriculum: A content analysis of social studies and science textbook* conducted by Salmani, B., Hakimzadeh, R., Asgari, M., and Khalsghinezhad, S.A. The purpose of the study is to analysis of the content of the 6th grade social studies and science textbook on the basis of three fields of Environmental education, Ecology, Environment and human activity. Under this study, the analysis was related to the questions, pictures, texts, and exercises. The

results showed that in the science textbook, more emphasized given towards human activity and environment whereas in social studies, more emphasizes was given towards ecology. Therefore, it is concluded that three fields of environmental education were not presented in similar way. So, there is need to bring improvement so they would be more comprehensible for the students.

RESEARCH OBJECTIVES

1. To assess teachers' perception about role of General Science textbook of Grade 8th in acquiring knowledge, skills and attitudes among students regarding Environmental Education.
2. To analyze the content of General Science Textbook of grade 8th with reference to Environmental Education.

RESEARCH QUESTIONS

1. What is the perception of teachers about the role of general science of grade 8th in order to acquire knowledge, skills, and attitudes regarding environmental education?
2. How much content is presented in General Science Textbook of grade 8th with reference to environmental education?

RESEARCH METHODOLOGY

The data under this study was collected with the help of two methods 1) Through content analysis 2) Through teachers' perception. In order to get teacher's perception a closed ended questionnaire was constructed which was based upon Palmer's model of teaching and learning. The population of study consisted of public sector school teachers who were teaching general science textbook at grade 8th level in the tehsil Rawalpindi, Province of Punjab. In Rawalpindi tehsil, there were 160 schools which comprised 4160 teachers. For the collection of data, firstly permission was taken from the chief executive office of education Rawalpindi and collected schools list from District education offices Rawalpindi. For sampling, 34 schools were taken in which eighty teachers were teaching general science grade 8th level textbook which was implemented by the Punjab textbook board Lahore. Simple random sampling technique was selected in order to select sample size. Self-constructed questionnaire which was based on 27 statements used in order to get the teachers perception regarding environmental education in the general science textbook at 8th grade. In order to analyze the content, a checklist was also utilized. In order to check the reliability, Cronbach alpha was applied. The reliability of the scale was .765.

RESEARCH FINDINGS**Table 1: Means Scores of Environmental Education Scale at Elementary Level**

S. No	Variables	Mean	Remarks
1	Education about the Environment	3.67	Agree
2	Education in/from the Environment	3.43	Neutral
3	Education for the Environment	3.50	Agree
Total	Environmental Education	3.5	Agree

Table 1 shows Means of Variables of environmental education at elementary level i.e. Education about the environment (3.67), Education in/from the environment (3.43), Education for the Environment (3.50). It is concluded that the Mean of Environmental Education is 3.5. Highest frequency mean score was observed against education about the environment (3.67) and lowest frequency mean was observed against education in/from the environment (3.43). This table also indicates that mostly teachers agreed regarding “Education about the Environment”.

Table 2: Frequency of Environmental Photographs with Reference to Grade 8th General Science Textbook

Content of Photographs	Frequency of Photographs
Natural	18
Non-natural	7
Environment improvement projects	0

Table 2 shows the frequency of environmental photographs with reference to grade 8th general science textbook. The table further indicated that there were 18 environmental photographs that are naturally whereas 7 photographs are those which were artificial and on the other hand, there are zero photographs are those which showed environment enhancing projects. This result also indicated that a textbook is based on natural photographs.

DISCUSSION

The mean of education about environment was 3.6 so it means that general science teachers inculcating knowledge, awareness about environment and develops understanding about environmental issues among students by using textbook whereas developing skills among students in order to sort out environmental issues is concerned, the teachers remained neutral which indicates that they do not agree that with the help of textbook, skills are developed among students because mean of the education in or through environment was 3.43. It shows that students are not involved

in those activities which are given in the book or in other words, there is no practical implementation of those activities in schools. The mean of the education for the environment was 3.50 which shows that teachers either male or female agreed that textbook of general science provides help in order to build attitudes among students towards environment and students are passionate, motivated to sort out their environmental challenges and give protection to environment. Sarmah. S and Bhuyan. S (2015) investigated that from grade V –VII, the content of different textbooks with reference to the environmental education had given more emphasis towards boosting cognitive abilities among students. So it was recommended to give equal focus towards all three domains; cognitive, affective and psychomotor domains respectively.

As Erten, Sen and Yuzuak (2015), said that for assessing textbook along content analysis, visually assessment is also undertaken. So, visual assessment of the lesson related to environmental education is concerned. It was based upon 25 pictures that were divided in to 3 sections 1) natural 2) artificial and 3) environment enhancement projects pictures. According to Karama, (2016) natural photographs meant by those pictures which are based upon natural scenes and taken with the help of camera whereas figures or diagrams are called artificial photographs. On the other hand, environment enhancement projects pictures are those pictures which show before and after changes or which show some modification occurred in environment scenario. So, the chapter had 18 natural and 7 artificial photographs and there were no environment enhancement projects photographs exist in the chapter. These pictures or diagrams were according to the content and cover up the demands of the content. The diagrams were quite visible and colorful as well.

As far as the content analysis of grade 8th. General science textbook is concerned. The entire book was based upon 12 chapters in which only one chapter was related to the environmental education. The chapter associated with the environmental education was chapter 4 named “Pollutants and their effect on Environment”. The lesson gives us knowledge about what are the sources, properties and hazardous effect of pollution, how air pollution can be a reason for generating different human organ system problems and what are the effects of human activities on environment. Green house had also been explained in this lesson. Moreover, the cause and effects of ozone depletion had also been highlighted in this chapter. Furthermore, the lesson moved around how rain of acid is formed and what is the impact of this on human and non-human living things. The lesson had also illustrated deforestation and its effect on the environment. Illustration regarding the importance of natural and human resources protection globally and locally has also discussed. At the end of the lesson, the suggestion had also been given in order to overcome the air pollution.

Examples were not significantly used in the chapter although proper punctuation was used wherever it was needed. Content was appropriately paragraphed with no irrelevant information. The content language was not easy and organized. The print size and pattern was appropriate although there is need to be more appealing and attractive. Where there is need of information, it must be mentioned side by side. Tasks were not according to the mental level of the students. These were beyond their mental and physical capabilities.

CONCLUSIONS

Mean of Variables of environmental education at elementary level i.e. Education about the environment (3.67) Education in/from the environment (3.43) and Education for the Environment (3.50). It is concluded that the Mean of Environmental Education is 3.5. It is concluded that teachers were agreed with environmental education.

The checklist about photographs about environment showed that there were 25 pictures existed in the environment related chapter in which 18 were natural photos, 7 were are based on non-natural pictures and the number of pictures that were showing any improvement in the environment was zero. It was also concluded that a textbook is based on natural photographs.

RECOMMENDATIONS

1. More chapters may be introduced in general science textbook of grade 8th level.
2. They may be needed to conduct more field activities in school in order to increase the awareness, understanding and skills among students
3. Schools should be responsible for conducting activities in schools regarding environmental education through community services programs.
4. Days can be celebrated in order to give awareness about environment and environmental issues. For instance, plantation day in which plants would dig, energy conservation day in which one hour we shut down lights in order to give awareness how much electricity is important for us and we need to utilize it sensibly.
5. Higher authorities may pass order to work on textbook activities by engaging teachers and students.
6. Under the “Green Pakistan Program”, higher authorities may involve students in this campaign so that students show their concerns towards environment protection.
7. In schools, activities may be conducted in which students make banners, charts, posters which may base upon those ways through which we can sort out pollution.
8. A study could be carried out at different academic levels from primary school to university in order to formulate the curriculum for giving education about environment.

9. In order to analyze the knowledge, skills and attitudes, a study could be organized among different members of society.

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