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## SUGGESTIVE WORKING GUIDELINE FOR DEVELOPING A SCIENTIFIC ENVIRONMENTAL AWARENESS PROGRAM FOR SCHOOL GOING STUDENTS

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### Abstract

In this study paper the investigator has tried to suggest a guideline for developing a program for environmental awareness of school going students of all levels. The steps are based on various principals and approaches of environment education given by experts of environmental studies. The stepwise procedure of development of program includes organization of content, managing materials and resources, selection of methodologies, construction of instructional sequence etc. This can be referred by any person like researcher, teacher, curriculum developer, member of NGO etc. who wishes to develop such a program for environmental awareness which is methodical, logical, scientific and flexible.

**Keywords:** Scientific, Awareness, Resources, Program, Methods.

### INTRODUCTION

Environmental awareness should be the integral part of any environmental curriculum encouraging children to take an active participation in the protection of their environment. Environmental awareness and environment education have become the need of the present time. The student community needs to be sensitized about the irreversible damage being caused to the environment and the ways and means to prevent them. Acquiring the required knowledge about environment, skills, attitude and values can arrest environmental degradation. Because, awareness leads to understanding and understanding leads to action. Thus, in the present study taken in hand by the investigator aims at providing a guideline for developing a holistic scientific program, which would be based on active learning strategy (participatory), action-oriented strategy, using Issue based approach, value clarification approach to enhance environmental awareness of students. Developing such a program for environmental awareness could redesign the environmental setting to foster teaching learning environment both in science courses and in other courses as well, such a program could also be significant for those NGOs which are working to spread awareness about environment in an informal way.

### STEPS OF DEVELOPING A HOLISTIC SCIENTIFIC ENVIRONMENTAL AWARENESS PROGRAM:

#### I. DETERMINATION OF POPULATION

First of all, it has to be decided about the target audience for the program. The program has to be age specific i.e., according to the physical and mental age, according to capability and interest of the students. Accordingly, evaluation should also be based on observational methods assessing students' interests, attitudes and personality traits.

#### II. DETERMINATION OF INSTRUCTIONAL OBJECTIVES FOR THE PROGRAM

Environmental Education (EE) is mostly considered as a process to develop awareness, knowledge and understanding about the environment, positive attitudes towards it, and commitment to protect and improve it. Thus, it entails development of major environmental concerns awareness, skills, problem solving, value clarification, attitude and relating concepts to local environment and resources. A few such objectives are given below

- To develop understanding among the students about the major environmental issues of the current world
- To assist students to further their understanding of major concepts basic to the development of an environmentally literate citizenry.
- To develop the study skills as mapping, collecting and classifying materials, experimenting, preparing interviews, questionnaires, reading of photographs and documents.
- To equip them with social skills which include attitude and respect towards environment and people.
- To prepare students to become actively involved in exploring and critically evaluating their environment and existing environmental problems.
- To prepare them to develop alternatives and plans of action for solving environmental problem
- To prepare them to weigh the pros and cons of various alternatives and then make environmental decisions.
- To develop their own set of values.



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### III. ORGANIZATION OF THE CONTENT

After referring several books on environment and going through the prescribed syllabus if any, content of program has to be decided. Aim should be that students must be made updated about the major issues which people all over the world are facing. Content of the program must be stimulating, interesting and need based.

### IV. STRATEGIZE LEARNING OPPORTUNITY

At this step it has to be decided that the learning will be traditional or activity - based or multimedia based, experimental or take place in a natural setting.

### V. DEVELOPMENT OF LESSONS / INSTRUCTIONAL SEQUENCE

Having organised the content to be taught, the next step is to decide teaching points under each lesson. The teaching points must be organised and put in such a sequence that simple and interesting things preceded to difficult and complex material. The next step is to determine related specific teaching objectives as well as learning outcomes for each teaching points.

### VI. SELECTION OF METHODOLOGIES FOR EACH LESSON

Environment awareness could be developed by adopting these methods for transaction of content. One or more methods can be adopted simultaneously

- i. **Class Discussions:** In this a topic or problem and the various aspects are discussed in the class. Sometimes children are given time to study and references are also cited. Main advantage is that it does not require much money and children are exposed to various aspects of the problem.
- ii. **Demonstrations:** In this method children are shown concrete objects or models in class. This helps in clear understanding of the topic in hand.
- iii. **Experimentation:** Experiment is the basic necessity of clearly understanding any scientific process. It ensures learning by doing.
- iv. **Small Group Projects:** This method is slightly more extensive for study. Here a class is divided into small groups and each group is assigned a project. The projects assigned to many groups may have some kind of relationship such as different aspects of one common problem. Children are given time to work on those projects and they finally report their own observations and conclusion to the whole class.
- v. **Outdoor studies:**  
Outdoor study needs planning and coordination among members of the study team. It may involve decision about aim of study, preparation, introduction of plan to children, field work, work in school, and drawing conclusions from observations. The teacher may also evaluate the work done and progress made by the teacher. Children's work may be study of different aspects of an interesting environmental object such as river, lake, village transact, cave, mud etc.
- vi. **Use of Exhibits**  
Exhibitions form another important medium of Environmental Education. An exhibition is organised to show the work done by the children on a particular theme, or work done by them under some projects. It may also be organized by some other agency. Personal hygiene, community health etc. can be themes of common interest.
- vii. **Role play/Simulation and Games**  
Games and simulations have intrinsic potential for motivation because Games require active participation of students, players get immediate feedback, almost all games require interaction among players and physical movement, games provide new and interesting way to convey information to children and through game activities the information is synthesized at higher cognitive level and it is easily available for analysis and application.
- viii. **Guessing Games**  
Everybody likes guessing games whether he is a child or an adult. Both chance and skill of asking questions play a part in finding the solutions. The basic rule of guessing game is that one person knows something that another one wants to find out. The thing to be guessed differs greatly from game to game. It can be something one player is thinking of, an object seen by one person, a word, an action or similar things.
- ix. **Interview, Questionnaires, Observation checklists**  
In Environmental studies the observations are recorded. Most of the observations may be factual records and numerical results. So, for recording these observations these techniques are very useful.
- x. **Brain Storming / Thinking Strategies**  
In the last decade Edward de Bono has repeatedly demanded thinking should be developed in schools. Its main intention is to change our rigid way of thinking and make us learn to think. Brainstorming mentioned by de Bono (1973) is a technique that has been used widely in psychology.



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## VII. MANAGING RESOURCES TO BE USED

Next step of program development would be managing the resources needed for transaction of the program

### (i) Resources of the locality

The resources of the locality may be in terms of material and personnel. Knamiller (1983) argues in favour of issue-based studies where issues are drawn from the locality or the community. This model assumes that issue base studies will help school leavers not only to be better at identifying, solving development problems but also will be motivated to do so.

### (ii) The School Ground

The school ground can be developed into an important study center with some planning and care. The children can conduct short term and long-term studies on plants and animals in the school ground.

### (iii) Equipment

Equipments are necessary for making accurate observations, collecting samples, measuring and recording. When students go to field study, they have to plan the kind of equipment that may be needed, if leaves are to be observed, these may be collected in plastic bags. While making the observations about Litters, hand gloves may be necessary. Much of the equipment will depend upon availability of material and the kind of study undertaken.

### (iv) Printed Words

These can be in the form of publicity materials, handouts/Xerox, posters, charts, reports and reference materials such as books and encyclopedias. They play an important role to guide the study and to draw conclusions. Magazines and newspapers also serve the useful purpose and are easily available.

### (v) Audio Visual Aids

Films, film strips, charts, personal slides, tapes and tape recorders are important resources which may facilitate the study. Sometimes a radio program or radio lesson or TV program can motivate the students or help them to conduct the study.

## VIII. DEVELOPMENT OF MULTIMEDIA MATERIAL

- i. **Environmental films**– These films are a good medium of interacting with students. They are easily available on the google search engine and can be downloaded from there.
- ii. **Animated videos** – Children specially of small age are interested in these animated videos. These serve as great medium of environmental awareness.
- iii. **Slide Shows** – Pictures showing various types of pollutions and alternative solutions can be of immense help to the program executer to make the program interesting.
- iv. **Posters and charts** –Handmade Charts and posters sending message are most recommended teaching aids which facilitate the study. They play important role to guide the study and draw conclusions.
- v. **Models** - Models help students understand abstract scientific ideas that cannot always be seen. A model helps to clarify thinking and resolve understanding. A model is best used after the scientific explanation. Modelling is an important part of scientific process. Example: model of green house, model of biogas plant, model of food pyramids.
- vi. **Flash cards** – Flashcards are small note cards. They are incredibly versatile study tool. They help to engross in active recall which teaches your brain to recollect a term, concept, or process without context clues.
- vii. **Power point presentations** - Apart from developing slide shows, adding web documentaries and other multimedia, power point presentations are also very useful for this.

## IX. DEVELOPMENT OF DISCUSSION QUESTIONS

Without evaluation the fruitfulness of any topic taught cannot be judged. The questions for evaluation should be formed under the heading ‘Discussion Questions’. These questions aim at developing critical thinking. Also, they cover the major points of whole lesson under these discussion questions.

## X. CONSTRUCTION OF MODULES FOR PROGRAM

A module aims at developing a clearly identifiable and certifiable portion of curriculum expressed in terms of competence objectives. The aims should be attained within a clear and realistic time limit. This time limit is a vital feature of the modular organization, since the entire program is built around the idea that time-spell, human and material resources should be spent to achieve probable results. A fruitful module is one in where the stated learning objectives and learning outcomes align with teaching activity and assessment (what has been called constructive alignment). Outline structure of the module is shown in following table:



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Table 1: Outline of Module of program

Topic	Teaching Points	Teaching Objectives	Teachers Activity	Mode of Teaching	Time taken	Learning Outcomes

**XI. Filtration Of the Program Through Expert’s Opinion**

After the development of the program, it has to be scrutinized by experts from different fields. Professors, teachers, researchers, principals can be better experts for giving suggestions for the improvement of the program.

**XII. FINALIZATION OF THE PROGRAM**

Based on the suggestions and personal conversation with the experts the program can be finalized and executed first on trial basis (pilot testing) and later on finally in real classroom situation.

**CONCLUSION**

The purpose of the present paper is to help researchers, teachers, environmentalists to develop a holistic scientific environmental awareness program, which would be activity based, self-investigative, interactive, thought provocative in nature. Developing such a program for environmental awareness could redesign the environmental setting to foster such teaching learning environment both in science courses and in other courses as well. Such a program could also be significant for those NGOs which are working to spread awareness about environment in an informal way. This can also be of immense help to conduct workshops or short-term training program for environmental awareness which is a contemporary need of society locally, nationally and globally.

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