

## ***Construction of Valid and Reliable Test for Assessment of Environmental Awareness***

**DR Manjul Gupta, Assistant Professor  
B.Ed. Department  
KNGPG College Gyanpur, Bhadohi U.P**

### **Abstract**

The study was carried out to construct valid and reliable test to the assess environmental awareness of adolescents. It is a comprehensive test of 75 test items under five categories i.e. Multiple choice Type, Completion Type, True / False Types, Attitude Scale and Short Answer Type. Reliability and validity of the test was determined on a sample of 50 adolescent girls. After qualitative item analysis, the result showed that Environmental Awareness Test has high content and face validity. The test has a reliability coefficient of 0.83 established through test- retest method. The test is valid and reliable for assessing environmental awareness of adolescents.

**Key Words :** Environmental Awareness, Construction and Test.

### **Introduction**

Success in research depends on the availability of instruments and techniques of sufficient precision to measure the phenomenon under study. The selection and development of research instruments or tools are the critical steps of any investigation, which call for a deep insight and perspective of the overall field on the part of the investigator.

To fulfil the purpose of the study researcher first of all studied the related literature in the field of environmental education and found that construction of valid and reliable test for assessment of environmental awareness has not been given enough attention. Search for the suitable tool to measure environmental awareness brought very few standardized tools to the notice of the researcher. Most of them did not serve the purpose of the present investigation as due to the following reasons:

1. Most of the test was prepared for the primary / elementary level.
2. Most of the test were not available in Hindi language
3. In most of the test concept of environmental awareness was not taken in a comprehensive perspective

Thus the decision was taken to construct the test for measurement of environmental awareness, keeping in view the objectives of the present study, age group and grade under investigation.

### **CONSTRUCTION OF ENVIRONMENTAL AWARENESS TEST**

Following steps were followed to construct the Environmental Awareness Test ( E.A.T. ) :  
**STEP-1.DETERMINING THE COMPONENTS OF ENVIRONMENTAL AWARENESS TEST**

First all the investigator carefully studied the concept of environment and explored its components.

The word ' Environment ' is derived from the French word **Environeer**, which means to encircle or surround. Environment can be defined as :

- 1 . The circumstances or conditions that surround an organism or group of organisms , or
- 2 . The complex of social or cultural conditions that effect an individual or community .

The word ' environment ' commonly means the surrounding but the very concept of the environment has meant different things to different people at different time.

**The United Nations Environment Program (UNEP)** has defined Environment as the outer biophysical system in which people and organisms exist.

**UNESCO and the International Association of Universities, 1986** has defined environment as the biosphere and its implications for mankind.

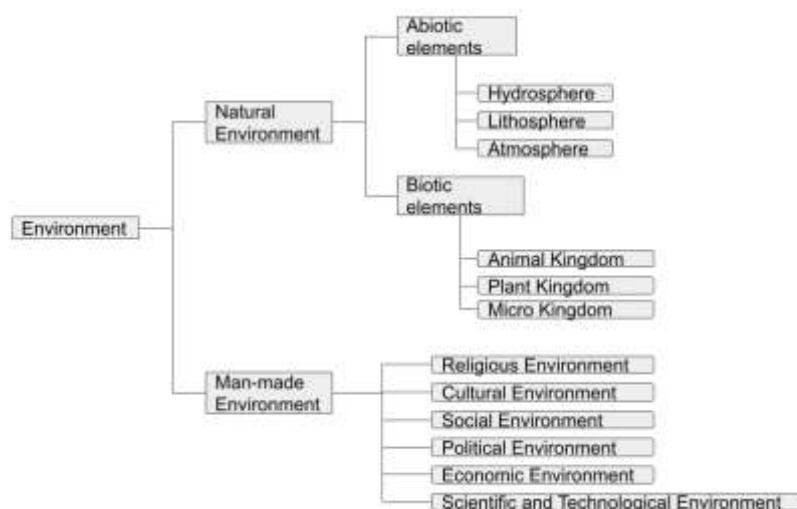
According to **Oxford Dictionary** ' the environment is the surrounding objects , circumstances of life of person or society " Environment is a word which describes in the aggregate , all in extrinsic forces , influences and conditions which affect the life , nature , behaviour , growth , development and maturation of living organism . "

**Holland et al.**

The most comprehensive definition of the environment came out in the work of the **Intergovernmental Conference on Environmental Education, Tbilisi, USSR, October, 1977**. In this context, the environment is considered to consist of a: " Whole set of natural and social systems in which the natural environment consisting of the four interlocking systems of the atmosphere, the hydrosphere, the lithosphere, and the biosphere is in constant change but the nature and system of such changes are affected by human activities. The social environment includes human groups, the material infrastructures built by man, and the production relationship an institutional system that he has devised. The social environment shows the way in which human societies have organized themselves and how they function in order to satisfy , first of all , needs relating to food , shelter , health , education and work . " **UNESCO , 1977**

No organism can live without an environment . Man is no exception ; dependence on environment is even more than other organisms . For man is more than a mere biological being . A civilized man requires more things for his comfort and safety than any other organism. He has developed an new kind of environment - the social and cultural environment in addition to the natural environment. This man - made environment ultimately depends and draws on the natural environment. To facilitate the study of the human environment, it is convenient to classify the environmental component in two broad categories:

- ( i ) Natural Environment
- (ii ) Socio-cultural or Man-made environment



**Figure 1: Components of Environment**

Both natural and man-made environments again have non-living and living components in them. These components are not mutually exclusive; they closely interact with one and other.

In the present context the environment encompasses everything, living and non living objects and the interaction between natural and man-made environment.

According to **The Random House Dictionary of English Language** awareness means the state of being aware, consciousness of a situation with direct attention.

Therefore, environmental awareness means consciousness of various components of environment, their interdependence, interaction and sensitivity towards their necessity to sustain life.

It was thus decided to construct an Environmental Awareness Test (E.A.T.) containing test items based on the following aspects of environment :

**1. Components of environment**

**(I) Natural Environment :**

A. Abiotic elements :

( i ) Hydrosphere

( ii ) Lithosphere

( iii ) Atmosphere

B. Biotic elements:

( i ) Animal Kingdom

( ii ) Plant Kingdom

( iii ) Micro Kingdom

**( II ) Man - made Environment :**

( i ) Religious Environment

( ii ) Cultural Environment

( iii ) Social Environment

( iv ) Political Environment

( v ) Economic Environment

( vi ) Scientific and Technological

**2. Inter - dependence of natural and man - made environment and importance of environment for man**

**3. Eco-System**

**4. Environmental Crisis :**

( i ) Population Explosion

( ii ) Urbanization

( iii ) Industrialization

( iv ) Deforestation

( v ) Pollution

**STEP-2.DETERMINING THE TYPES OF TEST ITEMS AND THEIR PREPARATION**

After deciding the components of E.A.T., the researcher studied the prescribed books of different subjects up to VIII standard and other sources like magazines and newspapers. After going through the test available in the field researcher took the decision to frame the various types of test items in E.A.T. viz.

1. Multiple Choice Type

2. True and False Type

3. Completion Type

For constructing the various test items following considerations were kept in the mind :

1. Due coverage and importance was given to each component of environment.
2. Emphasis was placed on knowledge of facts, concepts and laws related to environment.
3. The items on current issues were also added considering the fast changing scenario .

**STEP-3. THE PRELIMINARY DRAFT OF THE ENVIRONMENTAL AWARENESS TEST**

Initially 86 items were prepared for the Environmental Awareness Test. On the basis of types of items , test was divided into three parts i.e.

Part I - Multiple Choice Type

Part II- Completion Type

Part III - True/False Type

The distribution of the various types of tests - items in the preliminary draft of E.A.T. is presented in the table 1.

**Table1: Number of various types of tests item and their percentage in preliminary draft of E.A.T.**

S.N.	Types of Items	No. Of Item	Percentage
1.	Multiple Choice Type	55	64%
2.	Completion Type	15	17%
3.	True-False Type	16	19%
	<b>Total</b>	86	100%

**STEP-4. EXPERT'S OPINION AND SCREENING OF ITEMS**

The preliminary draft of E.A.T. was subjected to expert judgement where every item was required to be passed on its relevance to the content and criterion of environmental awareness. Experts' opinion were sought about the appropriateness and suitability of test items as well as to seek their suggestions for the improvement of the test. On the basis of suggestions given by the various experts some test items were modified, reframed and removed from the test.

Major suggestions of experts were to add an attitude scale and descriptive type questions in the test, to cover the affective domain because their view was that in dealing with environment ( nature ) heart is more important than head . On the basis of experts opinion and comments 26 items were deleted due to ambiguity and repetition and a five - point scale having 10 items and 5 short answered questions were added . Details of changes accreditation in the preliminary draft of E.A.T. are given below in the following table

**Table 2: Modification Made in the preliminary draft of E.A.T**

Number of Items which were framed or modified	Number of Items which were removed	Number of Items which were added
Part I-8 Part II-6 Part III-0	Part I-15 Part II-5 Part III-6	Part IV-10 Part V-5

**STEP-5.TRY-OUT OF THE TEST**

To ensure that the selected test items were according to the comprehension level of the subject, try-out was carried out on a group of 30 adolescents girls representing age group. Researcher enquired from the subjects about difficulties of test and then the few test items were further modified.

**STEP-6 ITEM ANALYSIS**

Item Analysis is very essential in test construction it means analysing each item of the test for its adequacy. Item can be analysed qualitatively; in terms of their content and form and quantitatively in terms of their statistical properties. Qualitative analysis includes the consideration of content validity, as well as the evaluation of items in terms of effective item-writing procedures. Quantitative analysis covers principally the measurement of item difficulty and discrimination. In the present frame of reference, the qualitative item analysis was made keeping in view the ambiguity, vagueness, repetition too much simplicity and complexity of the test items. Test was improved through the selection, substitution and revision of items.

**STEP-7.FINAL DRAFT OF E.A.T.**

After making the necessary modifications in the items, there were 75 items in final draft of E.A.T. Number of various types of test items and their weightage in terms of percentage is given below in the table

**Table3: Number of various types of test-items and their percentage in E.A.T.**

S.N.	Types of Items	No. Of Items	Percentage
<b>Part I</b>	Multiple Choice Type	40	53.3%
<b>Part II</b>	Completion Type	10	13.3%
<b>Part III</b>	True-False Type	10	13.3%
<b>Part IV</b>	Attitude Scale	10	13.3%
<b>Part V</b>	Short Answer	5	6.7%
	<b>Total</b>	75	100%

**RELIABILITY**

Reliability refers to the consistency of measurement. To determine reliability of the present test, test-retest method was used. The final draft of the test was administered on a group of 50 adolescent girls. The test was again administered on the same group after three weeks; The coefficient of reliability was computed by correlating the scores of the first trial with those of the second trial, the Product Movement Correlation Method was used for this purpose. Thus, the value of the reliability coefficient for E.A.T. was 0.83, which may be considered sufficiently high.

**Table 4: Reliability Coefficient of Environmental Awareness Test**

S.N.	Method	N	r
1	Test-retest	50	0.83

**VALIDITY**

Validity of a data gathering tool refers to the degree to which it measures what it intends to measure. The E.A.T. was validated by using content validity. For the content validity of the test, the components of environmental awareness were considered. The expert's opinion was sought in relation to test items covering all the components of environmental awareness. Thus, the test can be said to possess face & content validity.

**DISCUSSION**

As this study was conducted to construct a valid and reliable test to assess the environmental awareness of adolescents. The E.A.T was validated by using content validity, for this components of environmental awareness were considered. The expert's opinion was sought in relation to test items covering all the components of environmental awareness. The results indicates that all the content areas were well covered in the test. The judges helped to establish face validity. Therefor the various analyses helped to establish high content and face validity of EAT, are in line with the age long qualitative approach where content validity is determined only by experts' opinion or a rational affair which end in an expression of opinion of experts as supported by many authors. (Guilford 1971, Anastasi, 1976, Thorndike & Hagen, 1977; Nunnally, 1981). Face validity is concerned with judgment about the test after constructions (Nunnally, 1981). In their own view, the concept of face validity implies that a test should appear valid to a variety of judges in addition to being valid from a content point of view (Nevo, 1985; Zeidner, 1987). It is believed that when views are expressed by those recognized as experts on the issue of interest, they are more likely to acquire greater weights and enjoy more people's confidence than otherwise. Therefore, qualitative approach helped to ensure high content and face validity for the test. The reliability result was presented in table 4 through test - retest method. The result shows that a reliability estimate of 0.83 was obtained. This help to establish the internal test consistency of the EAT. This result reveals that EAT is highly reliable and could be used for adolescents .

**CONCLUSION**

The study was carried out to construct and produce a valid& reliable Environmental Awareness Test(E.A. T) mainly for adolescents' girls of Hindi speaking area. This test could be used to assess secondary school student's environmental awareness when they have completed their primary education. Two main points i.e. Validity and Reliability were kept into focus to guide the study. Empirical and theoretical literature related to the study were reviewed. To ensure the reliability and validity of the test- various samples were used. A sample of five judges was used to determine the face and content- validity. Then a sample of 50 testees was used to determine the reliability of the instrument. The validity of the test was determined through the expert judgement based on components of environmental awareness included in the test. This helped to establish high content and face validity. The reliability was estimated through test- retest method, Product Movement



correlation method was used for this purpose. The value of the reliability coefficient for E.A.T was 0.83, which may be considered sufficiently high. Hence the constructed Environmental Awareness Test has high validity and reliability. The test could be used to assess adolescent's Environmental Awareness in a comprehensive manner.

### **References**

- Anastasi, A. (1976). Psychological Testing New York: Macmillan Publishers Ebel, R.L. (1979). Essentials of Educational Measurement (3 Ed.). New Jersey: Prentice - Hall Inc.
- Gronlund, N.E. (1976). Measurement and Evaluation in Teaching New York: Macmillan Publishing Co. Inc.
- Guilford, J.P. (1954). Psychometric Methods. New York: McGraw - Hill Book Company Ltd.
- Guilford, J.P. (1965), Fundamental Statistics in Psychology and Education. New York: McGraw - Hill Book Company
- Saxena, Jadhao&Rajput, J.S. (1981). Development of an Environmental Awareness Test: Indian Educational Review, 16 (3) PP 31-41
- Singh, S. (2004). A study of environmental awareness among different educational groups. Indian Journal of Educational Research Vol. 23, No. 2, PP. 35-39.
- The Random House Dictionary of the English language (1996). The Unabridged Edition. New YOH: Random House.
- UNESCO. Educating for a Sustainable Future: A Transdisciplinary Vision for Concerted Action Report from the International conference on Environment and Society: Education and Public Awareness for sustainability. Organized by UNESCO and the Government of Greece, Thessaloniki, 8-12 December 1997. Paris: UNESCO, 1977.
- UNESCO. Final Report: Intergovernmental Conference on Environmental Education Organized by UNESCO in co-operation with UNEP, Tbilisi, USSR, 14-26 October 1977. Paris: UNESCO, 1977.
- UNESCO. The Tbilisi Declaration: Final Report. Intergovernmental Conference on Environmental Education Organized by UNESCO in Co-operation with UNEP, Tbilisi, USSR, 14-26 October 1977. Paris: UNESCO, 1977.