International Journal of Education and Psychological Research (IJEPR) Volume 8, Issue 1, March 2019
Print - ISSN: 2349 - 0853, e-ISSN: 2279 - 0179 Available online at www.ijepr.org
Orignal Research Article Open Access

Effectiveness of Self Learning materials on Environmental Awareness among Secondary Teacher Trainees

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Abstract:

The present study is about the effectiveness of self-learning materials on environmental awareness among the secondary teacher trainees. For the study 100 students were selected by using random sampling technique. The Environmental Awareness Test (EAWT) developed by K. Yeshodhara was used to collect the data. Investigator has developed self-learning material in environmental education for B.Ed. trainees. Experimental design has been adopted for the present study. Experimental and control groups were selected for the study. In the traditional way, environmental education is taught to the control group. While teaching the experimental group the investigator has used self-learning materials. The intercorrelation of the variables has been analysed by correlation. To determine the difference between different groups one way ANOVA was calculated. Hypotheses were examined in accordance with the objectives. The findings of the research can be used to provide environmental education effectively in training institutes. By using self-learning materials it has been found that environmental awareness among teacher trainees can be enhanced. Therefore self-learning materials used in experimental method are more effective than traditional method of learning environmental education.

Article History: *Received: 14th March 2019, Revised: 26th March 2019, Accepted: 26th March 2019, Published: 30th March 2019.*

I. INTRODUCTION

Man is an integral part of natural environment. The relationship between human being and environment has changed drastically over the last two decades. Today man uses the environment as a trash. The products and unnecessary materials that add to the environment are useless things that are continuously generated by man this causes environmental pollution in the name of development.

The principles of environmental education are focusing on awareness towards environmental issues and environmental risks. Educational processes are creating an effective treaty to protect and preserve his own environment and to understand the sensitivity of environmental problem to a man. Today the earth is to be protected for future generation. Therefore it is important that Human being has the responsibility both Individual and socially to preserve natural resources.

Preventive measures praided through environmental education can be carried to next generation many activities need to be planned and efforts are made to create environmental awareness in students. Education takes the precautionary steps in promoting environmental education to the next generation. As the environmental problem is a global problem. If students are able to focus on self-learning materials on environmental education they will have better environmental awareness.

II. OBJECTIVES OF THE STUDY

1. To know the environmental awareness among trainee teachers.
2. To know the change in environmental awareness by using self-learning materials among trainee teachers.

III. VARIABLES OF THE STUDY

1. Independent Variable : Self-learning materials (Environmental Education)
2. Dependent Variable : Environmental awareness

IV. HYPOTHESES OF THE STUDY

Hypotheses are formulated based on the objectives of the study.

1. There is no significant difference between control and experimental groups with respect to pre-test scores of environmental awareness of secondary teacher trainees.
2. There is no significant difference between control and experimental groups with respect to post-test scores of environmental awareness of secondary teacher trainees.
3. There is no significant difference between pre-test and post-tests environmental awareness scores of secondary teacher trainees in control group.
4. There is no significant difference between pre-test and post-test environmental awareness scores of secondary teacher trainees in experimental group.
5. There is no significant difference between control and experimental groups with respect to change in environmental awareness scores of secondary teacher trainees from pre-test to post-test.

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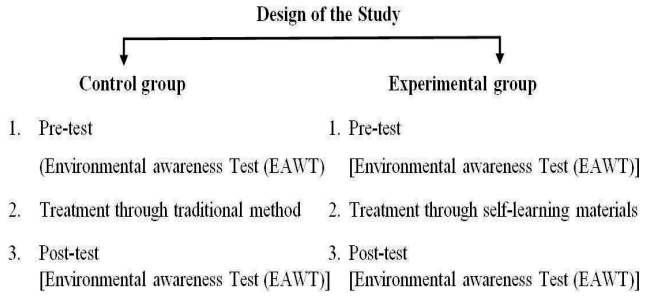
6. There is no significant difference between control and experimental groups with respect to pre-test and post-test environmental awareness scores of secondary teacher trainees.

V. DESIGN OF THE STUDY

Experimental method has been adopted for the present study. In experimental method, two group design is used. Experimental group and control group are selected based on simple random sampling technique.



VI. SELECTION OF THE SAMPLE

In Chitradurga city, there are 10 B.Ed. colleges, amongst them one is Government B.Ed. college, one aided college, remaining eight colleges are unaided. Only two B.Ed. colleges are randomly selected for collection of data. One of them is called the experimental group, another is considered as control group. Each group has 50 trainee teachers.

VII. TOOLS USED

The following tools were used to collect data in present study.

1. **Environmental Awareness Test (EAWT) :**

   Environmental Awareness Test (EAWT) was developed by K. Yeshodhara in 2003. This test is intended to measure the level of environmental awareness among teachers and students. This test is norm-referenced test and consisted of 36 multiple choice test items, which focused on ten different areas of environmental awareness like, (1) Environmental concepts, (2) Pollution and its control, (3) Population, (4) Health (5) Hygiene, (6) Animal world, (7) Bio-diversity, (8) Energy, (9) Environmental concern and legislation, (10) Sustainable development, the total marks on this test would be 36, for a right response to each question. One mark is allotted, the testee has to identify the correct answer among 4 alternatives given and write the corresponding alphabet in the space given on the left side of the item.

2. **Self-learning Materials :**

   Investigator developed self-learning materials for environmental education. Researcher selected two units in Environmental education subject of B.Ed. curriculum such as 4th unit : environmental education and 5th unit : evaluation in environmental education. After studying these two units with reference the environmental education, text books, encyclopedias and journals, Researcher developed the self-learning materials having each module with small headline, objectives, determining the concepts, creating self-evaluation questions and references for further information.

   Investigator considered all the above concepts in self-learning materials on environmental education. After taking the subjects experts opinion researcher has finalized self-instruction materials. Self learning materials used by experimental group for treatment.

VIII. COLLECTION OF DATA

Environmental awareness tool developed by K. Yashodhara was administered as pre-test for measuring environmental awareness. The test was administered to the experimental and control group to collect the data. The investigator transacted the lessons using self-learning materials to the teacher trainees on experimental group. For the control group instructors have taught, environmental education subject through traditional method. Soon after the experiment was completed. Students were administered the post-test for both the experimental group and control group. The data was collected and analysed.

IX. ANALYSIS OF THE DATA

The data collected was compiled, calculated the mean, standard deviation, coefficient of correlation between the variables (r), and one way ANOVA and 't' test to verify the hypotheses.

Hypothesis-1 : There is no significant difference between control and experimental groups with respect to pre-test scores of environmental awareness of secondary teacher trainees

To achieve this hypothesis, the independent 't' test has been applied and the results are presented in the following table.

Table-1 : Results of independent 't' test between control and experimental groups with respect to pretest scores of environmental awareness of secondary teacher trainees

Groups	n	Mean	SD	SE	t-value	P-value	Level of Significance
Control group	50	20.16	3.84	0.54	1.5051	0.1355	N.S.
Experimental group	50	19.04	3.60	0.51			

From the results of the above table, it can be seen that, a non significant difference is observed between control and experimental groups with respect to pretest scores of environmental awareness of secondary teacher trainees ($t=1.5051$, $p>0.05$) at significance level of 5 percent. Hence, the null hypothesis is not rejected and alternative hypothesis is rejected.

It means that, the pre-test scores of environmental awareness of secondary teacher trainees are similar in control and experimental groups.

The results obtained in this study are corroborated by the results obtained in the studies that were conducted by Dayanand D. Bhat (2002), Neelam Dhamija (2010), Biju K. (2014) and Rupinder Kaur (2015).

Hypothesis-2 : There is no significant difference between control and experimental groups with respect to post-test scores of environmental awareness of secondary teacher trainees

To achieve this hypothesis, the independent 't' test has been applied and the results are presented in the following table.

Table-2 : Results of independent t test between control and experimental groups with respect to post-test scores of environmental awareness of secondary teacher trainees

Groups	n	Mean	SD	SE	t-value	P-value	Level of Significance
Control group	50	20.46	3.71	0.52	16.1521	0.0001*	S.
Experimental group	50	31.34	2.99	0.42			

From the results of the above table, it can be seen that, a significant difference is observed between control and experimental groups with respect to post-test scores of environmental awareness of secondary teacher trainees ($t=16.1521$, $p<0.05$) at significance level of 5 percent. Hence, the null hypothesis is rejected and alternative hypothesis is not rejected.

It means that, the post-test scores of environmental awareness of secondary teacher trainees are different in control and experimental groups. In another words, the posttest scores of environmental awareness of secondary teacher trainees are significantly higher in experimental group as compared to control group.

The results obtained in this study are corroborated by the results obtained in the studies that were conducted by Dayanand D. Bhat (2002), Neelam Dhamija (2010) and Biju K. (2014).

Hypothesis - 3 : There is no significant difference between pre-test and post-test environmental awareness scores of secondary teacher trainees in control group.

To achieve this hypothesis, the dependent 't' test was applied and the results are presented in the following table.

Table-3 : Comparison of between pre-test and post-test environmental awareness scores of secondary teacher trainees in control group

Test	n	Mean	SD	Mean Diff.	SD Diff.	Paired t	P-value	Level of Significance
Pre-test	50	20.16	3.84	0.30	1.30	1.6348	0.1085	N.S.
Post-test	50	20.46	3.71					

From the results of the above table, it can be seen that the there is no significant difference was observed the pre-test and post-test environmental awareness scores of secondary teacher trainees in control group ($t=1.6348$, $p>0.05$) at significance level of 5 percent. Hence, the null hypothesis is not rejected and alternative hypothesis is rejected.

It means that, the pre-test and post-test environmental awareness scores of secondary teacher trainees in control group are similar.

The results obtained in this study are corroborated by the results obtained in the studies that were conducted by Dyanand D. Bhat (2002), Biju K. (2014) and Rupinder Kaul (2015).

Hypothesis-4 : There is no significant difference between pre-test and post-test environmental awareness scores of secondary teacher trainees in experimental group.

To achieve this hypothesis, the dependent 't' test was applied and the results are presented in the following table.

Table-4 : Comparison of between pre-test and post-test environmental awareness scores of secondary teacher trainees in experimental group

Test	n	Mean	SD	Mean Diff.	SD Diff.	Paired t	P-value	Level of Significance
Pre-test	50	19.04	3.60	12.30	4.60	18.8923	0.0001*	S.
Post-test	50	31.34	2.99					

From the results of the above table, it can be seen that the there is a significant difference was observed the pre-test and post-test environmental awareness scores of secondary teacher trainees in experimental group ($t=18.8923$, $p>0.05$) at significance level of 5 percent. Hence, the null hypothesis is rejected and alternative hypothesis is not rejected.

It means that, the pre-test and post-test environmental awareness scores of secondary teacher trainees in experimental group are different. It means that, the post-test environmental awareness scores of secondary teacher trainees are higher as compared to pre-test environmental awareness scores of secondary teacher trainees in experimental group.

The results obtained in this study are corroborated by the results obtained in the studies that were conducted by Dayanand D. Bhat (2002), Biju (2014) and Rupinder Koul (2015).

Hypothesis-5 : There is no significant difference between control and experimental groups with respect to change in environmental awareness scores of secondary teacher trainees from pre-test to post-test.

To achieve this hypothesis, the independent 't' test has been applied and the results are presented in the following table.

Table-5 : Results of independent 't' test between control and experimental groups with respect to change in environmental awareness scores of secondary teacher trainees from pre-test to post-test.

Groups	n	Mean	SD	SE	t-value	P-value	Level of Significance
Control group	50	0.30	1.30	0.18	17.7403	0.0001*	S.
Experimental group	50	12.30	4.60	0.65			

From the results of the above table, it can be seen that, a significant difference is observed between control and experimental groups with respect to change in environmental awareness scores of secondary teacher trainees from pretest to posttest ($t=17.7403$, $p<0.05$) at significance level of 5 percent. Hence, the null hypothesis is rejected and alternative hypothesis is not rejected.

It means that, the change in environmental awareness scores of secondary teacher trainees from pre-test to post-test are different in control and experimental groups. In another words, the change in environmental awareness scores of

secondary teacher trainees from pre-test to post-test are significantly higher in experimental group as compared to control group.

The results obtained in this study are corroborated by the results obtained in the study that were conducted by Biju K. (2014) and Rupinder Koul (2015).

Hypothesis-6 : There is no significant difference between control and experimental groups with respect to pre-test and post-test environmental awareness scores of secondary teacher trainees.

To achieve this hypothesis, the Analysis of covariance (ANCOVA) (pre-test scores as covariate) technique has been applied and the results are presented in the following table.

Table-6 : Comparison of between control and experimental groups with respect to pre-test and post-test environmental awareness scores of secondary teacher trainees by Analysis of covariance (ANCOVA)

Groups	n	Pretest		Posttest		
		Mean	SD	Mean	SD	Adjusted mean
Control group	50	20.16	3.84	20.46	3.71	20.18
Experimental group	50	19.04	3.60	31.34	2.99	31.62
F-test		2.2654@		398.8817#		
P-value		0.1355		0.0001*		

*p<0.05, @one way ANOVA applied, # ANCOVA applied

The results of the above table clearly show the following:

1. The control and experimental groups do not differs significantly with respect to pre-test environmental awareness scores of secondary teacher trainees (F=2.2654, p>0.05) at significance level of 5 percent.

   It means that, the pre-test environmental awareness scores of secondary teacher trainees are similar in control and experimental group.

2. The control and experimental groups differs significantly with respect to post-test environmental awareness scores of secondary teacher trainees (F=3457.1604, p<0.05) at significance level of 5 percent. Hence, the null hypothesis is rejected and alternative hypothesis is not rejected.

It means that, the post-test environmental awareness scores of secondary teacher trainees are different in control and experimental groups. It means that, the post-test environmental awareness scores of secondary teacher trainees are significantly higher in experimental group as compared to control group.

The results obtained in this study are corroborated by the results obtained in the studies that were conducted by Biju K. (2014) and Rupinder Koul (2015).

X. FINDINGS OF THE STUDY

1. The pre-test scores of environmental awareness of secondary teacher trainees are similar in control and experimental groups.
2. The post-test scores of environmental awareness of secondary teacher trainees are significantly higher in experimental group as compared to control group.
3. The pre-test and post-test environmental awareness scores of secondary teacher trainees in control group are similar.
4. The post-test environmental awareness scores of secondary teacher trainees are higher as compared to pre-test environmental awareness scores of secondary teacher trainees in experimental group.
5. The change in environmental awareness scores of secondary teacher trainees from pre-test to post-test are significantly higher in experimental group as compared to the control group.
6. The pre-test environmental awareness scores of secondary teacher trainees are similar in control and experimental group. The post test environmental awareness scores of secondary teacher trainees are significantly higher in experimental group as compared to control group.

XI. CONCLUSION

The present study found that the Environmental education is more effective when it is taught through self-learning material than the traditional method of teaching. Hence, we can conclude that self-learning material can be used to increase awareness in environmental education among the trainees.

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