Development of a Course in Environmental Education

For Would-be Teachers

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Abstract

The degradation of the environment and ever increasing environmental problems prompted NCERT to put forward some objectives. In order to fulfill the objectives of Environment Education (EE) and to achieve the Expected Learning Outcomes (ELOs: learning to learn, learning to be and learning to live together) set out by NCERT in 2000, agents for change are needed. If prospective teachers are trained and motivated, they can fulfill this requirement. With this in mind, the postgraduate.Department of Education, S.N.D.T. Women's University, undertook the project of developing a course financed by the University Grants Commission (UGC), under the Major Research Scheme in EE, in an endeavor to achieve Sustainable Development (SD) through formal education.

The significance of the research problem

Recently, a programme called Greening the Text Books was implemented at the national and state levels, in which some aspects of environmental knowledge are included in each subject at each level, right from the primary level. In this regard, a workshop was conducted in Ahmedabad from 12-14 January, 2002. This was a joint venture of MSCERT and the Centre for Environment Education (CEE). The author had participated in this workshop as an expert and a resource person and presented a paper— 'Various approaches to Environment Education'.

It is obvious that teachers at all levels of education must be aware of the environment and its problems and should know the fundamental principles of EE. They should also know how to communicate this message. Therein lies the need for a curriculum in EE for prospective teachers. If this curriculum were supported with material, it would be even more useful.

This education about and for the environment will create an awareness of and a positive attitude to the subject. If one is able to change the outlook and the approach of teachers to this particular subject, they are definitely going to bring about a change in the approach and outlook of the students and society as such. This, in turn, will lead to SD.

The objectives of the present research

- To select the basic terms or concepts to be introduced or included in the syllabus.
- To select the content.
- To prepare self-learning modules for each topic.
- To suggest and prepare appropriate teaching aids for various topics.
- To try out the curriculum and to conduct field-testing and to decide its effectiveness in terms of awareness and attitude.

Preparation and implementation

It was decided to develop a short, and precise, yet comprehensive curriculum.

The need for a new or revised curriculum

A question that may arise is that when a curriculum for EE already exists, what is the need for a new one? An attempt is made below to clarify this:

- There has been an explosion of knowledge and information in all fields since the industrial revolution. One has to keep pace with this burgeoning knowledge.
- The basic concepts in physical, social and biological sciences have been reformed due to research in all the aforementioned fields. This has thrown light on the inadequacies of existing education programmes or curricula. There has been a lot of progress in the field of environmental awareness and EE. Much research is being carried out in India and abroad in these fields.
- Only some of the extant curricula are developed keeping in mind the present or prospective teachers who play a pivotal role in creating behavioral changes in the students and society as such.
- When the existing curricula were developed, all the steps of curriculum development were not necessarily followed. The existing curricula do not include teaching methodology and they do not cover all aspects.. Support material was also not developed. .
- The period of general education has increased, which consequently lengthens the period of choosing specialized disciplines. In such conditions, students should be aware of new knowledge from the early stages of education.
- The less useful content and concepts should be discarded as new and significant items are added in accordance with the demands of time.

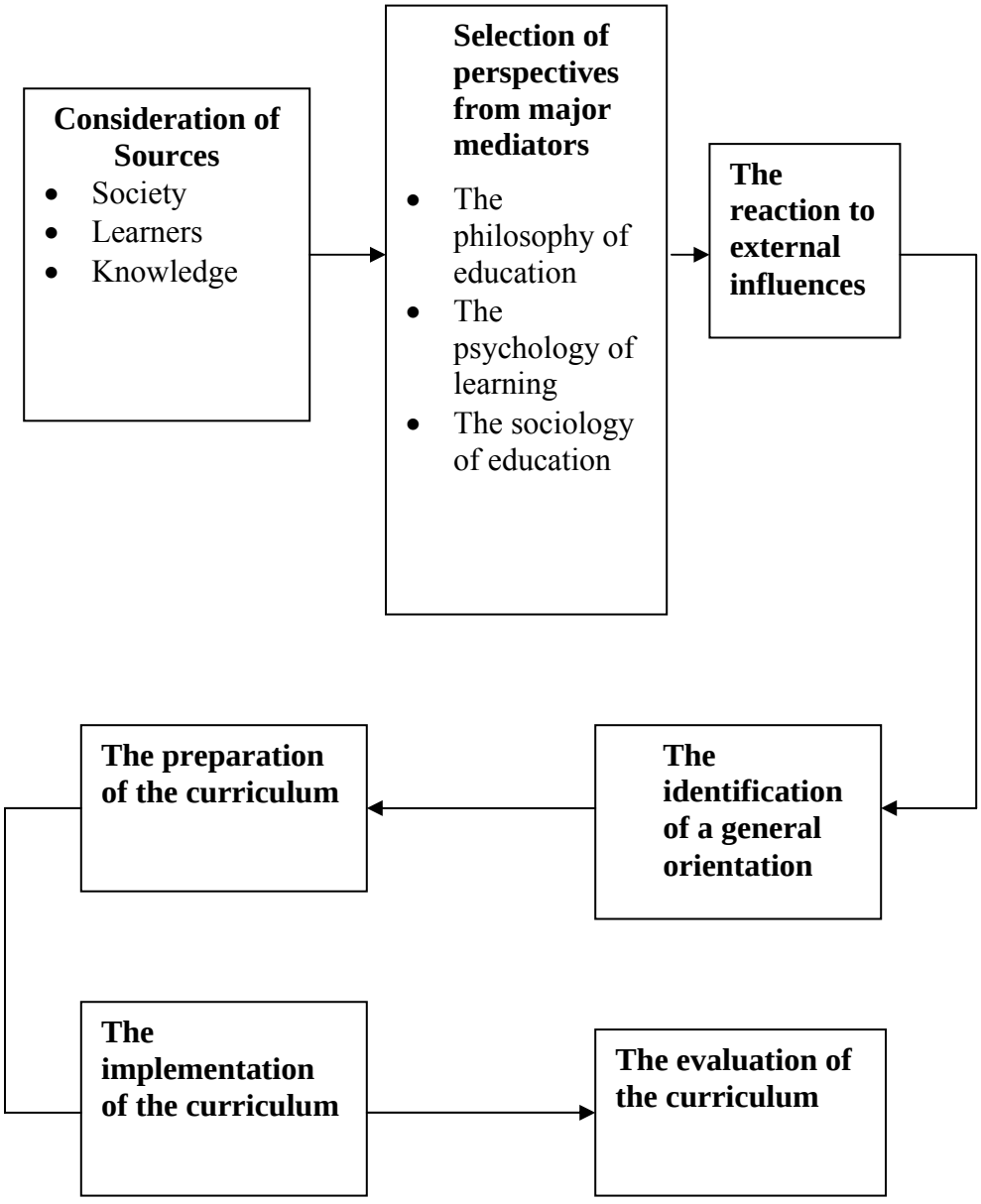
  Unfortunately, of the three aims of education (i.e. imparting knowledge, skill development and the inculcation of proper interests, values and attitudes), only the first is achieved by our education systems. This scenario must be changed. This can only be achieved by the development of a curriculum which enables the learners to be self-sufficient from the point of view of knowledge, skills, and attitudes/values and also helps fulfill national goals.

The next step was the preparation of the preliminary draft.

The preparation of the preliminary draft

In order to prepare the preliminary draft the researcher collected samples from different curricula implemented by different universities and institutions. The curricula selected were not only from Indian universities, but also from universities abroad. A detailed comparative study of the same was carried out which provided the direction for the selection of the topics. It formed the basis for the development of a new curriculum.

The General Flow of the Curriculum Development Activity



Preparing a draft of the syllabus

The next step was the actual preparation of a draft of the syllabus. After studying the various curricula in detail, topics were selected with certain ideas in mind, and the draft of the syllabus was prepared adding some totally new topics. Once the draft was ready, it was necessary to send it to different experts to get their approval. It was also necessary to get their comments and suggestions to carry out modifications and improvements. The difficulty was that the experts were not located at one place. It was not practically and economically viable to bring them together. Therefore to overcome this difficulty the Delphi Technique was used.

The following could be achieved with the use of this technique:

- Group members worked independently.
- They were not influenced by the opinions of the other members.
- The important thing is that the group members are not required to be present at the location, hence, experts who were geographically separated could also contribute. The cost of bringing them together was avoided.

This technique is primarily useful in illuminating long-term complex issues such as curriculum and self-learning material development in present research. It is, however, time consuming and may sometimes reduce the motivation that is generated in a group that interacts face-to-face.

The steps followed in the Delphi Technique

- The problem area (in the present research) was identified and drafts were prepared.
- The list of the topics was consolidated in the form of syllabi.
- Six experts in the subject area were identified.
- The drafts were sent to each one.
- The experts independently responded to the course content and sent it back to the centralcoordinator.
- The results were compiled, analyzed and on that basis the revised syllabi were developed and sent back to the experts.
- The experts were requested to comment and suggest new thoughts, ideas and solutions.
- Responses to the revised syllabi were collected, compiled and analyzed. Changes/modifications were made accordingly. E.g. topics such as Environmental Protection Law, and Sustainable Development were added.
- Final syllabi were prepared.

Thus two separate syllabi—a basic one for B.Ed and an advanced one for M.Ed—were developed.

The next step was to prepare suitable material for the course. The material was in different forms:

- Written material in the form of self-learning blocks for topics like teaching methodology, teaching aids etc., which were included in the B.Ed. syllabus.
- Compact Discs (CDs) for topics related to the environment.
- Transparencies for various cycles in the environment and food chain, food web etc.
- Handouts.

Videocassettes prepared by various agencies (CEE, BIAF) were also used to teach topics like the depletion of water, the nature of EE etc.

The development of an attitude scale and awareness test

While the material was being prepared, an attitude scale and an environmental awareness test were also simultaneously developed in order to test the attitude and awareness of the students towards the environment. The attitude scale was standardized.
The attitude scale and the environmental awareness test were administered together.

The implementation of the curriculum

The curriculum was then implemented at the B.Ed and the M.Ed. levels, using a single group design to test its effectiveness. Then they were given the self-learning material containing the intra-text questions along with the probable answers. The course was run for seven months with supporting activities like CD shows, video cassette shows, visits, workshops and so on. Many transparencies were prepared and used to explain various facts. The achievement test and attitude scale were administered in the end, on the basis of which an evaluation of the curriculum was carried out.
The evaluation revealed the necessity for some changes such as a reduction in the quantity of the content if this course is to be introduced to B.Ed students, as the time available for these students is very little (only 30 hours). Therefore, a few topics were shifted to the M.Ed. syllabus because the time allotted for this subject is 90 hours for theory and 30 hours for practicum. The B.Ed. syllabus therefore was made more activity based.

For M.Ed. students, there was more focus on the theoretical component. The structure of the M.Ed. course was also rearranged.

There is a deliberate overlapping in the syllabi. This is to make allowances for B.Ed. students who may not choose to join an M.Ed. programme, and for M.Ed. students who may not have encountered the subject at the B.Ed. level.

After modifications, these courses were again offered as electives at both levels. All the students opted for these courses, but some of them were asked to opt for other subjects on account of administrative difficulties and workload issues.

Analysis of Data

The data gathered from the attitude scale and the achievement test was analyzed by two methods:

- Qualitative analysis
- Quantitative analysis

Though the quantitative analysis allows the researcher to draw inferences regarding the achievement, it is not enough to only analyze the students' marks. The behavioral changes that were noted while implementing the programme cannot be evaluated quantitatively. Qualitative analysis helps in explaining the achievement in terms of marks.

Qualitative analysis

The observations made during the whole programme regarding students' behaviour clearly show that they have started taking a deep interest in the subject. They reduced the use of plastic carry bags. They started turning the fans and tubelights off when not needed. They also started walking short distances instead of using vehicles and minimised the use of elevators. Some of them even gave up environmentally harmful traditional ways of celebrating festivals. An awareness of legislation protecting the environment enabled them to take a stand against harmful practices. Many of them have started working in various schools and colleges for the protection and conservation of the environment. Now it has become a part and parcel of their life. Most of the students have suggested that this particular subject be incorporated as a regular subject of study for all student teachers in all educational colleges.

Quantitative Analysis

Quantitative Analysis is formatted in terms of scores after the tests have been administered.

In the present study, the following statistical measures were used:

Mean Measure of central tendency

't' Test Measure of significance of difference

The quantitative data comprised of pre-test and post-test scores of the achievement test administered on the various units taught. The teaching is effective if the post-test scores are significantly higher than the pre-test scores. To find out whether the post-test mean is significantly greater than the pre-test mean, the 't'-test was used. The test of the significance of the differences between the two means is known as a 't'-test. It involves the computation of the ratio between the experimental variance (observed difference between two sample means) and error variance (the sample error factor).

The researchers have used a single group, which involves three steps:

- A pre-test measuring the dependent variable.
- Experimental treatment is applied to the subjects.
- The same test, which was applied before the experimental treatment, is then reapplied— the post-test.

The difference in the means of pre-test and post-test scores indicates the difference brought about in the dependent variables by the application of the independent variables.

The 't' test is applied for two reasons:

- It is a single group design.
- The means are co-related.

Findings

The results of the't' test for pre-test and post-test comparison for the B.Ed

The 't' value is significant at 0.01 level as the obtained 't' value is 9.95, which is much greater than the table value.

The results of the't' test for pre-test and post-test comparison for the M.Ed

The 't' value is significant at 0.01 level as the obtained 't' value is 8.96, which is much greater than the table value.

The results of the 't' test for initial and terminal attitude scores for the B.Ed

The obtained 't' value is 3.68, which is greater than the table value.

This indicates that the increase in the attitude scores is significant at 0.01 level.

The results of the 't' test for initial and terminal attitude scores for the M.Ed

The obtained 't' value is 4.98, which is greater than the table value.

This indicates that the increase in the attitude scores is significant at 0.01 level.

It can be stated from the above results that the intensity of the attitude of the students towards the environment has increased.

Both the syllabi were thus found to be significantly effective.

The Outcome of the study

Both the syllabi have recently been approved by the Board Of Studies and Academic Council of the S.N.D.T. Women's University for inclusion in the B.Ed. and the M.Ed courses as optional papers and are a part of the recent curriculum introduced by the university. The Board of Studies has also approved of the inclusion of this programme as a certificate course for M.Ed. students and others.

Conclusion

The teaching programme was useful and effective in bringing about an interaction among the students (prospective teachers) and creating an interest in them for this subject.

● The students found the material developed (CD, transparencies etc.) very fascinating and useful.

● In their opinion the material was not only supportive but also self-explanatory. It was more effective than the normal lecture method.

● The various teaching methods used were highly appreciated by the students. They found these methods more interesting than the lecture method.

● The videocassettes fascinated the students the most and clarified their concepts.

● The observations made during the programme regarding students' behaviour clearly show that they have started taking a deep interest in the subject.

● Most of the students suggested that this subject be incorporated as a regular subject of study for all student teachers in all educational colleges.