

Preparation of Teacher-Assisted Learning Package on Biodiversity Conservation for Secondary School Students

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Abstract

The Biodiversity conservation aim is not fully satisfied due to the lack of appropriate method of teaching and activity based hands-on experience. The present study aims at developing a Teacher-Assisted Learning Package on Biodiversity Conservation, which integrates the important aspects of Biodiversity Conservation. The investigator prepared the Learning Package as Power point Lecture Slides with Content, Pictures, Motivational factors, Discussion Questions etc. Major Concepts of Biodiversity, Importance of Biodiversity, Threats to Biodiversity, Conservation Strategies and Sustainable Development are the 5 capsules in the Learning Package. Difficulty level of the content, target group, objectives to be satisfied etc. were considered while arranging content in the capsule. Utmost care was given while preparing the capsules in the Learning Package and arranging them in order by fixing the objectives under each set of capsules. It is hoped that, the Learning Package developed will serve to develop in students a respect, positive attitude, knowledge, and responsible behavior towards Biodiversity Conservation and it can help the students to learn more effectively and interestingly. Necessary modification was done on the Package by the investigator based on the performance of the students in the series of classes and students feedback. By appropriate method Validity and Reliability of the Learning package satisfied.

KEYWORDS: Learning Package, Biodiversity Conservation

1. INTRODUCTION:

The most important threats to Biodiversity have long been habitat loss, due to large scale conversion of land to agriculture and urban centers, introduction to invasive alien species, over exploitation of natural resources, and pollution. Climate change is now adding its effect to the cumulative pressure. In the last century we have lost 35% of mangroves, 40% of forests and 50% of wetlands. Due to human actions, species are being lost at a rate that is estimated to 100 times the natural rate of extinction. The IUCN Red List (2009), reports that of the 44,837 species they have assessed, 38% are threatened and 804 are extinct. There is growing consensus that most of the vital signs of Biodiversity is plummeting and that biodiversity lost is moving ecosystems ever closer to thresholds, or tipping points, beyond which their services –providing capabilities will be seriously undermined. Biodiversity loss has severe consequences for human societies and economies and the future of life on the planet. Reversing this Biodiversity loss is not only possible, but essential to human well-being. Therefore Biodiversity conservation is the need of the hour.

India has a total of 89,451 animal species accounting for 7.31% of the faunal species in the world and the flora accounts for 10.78% of the global total. The endemism of Indian biodiversity is high about 33% of the country's recorded flora are endemic to the country and are concentrated mainly in the North-East, Western Ghats, North-West Himalayas and the Andaman and Nicobar islands. However, this rich biodiversity of India is under severe threat owing to habitat destruction, degradation, fragmentation and over-exploitation of resources.

According to the National Antipollution Law, Japan 1969, “Environmental education enables people to enjoy good health and a high quality life. It is vital by preventing harmful effects to human health or damage to the environment caused by pollution of air, water, soil, vibration, noxious smell etc. caused by firms and individuals. The end includes animal and plants and their ecological system, which are loosely bound to the livelihood of people.”

The introduction of educational innovations in classroom develops student's independence and give them the capacity to be more self confident and self reliable in striving for acquisition of their own goals and aspirations as well as to be prepared for lifelong successful learning. Successful learning requires a new attitude to science, viewing it not as an isolated system of knowledge but as a dynamic structure that interacts with all other parts of culture (Marzano, 1997).

The main focus of the biodiversity education was to create knowledge, interest and necessary skills to solve various biodiversity problems with reference to the local context. In order to develop the Biodiversity consciousness among students, the action oriented Biodiversity education activities, experiential education, and field exposures that are vital to achieve sustainable biodiversity knowledge and motivate to protect and conserve local biodiversity. The biodiversity education module is enhancing teaching and training in biodiversity conservation at high school level (Ramadoss and Poyyamoli, 2011).

2. RATIONALE FOR THE SELECTION OF THE VARIABLE

The investigator made an attempt to develop a learning package for developing adequate knowledge, process skills and attitude in Biodiversity conservation among secondary school students.

The active learning participatory methods for biodiversity education for sustainable development encompasses comprehensive aspects of students cognitive, affective and behavioural development related to the perception and understanding of local biodiversity conservation. Which is practically having long term impacts on student's attitude towards local biodiversity and also in shaping their future life. It reflects student's experiences and action in their homes, school and community as this will get them pondering about everyday habits and happening in biodiversity dimension (Ramadoss and Poyyamoli, 2011).

The biodiversity education programs help the students to acquaint with the local biodiversity problems, and create an interest, motivation and action. It also increases the student's knowledge, interest and skills in order to protect and conserve local natural resources and biodiversity. There is need for extend teaching and learning activities in to the immediate environment(natural/built) of the students beyond the classroom for inculcating a culture of biodiversity conservation (Van Weelie and Wals, 2002).

Basic constructs of the active biodiversity education model for the successful study of ecology and biodiversity conservation, innovative model of environment education, is composed of three constructs - didactic, conceptual and technological (Kostova, 2003).

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3. THEORETICAL OVERVIEW OF LEARNING PACKAGE

Learning Package is a collection of materials to effect specified learning outcomes with a minimum of teaching content. Components of learning Package include materials to be read, looked at (Picture, diagrams) to work with (models, apparatus) and takes to undertake (Problems, Self tests, Peer group instruction).

Learning Package provide opportunity for learning from distance. They can offer a greater variety of learning experiences, thus allowing selection according to individual styles of learning and allow students to learn at their own pace and their own time.

Essential Features of a Learning Package

- a. The objectives and activities should be properly sequenced.
- b. The learning activities should make the best use of local community resources.
- c. It will provide opportunity for the learner to interact with other students and the community.
- d. The subject matter should be presented in an interesting manner.

Components of Learning Package

1. Statement of the purpose
2. Desirable pre-requisite skills
3. Instructional objectives
4. Diagnostic pre-test

5. Implements for the learning package
6. Programming
7. Related experiences
8. Evaluative post-test
9. Assessment of the package

Developing a Learning Package

The following are the steps in developing a learning package

1. Identifying the target group
2. Identifying the learning needs of the group
3. Decides terminal behavior
4. Identify entry behavior
5. Assessment of entry behavior through pre- test
6. Teaching frames including objectives, learning activities, formative evaluation and summative evaluation.
7. Tryout of the package
8. Revision and finalizing of the learning package.

4. METHODOLOGY

The Learning package is developed and standardized by the investigator. Details of the Learning Package development is as follows.

a. Planning

During the planning stage, the investigator conducted an extensive review related to the preparation of Learning Package from literature such as books, journals, published papers and from the details of available tools in similar areas. Details of the Learning Package reviewed are given in Table 1.

TABLE 1
Details of the Learning Packages Reviewed

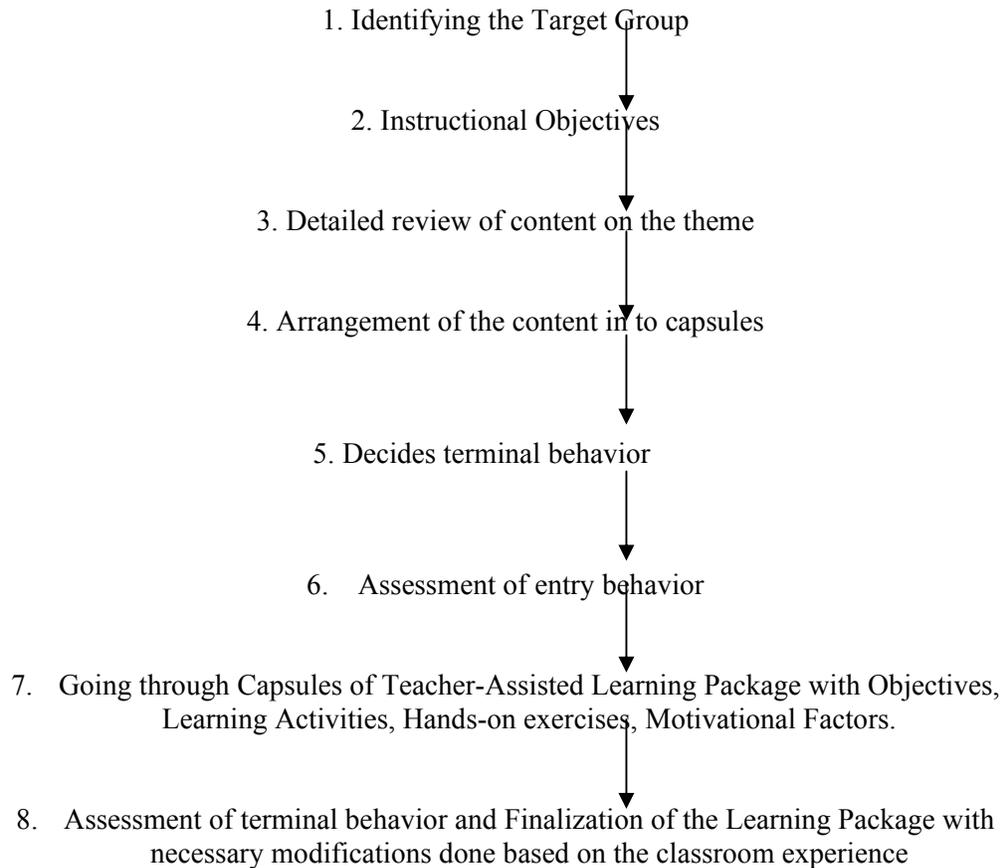
Sl. No:	Author	Year	Name of the tool	Components
1.	Mathew Jisha	1998	Learning Package for Zoology-Final year students on the topic 'Sericulture'	<ol style="list-style-type: none"> 1.Statement of the Purpose 2.Desirable pre-requisite skills 3.Instructional objectives 4.Diagnostic pre-test 5.Impliments of the Package 6.Programming 7.Related experiences 8.Evaluative post-test 9.Assesment of the Package
2.	Bindhu	2001	Learning Package in 'Apiculture' for Second year degree Zoology students	<ol style="list-style-type: none"> 1.Statement of the purpose 2.Diagnostic pre-requisite skills 3.Instructional objectives 4.Diagnostic pre-tests 5.Impliments for the learning package 6. Programming 7.Related experiences 8.Assesment of the Package

3.	Nithina	2010	Development and Validation of a Self instructional module on 'Biodiversity loss' at higher secondary level	<ol style="list-style-type: none"> 1. Identifying the target group 2. Identifying the learning needs of the group 3. decide terminal behavior 4. Identify entry behavior 5. Assessment of the entry behavior through pre-test 6. Teaching frames including objectives, learning activities, formative and summative evaluation 7. Tryout of module 8. Revision and finalization of the module
4.	Kuruvila	2010	Effectiveness of multimedia learning package on the Achievement of Basic Ideas in chemistry practicals at the Higher secondary level	<ol style="list-style-type: none"> 1. Pre-test 2. Administration of learning Package 3. Post test

5.	Sarah	2010	Testing the effectiveness of a parenting Package on Achievement motivation of secondary school students	1.Pre-test 2.administration of the Parenting Package 3.Post-test
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The steps of the Package were found to be without much deviation from the general framework of the Learning Package. The investigator selected 8 steps for the Package development and implementation of the package and these are given in the flowchart 1.

Flow chart 1. Showing the development and standardization of the Learning Package



b. Preparation of Teacher-Assisted Learning Package on Biodiversity Conservation

The investigator decided to prepare a Learning Package on Biodiversity Conservation for developing Knowledge in Biodiversity Conservation among secondary school students. For that the investigator visited WWF, KSBB for collecting various materials for the preparation of the Learning Package. The investigator read several articles related to Biodiversity Conservation like 'Green health' on 'Grihalekshmi' magazine, Articles of 'Padippura' as 'Malayala manoramma' news paper supplement, Articles of 'Vidya' as 'Mathrubhumi' news paper supplement, 'Tell Me why', 'Balarama –Digest', 'Eureka', and the articles written by Menakha Gandhi on Mathrubhumi newspaper especially motivated the investigator. In addition the investigator reviewed several Learning Packages related to Biodiversity Conservation from various libraries.

For the preparation of Learning Package all the available books on Biodiversity Conservation, and Environmental Biology were referred and also journals on 'Environment Awareness' were referred. The investigator also reviewed the NCERT Biology text book for secondary school students.

The investigator got useful instructions from experts in the field who are intimately connected with the leading organizations in the area of Biodiversity Conservation and Environmental protection. Thus, the investigator contacted the State Education Officer, WWF-India, Kerala State, Thiruvananthapuram. Member Secretary, Kerala State Biodiversity Board, Thiruvananthapuram, Resource persons in the field of Biodiversity Education for Sustainable Development and Nature Club Networking team and Professors of various Departments who are expert in the field and are directly or indirectly associated within the realm of Biodiversity Conservation.

In developing the Learning Package, the investigator followed the principle of constructing instructional materials. Information collected from these sources was summed up and arranged in the form of a Learning Package by following the guidelines for developing Learning Packages. The steps in the formation of Learning Package were strictly followed.

The investigator developed a Teacher-Assisted Learning Package instead of a self instructional material, the target group being secondary school students, under the assumption that these students needed teacher assistance to follow the Learning Package.

The investigator prepared the Learning Package as Power point Lecture Slides with Content, Pictures, Motivational factors, Discussion Questions etc. The Learning Package thus developed consists of 5 capsules. The first capsule covers the basic aspects of Biodiversity; Second capsule emphasize the Importance of Biodiversity; the third capsule highlights the Threats to Biodiversity; the fourth capsule highlights the Strategies for the Conservation of Biodiversity and the last

capsule deals with Sustainable Development. Difficulty level of the content, target group, objectives to be satisfied etc. were considered while arranging content in the capsule. The general objectives of the Learning Package are well defined at the beginning. The specific objectives of each capsule are given prior to each capsule. The components of the Learning Package thus developed are described as under: The investigator was keen to pose one or two questions at the end of each capsule which, it is hoped, would definitely motivate the students to undertake the activities prescribed the Learning Package and their by help them gain confidence in engaging in Biodiversity Conservation activities in future.

1. Instructions
2. Objectives
3. Content of the Package

Each capsule was incorporated with Specific objectives, 'Motivational factors', 'Do you know corner', and 'Hands-on exercises'. The content of the Learning Package are:

Capsule I - Major Concepts of Biodiversity
{Defenition, Type of Biodiversity (Genetic diversity, Species diversity and Ecosystem diversity), Sttus of Biodiversity and Present Sttus of Biodiversity}.

Capsule II - Importance of Biodiversity

{Importance of Biodiversity, Values of Biodiversity, Importance of Plants, Importance of Animals, Importance of Ecosystem- (Forest, Wetlands, Mangrooves, Grasslands, Food chain and Food web)}

Capsule III - Threats to Biodiversity

{Threats to Biodiversity, Threats to Plants, Threats to Animals, Factors of Biodiversity depletion (Habitat destruction, Invasive non native species, Population growth, Pollution, Over harvesting)}

Capsule IV - Conservation Strategies and

{Conservation methods (insitu conservation and exsitu conservation), Environmental organizations at different levels, Red data book, Significsnt programmes for the conservation of wildlife, Biodiversity register}

Capsule V - Sustainable Development

{Sustainable development –defenition and Sustainable development common principle}

c. Standardization of the Teacher-Assisted Learning Package

It is important that the instrument should be standardized.

(i). Validity of the Learning Package

Content validity was checked on the basis of judgment and opinion of experts. Objectivity of the module is ensured by thorough analysis of the content and also by collecting opinion and suggestions from the experts. Information collected was arranged in the form of a Learning Package by following the guidelines for developing Learning Packages. Difficulty level of the content, target group, objectives to be satisfied etc. were considered while arranging content in the capsule.

(ii). Reliability of the Learning Package

Three weeks after implementation of the Learning Package, a retention test was administered to test Knowledge in Biodiversity ($r = 0.520$). During the retention test these products and portfolios were collected back from the students and analyzed for consistency in sticking on to the simplest possible activities.

4. REFERENCES

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