

**EFFECTIVENESS OF MODULAR PACKAGE AS A SELF STUDY TOOL IN
SELF PACED LEARNING OF SCIENCE**

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Abstract

The present study provides an analytical overview of the effectiveness of modular package in learning Science. Educational technology offers solutions to tackle the problems of modern educational system. The paucity of challenging educational material, which will not stifle the creativity of the learner, is better met within modular scheduling. Yet the use of modular package have not found their place in the present day schooling in India, especially in learning Science for middle and high school's students. So the modular package on a concerned topic of Science i.e Air has been developed and tested for effectiveness in an experimental set up of 60 students using control-experimental two group design. by the investigator. It has been found while the low achievers can attain improvement in learning, the high achievers can develop competency through this approach. While the educational wastage could be eliminated, the productivity and accountability of educational system could be maximized through modular scheduling.

Key words: *Effectiveness, Modular package, Science*

Education is the process of all round development of human beings. The development should bring about both qualitative and quantitative behaviour changes in desired direction .The outcomes of these changes are in the form of acquisition of knowledge, inculcation of good human values, development of understanding, creation of interest and ability to perform certain skills and for bringing such changes in students the teacher should have certain qualities. For inducing such qualities he/she should be trained through teacher training institutes The Rabindara Nath Tagore has rightly stated "A lamp can never light another lamp unless it continues to burn its flame."

Educational Technology has emerged as a new discipline in the field of education. Sharma (1982) Educational Technology implies the use of all modern media, methods materials, practices, theories and principles for maximizing the learning outcomes. It facilitates learning, by control of environment, media and method .In student-centered approach, the strategies are designed to provide the students with highly flexible system of learning, which is geared to individual's life and and learning styles. The individualized instruction system includes programmed learning material (skinner and james, 1954), Personalized system of instruction



(Keller 1967) and modules. Under the individualized learning methods, a variety of different media such as slides, audiotapes, models, practical exercise, computer-based materials etc. can readily be incorporated.

1.2 : MODULAR APPROACH TO LEARNING

A module could be defined as a short unit of instruction dealing with a conceptual unit subject matter. Textbooks were initially conceived as modules, providing students with all the structure and information needed. But they do not contain characteristics of a module. Educational module should have four fundamental criteria. It must

- i) present or define a set of learning situations
- ii) have its own carefully specified function and be directed at clearly defined objectives.
- iii) include tests designed to guide the learner or teacher and provide them with feedback.
- iv) be capable of fitting into a variety of learning paths, methods and situations.

A MODULE INCLUDES THE FOLLOWING COMPONENTS

- i. specific instructional objectives
- ii. Guidelines for learners
- iii. Entry tests
- iv. Pretest on modular content
- v. Learning material
- vi. Embedded test
- vii. Reference books for further study
- viii. Post test
- ix. Keys for pre and entry test
- x. Keys for embedded test I&II

2.0: NEED FOR THE PRESENT STUDY

Educational technology offers solutions to tackle the problems of modern educational system. The paucity of challenging educational material, which will not stifle the creativity of the learner, is better met within modular scheduling. While the low achievers can improve their achievement in learning, the high achievers can develop competency and excel through this approach. While the educational wastage could be eliminated, the productivity and accountability of educational system could be maximized through modular scheduling. Modules help in inculcating the habit of self-learning in a particular subject. Yet the use of modular package have not found their place in the present day schooling in India, especially in learning Science for middle and high school's students. So, with the intention of developing

modules and testing their efficiency, the investigator conducted a study on the “**Effectiveness of modular package as self study tool in self paced learning of Science**”

3.0: STATEMENT OF PROBLEM

Effectiveness of Modular Package As A Self Study Tool In Self Paced Learning Of Science

4.0: OPERATIONAL DEFINATION OF KEY TERMS

Modular Package: A package in which learning content is presented in form of small units called modules consisting of frames.

Effectiveness: Here in the proposed study it is measured in terms of gain score of student on criterion reference test(calculated as difference from pre to post test) made by the investigator.

5.0: OBJECTIVES

- i. To develop a modular package on Science.
- ii. To study pretest scores of student learning through modular package on Science.
- iii. To study posttest scores of students learning through modular package on Science.
- iv. To compare pretest & posttest scores of students learning through modular package on Science.

6.0: HYPOTHESIS

There is no significant difference between the achievement scores of pretest and posttest of students when they learn through the modular package.

7.0: METHODOLOGY OF STUDY

7.1 : POPULATION

All those students studying in VI standard of schools in Sonipat.

7.2: SAMPLE

60 students of VI standard studying in Dadi Dhramvati High School at Sonipat.

7.3: TOOLS

- 1) **Instructional Tool**:- modular package on Science (Component -Air).
- 2) **Measuring Tool** -: Two parallel form of Achievement test

7.4: RESEARCH DESIGN

Keeping in mind the nature and need of the study the investigator adopted pretest posttest control group quasi experimental research design.

Independent variable: learning through modular package.

Dependent variable: Achievement in Science.

7.5: COLLECATION OF DATA : Study was completed as under:-



- i) Instructional and measuring tools were developed by the investigator.
- ii) Appropriate pretest was administered to experimental group before exposing the group to the treatment.
- iii) Experimental group be given appropriate treatment for a period of 10 days.
- iv) Appropriate posttest administered to experimental group after exposing them to appropriate treatment.

7.6: STATISTICAL TECHNIQUES TO BE USED:

Data was analyzed statistically using t-test.

8.0: DELIMITATION

Study was confined to:

- i) 60 students of one school situated in Sonipat.
- ii) Modular package on Science specifically with concerned topic i.e. Air.

FINDINGS:-

Modular learning is a new learning strategy for arranging learning experiences in education and it has been receiving much attention. The strategy of learning through modules could be implemented at higher levels of learning. A leaning module is a self- learning package dealing with one specific subject matter/unit it can be used in any setting convenient to the learner and may be completed at the learner’s own pace. Sufficient theories and practices are available for the practical application of modular learning. Here in the present study obtained data was analyzed, interpreted and conclusions were drawn.

Comparison of pretest scores both the experimental and the control group by applying statistical analysis reflected that there existed no significant difference between the group and both the groups were almost equal with respect to basic knowledge of Science. Therefore the null hypothesis, “there is no significant differences between mean scores of the experimental and control groups on pretest,” was accepted at 0.05 level. See table 1

Table 1: Significance of difference between means scores of the experimental and control Group on pretest

Group	N	M	SD	SE _D	t value
Experimental group	30	34.4	6.31	16.8	0.22
Control group	30	34.13	6.21		

NOT significant df =58 t-value at 0.05 level=2.00

In the same way, the comparison between means pretest scores of high achievers of the experimental and the control groups showed that the difference between means pretest scores of high achievers of the experimental and the control group was not significant at 0.05 level. This indicates that high achievers of both groups were almost equal in basic knowledge of Science(Air) at the beginning of experiment Therefore, the null experimental and control groups on pretest, “was accepted.

Similarly, the difference between the mean of pretest scores of low achievers of both the experimental and the control groups was also not significant at 0.05 level this shows that low achievers of both the experimental and the control groups had almost equal knowledge of “Air” at the commencement of the experimental. There, the null hypothesis, “there is no significant difference between mean scores of low achieves of the experimental and the control groups on pretest,” was accepted at 0.05 level.

The experimental group performed significantly better than the control group on posttest. The difference between the posttest mean scores of the two groups was significant at 0.05 level. Thus the null hypothesis, “there is no significant difference between the academic achievement of the students learnt through modular package and the students learnt through traditional method of learning,” was rejected at 0.05 level in the favour of the experimental group.

Table 2: Significance of difference between mean scores of the experimental and the control groups on posttest.

Group	N	M	SD	SE _D	t value
experimental group	30	65.71	7.97	1.17	4.48*
control group	30	53.39	9.02		

*** significant df =58 t- value at 0.05 =2.00**

Furthermore, the comparison of high achievers of both the experimental and the control groups on posttest scores depicted that difference between mean scores of both group was insignificant at 0.05 level. Therefore the null hypothesis, “there is no significant difference between the mean scores of the higher achievers of the experimental and control groups on posttest,” was rejected.



Table 3: Significance of difference between mean scores of high achievers of the experimental and the control groups on posttest.

Group	N	M	SD	SE _D	t value
High achievers of the experimental group	15	75.14	10.39	4.40	0.92*
High achievers of the control group	15	57.50	14.44		

***Not significant df =28 t- value at 0.05 =2.05**

While comparison of mean scores of low achievers of the experimental and the control groups showed differences significant at .05 level. Thus modular approach promises to be effective for low achievers. It is in the favour of experimental group. Thus the null hypothesis, “there is no significant difference between the mean scores of low achievers of the experimental and control groups on posttest,” was rejected at 0.05 level.

Table 4: Significance of difference between mean scores of low achievers of the experimental and the control groups on posttest.

Group	N	M	SD	SE _D	t value
Low achievers of the experimental group	15	60.28	4.29	1.99	5.74*
Low achievers of the control group	15	48.85	4.25		

*** Significant df =28 t- value at 0.05 =2.05**

The t-value obtained in case of “treatment” as the source of variation and “achievement level” as source of variation was found to be significant at 0.05 level. Thus the null hypothesis, “there is no significant difference between the mean scores of high achievers and low achievers of control and experimental groups on posttest,” was rejected.

CONCLUSIONS In the light of the statistical analysis and the finding of the study, the following conclusions were drawn.

1. On the whole, modular learning is more effective learning process for Science as compared to traditional learning method. Because in modular learning the students are provided the opportunities of learning at their own pace, according to their ability level and needs.
2. In spite of the fact that, students in the modular approach outscored the students working in traditional learning mode have no priority over students learnt by traditional method in retaining the learnt Science material. But it could not be generalized. May be it have some other reasons like family background are basic knowledge of subject. Overall modular approach is more effective as compared to traditional method.
3. Low achievers in self –learning style have significant superiority over low achievers learning science by traditional method. Thus modular approach is very effective method of learning Science to the low achievers as compared to traditional method of learning. In self learning style immediate reinforcement is provided by feedback to practice task, which motivate the student.

SUGGESTION

In the light of findings and conclusions of the study, following recommendations were made.

1. This study proved that modular learning is more effective mode of instruction for Science as compared to traditional method of learning. This method should be applied to other subjects as well as other level of education. Therefore the teacher of Science should use modular learning to improve the academic achievement of the student.
2. Modular learning is a new technique in classroom setting, Science teachers should be provided training in module writing and learning.
3. The result of single study is insufficient to decide about the maximum use of modular approach in our classroom setting. Thus a series of studies on modular approach in different situations and mixed gender at different levels should be carried out.
4. This study examined only the academic achievements of students in Science, further studies be conducted to investigate the effectiveness of modular learning for other dependant variables such as attitude towards subject, self –concept, social skills and academic motivation.
5. The study was conducted on students of middle level but there is need to conduct same study on higher secondary students also to check the effect of modular learning.
6. There is need to transform the text books of various subject in modular form. because the traditional text books do not meet the criteria of modular approach.



7. Writing of module is a technical job and special skill and proficiency is needed, so there is need to train the teachers in this field.
8. There is shortage of trained and competent teachers especially in Science. Modular approach is self-learning package and through this approach such problems can be tackled.
9. In service training of school teachers should be arranged for preparing modules in different subjects.
10. All the learning and instructional material should supported modular approach. Efforts should be made to provide such materials to all teachers, all subjects in all the institutions.

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