

EFFECTIVENESS OF SELF – LEARNING PACKAGE FOR ENHANCING UTILITARIAN VALUE IN MATHEMATICS AMONG SECONDARY SCHOOL STUDENTS

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Abstract : Education and learning takes place as a result of reconstruction of experiences of an individual. It is possible only through effective Self - Learning Packages. In view of present educational scenario, effective learning packages can contribute a lot to the learning process. In our education system there are a number of methods followed for enhancing Self- Learning among students. But most of these are of no use. In this situation, a well prepared learning package can contribute a lot in Self- Learning of students. Self- Learning means taking information, processing it and retaining it without the need of another individual to be teaching it, in order for the understanding to occur. A well developed self- learning package can facilitate the learning of mathematical concepts and application. However, the learning through a package will be helpful for students to work in their own pace. Definitely, we can say that Self - Learning Package is a gift that we give to students when they are old enough to receive it. So in the present study the investigator tries to experiment Self- Learning Package for enhancing utilitarian value in Mathematics among Secondary School Students.

Key words: Effectiveness, Self -learning package, utilitarian value, Secondary school students, Experimental group, Control group

Introduction - Learning is the core part of the Educational process. Learning is not process oriented, but it is product oriented. The present world is in the process of technological advances demand a variety of well trained man power of various grades who can read, write, compute and have learnt how to learn. The science of Mathematics is also changing rapidly. The rapid spread of modernization in science, technology and even in sociology is due to the process of mathematisation. It is a part of commonsense that most of the issues that we pose to handle in our day to day life are related to Mathematics, directly or indirectly. It is necessary to train children to think Mathematics in relation with life situation. So a life deprived of mathematical knowledge is a matter beyond imagination, irrespective of its span. So we can say that

Mathematics determines the future of mankind. It is necessary to create an environment in the class which motivates the children to learn. The entire environment is charged with Mathematics. In the present study, the investigator emphasize on the role of a Self-Learning Package for enhancing Understanding about practical value of Mathematics among Secondary Level Students.

1. Review of literature

There are so many studies related to the effectiveness of Self Learning. The descriptions of these are given below in detail.

Madanakumar (2012) conducted a study to find out the effectiveness of electronic media based instructional strategy to create environmental awareness among secondary school pupils of Kerala. The study was designed with strategies of teaching as independent variable and scores of the test of environmental awareness and environmental ethics as dependent variables. The electronic media based instruction lesson plans, standardized environmental ethics scale and the present activity oriented lesson plans were used for collection of data. The findings of the study revealed that electronic media based instruction is more effective than the present method of teaching to develop environmental awareness among the secondary school pupils.

Abbas (2011) developed and tested the effectiveness of Meta cognitive integrated multimedia science learning package on achievement in Chemistry and meta cognitive ability. The first phase of the study was aimed at finding out the existing level of metacognitive ability. The first phase of the study was aimed at finding out the existing level of metacognitive awareness of secondary school students and metacognitive teaching competency of their teachers. The findings of the study revealed that the prepared learning package is effective in enhancing achievement in Chemistry, metacognitive ability, self efficacy, scientific creativity, social skills and

retention capacity as well as in reducing academic anxiety of students.

Ali, *et al.* (2010) conducted a study to explore the impact of modular teaching on the achievements of students. The study was experimental in nature with equivalent group study design. The collected data of both groups were analyzed and interpreted using mean, standard deviation and t- test and conclusions were drawn based on this data. The results of the study were in the favour of modular teaching approach because experimental group scored more than the control group in the achievement test. Therefore, it is suggested that this approach should be widely applied in conventional classroom at various levels of education.

Anu (2010) conducted a study to focus on the development of an emotional intelligence enhancement package for primary school students with reference to emotional competencies. As a prelude to the experiment, the investigator analyzed the level of emotional intelligence of primary school students through a survey using a standardized emotional intelligence test (EIT). The effectiveness of the developed Emotional Intelligence Enhancement Package (EIEP) was assessed through EIT. The results of the experiment revealed that EIEP can be effectively used for raising the emotional intelligence of upper primary school students.

Gopinath (2009) developed a plan of Action for Environmental Education through learning of Geography in secondary schools. The study was experimental in nature and was conducted on a sample of 322 secondary school students. The plan of Action for Environmental Education developed by the investigator was found to be effective and superior than the existing method of teaching for the whole sample and sub samples based on sex, school locale and medium of instruction.

Scoullos and Alampei (2004) prepared a material to facilitate the educator's work in the closely related fields of environmental education or education for environment and sustainability or education for sustainable development and it was designed mainly for Secondary School Students. The material aimed at the development of problem solving and decision making skills, in order to stimulate the responsible behavior of the students, and their ability to undertake action in favour of the environment and natural resources..

Balasubramanian and Rangarag (2002) conducted a study on "Development and Validation of Syllabus oriented computer based Instructional Package in teaching Physics. The objectives of the study were (1) to develop syllabus based Computer Software Packages in

teaching Physics at Higher Secondary Level. (2) to validate the developed Computer Software Packages from technical and pedagogical point of view by experts, educationist and practicing teachers. The developed computer software packages have proved quite effective.

Bindu (2001) conducted a study named preparation and testing of a learning package on Apiculture for second year degree Zoology students. The objectives of the study were (1) to study the extend of familiarity of BSc Zoology students with Apiculture and related aspects,(2) to prepare a learning package on Apiculture for second year degree zoology students and (3) to test the effectiveness of the learning package prepared by comparing it with that of the Formal method. The major findings were (1)present teaching learning process (Lecture method) is ineffective in developing practical occupational awareness among BSc. Zoology students in the occupation 'Apiculture' that they have learnt in their BSc. Zoology syllabus and (2) the learning package is more effective than the text book in the teaching of Zoology in Colleges.

Varma (1998) made a study to examine the effectiveness of instructional media in modifying the cognitive and effective behavior in prevention and control of Acquired Immune Deficiency Syndrome (AIDS). The objectives of the study were (1) to find out whether the effect of instructional media viz. video, audio, slides, posters and lecture method are effective in modifying the cognitive and affective behaviour among undergraduate students with regard to AIDS epidemic and (2) to find out whether there is any significant difference between lecture method and different instructional media.

Harris (1998) investigated the effectiveness of an experimental teaching approach in promoting development of student attitudes, behaviours and knowledge in health education. The teaching for Health Understanding approach was compared to a traditional instructional approach in health education in public secondary high school. Students in both the experimental and comparison group completed a pre-test prior to instruction and a Posttest following instruction. The study showed no significant differences in either teaching approaches or student outcomes related to the differing teaching approaches. Changing health attitudes, behavior and knowledge poses major challenges to health education.

Garay (1998) examined the relationship between a rural audiences' frequency of exposure to radio plays, which promoted nutritional and health related practices, and their attitudes and knowledge about these recommended practices. The data were collected by the

administration of a designed survey instrument (questionnaire) for the study. The audience was Pretested at the beginning of the programme broadcast and then Posttested after its conclusion. This study concluded that radio, is an efficient tool to reach its rural audience. It has an important influence in the audiences' attitude and is specially effective in the transmission of basic knowledge about nutrition and health.

Rajaswaminathan (1998) conducted a study on "Impact of Multimedia Package in the Teaching of Commerce with reference to select variables." The study found that the use of Multimedia Package was more effective than conventional method of teaching.

Hill's (1998) experimental study compared the traditional method of teaching and an individualized Learning Package. The experimental group scored significantly high and the mean time spend was also less than the control group.

Gray (1996) studied the difference in achievement of students in traditional and distance learning environments. Non-experimental design was formulated to conduct the study. Achievement test and questionnaire were the major tools used. The study concluded that students in distance learning environments achieve academic success at a rate equal or better than students of traditional environments.

Patel (1995) conducted a study to investigate the environmental awareness of secondary students in the context of IQ and sex and also to examine the effect of the environmental study by multimedia package on environmental awareness of Secondary School students. The study revealed that students with high IQ had increased environmental awareness; the environmental awareness multimedia package was more effective than the traditional lecture method.

Self-learning programmes for teachers were developed by Lambhate (1987) and Das(1990) and the effectiveness of the material was studied. Quasi-experimental design was used to conduct the studies. Achievement test was used to assess the performance of participants. The study revealed that teaching through self-learning material is significantly more effective than traditional teaching.

Wilkinson (1976) developed a Learning Package for teaching Science. Learning Package is a collection of materials to effect specified learning outcomes with minimum teaching contact. The conclusion was that learning package can offer a great variety of learning experience thus allowing selection according to individual

styles of learning and that it allows students to learn at their own pace and time. Pultorak (1975) and Rowland (1995) worked on Modular Approach for effective instruction of graduate students. Questionnaire, pretest & post-test were used to gather relevant information. The results showed that modules are very effective for instruction.

Weiss and Roshfield (1975) developed and assessed a self instructional EE programme for elementary teachers. A self EE package was developed for elementary school teachers and reviewed by a panel of experts. The final package contained eight modules dealing with basic concepts and principles of Ecology. Teachers who were taught with EE package were found to be more knowledgeable about the environment than the control group. The self instructional package was effective in helping teachers to learn environmental concepts and principles to learn at their own pace.

Hurst (1974) designed flexible competency based learning module to change elementary teacher trainee's knowledge, skills and attitude towards enquiry teaching. The effectiveness of the module was compared in three classroom settings, individual group and control group. The study revealed that in both individualized and group settings, teaching learning modules may serve as means to creative instruction in teacher education in future.

Donald and Mervin (1973) conducted a study to investigate the effectiveness of a series of Self Instructional Modules (SIMs) for training secondary level Social Studies Teacher Trainees to develop and ask higher level questions. The study showed that Self Instructional Module is more superior to conventional methods for developing concepts and skills.

2. Definition of Key terms

- **Effectiveness :** The term effectiveness stands for the outcome of the study when the influence of another or condition. "It is the plan for construction or presentation which cause desired change in learner's behaviour" (Good, 1972).
- **Self - Learning Package :** A Self-Learning Package is a document containing all that is necessary for a student to attain one or more educational objectives independently of the teacher. Using these packages, the student can take over a large part of his training while the teacher remains available, when needed.
- **Utilitarian value :** Utilitarian value means value having useful function. It is the value that has usefulness

in real life situations. Anything has 'utilitarian value' means that, the particular thing is applicable to daily life situations and using that thing we can find solutions to real life problems.

- **Secondary School Students :** The Secondary School Students are those who studying in schools recognized by the government of Kerala for giving instructions to students at the terminal stage of school education .
 - **Experimental group :**The group of students that we experiment our new teaching strategy
 - **Control group :**The group of students who taught by traditional teaching method

3. Objectives of the Study

The following are the objectives of the study:

1. To develop a Self – Learning Package for enhancing utilitarian value in Mathematics among Secondary School Students
2. To find out the effectiveness of the Self – Learning Package for enhancing utilitarian value in Mathematics among Secondary School Students for the total sample as well as subsample based on
 - a) Gender b) Locality
3. To compare the effectiveness of the Self – Learning Package and Activity Oriented Method for enhancing utilitarian value in Mathematics among Secondary School Students for the total sample as well as subsample based on
 - a) Gender b) Locality

4. Hypothesis of the study

Based on the objectives specified, the hypothesis is formulated as:

There is no significant difference in the effectiveness of Self–Learning Package and Activity Oriented Method for Enhancing Utilitarian Value in Mathematics among Secondary School Students for the total sample as well as subsamples based on

- a) Gender b) Locality

5. Method

Keeping in view the objectives of the study, experimental method is appropriate for the present study .

5.1 Variables Used for the Study

In the present study, the investigator selected the following variables.

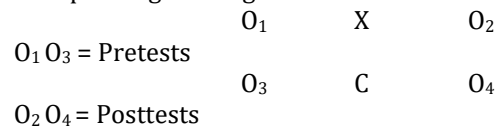
5.1.1 Independent Variables: The independent variables are Self- Learning Package and Activity Oriented Method for enhancing utilitarian value in Mathematics among Secondary School Students for Control group and Experimental group respectively.

5.1.2 Dependent variable: The dependent variable is the effectiveness of Self- Learning Package for enhancing Utilitarian Value in Mathematics among Secondary School Students. The achievement in the enhancement of utilitarian value in Mathematics depends on the effectiveness of the Self-Learning Package.

5.2 Design of the Study

In the present study, the investigator adopted the Pretest- Posttest Nonequivalent-Groups design. This type of experimental design consists two nonequivalent groups, one group is treated as Experimental group and the other is treated as Control group . While selecting the sample, due representation is given to Gender and Locality of the school.

A Learning Package is intended to teach the Experimental group through different learning activities. The Control group taught by the Activity Oriented Method. A standardized pretest conducted for both Control group and Experimental group. Both the groups were taught by the investigator herself. After the experimental treatment a standardized Posttest conducted for both the groups. The experimental design for the Pretest- Posttest Non equivalent-Groups design is diagrammed as



6. Methodology in Brief

6.1 Population for the Study The Secondary School Students in Ernakulam district are the population for the present study .

6.2 Sample Selected for the Present Study

The study conducted on a sample of 162 Secondary School Students of VIIIth Standard, consisting of Girls and Boys from St.Philomena's H.S.S,Koonammavu from rural area and Darul Uloom H.S.S, Ernakulam in urban area of Ernakulam district .

The details of the sample selected for the study is shown in the Table 1.1

St.Philomena's Koonammavu		H.S.S, Darul pullepady		Uloom	H.S.S
Rural locality			Urban locality		
No:of Students in the Control group	No: of Students in the Experimental Group	Total	No:of Students in the Control group	No:of Students in the Exp.Group	Total
38	42	80	39	43	82
Total					162

Table 1.1 Details of the Sample Selected for the study

7. Statistical Techniques

The following statistical techniques is used for the present study.

1. Arithmetic mean
2. Median
3. Standard Deviation
4. t- test
5. ANCOVA

8. Experimental Procedure

The investigator conducted the study in aided schools of Ernakulam district. In each of the school the investigator selected two divisions of VIIIth Standard.

One group is selected as Experimental group and the other group is selected as Control group. The Experimental group was treated with Self-Learning Package prepared by the investigator, and the Control group is treated with the Activity Oriented Method. After the treatment of both the group a standardized Achievement Test in Mathematics is conducted for both the group. The following figure shows the experimental procedure the investigator followed in the study.

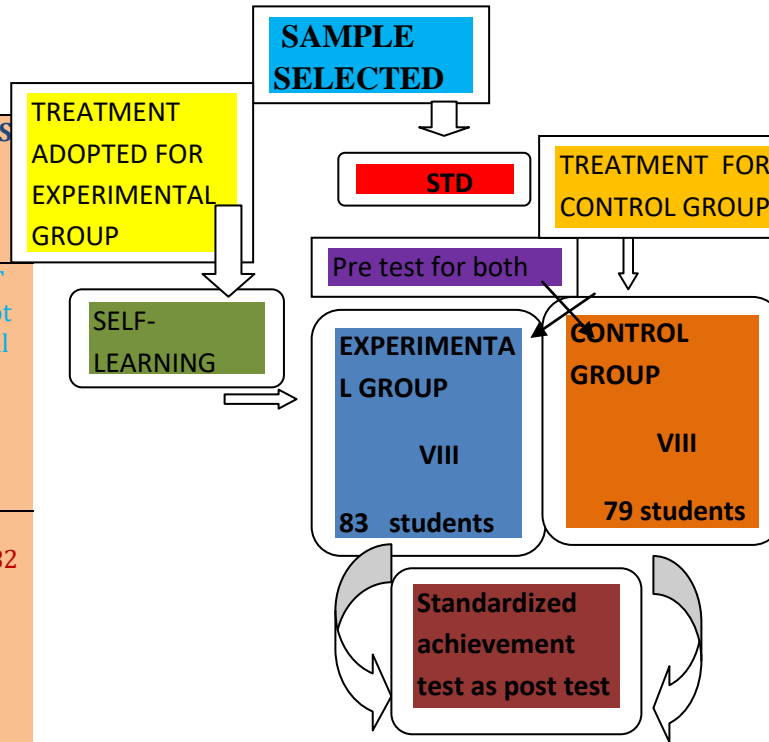


figure 1 Experimental Procedure

9. Conclusion : The present study was intended to examine the Effectiveness of the Self -Learning Package for Enhancing Utilitarian Value in Mathematics among Secondary school Students.

The important findings emerged out of the study are given below under appropriate heads

Conclusion I: There is significant difference in the effectiveness of Self-Learning Package and Activity Oriented Method for Enhancing Utilitarian Value in Mathematics among Secondary School Students for the total sample.

Conclusion II: There is no significant difference in the pretest Scores of Secondary School Students in the Control and Experimental Group with respect to Their Achievement in Mathematics (Based on Total There is significant difference in the effectiveness of Self-Learning Package and Activity Oriented Method for Enhancing Utilitarian Value in Mathematics among Secondary School Students for the total sample.Sample)

Conclusion III: There is significant difference in the Posttest Scores of the Secondary School Students in the Control and Experimental Group with respect to their Achievement in Mathematics (Based on Total Sample).

Conclusion IV: *There is significant difference in the Pretest and Posttest Scores of Control Group with respect to their Achievement in Mathematics (Based on Total Sample)*

Conclusion V: *There is significant difference in the Pretest and Posttest Scores of Experimental Group with respect to their Achievement in Mathematics (Based on total*

Conclusion VI: There is significant difference in the Gain Scores of Control and Experimental groups for the total sample with respect to their achievement in Mathematics.

Conclusion VII: There is no significant difference in the effectiveness of Self-Learning Package and Activity Oriented Method for Enhancing Utilitarian Value in Mathematics among Secondary School Students for the subsample based on Gender.

Conclusion VIII: There is no significant difference in the Pretest Scores of Girls and Boys in the Experimental Group with respect to their Achievement in Mathematics.

Conclusion IX: There is no significant difference in the Posttest Scores of Girls and Boys in the Experimental Group with respect to their Achievement in Mathematics.

Conclusion X: There is no significant difference in the Mean Gain scores of Girls and Boys in the Experimental Group with respect to their Achievement in Mathematics.

Conclusion XI: There is no significant difference in the effectiveness of Self-Learning Package and Activity Oriented Method for Enhancing Utilitarian Value in Mathematics among Secondary School Students for the subsample based on Locality.

Conclusion XII: There is no significant difference in the Pretest Scores of Rural and Urban Secondary School Students in the Experimental Group with respect to their Achievement in Mathematics.

Conclusion XIII: There is no significant difference in the Posttest Scores of Rural and Urban Secondary School Students in the Experimental Group with respect to their Achievement in Mathematics.

Conclusion XIV: There is no significant difference in the Mean gain Scores of Rural and Urban Secondary School Students in the Experimental Group with respect to their Achievement in Mathematics.

10. Tenability of Hypothesis

The hypothesis formulated for the study are tested for tenability in relation to the findings of the study:

The hypothesis of the present study was ' *There is no significant difference in the effectiveness of Self-Learning Package and Activity Oriented Method for Enhancing Utilitarian Value in Mathematics among Secondary School Students for the total sample as well as subsamples based on*

a) gender *b) locality'*

The analysis of variance of the 'Y' means indicate that there exist significant difference in the Mean achievement scores between Control group and Experimental group. Hence hypothesis I is rejected.

The mean gain scores of achievement test for the Girls is 12.75 and standard deviation 1.9 and the mean gain scores of achievement test for the Boys is 13.02 and standard deviation is 1.39. The critical ratio obtained is 0.74 which is not significant at 0.01 level and 0.05 level, indicating that there is no significant difference between the gain scores of Girls and Boys. This means that the two groups do not differ significantly with respect to their achievement in enhancing utilitarian value in Mathematics.

The Mean gain scores of achievement test for the Rural Secondary School Students is 13.05 and standard deviation 1.4 and the Mean gain scores of achievement test for the Urban Secondary School Students is 12.73 and standard deviation is 1.88. The critical ratio obtained is 1.47 which is not significant at 0.01 level and 0.05 level, indicating that there is no significant difference between the gain scores of Rural and Urban Secondary School Students. Hence, it can be concluded that the Self Learning Package for enhancing utilitarian value in Mathematics is effective irrespective of the Gender and Locality.

Therefore the hypothesis I (a) and I (b) are not rejected

11. Educational Implications of the Study

The present world is the world of practical thinking. No pure theories and bookish knowledge alone can help man to attain his goal of development. Every theory should come into practice of mankind. The educational implications based on the findings of the present study are following

1. The study shows that every class subjects can be taught through learning packages
2. The learning packages are learner centered.
3. It supports a child centered Curriculum
4. Educationalist, School administrators and teachers get an innovative method of teaching

5. Learning Packages can be used as a tool for effective teaching learning process.
6. A child learns much if variety of learning Materials and learning experiences are provided.

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