

EFFECT OF DAILY HOME ASSIGNMENTS (DHAs) ON RETENTION OF SECONDARY LEVEL STUDENTS

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ABSTRACT

The present investigation was intended to explore the effect of Daily Home Assignments in terms of retention in Science subject. Experiment was conducted on IX-class students studying in Digambar Jain Inter College, Agra. The school was selected purposively and there were total 66 IX class students (N=66) who were randomly assigned to Experimental Group (N=33) and Control Group (N=33). Tools employed were: Instructional Material based on Traditional Approach, Daily Home Assignments and Science Retention Test. Two Groups, Randomize Subjects, Post-test Only design was implemented to execute the research. Subjects of the Experimental Group were treated with Traditional Approach with Daily Home Assignments whereas subjects in the Control Group were treated with Traditional Approach without Daily Home Assignments. Both the groups were treated for twenty-five days and after two weeks of treatment Science Retention Test was administered to the subjects of both the groups. Normality of Science Retention Test scores was determined through Numerical Method (Shapiro Wilk test) as well as through Visual Method (Histogram). Further analysis was carried out by Using Mann-Whitney U-test. Findings revealed the significant effect of Daily Home assignments on Retention of IX class students in Science subject.

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INTRODUCTION

Science and Technology have become pervasive in the present world in such a way that it has not left any sphere untouched. Even, Science related issues have been encountered in prevailing problems related to global warming, genetically transformed food, environmental protection etc. Which affects our life directly (International Council for Science [ICSU], Paris (2005). On one hand where Science and Technology have the potential to resolve the prevailing problems on other hand amelioration in Science and Technology are considered as important factors for growth and development of any Nation. In order to withstand the emerging issues and for raising living standards quality Science education has emerged as matter of great concern at global level. There is a need to fascinate our youth towards the profession of scientists, so as to conduct influential researches.

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Quality Science education at various levels can play a vital role in directing young minds towards scientific careers. Besides focusing on students' achievement in Science subject it is also required to enhance students' retention as one of the major goals of education is the retention of knowledge and its application in new situations. Retention in terms of learned information refers to storing information in long-term memory in such a manner that it can be retrieved readily, on application of certain prompts (Bennett & Rebello, 2012). It is through retention only it becomes possible to transfer the gained knowledge in new situations which is prerequisite for scientific inventions and in resolving existing science related issues. Benefits of retention can be well reflected through the following quote:

"The benefits of the learning retention process involve not only strengthened knowledge but also increase likelihood that participants will apply new knowledge and skills, understand the results that can be achieved, and reflect and document progress toward a broad goal". (Humentum, 2018). These lines emphasize well the significance of learning retention which is the crucial variable among other academic variables viz. Achievement, creativity, problem solving etc.

Increasing students' retention has always been a focusing issue among researchers and educators. Researches have also been conducted to determine the methods and strategies through which retention of students can be improved and statistical techniques through which it can be measured. One of the alternative ways to enhance students' retention is Homework/Home Assignment. It has been reported that there are several benefits of giving home assignments which have been categorized into four categories: immediate scholastic effects, long-term scholastic effects, non-scholastic effects, involvement of parents. Favorable effects of homework related to immediate scholastic learning and achievement includes: improved retention of knowledge, improved understanding, enhanced critical thinking, formation of concepts and skills related to information processing, promoting leisure time learning, healthier attitude towards school, improved skills and study habits and enrichment of curriculum (Kralovec & Buell, 2000 and Cooper, 2007). Homework can assist the students in developing lifelong necessary skills, it can serve as a tool in making them more responsible, it can help students by establishing habit of study, and retention of information can be improved Caston & Penrose (2013). Huisman (2016) carried out an evaluation programme to achieve a clear understanding of how homework assists or hinder the students' achievement, particularly the overall grade attained by the students. The key findings were: that due to missing home-work students received failing grades which was the primary cause. Conclusion emphasized on need of policies on homework in order to support students learning without compromising their grades. Hanover (2018) investigated the purpose served by the homework, its impact on students' achievement, amount of appropriate homework, type of homework to be assigned. It was recommended that impact of homework on achievement of elementary level students is minimal whereas its impact is positive on achievement of middle and high school level students. Load of homework should be increased gradually according to the level of the students. Homework should emphasize on content already delivered in the classroom, instead of introducing new one. It should aim at reinforcing skills which are previously learned by the students. While designing the homework teacher should take into account the availability of resources for students at home. Teachers should explore different means to facilitate additional resources for assisting students in completing homework. Time devoted by the students in getting their assignments complete is also an important factor and is directly proportional to their performance (Epstein & Voohris, 2001). It has been mentioned that homework is useful for students in developing several beneficial skills and also serves several benefits for parents in determining their students' success (Costley, 2013). Attempts have been made in order to reveal views of teachers regarding homework at primary level (Buyukalan & Altinay, 2018).

Despite of certain benefits, researches on Home assignment at national arena are in wane which provided the scope to study the effect of Daily Home Assignments (DHAs) on students' retention in Science subject. In the present study attempt has been made to study the effect of DHA supplemented with traditional approach based instructional material on retention of secondary level students in science subject.

Definitions of the terms Used in the Study

The terms used in the present study were defined as follows:

- a) Daily Home Assignments: Daily Home Assignments (DHA) in the current study refers to, daily academic task assigned to students after delivering each Science lesson by the researcher to be completed by them at home.
- b) Retention: Retention in context of present study can be defined as the students' ability to recall Science content that they have learned during research intervention, after a certain time interval.

Objective of the Study

To study the effect of Daily Home Assignments (DHAs) on Retention of secondary level students in Science subject.

Hypothesis of the Study

H_0 : There exists no significant difference between Retention of students taught through Traditional Approach with Daily Home Assignment and Traditional Approach without Daily Home Assignments.

Sample of the Study

Sample comprised of class IX students studying in Digambar Jain Inter College, Agra. The school was selected through purposive sampling while its 66 IX-class students were randomly allocated to Experimental Group (N=33) and Control Group (N=33).

Tools of the Study

Tool employed in the present study were Instructional Material based on Traditional Approach and Science Retention Test.

Design of the Study

Two Groups, Randomize Subjects, Post-test only design was used to execute the present study (Table 1). According to this design the available subjects are assigned to two groups through randomization which provides control for all extraneous variables which are relevant. No pre-test is administered and the random allocation of subjects assures that any initial difference between the groups occurs only due to chance (Koul, 2009). In this study the available subjects i.e., 66 IX-class students were randomly assigned into two groups viz. Experimental Group (N=33) and Control Group (N=33). Students in the experimental group were treated with Instructional material based on traditional approach with daily home assignments whereas students in the control group were treated with instructional material based on traditional approach without daily home assignments. Science Retention test was administered on both the groups after two weeks of intervention. This gap of two weeks was decided on the evidence of previous studies in which Retention test was administered after the duration of two week (Fatokun, Egeya & Uzoechi 2016; Valdez, 2015; Obi, Agwagah, & Agah., 2014; Duyilemi & Bolajoko, 2014).

Table 1. Two Groups, Randomized Subjects, Post-test only Design

Groups	Treatment	Post-test
Experimental Group	Instructional material based on Traditional Approach with DHA	Science Retention Test
Control Group	Instructional material based on Traditional approach without DHA	Science Retention Test

Statistical Techniques Used

For determining nature of distribution of data Numerical as well as Visual methods were employed. Shapiro-Wilk test was used under Numerical Method whereas Histogram was used under Visual Method. Further comparison of Science Retention test scores of Experimental Group and Control Group was carried out by using Mann-Whitney U-test.

Data Analysis and Interpretation

Analysis of data and its interpretation have been categorized into two segments viz. determining the distribution of Science Retention test Scores followed by comparison of Science Retention Test scores obtained by students of Experimental Group and Control Group. These two segments have been elaborated as follows:

a. Determining the distribution of Science Retention test Scores

Ghasemi & Zahedias (2012) emphasized that the normality should be determined through normality test as well as through visual methods. Thus, in the present study distribution of Science Retention Test Scores was analyzed through normality test i.e., Numerical Method (Shapiro-Wilk test) as well as by employing Visual Method (Histogram).

i) Numerical Method (Shapiro-Wilk Test)

Distribution of Science Retention test Scores obtained by students of Experimental Group and Control Group was first determined by using Shapiro-Wilk test. Values of Shapiro-Wilk test statistics obtained on Science Retention Test scores of Experimental Group and Control Group have been mentioned in Table 2.

Table 2: Shapiro-Wilk test statistics on Science Retention Test scores of Experimental Group and Control Group C.

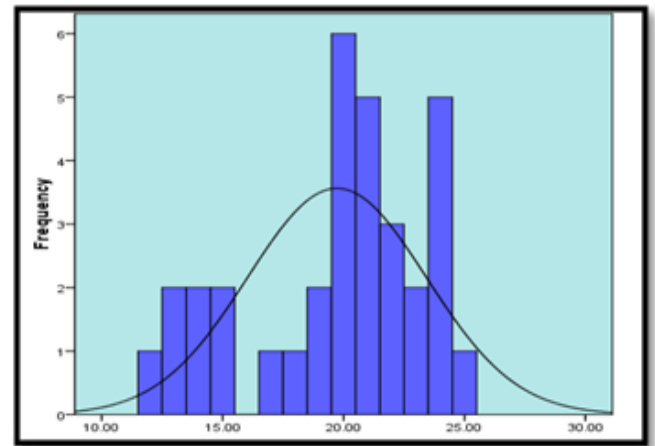
Science Retention Test Scores	Shapiro-Wilk	
	Statistics	Sig.(p-value)
Experimental Group	.911	.011
Control Group	.893	.004

Table 2 reveals the obtained values of Shapiro-Wilk test statistics for Science Retention Test scores of Experimental Group and Control Group, which were obtained as .911, .893 with their corresponding significance values as .011 and .004 respectively. The obtained p-values of Experimental Group and Control Group were smaller than the alpha value .05 which results in the rejection of null hypothesis at .05 level of significance i.e. the data on Science Retention Test are normally distributed at 95% level of confidence. Therefore,

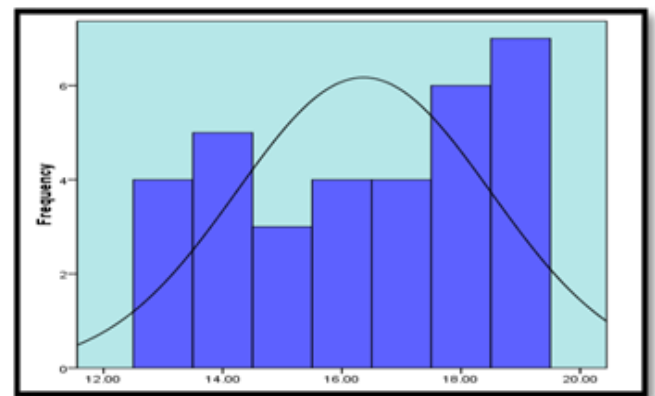
it can be concluded that Science Retention Test scores of Experimental Group and Control Group, were not found to be normally distributed.

ii) Visual Method (Histogram)

Any inference when based on two supporting facts is much more authentic in comparison to the inference based on single fact. Thus, the distribution of Science Retention test scores obtained by students of Experimental Group and Control Group was also analyzed through visual method (Histogram). The obtained Histograms on Science Retention Test scores of Experimental Group and Control Group have been depicted in following Graphs.



Graph 1. Histogram of Science Retention test Scores of Experimental Group



Graph 2. Histogram of Science Retention test Scores of Control Group

Obtained histogram (Graph 1) reveals that the Science Retention Test scores of Experimental Group does not resembles the normal bell-shaped curve, instead it depicts the leptokurtic peak. It can be seen in the obtained Histogram (Graph 2) that the scores are not following the normal bell-shaped curve. They are slightly skewed to the left side with a slight leptokurtic peak. Thus, it can be concluded that the Science Retention test scores of Experimental Group and Control Group does not possess normal distribution. Thus, the prerequisite for applying parametric test was not fulfilled and researcher selected non-parametric statistics (Mann-Whitney U test) for further analysis and interpretation of data.

a. Comparison of Science Retention Test Scores of Experimental Group and Control Group

Comparison of Science Retention test scores of Experimental Group and Control Group was done by using *Mann-Whitney U test*. Null Hypothesis framed to study the effect of Daily Home Assignments on Retention of secondary level students is as follows.

Ho: There exists no significant difference between Retention of students taught through Traditional Approach with Daily Home Assignment and Traditional Approach without Daily Home Assignments.

The values obtained on Mann-Whitney U test statistics obtained on Science Retention Test scores of Experimental Group and Control Group have been presented in Table 3.

Table 3: Mann-Whitney U test Statistics for Science Retention Test scores of Experimental Group and Control Group

Groups	N	Mean Rank	U-value	Z-score	Level of Significance
Experimental Group	33	43.18	225.00	4.11	p<0.01
Control Group	33	23.82			

It can be observed from Table 3 that the mean rank (43.18) of Experimental Group was more than mean rank of Control Group (23.82). The obtained U- value was 225.00. It was converted into Z-score (4.11) which was greater than 2.58 i.e., the table value at 0.01 level of significance. Thus, the null Hypothesis i.e., *There exists no significant difference between Retention of students taught through Traditional Approach with Daily Home Assignment and Traditional Approach without Daily Home Assignment* was rejected at .01 level of significance. This indicates significant difference between Retention of students taught through Traditional approach with DHAs (Experimental Group) and Traditional Approach without DHAs (Control Group).

Findings and Conclusion

From data analysis and its interpretation, it was found that

traditional approach supplemented with Daily home assignment had positive effect on students' retention in Science subject. This finding was in line with the recommendations given by Allane & Macgregor (2009). It was stated that favorable effects of homework related to immediate scholastic learning and achievement includes improved retention of knowledge. Present finding also supports the opinion of Caston & Penrose (2013) that home assignments can also help students by establishing habit of study and retention of information can be enhanced. This significant effect of DHAs on Retention of students of Experimental Group was apparent as they were exposed to Traditional Approach with Daily Home Assignments. Appropriate amount of homework was given to them as it was mentioned that the belief "more is better" may not suited with all students, various levels, different skills, varied subjects and several grades (Allane & Macgregor, 2009). Daily revision of the taught content to accomplish the aim of getting their home assignments complete enabled them to retain the content for long. Problem faced by the students in getting their assignments complete were also resolved through regular follow up of the Daily Home Assignments by the researcher. Sometimes students were also appreciated for the best assignments. This motivated them and others also to get their assignment complete on regular basis and in proper way. Home work was given from the topics which were taught to them during their Science class. In contrast, students in the Control Group were not given any home assignment; they were simply instructed with traditional method. They might have not revised the taught content daily after going to their homes which in turn resulted in decreased Retention scores on Science Retention Test. Seeing the results of the present study, it can be said that teachers can successfully employ this cost-effective tool to enhance students' retention in Science as well in other subjects like Mathematics, History which requires daily practice and retention of concepts respectively. It could be included as separate component of evaluation policy in order to take home assignment sincerely by the students as well as by the teachers. This will not only help them in improving their grades but will also enhance their retention through revisions and instill in them the habit of self-study. Through home-work teachers can engage their students in daily revision and practice of the content. Regular follow up help the teachers to reveal students' misconceptions which can be made clear in the next class. Students' performance in their homework also provides feedback to the teachers to re- structure their teaching plans. They can also direct home work in order to make students prepare for the next class. Teachers are required to follow the recommendation of researches based on homework in order to harness several benefits of Home assignments besides enhancing students' achievement and retention.

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