Effect of Mastery Learning Strategy on Achievement in English in Relation to Intelligence

DR. RAM MEHAR*

ABSTRACT

The present study investigates the effect of mastery learning strategy on achievement in English in relation to intelligence. The sample was drawn of IXth class students taken from two different schools of Panchkula (Haryana), affiliated to CBSE, New Delhi. Instructional material based on mastery learning strategy were prepared and implemented to the experimental group after pre-testing. The gain scores were computed after post-test for all the students. General Mental Ability Test (1972) by Jalota was also administered. A 2 ×3 analysis of variance was used to arrive at the following conclusions: (i) Mastery learning strategy group was found to attain significantly higher achievement scores as compared to conventional group, (ii) Performance of students with different intelligence levels through mastery learning strategy was found significant, (iii) Significant interaction effect was found to exist between the two variables.

Introduction

Teaching is an activity which is designed and performed for the attainment of some broad goals or a large number of specific objects in terms of change in pupil's cognitive structure and behaviour. Teacher in an experimental situation may use a simple model. But in actual practice no teacher sticks to one model. There are various models of teaching. Eggen, Kauchak and Harder (1979) defined "Models are prescriptive teaching strategies designed to accomplish particular instructional goals".

Teaching is a difficult task. It requires different types of method and teaching aids. The selection of these methods and techniques

* *Senior Assistant Professor*, Department of Education, USOL, Panjab University, Chandigarh

depends upon the nature of content, learning objectives, learner abilities and students entering behaviours (Davis and Sorrell,1995). The main focus of teaching is to bring about a desirable change in the behaviour of learner. It is brought about the teacher using teaching strategies to achieve his objective. But traditionally we have been using teaching method for content presentation. In order to increase the effectiveness of the presentation, the audio visual aids are also used.

According to Joyce and Weil (1985), "Model of teaching is a pattern or plan which can be used to shape a curriculum or course, to select, instructional material and to guide teacher's action. Models are designed to attain specific goals. When a teacher identifies a goal, selects a particular strategy designed to attain goal, we can say he is using a model approach". According to Shahid (2000), "Model of teaching can be defined as instructional design which describes the process of specifying and producing particular environmental situation that cause the students to interact in such way that a specific change occurs in their behaviour".

According to Bloom (1971), "Mastery learning is based on the belief that any teacher can virtually help all students to learn excellently, quickly and self confidently. Mastery learning believe that it can be implemented simply by modifying traditional group instructional procedures to ensure that some students have more time and they receive appropriate additional instruction according to the result of the formative evaluation".

"Mastery learning uses differentiated and individualised instruction, progress monitoring, formative assessment, feedback, corrective procedures, and instructional alignment to minimise achievement gaps (Bloom, 1971; Zimmerman & Dibenedetto, 2008). The strategy is based on Bloom's learning for mastery model, which emphasises differentiated instructional practices as strategies to increase student achievement. Drawing from the principles of effective tutoring practices and learning strategies, mastery learning uses feedback, corrective procedures, and classroom assessment to inform instruction. Rather than focusing on changing content, this strategy endeavours to improve the process of mastering it" (Bloom ,1971).

According to Davis and Sorrell (1995), "The mastery learning divided subject matter into units that have predetermined objectives. Students, alone or in groups, work through each unit in an organised faction. Students must demonstrate mastery on unit exams, typically 80 per cent before moving on to new material. Students who do not

achieve mastery receive remediation through, peer monitoring, small group discussions, or additional homework. So, students with minimal prior knowledge of material have higher achievement through mastery learning than with traditional methods of instructions".

According to Bloom (1968), mastery learning offers a powerful new approach to student learning which can provide almost all students with the successful and rewarding learning experiences. What Cioch (1977) proposes for food service courses is also relevant in other settings i.e. almost all students can master what they are taught. Further, procedures suggested whereby each student's instruction and learning can be managed within the context of ordinary group-based classroom instruction so as to promote his fullest development. Mastery learning makes student learning more efficient than conventional approaches. Mastery learning differs from traditional curricular programmes. The emphasis is on assuring that every student achieves or 'masters' the curriculum and only moves ahead once demonstrating an acceptable level of performance (Bloom, 1976). Mastery learning helps students to learn more content in less time. It also helps in developing learner's interest and attitude towards the subject taught than usual classroom methods. Mastery learning has an impact on the affective outcomes of education like modification in self-concept and to some extent development of positive attitude towards the subject. When learners are conceived that they can learn effectively, they will confront any learning task with the quite strength of knowing they will able to cope. Teaching strategies, which help reducing student anxiety, also enhance student achievement. The mastery learning approach came into practice in the decade though the concept is an old one. The different authors from different field defined mastery learning in a variety of ways (Bloom, 1968).

The word 'intelligence' is said to be the literal translation for Aristotle's term 'diagnoses'. Plato was the first to begin the discussion on intelligence with his tripartite division of the 'nous' which covered the soul, mind, spirit and thinking as well as that of mental ability. Intelligence is generally considered as the most important correlates of achievement. So intelligence is the common factor to affect the achievement of the learner. It is a descriptive concept. Commonly it is associated with the general behaviour of an individual so that it becomes synonymous of brightness of being brainy. A psychologist presents it as theoretical construct which may vary from very low to very high. Generally intelligence conveys three messages such as

ability to adjust, ability to learn and ability to carry on abstract thinking.

According to MacMillan (1990), "In education, intelligence is the ability to learn or understand or to deal with new or challenging situations. In psychology, the term intelligence may more specifically denote the ability to apply knowledge to manipulate one's environment or to think abstractly as measured by objective criteria. Intelligence is usually thought of as deriving from a combination of inherited characteristics and environmental factors. The subject remains hotly debated and many have tried to show that either biology (especially genes) or environment are more or less exclusively responsible for producing differences in intelligence. Particularly contested have been studies purporting to show links between ethnic heritage and intelligence, most of which have not been accepted in the scientific community. General intelligence is often said to comprise various specific abilities but critics contend that such compartments fail to reflect the nature of cognition and that other models, perhaps based on information processing, are needed. High intelligence is sometimes shown to correlate with social achievement, but most experts believe other factors are important and that intelligence is no guarantor of success. Intelligence means the ability to reason and profit by experience. An individual level of intelligence is determined by a complex interaction between his heredity and environment".

Need and Significance of the Study

The proper teaching strategies help teachers in solving learners' problems and bring remarkable improvement in their overall behaviour. Review of the literature shows that use of various teaching strategies gave quite positive results in comparison to traditional teaching methodology. While teaching high school English student's, investigator found conventional method not that much effective. Investigator thought to conduct research study by using mastery learning strategy for teaching experimental group and conventional method for second group of students and investigate whether the use of mastery learning strategy is effective or not. Intelligence affects how students go about studying. Thus, the present study gives wider range of knowledge regarding the effect of mastery learning strategy and relationship with student's intelligence in English grammar. The findings of the present study are also be helpful to assist the students

to improve their learning skills in English. The results of the present study are also helpful for teachers in understanding and adopting the approach of a strategy and break the monotony of the conventional teaching strategy. Therefore, the investigator made an attempt to enquire into the effect of mastery learning strategy on achievements in English in relation to intelligence.

Objectives

1. To compare the performance of groups taught through mastery learning strategy and conventional teaching strategy.
2. To compare the performance of groups having different intelligence levels.
3. To examine the interaction effect between teaching strategy and intelligence levels.

Hypotheses

H1 : The performance on English grammar of mastery learning strategy group is higher than the conventional group.
H2 : The performance of groups having different intelligence levels is significantly different from one another on English grammar.
H3 : There exists significant interaction effect between mastery learning strategy and intelligence levels.

Methodology of the Study

It is necessary to adopt a systematic procedure to collect the necessary data which helps to test the hypotheses of the study under investigation. Various steps of research methodology followed in the present study are as follows.

Sample

The study was carried out on 100 students of IXth class of Panchkula i.e. Hans Raj Public School Panchkula (Haryana) and D.A.V. Senior Secondary School, Panchkula (Haryana). It was random and purposive sample. The two schools were randomly selected from the total schools of Panchkula. The study was conducted on two intact groups viz. one is experimental group and other is control group in each school. From each school, the two intact sections of 25 students were selected.

Design

2×3 analysis of variance was employed for analysis of mean gain scores on achievement. The main dependent variable was performance gain. The two independent variables were instructional treatment and intelligence levels. The variables of teaching strategy were examined at two levels, namely mastery learning strategy and conventional teaching strategy. The classification of intelligence group was done for intelligence variable operating at three levels viz. high, average and low intelligence.

Tools used

The following tools were used for the collection of data:

1. General Mental Ability Test by Jalota (1972) was used.
2. Achievement Test in English grammar was prepared by the investigator.
3. Five Lessons in English grammar based on mastery learning strategy and conventional teaching strategy were prepared by the investigator.

Procedure

After the selection of the sample and allocation of students to the two instructional strategies, the experiment was conducted in four phases. Firstly, the General Mental Ability Test was administrated in each school, in order to identity intelligence levels of the students. Secondly, a pre-test was administered to the students of experimental and control groups. The answer-sheets were scored to obtained information regarding the previous knowledge of the students. Thirdly, one group was taught through mastery learning strategy and another group was taught through conventional teaching strategy by the investigator. Fourthly, after the completion of the course, the post-test was administered to the students of both the groups. The answer-sheets were scored with the help of scoring key. Time limit for the test was one hour.

Analysis and Interpretation of the Results

Analysis of Descriptive Statistics

The data was analysed to determine the nature of the distribution of scores by employing mean and standard deviation. The analysis of variance was used to test the hypotheses related to strategies of

teaching and intelligence levels. The mean and standard deviation of different sub groups have been presented in table - 1, 2 and 3.

Table 1
Means and SD of Achievement Scores for the Different Sub Groups

Intelligence Groups	Teaching						Total		
	Mastery Learning Strategy			Conventional Strategy					
	N	Mean	SD	N	Mean	SD	N	Mean	SD
High Intelligence	13	5.92	4.16	13	2.92	2.55	26	4.42	5.65
Average Intelligence	24	11.21	5.34	24	4.46	2.94	48	7.83	9.70
Low Intelligence	13	15.38	3.02	13	5.85	3.01	26	10.62	11.87
Total	50	10.92	5.67	50	4.42	3.07	N= 100		

Source: Field Study, 2011

It may be observed from the Table-1 that the mean scores of mastery learning strategy (M=10.92) is higher than the conventional teaching strategy (M=4.42). This shows that mastery learning strategy is more effective than that of the conventional teaching strategy. It is also confirmed that the mean of the three groups i.e. high, 6 average and low intelligence group is 4.42, 7.83 and 10.62 respectively. It is concluded that the gain mean with mastery learning strategy has shown significant differences for high, average and low intelligence students. These differences are also found in respect of the different intelligence group taught through conventional teaching strategy.

Analysis of Variance on Achievement Scores

The mean of different sub-groups, sum of squares, degree of freedom, mean sum of squares and the F-ratio have been presented in Table - 2.

Table 2
Summary of Analysis of Variance (2×3) Factorial Designs

Source of Variance	Sum of Squares	df	Mean Sum of Squares	F-ratio
Treatment (A)	1056.25	1	1056.25	69.13**
Intelligence (B)	500.94	2	250.47	16.39**
Interaction (A × B)	140.41	2	70.21	4.59*
Error	1436.51	94	15.28	

* Significant at 0.05 level ** Significant at 0.01 level
(Critical Value 3.94 at 0.05 and 6.91 at 0.01 level, df 1/94)
(Critical Value 3.09 at 0.05 and 4.84 at 0.01 level, df 2/94)

Treatment (A)

It may be observed from the Table - 2 that the F-ratio for difference in mean gain scores of mastery learning strategy and conventional teaching strategy group is 69.13, which in comparison to the table value was found significant at 0.01 level of significance. It shows that the groups were not different beyond the contribution of chance. Hence, the hypothesis H1: The performance on English grammar of mastery learning strategy group is higher than the conventional teaching strategy group, is accepted. The result indicates that the performance of mastery learning strategy group is more effective than that of the conventional teaching strategy group.

Intelligence Groups (B)

Table-2 shows that the F-ratio for difference in means of the three groups of intelligence level are 16.39, which in comparison to the table value was found significant at 0.01 level of significance. It shows that the three groups were different beyond doubt of operating chance factor. The result indicates that three intelligence lever differ significantly in respect of achievement course irrespective of strategy of teaching. Hence, the hypothesis H2 : The performance of groups having different seven intelligence levels is significantly different from one another on English grammar, is accepted at 0.01 level of significance. The observed difference may be attributed to the chance factor. The result indicates that the high, average and low intelligence group did not yield equal level of achievement.

In order to probe deeper, the ratio was followed by t-test. The value of the t- ratio for the different combinations have been given in the following Table-3

Table-3: t-ratio for different combinations of intelligence levels

Intelligence Groups	**High Intelligence**			**Average Intelligence**			**Low Intelligence**		
	N	**Mean**	**SD**	**N**	**Mean**	**SD**	**N**	**Mean**	**SD**
High Intelligence N Mean SD	--			1.91			2.40*		
Average Intelligence N Mean SD	--			--			1.03		
Low Intelligence N Mean SD	--			--			--		

*Significant at 0.05 level
(Critical Value 2.00 at 0.05 and 2.65 at 0.01 level, df 72)
(Critical Value 2.01 at 0.05 and 2.68 at 0.01 level, df 50)

It may be observed from the Table - 3 that the t-ratio for the difference in gain means of high and average intelligence groups is 1.91, which in comparison to the table value was not found significant even at 0.05 level of significance. Hence, the hypothesis of significant differences is rejected in case of high and average intelligence irrespective of grouping across other variable. The result indicates that the achievement of high and average intelligence groups was not significantly different in respect of gain scores.

Table - 3 shows that the t-ratio for the difference in gain means of high and low intelligence groups is 2.40, which in comparison to the table value was found significant at 0.05 level of significance. Hence, the hypothesis of significant differences is not rejected in case of high and low intelligence irrespective of grouping across other variable. This infers that low intelligence group performs significantly better than that of high intelligence groups on achievement in respect of gain scores.

Table - 3 shows that the t-ratio for the difference in gain means of average and low intelligence groups is 1.03, which in comparison to the table value was not found significant even at 0.05 level of significance. Hence, the hypothesis of significant differences is rejected in case of average and low intelligence irrespective of grouping across other variable. The result indicates that the achievement of average and low intelligence groups was not significantly different in respect of gain scores.

Interaction Effect (A × B)

It may be observed from the Table-2 that the F- ratio for the interaction between treatment and intelligence groups is 4.59, which in comparison to the table value was found significant at 0.05 level of significance. It indicates that the two variables do interact with each other. Hence, the hypothesis H3, there exists significant interaction effect between mastery learning strategy and intelligence levels, is accepted. So, mastery learning strategy and conventional teaching strategy have not yielded equal levels of achievement for high, average and low intelligence level for the students.

Discussion

The result of the present investigation have lead to the conclusion that mastery learning strategy yields higher levels of attainment in English grammar as compared to the conventional group. The results

are supported by the findings of Kulik, Kulik and Bangert - Drowns (1990) found that positive correlation of students attitudes towards instruction and content of mastery learning programmes. Lazaowitz, Baird, Bowlden and Lazaowitz (1996) found that group of mastery learning students did better in some topics as compared to individualise mastery learning. Dutt and Kumar (2002) found that mastery learning strategy is better on achievement in economics than the traditional method of teaching. Wachanga and Gamba (2004) found that mastery learning approach facilities students learning chemistry better than the regular teaching methods. Dillashaw and Okey (2006) result indicates that achievement of mastery learning students were significantly higher than that of non-mastery control students. Adeyemi (2007) found that mastery learning approach on student's performance in social studies was more effective than the conventional method of teaching. Wambugu and Changeiywo (2008) concludes that mastery learning approach is an effective teaching method which physics teachers should be encouraged to use and should be implemented in all teacher education programmes in Kenya. Damavandi and Kashani (2010) found that mastery learning method is more effective on performance of weak students in higher levels of learning method than in common learning method. Sakiz (2011) found that mastery approach goal orientation was significantly positively associated with college students.

The performances of students in English grammar through mastery learning strategy have shown significant differences for high, average and low intelligence students. The results were consistent with the findings of Dutt (1987) found that intelligence of the problem solver significantly affect the problem solving ability irrespective of strategies of training. Gill (1989) found that high intelligence students scored higher on originality than low intelligent subjects irrespective of training strategies. Bal (1992) found that intelligence had a significant effect on acquisition and retention of higher level writing skills in English. Riding and Pearson (1994) revealed that effect of intelligence on performance in different subjects showed significant effects. Bogaards (1996) found that intelligence played significant role to influences language learning. Mishra (1997) found achievement of students differ significantly at different levels of intelligence. Kohli (1999) found that intelligence have significant effect on the achievement of students. Mehra and Mondal (2005) indicated that the high intelligence group performed better on achievement in Science than the low intelligence group taught by

traditional instruction. Singh (2005) found that the students belonging to high level of intelligence had better performance than the low level of intelligence and Aruna and Usha (2006) found that intelligence have significant positive correlation with process outcomes in Science.

The performance of mastery learning strategy was found interacting with each other at different levels of intelligence. It indicates that performance through mastery learning strategy of teaching was different for different levels of intelligence.

Conclusion

The present study reveals that performance in English grammar of students taught through mastery learning strategy was significantly higher than those which were taught through conventional teaching strategy. The gain mean with different teaching strategy at different dimension of intelligence levels groups do differ to each other. Further, the gain means with mastery learning strategy has shown significant differences for high, average and low intelligence students. However, the difference in mean score for interaction across different grouping did turn out to be significant. The 10 study recommends the use of mastery learning strategy for better performance of English students at secondary stage.

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