

EFFECT OF MASTERY LEARNING APPROACHES IN IMPROVING STUDENTS' LEARNING OUTCOMES AT ELEMENTARY LEVEL

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ABSTRACT

The basic purpose of current work is to determine the effect of the Mastery Learning Approaches (MLA) on improving students' academic performance in science, as well as their effect on improving students' learning outcomes. These were conducted in order to determine the best methods of teaching for the improvement of students' science learning outcomes. The non-equivalent post-test, pre-test experimental design was used in this study. In Multan tehsil Saddar, 43 basic educational elementary schools were chosen using a simple random sampling technique. According to the study, MLA can help improving students' learning outcomes in science. It is thus recommended that the Education Ministry should conduct trainings for science teachers on how to effectively implement these pioneering teaching tactics during instruction so that students can be guided to learn meaningfully and are helped in remembering, what they have learned in science.

Keywords: Mastery learning, Learning outcomes.

INTRODUCTION

The development of a country depends on the scientific thinking of its people. They have become the world's leading nation in development work as they use their scientific knowledge in research work (Anderson, 1975). Science is the best way to solve a country's problems. And the country has done very little to avoid a crisis. In the past, science was not important, so people preferred to reduce it by hand, so it took a long time to get out of a problem. Science has forced people to think differently so that people can invent new ideas (Bloom, 1968).

In 1920 the concept of mastery learning came, in 1968 Benjamin bloom formally proposed the concept of mastery learning approach. In master learning, time is required for the focus of the instruction in which children of different communities have to prepare the same type of material (Buzan & Buzan, 1996). Many children may fall in failure because they do not focus on instruction that is time limited. Mastery learning is considered to be a research teaching method for more than fifty years. Mastery learning is a collection of starta-based, personalized teaching and learning practices that are based on evidence, that, in case schoolchildren are given proper time, they will approach high degree of understanding in specific topic (Obih & Ekomaru, 2011).

Motivation for master learning came when the school went to achieve, and achievement gap in the classroom was reduced. If the children are given maximum instruction and optimal time to understand then the master himself changes in them. According to bloom, more than 90 percent of children learn from mastery learning. And according to bloom by mastery learning the positive attitude and interest develops towards mastery subject as compared to other teaching methods (Bütüner, 2006).

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In Pakistan, teaching of science at elementary level suffers from many pedagogical issues. Often the teachers are unable to transfer the complete knowledge to the students by using different teaching approaches. The present study was formed to find out the incidence of students who happenstance problem and difficulties especially in learning of science at elementary level in Multan, Punjab.

REVIEW OF LITERATURE

Mastery learning is a collection of strata-based, personalized schooling and learning practice that is based on the supposition that in case, pupils are provide with enough time, they will achieve in a given area, a high level of understanding. Mastery learning is a collection of group-based, individualized teaching and learning practices that are based on the assumption that if students are given enough time, they will attain in a given area, a high level of understanding.

Mastery learning is a teaching and learning technique in which pupils must achieve a programmed level of mastery for each unit of instruction before progressing to the next. Mastery learning is not a new perception in American education; it has existed for more than 7 decades. This is a method in which students attain the same level of topic mastery over time but with different rates (Cunningham, 2006).

Significance of mastery learning approach

1. Providing them with a solid foundation on which to build and expand their knowledge.
2. Adaptable online technology that allows pupils to work at their own pace.
3. Increased peer participation for moments of shared learning.
4. Increased one-on-one interaction with educators (Buzan & Buzan, 1996b).

Drawbacks of mastery learning approach

1. You will teach more than you have ever before.
2. Students aren't always eager to learn....
3. You may be unfamiliar with the concept of content-based planning rather than time-based planning.
4. Stakeholders may be unaware of the concept of mastery learning.
5. Grading is done differently in a mastery learning classroom (Findlay & Lumsden, 1988).

Effectiveness of mastery learning approach

Cognitive engagement, feedback, repetition, and a longer time span are all characteristics that contribute to the effectiveness of mastery learning. Pre-training or additional practice the cost of education, and self-regulations are all factors that influence mastery learning success. Simulation and practice in a variety of workshops can lead to mastery learning.

According to the research, there is a positive impact of mastery learning on students' learning attitudes, achievement, and subject retention. Schools which have used it, mastery learning has proven as an effective teaching-learning strategy. On student achievement, the effects of traditional instructions, mastery learning with teams, mastery learning alone and teams alone all have been studied (e.g., Mavarech, 1985). Despite the fact that the concept of these studies was the same, the end results were vastly different. According to Slavin and Karweitt, the team treatment had an effect on student achievement but there is no effect of the mastery learning treatment. According to Savarech, mastery learning is a key indicator of improved success.

According to Mavarech, the disparity in findings of the two studies is due to socioeconomic factors. Slavin and Karweitt's studies participants came from lower-income families, while Mavarech's participants came from average income houses. Dunkelberger and Heikkinen (1984) conducted narrowly focused research on only single aspect of mastery learning, repeatable testing. A comparison was made between two group of participants, one that were only allowed one attempt at the test with ones that were allowed to repeat tests. According to the authors, from mastery learning cognitive gains, are associated with a combination of retesting and remediation, rather than just retesting. Guskey et al. (1985) looked into the outcome of mastery learning on motivation and achievement. The article compared a mastery learning group to a lecture style group. The main variable in the study was the impact of motivation on student achievement.

According to the researchers, the mastery learning group had a higher level of success, more motivation and fewer absences to learn course material. Ritchie and Thorkildsen (1994) in their work investigated accountability and achievement. In their work, two mastery learning groups were compared

and the difference in treatment was that the group was made aware that they were going to be enrolled in a mastery learning program, whereas the second group was not. The researchers discovered a statistically noteworthy difference between these two groups, with the earlier; informed group outperforming the uninformed group. The focus of the informed group on the learning environment may have shifted. Both of these findings refute critics' claims that the mastery learning program improves outcomes uniquely by increasing instructional time due to remediation. Mastery and non-mastery learning was compared by Wentling (1973) in terms of how feedback affects achievement.

The mentioned study looked at attitude toward instruction; time spent on instruction, immediate cognitive achievement, and delayed cognitive achievement. Mastery teaching is one more important aspect of mastery learning. The tools required to teach mastery learning, as well as teacher and student attitudes towards student achievement as a result of mastery learning was investigated by Okey (1974, 1977). Significantly favorable benefit was identified in each region. It was discovered that instructors were implementing new teaching tactics in the classroom that had a positive impact on both their own and their students' attitudes toward learning (Dunkelberger & Heikkinen, 1984).

Objectives of Research

With respect to the over fabric, the taking after targets were considered:

1. To explore the role of the MLA in the enhancement of learning in the subject of science
2. To highlight the effectiveness of the MLA in the learning of science at elementary level.

RESEARCH METHODOLOGY

Research design

Researcher has used Quasi-Experimental Research Design to conduct this study because it states the cause-and-effect relationship between two groups. Researcher has also used this design because it is less expensive and valid. Pretest and posttest are also a type of experimental research design, and this study utilized these tests to confirm the effectiveness of MLA on student learning outcomes in science subject.

Populations

The population is the total number of elements from which subjects are selected (Faiz et.al., 2021; Kanwal et al., 2022; Lakhan et al., 2020; Ali et al., 2021; Sajjad et al., 2022; Siddique et al., 2021). Study population is made up of students from Multan's basic elementary school. The study's participants are all District Multan elementary school students.

Sample

The sample were the number of subjects chosen from the population (Jabeen et al., 2022; Ali et al., 2021; Siddique et al., 2021; Mah Jabeen et al., 2021; Munir et al., 2021; Saeed et al., 2021; Siddique et al., 2020). Researcher selected the GGES Bakht Ali Wala Markaz 5-Faiz for sample and selected grade 8th for experiment. The grade 8th was already divided in two sections A and B. There were 30 students in each section. Moreover, Researcher selected section A having 30 students as experimental group similarly section B having 30 students as experimental group.

Development of Research Tool

Instrument utilized in the study was 100 various choice question test items prepared from the science book of Grade 8. The test instrumentation gets information on the bio-data of respondents. And this tool is divided in two parts the one is pretest and the other is posttest. Pretest used to check the prior knowledge of students while the posttest used to check the knowledge gained by MLA. There was total 4 section mentioned in pretest as well in posttest. First section carried demographic information which closely affected the learning outcomes of students, second section was biology carried 24 multiple choice questions contain information according to both techniques Mind mapping and mastery learning teaching technique, third section was chemistry carried 32 multiple choice questions Information according to both techniques Mind mapping and mastery learning teaching technique. And fourth section was physics carried 44 multiple choice questions contain information according to both techniques Mind mapping and mastery learning teaching technique also.

Data analysis

After the collection of data, data analysis procedure was started which involves editing of data coding the data classifying it and tabulating the collected data. The results of the advance progressive matrices for adult were entered in the program named Statistical Package for Social Science (SPSS). Correlation

technique was employed to find out relation between mind mapping technique and mastery learning technique on learning outcomes.

Demographic Analysis of Sample

Table NO. 1 Age of Respondents (In Years)

Sr. No	Age of Respondents	Frequency	Percentage
1	11-12 Y	22	36.7
2	13-14 Y	16	26.7
3	15-16 Y	22	36.7
4	17-18 Y	0	0
Total		60	100

Table mentions that 36.7% of the respondents were with age of range 11-12 years, 26.7% of the respondents were with age of range 13-14 years, 36.7% of the respondents were with age of range 15-16 years.

Table No. 2 Parents Education

Sr. No	Parents Education	Frequency	Percentage
1	Educated	6	10.0
2	Non-Educated	54	90.0
Total		60	100

Table depicts that parent of 10% students are educated whereas parents of 90% students are non-educated. Therefore, it is concluded that there is a paramount difference between the both

Table No. 3 Siblings

Sr. No	Siblings	Frequency	Percentage
1	Yes	60	100
2	No	0	0
Total		60	100

Table depicts that all students have siblings.

Table No. 4 Financial condition

Sr. No	Financial condition	Frequency	Percentage
1	Poor	48	80.0
2	Mediocre	12	20.0
3	Rich	0	0
Total		60	100

Table depict that 80.0% students belongs to poor family, 20.0% belongs to mediocre family whereas nobody belongs to rich family setting. Therefore, it is concluded that there is a paramount difference between the three.

Table No. 5 Mother Tongue

Sr. No	Mother Tongue	Frequency	Percentage
1	Saraiki	60	100
2	Punjabi	0	0
3	Urdu	0	0
Total		60	100

Table depict that all students speak Saraiki.

Table No. 6 Pretest result of student's responses taught with mastery learning technique

Subjects	No of items	No of respondents	Mean	S.D
Biology	24	30	69.1	2.3
Chemistry	32	30	88.5	2.4
Physics	44	30	122.0	5.8

Table No. 7 Posttest Result of Student's Responses Taught with Mastery Learning Technique

<i>Subjects</i>	<i>No of items</i>	<i>No of respondents</i>	<i>Mean</i>	<i>S.D</i>
Biology	24	30	69.2	3.3
Chemistry	32	30	93.3	1.9
Physics	44	30	128.7	2.2

Table No. 8 Comparison of Technique Analysis of Biology

<i>Sr#</i>	<i>Teaching techniques</i>	<i>No of students</i>	<i>Achievements</i>
3	Pre mastery learning	30	69.1
4	Post mastery learning	30	69.2

Table No. 9 Comparison of Technique Analysis of Chemistry

<i>Sr#</i>	<i>Teaching technique</i>	<i>No of students</i>	<i>Achievements</i>
3	Pre mastery learning	30	88.5
4	Post mastery learning	30	93.3

Table No. 10 Comparison of Technique Analysis of Physics

<i>Sr#</i>	<i>Teaching technique</i>	<i>No of students</i>	<i>Achievements</i>
3	Pre mastery learning	30	122.0
4	Post mastery learning	30	128.7

Table No. 11 Comparison of Mean Scores of Pre and Post Mastery learning Technique (Paired Sample T-Test)

<i>Teaching technique</i>	<i>N</i>	<i>Mean</i>	<i>S.D.</i>	<i>t</i>	<i>df</i>	<i>Sig.</i>
Pre-Mastery Learning	30	94.0	2.9	5.6	29	.00
Post-Mastery Learning	30	97.2	1.4			

*P<.05 Level of Significance

Table indicates that the empirical information for pre-Mastery learning (N=30, M=94.26) and for post Mastery learning (N=30, M=97.26) with t-statistics ($t(29) = 5.69$, $P < .05 = .00$) which leads to the decision that there is a significant difference in the opinion of pre and post mind mapping regarding effect of Mind mapping teaching approach on academic performance of students. Moreover, it illustrates that the difference of means is 3.26 for pre and post mind mapping technique which is also significant.

Crisscross Analysis of Biology

Table No. 12 Comparison of Mean Score of Pre-Mastery learning and post-Mastery learning Technique in Biology

<i>Teaching technique</i>	<i>No of respondents</i>	<i>Achievements</i>
Pre-Mastery learning	30	69.1
Post Mastery learning	30	69.2

Table Posits compendious results regarding two techniques as enshrined above. The first technique, possessing Pre-Mastery learning, reveals 30 student respondents procure 69.14% achievement in biology subject. While, the second technique, possessing post mastery learning, reveals 30 students' respondents procure 69.20% achievement in biology subject.

Crisscross Analysis of Chemistry

Table No. 13 Comparison of Mean Score of Pre-Mastery learning and post-Mastery learning Technique in Chemistry

<i>Teaching technique</i>	<i>No of respondents</i>	<i>Achievements</i>
Pre-Mastery learning	30	88.5
Post Mastery learning	30	93.3

Table Posits compendious results regarding two techniques as enshrined above. The first technique, possessing Pre-Mastery learning, reveals 30 student respondents procure 88.50%

achievement in chemistry subject. While, the second technique, possessing post mastery learning, reveals 30 students' respondents procure 93.30% achievement in chemistry subject.

Crisscross Analysis of Physics

Table No. 14 Comparison of Mean Score of Pre-Mastery learning and post-Mastery learning Technique in Physics

<i>Teaching technique</i>	<i>No of respondents</i>	<i>Achievements</i>
Pre-Mastery learning	30	122
Post Mastery learning	30	128.7

Table Posits compendious results regarding two techniques as enshrined above. The first technique, possessing Pre-Mastery learning, reveals 30 student respondents procure 122% achievement in physics subject. While, the second technique, possessing post mastery learning, reveals 30 students' respondents procure 128% achievement in physics subject.

FINDINGS

Pretest Results of students Responses taught with Mastery learning Technique. It is comprised of 3 subjects. In the first subject, which was biology Total items were 24, which were taken from science book. Wherein, the total respondents were 30 students, rendering Mean 69.14% and S.D at 2.32% respectively. While, in second subject, which was chemistry Total items were 32, which were taken from science book. Wherein, the total respondents were 30 students, rendering Mean 88.50% and S.D at 2.45% respectively. Lastly, in third subject, which was physics Total items were 44, which were taken from science book. Wherein, the total respondents were 30 students, rendering Mean 122.00% and S.D at 5.83% respectively. Majority of respondents 72 (72%) responded that Insult promotes the Harassment.

Posttest Results of students Responses taught with Mastery learning Technique. It is comprised of 3 subjects. In the first subject, which was biology, total items were 24, which were taken from science book. Wherein, the total respondents were 30 students, rendering Mean 69.20% and S.D at 3.30% respectively. While, in second subject, which was chemistry Total items were 32, which were taken from science book. Wherein, the total respondents were 30 students, rendering Mean 93.30% and S.D at 1.91% respectively. Lastly, in third subject, which was physics Total items were 44, which were taken from science book. Wherein, the total respondents were 30 students, rendering Mean 128.73% and S.D at 2.25% respectively. Majority of respondents 72 (72%) responded Physical conduct of punishment is consider as Factors of Harassment.

The empirical information for pre-Mastery learning (N=30, M=94.0) and for post Mastery learning (N=30, M=97.26) with t-statistics ($t(29) = 5.69, P < .05 = .00$) which leads to the decision that there is a significant difference in the opinion of pre and post mind mapping regarding effect of Mind mapping teaching approach on academic performance of students. Moreover, it illustrates that the difference of means is 3.26 for pre and post mind mapping technique which is also significant.

The first technique, possessing Pre-Mastery learning, reveals 30 student respondents procure 69.14% achievement in biology subject. While, the second technique, possessing post mastery learning, reveals 30 students' respondents procure 69.20% achievement in biology subject. The first technique, possessing Pre-Mastery learning, reveals 30 student respondents procure 88.50% achievement in chemistry subject. While, the second technique, possessing post mastery learning, reveals 30 students' respondents procure 93.30% achievement in chemistry subject. The first technique, possessing Pre-Mastery learning, reveals 30 student respondents procure 122% achievement in physics subject. While, the second technique, possessing post mastery learning, reveals 30 students' respondents procure 128% achievement in physics subject.

DISCUSSION

The discoveries of the review uncovered that there was no critical distinction in the presentation of science understudies before they were shown science utilizing MLA. This infers that the two gatherings were very homogeneous toward the beginning of the review. It infers that the understudies utilized in the review have a comparative logical foundation. The aftereffects of theory one, which expresses that there is no critical contrast in the impact of MLA showing strategies on understudies' scholastic

execution in science, uncovered that the two showing techniques utilized affect the scholarly exhibition of the understudies in their gatherings, as the post-test mean scores in each gathering are higher than the individual pre-test mean scores. This proposes that the medicines gave upgraded the understudies' presentation.

Moreover, the result of speculation two, which expresses that there is no critical contrast in the impact of the methodologies on understudies' maintenance of science, uncovered that there was no huge distinction in the maintenance of understudies showed utilizing the two methodologies. As indicated by the discoveries, the two methodologies worked on understudies' maintenance of science equally. Mind planning, as opposed to idea planning, puts a high worth on the most common way of leading exploration, as essentially all concentrates on we observed spotlight on understudies drawing all alone rather than concentrating on mastery learning. The utilization of brain planning further develops both understudy learning and educator instructing.

By consolidating programming, mind planning, specifically, greater affects instructing and learning. Assuming that product is utilized, it will save time and make both instructing and learning more striking. Therefore, when we use mind planning, we should look past the product and endeavor to further develop the instructing offices. Notwithstanding, in light of the investigations we explored, we found that most of studies, especially in Pakistan, were directed utilizing paper and pencil. We accept that 3-6 months would be the best time period. It gives us a significant clue that following 3-6 months, understudies ought to have the option to dominate the expertise of psyche planning. Educators will then, at that point, have a superior order of time to direct understudies through the method involved with learning mastery learning. This review utilized brain guides to depict center school understudies' psychological models about science to decide their perspectives and insights about science.

The review found that the scores got from the science mastery learning made by understudies varied altogether by grade level, and that the connected distinction was because of eight grade understudies' discernments. As per Akarsu (2013), 6th and 7th grade understudies have comparable viewpoints on the idea of science. Then again, it was found that the brain map scores of eighth grade understudies were fundamentally lower than those of 6th, seventh, and eighth grade understudies. At the end of the day, 5th grade understudies recollected less ideas, articulations, connections, and visual components about science through mental relationship than different understudies. This finding might be clarified by the way that 5th grade understudies are more averse to experience science-related ideas and battle to arrange their insight in their brains. Center school understudies accentuated the distinct and hypothetical cycles of science to them maps. To them maps, center school understudies to some extent underscored the illustrative and hypothetical cycles of science.

It was found in the review that the understudies just expressed the exploratory strategy for of information assortment. Young men and young ladies have comparable impression of the expressive and hypothetical cycles of science. This finding demonstrates that understudies accept that logical information must be gotten through trial strategies. One of the intriguing discoveries of this study is the connection among training and science in the brain guides of a little gathering of understudies. While making this association, a few understudies stressed the picking up showing process specifically. The concentrate additionally shows that psyche guides can be utilized to rapidly recognize understudy misinterpretations and information holes. Our examination shows that when understudies can talk about and put together their considerations remotely with their friends, they react to the strategy, become occupied with the material, and appreciate learning (Budd, 2004). Educators should initially invest energy showing understudies how to make mastery learning to utilize the strategy. This can be achieved by having the educator show past points. This underlying venture can be finished in a couple of examples, yet the advantages are monstrous. Professionals might find that joining mastery learning into their homerooms addresses the issues of individual understudies, yet additionally fills in as a significant instrument for fast, exact, and viable developmental appraisal.

CONCLUSION

The study found that MLA is effective in improving students' academic performance in science. This implies that MLA has the potential to assist students in associating ideas, thinking creatively, and making connections. This implies that the MLA could improve the retention ability of the learners in the same proportion. As a result, MLA would be one of the most effective learning strategies that teachers could use to overcome many of the problems encountered in science teaching and learning.

Because most students struggle to learn science. The necessary facilities for MLA are available; it should be used to maximize learner output.

RECOMMENDATIONS

The following recommendations are made based on the findings of this study and the conclusion reached:

- Science teachers and specialists should focus in their endeavors on understanding the attributes, qualities, and shortcomings of individual students to aid the plan of proper educational projects to address their issues.
- In light of the review's discoveries that MLA altogether further develops learning, it is suggested that science instructors carry out the methodology, as well as other participatory procedures, during guidance so understudies can be directed to advance seriously.

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