

Volume 2 Issue 2 (Jan-Mar 2025)

Methods of Teaching, Students' Initial Learning and Delayed Retention Learning: A Study of Public Sector Colleges in Lahore

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Abstract

The current research was conducted to observe the influence of various teaching means on the learning of students in terms of the initial learning (IL) and delayed retention learning (DRL). The IL and DRL of students who were taught using lecture method and those taught using discussion method were compared in the study. The research involved the quasi-experimental pre-test post-test design. The sample comprised of the public sector colleges in Lahore providing graduate courses and one college was chosen by purposive sampling. The sample was intact classes of the subject Education in that college. The two groups were the same in terms of content in the course but the method employed in teaching acted as the independent variable. To gauge the initial learning, created a multiple choice test based on course outline. The items were validated using item analysis and reliability of the test was as well estimated. The findings revealed that there was a difference in initial learning and delayed retention scores of lecture group and discussion group. Nevertheless, the comparison of the male and female students was not statistically significant. These results indicate that more interactive strategies like discussion can assist the students to learn more initially and to recall the content over a longer duration as opposed to a teaching approach that relies primarily on the lecture.

Keywords: lecture approach, discussion approach, initial learning (IL), delayed retention learning (DRL), gender differences

Introduction

The main determinant to make the societies grow is education which develops the skills, knowledge and confidence of people. When students study in colleges and universities, they are not the only ones whose learning is determined by the subject matter but also influenced by how the subject matter is presented by the teachers. The type of teaching, the amount of contact in the classroom and the manner in which teachers engage students influence the understanding and the retention of the information to be remembered among the learners. (Shieh & Yu, 2016). With increased higher education and more varied needs of students, there has been an interest to research on which of the teaching techniques actually assists the students to learn better.

The Dale Cone of Experience synthesis of a number of hypotheses suggested under instructional structure and maintenance learning processes. The estimation made by Edgar Dale (1967 cited in Anderson, 2012) indicated that, learners have more information to hold through what they will be doing rather than listen, read or watch in the process of seeming to have done so. The mean maintenance rate of various strategies of teaching is on the cone graphs. It

portrays that the learner only retains a little more than 10% of what he reads, 20% of what he see and hear in a speech, and perhaps 80% of what he does come across in practice. The teaching methodology that involve the student in practical way attracts more learning and the larger the amount of information that is likely to be memorized. It also recommends that in selecting a method of teaching one should remember that engaging the students in the teaching process enhances the knowledge and retention.

Instructional strategies have integral part in academic performance. Lecture method still remains the most prevalent in most colleges since it enables the teacher to teach a lot of the content within a short period of time. Lectures should be delivered in a clear manner as this can assist the student in understanding the new material particularly in the subject with dense content. Nonetheless, other researchers indicate that long lectures can decrease student involvement and occasionally promote memorization and not actual learning (Ahmad et al., 2021). Conversely, discussion method teaching emphasizes on the student participation. The approach is associated with active learning, in which the students not merely listen but think, question, and discuss ideas. Past research indicated that students can learn when they engage in the active processing of information. Prince (2004) and Freeman et al. (2014) demonstrated that peer discussion, questioning, and group tasks tend to promote learning and increase academic success. These findings are also backed up by studies.

Khan and Malik (2018) found out that despite the prevalence of lectures in public colleges, students who went through discussion based classes had a clearer grasp of the concepts. According to Rafiq (2019), the discussions enabled the students to ask questions with fewer fears and think more about the subject. Whereas the IL and DRL inform us about the ability of the students to remember information after a certain period of time. Higher education requires retention particularly in institutions where learners are supposed to refer and use concepts gained in various semesters. Psychological studies indicate that the memory is enhanced when the students explain concepts in their own words, engage actively and rehearse the recall of information. Pakistan studies like Ahmad and Tariq (2020) have revealed that students who participated in discussion based learning retained the material better even after a number of weeks. The same results were obtained by Ali (2017), who indicated that the involvement and engagement contribute to students being able to keep the knowledge longer.

Cepeda et al. (2006) expounded, spaced learning and active retrieval that are prevalent in discussion method of teaching enhance retention. Kim et al. (2013) discovered that collaborative learning was instrumental in assisting university students to reconsider and to strengthen what they have learned leading to improved understanding. The paper has been built on two key concepts. Constructivism means that students develop their own constructive meaning by linking the new knowledge to the one that they already have and this is in most cases through interaction, discussion and so on. Cognitively, retrieval and elaboration, among other memory processes, are significant in learning. The methods are lecture and discussion and these are correlated according to these theories. Discussion techniques involve students thinking, remembering and describing concepts and could enhance the long term memory. When properly organized, lectures provide the students with a clear point of understanding right away.

Despite the researches carried out on the teaching approaches, few studies have concentrated on the setting of public colleges. The problems encountered in these colleges include high classes, inadequate resources and diversity in the teaching abilities of the teachers. As Pakistan is attempting to enhance quality of the teaching process in higher education, research based evidence in local contexts should be collected. Knowing the impacts of teaching methods on achievement and retention of outgoing students can be beneficial to teachers, college administrators and policy makers, to make teaching methods and training programs better.

Research Objective

This study was aimed at comparing the impact of lecture and discussion modes of teaching on the initial learning and the delayed learning of the students.

Research Hypotheses

The study was guided by the following hypotheses:

1. There is a significant difference in DRL scores between students taught through the lecture method and those taught through the discussion method.
2. There is a significant difference in IL scores of students taught using lecture based instruction and those taught through discussion based instruction.

3. There is a significant difference between students' IL and their DRL scores when they are taught through the lecture method.
4. There is a significant difference between students' IL and their DRL scores when they are taught through the discussion method.

Research Methodology

This research design was a quasi-experimental, which is normally utilized in the educational environment where not all the time can students be assigned to instructional groups randomly. The design enabled the researcher to contrast the influence of the two teaching strategies lecture and discussion on the academic success and retarded retention of the students. Both methods of instruction were done in a pretest posttest design. The groups were taught the same content, only that the method of teaching was different. One of them was taught by the lecture technique where the teacher presented the content, in a teacher centered and structured way. The second group was instructed in the discussion format, and that entailed interactive work, guided questions and involvement of the students. The duration of teaching in the two groups was comparable and so were the learning objectives. In order to evaluate delayed retention, the follow up test was conducted after a given eight weeks interval after the instructional period was over. This enabled the researcher to study the level of retention of the material by the students when time passed.

The study population or the sample was students of intermediate level studying in the public sector colleges in Lahore. Two colleges one male and one female college were identified out of the seventy four public colleges using a purposive sampling process. The uninterrupted classes of these colleges with 150 students were taken in their entirety as a sample in the experimental study.

Table I:
Demographic Information of the Respondents

Gender	%	F	CF
Male	46.6	70	70
Female	53.4	80	150

Instruments of the study

The study utilized two instruments:

1. IL test assessed the original knowledge of the students regarding the material taught either in lecture or in a discussion. It was made by using multiple choice questions that were based on the curriculum to measure understanding, memory and practice of ideas.

2. DRL test were similar and equally difficult as the items in the IL test. This was to determine the extent to which students remembered the information after a period of time, which gives an understanding of the long term learning. At least, to make the instrument quality and accurate, the item analysis and the expert judgement were conducted. The process of item analysis revealed that there were no weak or questions to be dropped. Only the ones that had an acceptable level of difficulty between 40 to 80 percent and a discrimination index of a minimum of 0.50 were included in the final edition of the test. The tool was next piloted using a sample of 30 students; these were not the actual sample. The pilot study assisted in testing the internal consistency of the instrument, and the reliability coefficient was 0.82, which shows that the instrument has a satisfactory level of reliability to be used in the research.

Findings , Dicussions and Recommendation

The analysis of data was performed to compare the mean scores between the groups. The independent samples t-tests were applied to compare the differences between instructional methods. Paired samples t-tests were used to compare achievement and delayed retention scores of the students in the same instructional approach.

H01 There is a significant difference in DRL scores between students taught through the lecture method and those taught through the discussion method.

Table 2

Independent Samples t-Test for Delayed Retention Scores by Instructional Method

Variable	N	Mean	SD	df	t-test	sig
Lecture	75	20.40	4.12	148	3.678	.000
Discussion	75	17.93	4.08			

The results in Table 2 show a statistically significant difference in DRL scores between the two instructional groups, as indicated by the t-value of 3.678 and a significance level of $p = .000$, which is well below the of .05. This finding leads to the rejection of the null hypothesis. Students who were instructed through the lecture method retained more information over time than those taught through the discussion method, as reflected in their higher mean score (20.40) compared to the discussion group (17.93).

H₀₂ There is no significant difference in IL scores between students taught through lecture and discussion methods.

Table 3*Independent Samples t-Test for IL Scores by Instructional Method*

Variable	N	Mean	SD	df	t-test	sig
Lecture	75	27.18	5.19	148	3.27	0.02
Discussion	75	23.17	5.64			

Table 3 shows a statistically significant difference in IL scores between the lecture and discussion groups ($t = 3.27$, $p = .02$). This indicates that students who were instructed through the lecture method performed significantly better on the post instruction IL than those who participated in discussion based learning. The higher mean score of the lecture group (27.18) compared to the discussion group (23.17) suggests that lecture instruction effectively supported students' short term comprehension.

H₀₃

There is no significant difference between IL and DRL scores for students taught by the lecture method.

Table 4*Paired Samples t-Test for IL vs. DRL Scores by Lecture Method*

Variable	N	Mean	SD	df	t-test	sig
Achievement	75	31.2	3.61			
Retention	75	28.3	2.52	7	.213	.004

The paired samples t-test shows a significant difference ($t = .213$, $p = .004$) between IL and delayed retention scores for the lecture method. As the p-value is below .05, the null hypothesis is rejected. Students demonstrated higher immediate achievement (31.2) than delayed retention (28.3). This decline aligns with theories of memory decay and suggests that while lecture instruction supports strong initial comprehension, the absence of reinforcement contributes to reduced retention over time.

H₀₄

There is no significant difference between IL and DRL scores for students taught by the discussion method.

Table 5*Paired Samples t-Test for IL vs. DRL Scores by Discussion Method*

Variable	N	Mean	SD	df	t-test	sig
Achievement	75	30.7	2.94	73	2.90	.003
Retention	75	26.9	3.51			

Table 5 indicates a significant decline from achievement (30.7) to delayed retention (26.9) for the discussion method ($t = 2.90$, $p = .003$). The difference is statistically significant, which leads to rejection of the null hypothesis. Discussion-based learning appears to support immediate understanding but may not provide long term reinforcement unless paired with structured follow up activities.

Discussion

The implications of this study can assist about teaching methods influence learning of students in the short term and the long term. Overall, the results indicate that lecture method scored better than the discussion method in ILAs well as DRL scores. This trend can be compared to that previous researches have also found, setting where students are accustomed to the structured and teacher centered learning. The distinction between the lecture and discussion group in terms of the DRA is one of the key findings, as the former scored higher than the latter. This implies that information taught to students in a clear step by step manner will be remembered over a longer period of time. The lectures were arranged in a systematic fashion, which may have assisted the students in arranging and storing the information in a more significant manner. Auwal (2013) also added that lectures with visual aid may assist students in establishing a greater connection within their minds, this enhances their long term memory. The Cognitive Theory of Multimedia Learning by Mayer (2005) also elaborates that students learn more effectively when the verbal explanation is used alongside visual contents. Probably, such dual processing was one of the reasons that led to the improved DRL scores of the lecture group.

It was also revealed in the study that, students who were taught using the lecture method scored more in the IL test. Similar results were also obtained in previous research conducted by Axtell (2008), Raza (2011), and Auwal (2013). In most colleges of the public sector, students are more used to a teacher centered setting where information is passed on to them directly. Due to this background they might be more at ease and comfortable with the lectures. Conversely, discussion learning involves independent reading, critical thinking and active participation skills, of which most students might still be evolving. The discussion approach may have not been as effective in the given setting, therefore. The other notable finding is that, both groups exhibited the decrease between the IL test and DRL test. Despite the initial acquisition of students, they forgot some of the content over time. This reduction is in tandem with the results of Raza (2011) and Raheem (2011) who described that the level of retention gets lower when the lesson is not revised and followed up. In this experiment, there were no reinforcement activities between the two tests, and this could have brought about some form of natural forgetting. David (2010) referred to the process as normal memory decay in cases where the information is not revisited. In general, the findings suggest that, although the two approaches can be used to facilitate learning, the lecture approach might be more useful in enhancing both IL and DRL in colleges where students are very dependent on structured education. Simultaneously, the findings remind that reinforcement is a crucial factor in retention regardless of the method of teaching applied. Learning is likely to be forgotten without revision and practice. Overall, the results indicate that both lecture and discussion techniques possess certain merits, however, the lecture technique in particular with the help of the audiovisual material could yield more effective consequences in the public colleges because students are more accustomed to such a manner of teaching and respond more to the lesson structure.

Recommendations

Considering the results of the research, it is possible to develop a number of recommendations to enhance the teaching and learning at the colleges of the public sector. Undergraduate level teachers ought to utilize multimedia devices PowerPoint slides, diagrams, and animations more often to help students comprehend the material and ensure long term knowledge acquisition. Colleges can also make sure that the classrooms are well stocked with projectors and other teaching technologies and also organise regular training workshops in helping the teachers to gain confidence in using these tools properly. The study must be done in other topics and on different levels of education in the future to establish whether the findings of this research are similar in other settings. Education authorities are also urged to conduct professional development programs, such as refresher training and teaching seminars, to expose the teachers to new and effective instruction practices. Researchers can also take into consideration longer time gaps between the posttest and delayed retention test so as to better understand the effects of various methods of teaching on memory within longer periods of time.

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