

“Effect of Reinforcement on Teaching – Learning Process”

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A Case Study in Bongaon, North 24 Parganas, West Bengal, India.

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Abstract: *The concept of reinforcement is identical to the presentation of a reward. The present study deals with the importance of reinforcement in teaching-learning process. The data has been collected from five schools in Bongaon Municipal Area, North 24 Pgs, West Bengal, India. A total of hundred (100) students of class – IX were taken who had been equally divided into experimental groups and control groups. The main independent variable for the present study was reinforcement. The dependent variable in the study was the behavior of the students. The result of this study supported the Skinner’s operant conditioning theory.*

Key Words: *Operant Conditioning, Reinforcement, Positive Reinforcement, Negative Reinforcement.*

I. Introduction :

Operant Conditioning refers to a kind of learning process where a response is made more probable or more frequent by reinforcement. It helps in the learning of operant behavior, the behavior that is not necessarily associated with a known stimulus.

The concept of reinforcement is identical to the presentation of a reward a reinforcer is the stimulus the presentation or removal of which increases the probability of a response being repeated. Reinforcement is of two types –positive reinforcement and negative reinforcement.

A positive reinforcement is any stimulus such as food, water, sexual contact etc. the introduction or presentation of which increases the likelihood of a particular behavior. In the educational context, praise, grades, medals and other prizes awarded to students are examples of positive reinforcers.

A negative reinforcer is any stimulus the removal or withdrawal of which increases the likelihood of a particular behavior. An electric shock, a loud noise etc. are said to be negative reinforcers. In the educational context, one example may be a teacher’s saying to the students that whoever does drillwork properly in the class would be exempted from homework.

II. Schedules of Reinforcement:

1. **Continuous Reinforcement Schedule :** It is an arrangement of providing reinforcement after every correct response. For example, a student may be rewarded for every correct answer.
2. **Fixed Interval Reinforcement Schedule :** It is an arrangement of providing reinforcement after a set interval of time, e.g., every 3 minutes or every 5 minutes. How many times he has given correct responses during this fixed interval of time does not matter. It is only at the expiry of the fixed interval that he is presented with some reinforcement.
3. **Fixed Ratio Reinforcement Schedule:** It is an arrangement of providing reinforcement after a fixed number of responses. For example, a rat might be given a pellet of food after a certain number of lever presses. A student may be properly rewarded after he answers a fixed number of questions say 3 or 5. It is used in some factories by employers of casual workers or laborers where wages are paid on a piece- work basis that is the number of garments sewn or the number of baskets or boxes packed.
4. **Variable Reinforcement Schedule :** It is an arrangement of providing reinforcement after a varying intervals of time or after a varying number of responses. In this case, reinforcement is irregular. The individual does not know when he is going to be rewarded and consequently he remains motivated throughout the learning process in the hope of reinforcement. The most common example of such a schedule is gambling. Here rewards are unpredictable and keep the players well-motivated through occasional returns.

III. Conclusions about the various Reinforcement Schedule:

Reinforcement and its schedule play a key role in the condition of operant behavior and acquisition of a learning. Where a continuous reinforcement schedule increases the response rate, the discontinuation of reinforcement may result in the extinction of that response or behaviour. A continuous reinforcement schedule, thus, yields the least resistance to extinction and the lowest response rate during learning. Learning of a response, therefore, occurs quickly if every correct response is rewarded, but it is forgotten easily when the reinforcement is stopped. If reinforcement is given after a varying number of correct responses or at varying

intervals of time, the response is remarkably resistant to extinction. However the fixed interval reinforcement schedule(FIRS) are found to provide the lowest yield in terms of performance as the individual may soon learn to respond correctly only when the time or turn of reinforcement arrives. Similarly he may lose interest in getting reinforcement after a fixed interval or fixed number of correct responses.

Weighing all these properly, Skinner suggests a 100percent schedule to begin with followed by a fixed interval or fixed ratio schedule to finally arrive at the variable reinforcement schedule for, better result in learning or training.

Hypothesis:

H₁ : There is no significant difference in the unit test result of the control group and the experimental group.

H₂ : There is no significant difference in the attendance of the control group and the experimental group.

IV. Methodology:

Experimental Research was most suitable for the present study. In the present investigation the sample was divided into two groups. Five schools were chosen randomly to carry out the experiment. Students of Class IX were then selected randomly who were divided equally into groups, one experimental group and the other control group. They were taught for a month by the same teacher. Both Classes did the same chapters.

The control group was taught without reinforcement. The experimental group was taught with 100 percent reinforcement schedule beginning with followed by a fixed interval schedule to finally arriving at the variable reinforcement schedule. Different item such as praise, grades, medals, pens, trophies etc are used as positive reinforcer at different days.

Variables:

The main independent variable for the present study was reinforcement provided by the teachers. The dependent variable in this study was the behavior of the students.

Sample:

Five schools were selected for this study. Bongaon Municipal Area was the target population. Out of these schools 100 students of Class IX were taken for the study. The two groups(Experimental Group and Control Group) were divided.

Table 1.1 : Division of sample as Experimental Group and Control Group

Sl. No	Institutions	No. of Students Involved		
		Experimental	Control	Total
1	School A	10	10	20
2	School B	10	10	20
3	School C	10	10	20
4	School D	10	10	20
5	School E	10	10	20
	Total	50	50	100

Tools:

The tools utilized for collecting data were:

1. Unit Test was constructed by the researcher every week.
2. Quiz conducted by the researcher.

Findings and Interpretation :

The statistical technique employed for analyzing the data were Mean, Standard Deviation(SD) and t-Test.

Testing for H₁ :

Table 2.1 : Mean, SD and ‘t’ value of Experimental Group and Control Group

Sl. No	Categories	N	M	S.D.	t	df
1.	Experimental Group	50	71.20	12.40	2.30	98
2.	Control Group	50	64.12	13.92		

There existed a significant difference in the results of the students between the experimental group and control group at 0.05 level of significance. The null hypotheses was rejected. This showed that there was a positive effect of reinforcement on the experimental group. There was development in the competency of the experimental group.

Weekly unit test scores were compared using a ‘t’- test for comparison of Means. Average test scores from all students in each class were compared for each week of class. The result of this test showed a significant difference between the teaching group with reinforcement and teaching group without reinforcement. The teaching group who was provided reinforcement displayed higher scores(Figure 1.1). The unit test scores for the reinforced group was higher than those for the group without reinforcement.

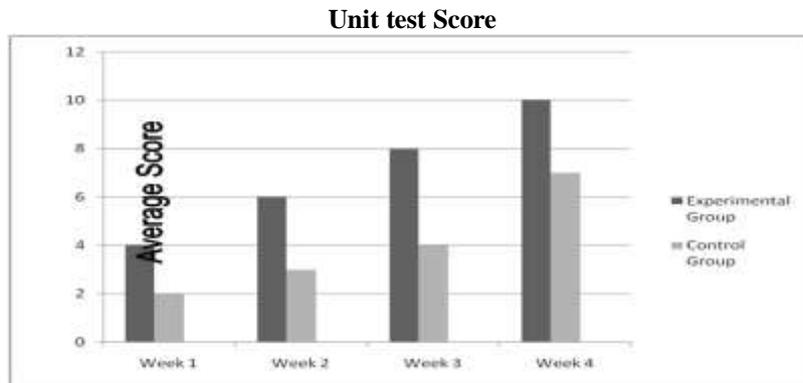


Figure 1.1 : Average Unit test Scores Obtained by the students of both groups.

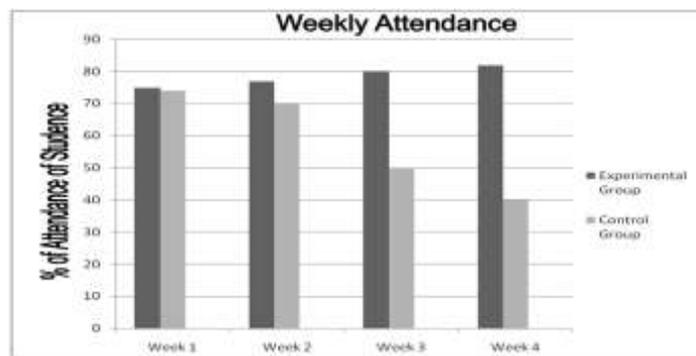
Several Statistically significant differences were found between the two groups. The weekly test scores between the reinforced group and the normal group showed a clear trend. As a class the reinforced group scored significantly higher than the normal group every week, even though both groups covered the same topics, did the same activities and took the same quiz. The Students in the experimental group were more actively involved in their Learning experiences, the retained more information and were able to recall and apply this information better than the control group.

Testing for H₂:

Table 2.2 : Mean, SD and “t” value of Experimental Group and Control Group

Sl. No.	Categories	N	M	S.D.	t	df
1	Experimental Group	50	84.45	3.02	11.68	97
2	Control Group	50	76.32	4.11		

There existed a significant difference in the attendance of Experimental Group and Control Group at 0.01 level of significance. Thus the Null hypothesis is rejected,



Weekly attendance for both the groups was analyzed to determine whether the teaching style used in the class had an effect on the students’ interest and therefore their participation in the class(Fig.2). Data was analyzed using percentage which demonstrated that there was a significant difference between the attendance of the two groups. Attendance among the students of control group showed a sharp decline towards end of the month.

V. Conclusions:

The results of this study supports the importance of Skinner’s Operant Conditioning theory in teaching-learning process . It was anticipated that the reinforced group would have higher average on the weekly quiz grades, and this was supported by statistical analysis. The Control Group exhibited less student participation and interaction than the Experimental Group. Students’ Comments, their attitude, expression from

the members of reinforced group indicated a high level of interest, satisfaction and increased students participation were evident to any observer. Students were more enthusiastic and willing to volunteer answers and ask questions of the instructor in order to clarify material and discussions resulted in many new points being introduced. The data collected for this study certainly supported the benefits generally attributed to Skinner’s operant conditioning theory.

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