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Effects of Innovative Teaching Strategies on Students' Performance

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Abstract - The purpose of this experiment was to investigate the effects of innovative teaching strategies on the performance of students of grade 1. The experiment was done on the teaching of science subject to the students of grade 1. A sample of 50 students (boys and girls) was selected randomlyout of the population of 100 students in grade 1 from anEnglish medium school of Islamabad. Two groups of 25 students each were made. Pre-test of General Science was given to both the groups and the results were recorded. One group was taken as a control group which was taught science by the teacher who used conventional method of teaching while the other i.e the experimental group was taught by the teacher who used innovative teaching techniques. After one month's time of teaching, a post-test was conducted.

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Effects of Innovative Teaching Strategies on Students'Performance

Dr.Fauzia Khurshid [α] & Urusa Ansari [σ]

Abstract - The purpose of this experiment was to investigate the effects of innovative teaching strategies on the performance of students of grade 1. The experiment was done on the teaching of science subject to the students of grade 1. A sample of 50 students (boys and girls) was selected randomlyout of the population of 100 students in grade 1 from anEnglish medium school of Islamabad. Two groups of 25 students each were made. Pre-test of General Science was given to both the groups and the results were recorded. One group was taken as a control group which was taught science by the teacher who used conventional method of teaching while the other i.e the experimental group was taught by the teacher who used innovative teaching techniques. After one month's time of teaching, a post-test was conducted. It was found that after one month the students (n=25) who were instructed using modern teaching techniques achieved significantly higher scores on science test than did the students (n=25) whose instructions were done on traditional/conventional method.

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I. Introduction

An enormous amount has been written in the last two decades about research on how people learn.Students actively learn by observing and performing activities, the process of learning is far more accelerated when a practical implementation is associated and the learner is benefited with the applied knowledge and skills and it also involves trial and error at times during self-exploration.

It's more effective if the students are made to perform rather just asked to remember some information. The applied and implicit knowledge should be the ultimate goal of the education system.A typical classroom environment with a presentation from the course teacher accompanied by a lecture does not promote learners to participate and does not build a required involvement level of the students. Most of the learners just copy the notes from lecture or board considering it part of their responsibility being in the class but it does not build their engagement level with the course being taught. This typical environment only promotes a fraction of students who start thinking at their own and try to raise questions taking initiatives.

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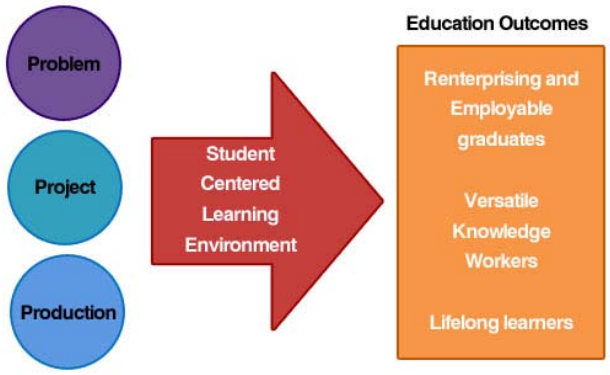
Before the advent of technology in the teaching methods, the instructor is the transmitter and the learners are the receivers of the knowledge being transferred.The typical medium can be imagined as a board, chalk and the lecture. The early twentieth century technique was followed for decades and still in practice at many places. The instructor is the center of this model delivering factual knowledge to the whole group of learners and having a complete authority in the classroom. The students have a minimum role to play here and the just at the receiving end of the transmission (Orlich et al. 1998).Educationists of today find this method limiting and less effective as the learners may lose their concentration within half an hour due to passive role and less participation. Some of the limiting factors can be summarized as:

1. This is a one way transmission of knowledge.
2. The knowledge is purely factual.
3. Students' feedback and queries are very limited or even non-existent at times.
4. Course material is limited to the pre-prepared lectures and text books.
5. Insufficient elements of interest and engagement for the learners.
6. Applied and real life knowledge is least discussed and focus is purely based theory.
7. The system promotes memorizing skills of student and least concerned with the understanding.

As this approach is least practical and applied and more theoretical and memorizing (Teo & Wong, 2000), activity based learning encourages student to learn real life problems based on applied knowledge and keep the interest and understanding of the students at its highest level.

(Boud & Feletti, 1999).

Today is the era of science and technology and there is a great need to improve quality of education specifically of science education. This can be possible by brining fundamental changes through innovates techniques through which teachers can provide students centered learning environment that can make learning process interesting and understandable to the young learners.



At a primary level there are so many children who get bored in the classrooms and some of them even refuse to go to school. Most of them are highly intellectual and they feel boredom and monotony in the class due to same usual teaching patterns of the teachers. These children sometimes produce alarmingly poor results in the exams.

The researchersanticipated to determine the effects of innovative teaching techniques on students' achievement. This was an experimental research conducted on the students of grade 1 to analyze the psychological effects of teacher's behavior and teaching styles on students' learning.

There was a research conducted on elementary classrooms in 1974 by Jane Stallings and her associates to study relationship between teacher behaviors and student achievement (Stallings & Kaskowitz, 1974). The behaviors of teachers were observed in 166 classrooms and their students were tested for achievement gains in mathematics and reading. Along with many other findings it was discovered that the teachers who were more business-like and had pre-planned activities in structured classrooms produced better results as compared to those with informal classrooms and routine methods.

Steven McGee and Bruce Howard in their work compare conventional method of teaching with the Horse Race and emphasis that the conventional methods are no good for the overall growth of the class rather they create only a competing environment.

Doyle studied the impact of academic learning through indirect tasks in 1983 where the learners were redirected to focus their attention to alternate tasks rather direct study of the curriculum. He concluded that learning can is influenced by targeting and applying different ways of processing information and focusing the attention towards a particular task.

Croker and Algina 1986 assert in their work the individual needs of the students that cannot be fulfilled with one standard teaching method as every student comes from different background and possess different questions about the things being taught and have a different focus towards the environment around him or her. So until and unless the things get cleared in the mind of students, the learning cannot be gauged, rather conventional methods are mostly measuring the memorizing skills of the students instead of bringing clarity in their minds.

II. Method

The objective of this experiment was to uncover the effects of innovative teaching techniques used by the grade 1 science teacher. The techniques the researcher used during this one month of experiment were:

- Team projects
- Individual projects
- Field trip
- Flash cards
- Real objects
- Audio- visual aids
- Internet access
- Computer assisted instructions
- Role play
- Work sheets
- Smart Boards
- Group discussions
- Quizzes
- Mind Maps

This experiment was conducted after the final exams of class 1 with the consent of their parents.

a) Population

50 students were selected on random sampling out of the total population of 100 students of class1. These children were average students. Out of these 50 students again systematic random sampling was done to divide them into two groups of 25 students each. Pre-test was taken. Now one group is said to be the control group and other one is the experimental group.

b) Control Group

The control group was kept as constant and was taught by the teacher who did not use the above mentioned techniques rather she taught with traditional (lecture and discussion) method.

c) Experimental Group

Experimental group was taught by the teacher using all the above mentioned techniques.

d) Intervening Variables

Class environment and arrangement were initially kept the same. The qualification and experience of both the teachers were exactly equal. Home assignments given to both the groups were exactly the same in order to avoid the intervening of the parents.

i. *Hypothesis*

1. There is no significant difference between mean scores of experimental group and controlled group on pretest.

2. Students taught by the teacher using innovative teaching strategies produce better results as compared to the other group of students taught with traditional/conventional method.
3. The under achievers or the students having below average scores perform well in experiment group and thereby collective achievement of the experiment is better than the control group.
4. The students of the experimental group have more clear concepts and they will be retained longer as compared to those taught with traditional method.
5. Students of the experimental group will attend the school happily and will take interest in the class.

III. Experiment

The duration of the experiment was one month starting from March 28th to April 27th 2012 after the final examination was over. The reason for conducting the experiment at this time of the year is that the regular classes would not be disturbed and the parents of any of the groups would have no objection.

According to the planner made by the researcher, four topics were taken from the General Sciencebooks which were not from the text book prescribed for that school. Namely; 'We are alive', 'Plants are alive', 'living and Non-living things' and 'We need food'. These four topics were divided into four weeks.Initially both the class rooms were set on the same standard pattern later the researcher rearranged the experimental classroom with modern equipment.Exactly after one month's time, post-test was conducted from those four topics. A remarkable difference was observed between the scores of the two groups.

IV. Results

a) Pre-Test Results

SNO	Control Group Scores	SNO	Experiment Group Scores
1	67	1	68
2	69	2	72
3	91	3	80
4	78	4	76
5	87	5	88
6	90	6	84
7	81	7	89
8	84	8	83
9	97	9	94
10	91	10	93
11	87	11	85
12	88	12	86
13	87	13	95
14	93	14	88
15	77	15	76
16	88	16	94
17	92	17	89
18	96	18	95
19	93	19	94
20	95	20	94
21	97	21	98
22	93	22	99
23	97	23	94
24	91	24	93
25	96	25	97

b) Statistics

	Control Group	Experiment Group
Mean Score	88.20	88.16
Standard Deviation	8.25	8.40
Variance	65.28	67.73

c) Distribution

Range of Scores	Control Group	Experiment Group
60-70	2	1
70-80	2	3
80-90	7	9
90-100	14	12

Pre-test results display a clear similarity between the control group and the experiment group. The mean scores are matching: i.e. 88.20 and 88.16. The standard deviation and variance shows that the scores are equally distributed in the two groups. And the frequencies of the various grades are also almost same with equal number of students: in the lower bands, 60 - 80 we have 4 students in each group and above 80 we have 21 in each. So there exists a symmetry and it was kept as per hypothesis, the experiment is supposed to evaluate the impact on students with a blend of different grades and different IQ and acceptance level.

d) Post-Test Results

SNO	Control Group Scores	SNO	Experiment Group Scores
1	64	1	75
2	86	2	89
3	71	3	79
4	83	4	94
5	91	5	97
6	73	6	89
7	83	7	99
8	79	8	89
9	65	9	78
10	63	10	79
11	76	11	99
12	77	12	97
13	84	13	94
14	86	14	96
15	71	15	93
16	75	16	99
17	85	17	97
18	73	18	94
19	63	19	99
20	62	20	94
21	75	21	95
22	54	22	94
23	63	23	93
24	71	24	91
25	68	25	94

e) Statistics

	Control Group	Experiment Group
Mean Score	73.64	91.88
Standard Deviation	9.46	6.99
variance	85.99	46.91

f) Distribution

Range of Scores	Control Group	Experiment Group
60-70	8	
70-80	10	4
80-90	6	3
90-100	1	18

The post-test results are completely different from the pre-test results. There exists a huge gap between the mean scores and the experiment group is a clear win. The mean score for the control group turned out to be 73.64 and the experiment group is much higher i.e. 91.88.The variance is half. The scores in the experiment group are more focused which shows a convergence in score bands and the transition is from lower to higher as the mean score is raised.

The analysis of the score bands shows a good shift in the higher band of the experiment group while the frequencies are distributed in the control group and no pattern can be observed.The lowest band is eliminated in the experiment group which is very positive indicator as it shows the achievement of students that may be referred as under-performers compared to the rest. Likewise the middle bands are moved to the high achievers and the result becomes over all improved.Hence the statistics show the both individual and collective achievement in the experiment group; improvements in underachievers, convergence towards the higher band of scores.

V. Analysis

Starting with same mean score in the pretest almost same distribution of grades, the post test results are totally different. There is noticeable difference in the mean scores of the two groups i.e. 91.88 of experiment group compared to 73.64 of the control group. Clearly the experiment group outperformed the control group. This is not the only measure. We have a reduced variance and standard deviation in our results showing the overall achievement of the group and similarity in the pattern of scores among the experiment group students. The results get further clarify if we observe the frequency of various ranges of scores. The mode of experiment group is 90-100 and while the control group is 70-80. Also the frequency is highest and concentrated in the high group. The ratio of under achievers is the minimum; there is not student found in the minimum band of scores.

VI. Conclusions

With the observed results the conclusion is very clear that the innovative teaching methodologies outperform the traditional classroom teaching. The impacts are found on both individual and group level. It satisfies the individual learning requirements and increases the interest level among the students. At the group level, more students are found scoring higher grades and with the special focus on the students who performed less in the pretest the frequencies of lower grades are remarkably reduced. The quantifiable hypothesis number 1, 2 and 3 are clearly proved through this experiment.

VII. Discussions and Suggestions

Education is a beacon for all mankind;it is the right direction to surge. We have to make education a learning process that generates interest in the students and motivate them to stay back in the institutions than to run away from it. Education should be entertaining and fun to students not boredom or just a duty.Teaching is also changing classroom experience. The researchers recommend that the teaching would be highly effective if the teacher starts to use innovative teaching techniques. Islam bestows a great importance to the acquisition of knowledge and education. "Iqra"; 'read' is the first word of our Holy Book Quran. Education is thus the beginning of every human activity.

To restrain the traditional approach of teaching; teachers must use innovative strategies to enhance the cognitive level of students.Students must be given the exposure to the science and technology to compete the outer world. The positive responses of the students also demonstrate that the new techniques are the effective means of reinforcing the learning process, particularly for those learners who are not getting benefited from the traditional (face-to-face) mode of delivery.

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