

A COMPARATIVE ANALYSIS OF TEXTBOOK AND ACTIVITY BASED METHOD IN THE SUBJECT OF SCIENCE AT ELEMENTARY LEVEL

***Prof. Dr. Ismat Ullah Cheema**

Lahore School of Professional Studies, UOL

****Bushra BiBi**

Secretary BISE Lahore

*****Dr. Muhammad Iqbal**

Associate Professor of Education, Division of Education, UE Lahore

******Zunab Fareha**

Mphil Education, Division of Education, UE Lahore

Abstract

Strategies, techniques, approaches and methodologies are essential part of teaching and learning whereas the textbook is a systematical arrangement of content related to subject that helps in teaching at specific academic level. The activity based method is the form of learning where students are actively engaged in a given task with a focus on making the abstract concrete or learning by doing. This experimental study, lasted for four weeks, compares the textbook and activity based method of teaching in the subjects of science at elementary level which was conducted on grade VI students to explore the effectiveness of activity and textbook based method of teaching after arranging pre and post test. The mean score of control group on post test was 12.26/20 and the mean score of experimental group on post test was 18.44/20. The results reflect that the performance of experimental group was significantly better than the controlled group. Hence, the study finds by investigating that activity based method of teaching has potential to enhance the academic achievement of the students in the context of the regular science teaching class.

Keywords: Strategies, textbook method, activity method, science, elementary

INTRODUCTION

To produce a well-developed and a groomed student, the teachers of all levels should performing different techniques and methods. The profession of teaching is a miscellaneous, complex and tough activity. We can call it a self-motivated and such a dynamic process. A teacher plays a specific and vital role in the effective teaching method. The learning of students can also be improved by teacher. Teaching methods are design of teacher performance that persistent, relevant to different subject matters and

relevant to education (Farooq, Chaudary & Mahmood, 2005). Science was given special prominence because for survival in the current consequence science education is essential at each level as designated the character of science teaching in the socio-economic development of societies and cultures, and nations barely needs any discussion, debates or arguments (Iqbal, Saiqa & Rana, 2009).

The method of activity based Teaching is naturally and specifically a Student-Centered which invites students to being an active participant and contribute energetically in their particular experiences of learning (Frooq, Chudary & Mahmood, 2005).

In Pakistan, Textbooks based method of teaching is given main concern in our schools and educational system. Teachers consociate textbook as the crucial and significant tool of teaching. The books are foremost source of knowledge and content for both students and teachers in education. While Activity Based Method is very popular among teacher in schools and in the educational world. Mostly teacher consider this method very effective.

In this study, the researchers have thrown light on both methods of teaching and their effectiveness on student learning process.

Statement of the Problem

We have various methods of teaching while this study was designed to compare textbook based method and activity based method of teaching in the subjects of science at elementary level. Hence, the study is experimental in nature and has been conducted on the study of elementary level by making two groups: controlled and experimental.

Objectives of the Study

The objectives of this research are:

- To compare the text book based method and activity based method of teaching in the subject of science at elementary level
- To identify the importance of textbook based method and activity based method
- To explore effectiveness of both teaching method in the subjects of science at elementary level
- To find elements that are lacking in both methodologies and how they can be improved for effective learning of students.

Significance of the Study

Teaching methods are always important in world of teaching and learning. Because teaching methods help us to make our delivery of content better and it also helps us the learning of students effective. Teaching method is the essential component of teaching. It helps facilitator to achieve goals. But there are many methods of teaching for the facilitator. How a teacher can come to know the best suitable method of teaching. Teacher has to recognize the needs of students, organization of classrooms and requirement of content. Teaching method is all related to the way of content delivery. The researchers selected this topic because textbook are main tool of teaching in Pakistan and

its most widely used in schools especially at elementary level. On the other hand activity based method also frequently used in schools. Teaching of science at elementary level is also the reason of this study. This study may be helpful for those teachers who are teaching science at elementary level. They can modify or transform their teaching methodologies in the light of study. Teachers can also make their methodologies and activities more interesting and effective. What role both of text book based method and activity based method play at elementary level. We can see how they both method change the achievement level of the students. The study can also be beneficial for textbook developers. They would find any appropriate guidelines for selecting suitable activities and effective use of textbook. This study would also helpful for those who want to read about two most frequently used teaching methods.

Research Questions

- 1) What is the comparison of text book based method and activity based method of teaching in the subject of science at elementary level?
- 2) What is the importance of textbook based method and activity based method?
- 3) How to explore effectiveness of both teaching method in the subjects of science at elementary level?
- 4) How to find elements that are lacking in both methodologies and how they can be improved for effective learning of students?

Research Methodology

This study was experimental in nature which describes the comparison of textbook based method and activity based method of teaching in the science subject at elementary level.

Population of the Study

The objective of the study was to compare the relative effectiveness of activity based method of teaching on the achievement of elementary students in the subject of science. Thus, the students studying science at elementary level in Lahore city constituted the population of this study.

Sample of the Study

The students of 6th class of Government Boys High School Township, Lahore were selected as subjects of the study. The sample of study consisted of 54 students of two sections of class 6th namely Control and Experiment group.

Design of the study

This research design involved two groups, one is experimental group which was taught by activity based method of teaching and other is control group which was taught through textbook based method. The sample comprised of 54 student including 27 students in experimental group and 27 in control group. All students belong to the same demographic area so it was assumed that they belong to same socio-economic status and background. Students of 6th class of Government Boys High School, Township, Lahore, were selected

as subjects of the study. An objective type achievement test based on chapter studied before the experiment were administered to all the 54 students of 6th class then all the 54 students distributed in two equal halves and equated on the basis of their pre test scores. So the groups were obtained through paired matching on the basis of the previous knowledge of the students. One group randomly assigned as experimental group while other kept as control group were taught through activity based method of teaching and the control group through the textbook based method. The experimental procedure lasted for a period of four weeks. At the end of experimental procedure an objective type post-test was administered to both groups to see the effect of teaching methods.

Pre Treatment Conditions

Equal conditions for both groups at each stage were established i.e. teaching duration in a day and treatment length in terms of time was the same for both experimental and control groups.

Treatment Conditions

The students of two selected were exposed to essentially the same experience except for the method of instruction.

Research Instruments

The following instruments were used for study:

1. Two tests made as pre-test and post-test.
2. Two chapters of 6th class science textbook prescribed by Punjab Text Book Board namely:
 - Air
 - Solutions
3. Instructions for the teachers
4. Observation by the researcher

Selection and Trainings of teachers for Experiment

Two teachers with similar qualification, training and teaching experience at elementary level were selected. One teacher was assigned to the experimental group and the other to the control group. Experimental group teacher was given direction of relevant activities to the lessons. The teacher of E group has different instructions to demonstrate different activities at various stages of lesson. Both teachers have the instructions about administration and score of pre-test and post-test.

Review of Literature

Science is related to human, strongly related innovativeness. In our lives it's also play an important role. It dominates human lives. Science also plays an important role in society; it gives opportunities to society and many challenges. It is very exciting, puzzling, alarming and energizing but it is not boring (Albone, 2003). Majority of students at elementary are quite curios so science is most suitable and interesting subject for ideal learning. Science makes them students learning effective and help in discover new world. Science is very creative subject, it include different activities, labs work and many experiments. Science is a basic subject and act as a foundation of education for children.

Science and technology are very important in world because these are the foundation of modern civilization which is now had gain the global market place. Many of different discoveries are occurring in the world and these discoveries are integrating in our lives at an exponential rate. Many debates of complex and tough problems of technology and science in the media, on internet and on the TV are taking place due to daily new science discoveries. In the whole world the standards for technical and scientific literacy are become higher especially around us (Albone, 2003).

In our whole life, the process of learning goes hand in hand with life. Rehman (2004) stated that if we go back in human history when he lived in forest with animals, at that time animal and human also taught their children how to live and survive in forest. Time passed and man comes to know about different things and how to teach others about those things. Without purpose everything is useless and incomplete. So teaching also has purpose. The purpose of teaching is leaning. Teaching is related to four characteristics; teacher, learner, learning process and learning situation. The most common and helpful teaching aid for affective teaching is textbook. A good textbook saves our valuable time. All students read same text establishes a common background that is important for processing teaching procedures. An effective and appropriate organized textbook successfully combines inter and intra related course material. There is labeled diagrams, photographs, drawings and charts present in textbook for clarifying different content. In the education system little doubt is reduced to the value of textbooks.

Razia Fakir Mohammad and Roshni Kumari (2007) conducted a research by the name of "Effective Use of Textbooks: A Neglected Aspect of Education in Pakistan". In their research the members were teachers from government sector in the rural context and they all participated in an in-service teacher education program and were involved in improving the teaching and learning situations. The school had very limited resources regarding with teaching and learning. Their research work uncovered different gaps in the textbooks e.g. lack of clarity of language as well as insufficiency of information present in textbooks. It was observed in some instances that the language used in the textbook did not clearly define the presented concepts and the teachers were also unable to understand it, they imperfectly communicated the given information in the textbook to the students.

Textbook based method of teaching is also known as 'traditional method', 'direct method', 'lecture method' or 'teacher-centered method'. Similarly, activity based is known as 'out-class method', 'indirect method', 'learning by doing', 'cooperative learning' or 'new-world method'. Whatever the style teacher has adopt, the main thing a teacher has to make sure that the students have learnt the idea which he wanted to teach.

A teacher has to make sure that students are receiving his delivered knowledge through methods (Rehman, 2004).

Teaching methodologies are essential part of education. A facilitator transfers his knowledge to learners through different teaching methodologies. Teachers choose the right method of teaching for transfer knowledge to students in effective manner. In the world of teaching, there is no specific rule to select the right method of teaching. A good facilitator chooses different methods of teaching to teach appropriate topic. There are many teaching methodologies in the world of practicing educational institutions. Facilitator has different methods to transfer their knowledge.

The method of activity based teaching is make that kind of learning where a student engaged himself in a given task or activity. The children become workers in the activity based method. The learners become keen observers. They are interested in many types of work. Their thinking abilities explore and penetrate deep down into the concept taught. Inquiring attention form at high degree, while mutual work, their self-confidence is boosted and mutual patience takes place among them. S.K. Kochar (2006) was in favour of activity based method by saying that a teacher should provide the students a nurture and reasonable experiences of learning. All these experiences of learning should have capability to make good learning, development and participation of students. Teacher have to know that how a facilitator can make a good bond with students and other peoples at every stage.

According to Farooq, Chaudary and Mahmood (2005), the activity based method is teaching is quite student-centered in nature that invites the students to participate actively in his or her own learning experiences (discussion, debate, role-play and simulation). The greater the range on students will greater the degree of teacher responsibility. In this method all pupils of whatever age must be active for performing the task.

Iqbal, Saiqa and Rana (2009) described that Pakistani teachers have two various method of teaching for science curriculum, the one is textbook based method and the second is activity based method. The textbook approach starts from pre-determine body of knowledge but activity based approach starts from learner active participation. One possible explanation for this is the lack of development can be traced to the way science is taught in schools. During science teaching in schools, teacher emphasis is placed on the content knowledge and teachers promote the science's view that they were oriented to themselves.

An activity based method is a time consuming process and a very short syllabus covered through this method during a lecture in the comparison of textbook based method. In Pakistan teachers wants to cover the maximum syllabus in minimum short time and this can only happen with that kind of teaching method who's totally emphasize on the content, or you can say in other words the textbook based method. The textbook based method covers the content speedily. While activity based method is time consuming as compared to textbook based method of teaching. So for government teachers textbook based method is quite easy as compared to the activity based method.

Iqbal, Saiqa and Rana (2009) made a study on the secondary school science teachers and their views about the nature of science. They showed the modern science curriculum in various countries of the world don't focused on the developing the understanding of science concepts in the students. Recent reforms in science have added an emphasis on developing students understanding about the nature of science.

Data Collection

During the experimental procedure two different teaching methods were applied. Control group was taught through textbook based method in the classroom, while experimental group was taught with activity based method of teaching. The procedure of experiment continued for four weeks. After the experiment was over, post-test was administered to measure the achievement level of the sample subjects. Thus 27 students were selected for experimental group and 27 students of the control group in the retention test. Pre-test scores of the sample serve as data equate the control group and experimental group; post-test scores serve as data to measure achievement of the students as a result of treatment.

Analysis of Data

All the collected data that is available in hard form has been set for evaluation. Statistical analysis used for data from the selected population has been analyzed. The software of SPSS has been used for purpose of analysis of data collected from the sample. The analysis of data of is done by SPSS.

Presentation and Analysis of Data

The objective of this study was to compare textbook based method and activity based method of teaching in the subject of science at elementary level. The study was experimental in nature. The research design was post test only control group and experimental group design. This chapter deals with the presentation and the analysis of data. The following statistics were applied for the analysis of the data: Mean, Standard Deviation, t-test and Significance. This chapter is confined to the analysis of data and interpretation of data collected through post test. Significance between the mean scores of the experimental and control groups on post test were found by applying t-test.

Table: 1.1

Independent sample t-test for the analysis of the gain scores of pretest of all students

Test	Variables	N	Mean	Std. Deviation	t-value	Sig
Pre test	Experimental group	27	6.81	1.834	.083	.934
	Control Group	27	6.85	1.861		

Sig level < 0.05

The table 4.1 shows that the pretest score of experiment and control group were same, $t = .083$, $p = .934$. So, the result of the above mentioned table shows that no significant difference was found between the experimental group mean score (Mean= 6.81, SD= 1.834) and the control group mean score (Mean= 6.85, SD=1.561)

Table: 1.2

Independent sample t-test for the analysis of the gain scores of posttest of all students

Test	Variables	N	Mean	Std. Deviation	df	t-value	Sig
Post test	Experimental group	27	18.44	1.368	26	-11.764	.000
	Control Group	27	12.26	2.640			

Sig level < 0.05

The significance value and mean for sample t-test (26) = -11.764, $p < .0001$ It was also indicated in the above table that t.value for all students ($t = -11.764$, $p = .000$) of post-test for academic achievement of students The result of the study shows that group performance of the Experimental group score (Mean= 18.44, SD= 1.368) and the control group mean score (Mean= 12.26, SD= 2.640).

Findings

Teaching and learning both are different process and wide in their scope, methodology, approach and application. In the traditional point of view, teaching process and learning process is basically teacher centered where the teacher is the authority of knowledge. Whereas, on the other hand, the activity based method of teaching is a student centered approach in nature and in principle. In the type of activity based method of teaching the child is an agent on his own. He is given the pleasure of place in the constituent of learning. The present study was designed to investigate the comparison of textbook based method and activity based method of teaching in science subjects at elementary level. For this purpose 6th class was selected to find out the effectiveness of activity based method of teaching with comparison of textbook based method of teaching.

The research design consisted on two groups, an experimental group (E) which received a complete treatment based on activity based method of teaching, and a control group (C) which received the complete treatment based on textbook based method of teaching in order to measure achievement level of experimental group and control group the same test constructed and administered to both groups. Two teachers were selected and were given instructions regarding pre test and post test administration and scoring. Time was given of four weeks for this experimental procedure. At the end of experimental procedure a post test was administered to both groups to see the effects of intervention mean score of experimental group on post test and pre test respectively. The analysis of

data reveals that the performance of experimental group is significantly better than that of control group both on post test.

The following emerged as a result of the analysis of data:

- We had compared the both method of teaching for checking the effectiveness of teaching and learning.
- As we have the score of post-test experimental group score (Mean= 18.44, SD= 1.368) and the control group mean score (Mean= 12.26, SD= 2.640). So we can see the difference between the test scores. Thus, the result show the effectiveness of activity based method of teaching.

Conclusion

The following conclusions were extracted from the findings of the study:

1. The experimental group and the control group were equivalent at the time of starting of the study.
2. Analysis of the data shows that the activity based method of teaching was more effective for teaching science as compare to textbook based method of teaching.
3. Teaching of science through activity based method of teaching plays a positive and effective role in improving the academic achievement of the students who are studying science at elementary level.

Recommendations:

1. The result of experiment shown the effectiveness of activity based method of teaching, so it is recommended that this method should be applied to other class and also for subjects taught in the Pakistani institutions.
2. As the result of the study shows that activity based method of teaching was more effective and feasible for teaching science at elementary level, so it is recommended that the activity based method of teaching can be used for other subjects and classes.
3. The science teachers at elementary level can use activity based method for maximum benefit of their students.
4. The result of study recommended that activity based method of teaching motivate the students for learning and teacher should use it rather than textbook based method of teaching.

References

Albone Eric (2003). The Importance of School Scientist Partnership

Ch. Muhammad Shahid Farooq, A.h. (2005). Comparison of Activity Based and Traditional Based Method of teaching on achievement of mathematics. *Bulletin of education and research*, 27 (No 2), 57-64.

Hafiz Muhammad Iqbal, Saiqa Azam and Rizwan Akram Rana Secondary School Science Teachers' Views about the 'Nature of Science' BER 27(2), 65-80 *Bulletin of Education and Research December 2009, Vol. 31, No.2 pp 29-44*

J.M Chambliss and C.R. Calfee, (1998). *Textbooks for learning: nurturing children's minds*. Oxford: Blackwell Publishers

Kochhar. S.K (2006). *Methods and Techniques of teaching*. New Delhi: Sterling Publishers

Razia Fakir Mohammad and Roshni Kumari (2007) Effective Use of Textbooks: A Neglected Aspect of Education in Pakistan. *Journal of Education and International Development* 3:1.

Zikar-ur-Rahman (2004) *Modern Teaching Methods*. New Delhi: Anmol Publisher.