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Effects of Project-Based Learning on Students' Academic Achievement in the Subject of Social Studies at the Elementary Level

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ABSTRACT

This study investigated the effects of using a project-based learning approach in teaching elementary-level social studies. The study was experimental and was conducted using a Pretest-Posttest Equivalent Group Design. The sample students of the study were equally assigned to two groups, i-e, an experimental group and a control group. Pre- and post-tests were used to collect data from both the study groups, which reflected their academic achievement. The data were analyzed and interpreted using Mean, Standard deviation and Paired Sample t-tests. The study results show that project-based learning is an effective teaching method for social studies at the elementary level. Therefore, the study recommends using this approach for teaching the subject at the elementary level to enhance students' academic achievement. To achieve this purpose, the social studies textbook should be revised to include the procedures and principles of project-based learning. Furthermore, training and workshops should be arranged for teachers to train them to use this approach efficiently in their teaching.

1. INTRODUCTION

Teaching is a dynamic process that involves a wide range of methods to fulfill the various learning needs of students. Teaching social studies has always been a matter of challenge for teachers due to its predominant theoretical nature. Students hardly find it engaging and interesting. As a result, social studies is considered a boring subject with no significance for life (Zhao and Hodge, 2005). One of the reasons for this is the subject matter, which is dull, and the old teaching methods used for teaching this subject (Martell Hashimoto, 2011).

Students are believed to take less interest in subjects in which they are not active participants (Chiodo& Byford, 2006). Social studies teachers must enhance students' interests by ensuring active learning involvement to face this challenge. For this purpose, they may use different engaging instructional activities such as inquiry-based learning, cooperative learning, problem-solving and project-based learning strategies (Driscol, 2005). Therefore, learning through projects is one of these teaching strategies that teachers may use to make their teaching more interesting and useful for their students. It is also

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considered a student-centered approach as it effectively engages them in investigating things themselves without anyone; the instructor assumes the part of facilitator or guide (Bell, 2010). Project-based learning enhances students' cognition through active engagement in solving complex issues (Afzal, Ali Khan, & Hamid, 2010; Johnson, Johnson, Roseth, & Shin, 2014).

At the school level, social studies is taught to elementary class students. The major purpose is to equip them to know, explore and solve problems and make wise decisions to be good and liable citizens in the future. Project-based learning is thought to have been proven to be an effective instructional approach to achieve this important objective. It allows the students to work together and become aware of the different dimensions of their society.

Project-Based Learning

Sunbul, cited in Baş (2011), affirms that the foundation of the project teaching method is not novel. William Heard Kilpatrick, in the 1920s, supported the idea of a project-based approach. He believed this scheme contains four components: aiming, preparing, implementing, and evaluating (Foshay, 1999).

The project method of teaching is mainly a student-centered approach. In such an approach, a student develops a question and starts working on it as a research project under the supervision of a teacher (Bell, 2010). According to Demirhan (2002), Naidoo (2012), and Thomas and Mergendoller (2000), project learning is a teaching model that is used to organize learning around some project activity. More specifically, it is a teaching methodology that allows learners to do things practically and to actively participate in creating novel ideas and information.

Grant (2002) states that the teaching and learning approach empowers learners. It does not depend on a rigid lesson plan to achieve specific learning objectives. Still, it facilitates students by involving them in detailed research activities, further allowing them to learn more rigorously. Thus, The students can demonstrate their abilities and create artifacts such as poems, multimedia presentations, etc. According to Blumenfeld et al. (1991) and Demirhan (2002), project-based learning is the best approach to concentrating on students' classroom engagement for learning and enquiring about the problems.

Goals of Project-Based Learning

As a learning approach, it promotes students' motivation, attendance and involvement in learning (Thomas, 2000). It has been observed that students find a more supportive atmosphere for learning and feel more empowered by getting responsibilities (Boud & Feletti, 1997). The key goals of this approach include:

- To empower students to search their study materials and enable them to become more information literate (Niadoo, 2010).
- To make students independent learners by allowing them to identify their own learning needs (Barrows, 1986). In this way, the students play a more active role in setting targets for their learning and managing their time and means for attaining those targets (Albanese & Mitchell, 1993; Oyewo & Umoh, 2016).

Criteria for Project-Based Learning

Thomas and Mergendoller (2000) and Savelsberghet al. (2016) claim that projects used for Project-based learning must fulfill the five criteria mentioned below:

- The project must be considered as the main strategic approach to teaching and learning.
- The approach must focus on questions and problem-solving activities to teach students basic concepts.
- The approach must be all about students' engagement in enquiring and identifying.
- This approach is student-centered and student-oriented.
- The projects must be lifelike and reliable.

PBL Approach at the Elementary School

Schooling, particularly in middle age, is very competitive and enthusiastic. Elementary-level teachers keep students intellectually and socially engaged during this key age of remarkable intellectual and social development. Realistic projects that motivate students to learn actively are extremely needed for the whole growth of students at this stage. PBL has changed the entire program and technique of learning and teaching in almost all the relevant social or pure sciences subjects. Inquiry and problem identification and engagement with such process is the base of the approach; however, it may usually need a comprehensive program of implementation (Gultekan, 2005).

PBL Approach in Social Studies

In PBL, students are facilitated to work on different projects in social studies. In this way, the students accumulate new information and create knowledge by searching various topics and tapping the primary and secondary sources. They also analyze it as per their retrieved understanding. Participation in these activities enables them to present their ideas innovatively. Hence, well-planned projects allow students to have their hands on the experimentations, resulting in a better understanding of concepts and detailed and cohesive knowledge about the phenomena they investigate (Tavalin, 2012).

Projects in the Teaching of Social Studies

Stripling, Taveras, Klein, King, Bey, &Commitante (2009) describe the following examples of using projects in the teaching of social studies:

Log Explorer

In almost every classroom, students are given notebooks, which they use to note whatever reflections they have on the subject or question under investigation. This notebook is also called the log explorer. Students can also use explorer logs in their preparation and pre-planning for projects.

Behaving Like Historians

Most of the time, those teachers are appreciated and liked and even preferred by students who know history, have a strong history background or know teaching skills like historians. Even teachers prefer teaching history as a process of investigation, not a collection of facts. They prefer teaching history inquiry-based, just as historians do,

rather than lecture-based methods. This has made students realize they can conduct their history analysis as openly as possible.

Guide to Research

Students of Social Studies can be engaged in different research projects using research guides, which inculcate diverse approaches and structures. Students may be guided to research many perspectives using various data collection tools and sources.

Document Analysis

Document analysis in social studies projects can be a great data collection and analysis source. Using and documenting historical eras and periods will usually stick to a specific time. Students will analyze various documents while discussing social studies, including photos, advertisements, cartoons, and video and audio recordings.

Maps, Graphs and Globe

Maps, graphs, and globes may be effective tools in social studies projects. Though these documents keep changing, they positively influence learning and teaching in this approach. Students using maps can easily trace different places and thus understand ancient events within their proper historical context. Teaching social studies at the elementary level has been challenging because students usually require modern skills in teaching these subjects, along with motivation and enthusiasm. Therefore, a project-based approach is one of the leading techniques requiring proper implementation and investigation. However, on the ground, it is misconceived and still unimplemented.

Research Objectives

- To investigate the effects of project-based learning on students' academic achievement in social studies.
- To determine the effect of the lecture teaching method on students' academic achievement in social studies.
- To compare and measure the effects of project and lecture teaching methods on students' academic achievement.

Hypotheses of The Study

The following null hypotheses were tested to reach concrete conclusions in the study:

- H1: Project-based teaching & learning do not significantly affect students' academic achievement in social studies.
- H2: The lecture teaching method does not significantly affect students' academic achievement in social studies.
- H3: There is no significant differentiation between the effects of project-based learning and lecture methods on students' academic achievement.

2. METHODOLOGY

The Research methodology adopted in this study includes:

Population and Sample

Elementary school students from District Swat were studied in this study. Social studies students in eighth grade were included in the second part of the study. In District Swat, there are twenty-two (22) GGHs. A convenience sampling technique was used to select Government Girls High Secondary School No.1 Saidu Sharif Swat for this experimental study. Sixty (60) students of Grade 8 constituted the sample of this study. These students were equally divided into two groups, i.e., the experimental and the control groups.

Research Design

Pre-testing, true-testing, and quasi-testing are the three key experimental study designs, according to Best and Kahn (2012). Each design is appropriate for a specific setting and should be used accordingly. True experimental designs are regarded as the most powerful because they control internal and external threats to validity. A pretest-posttest equivalent group design is considered the most effective web design of actual experimental design, according to Gay (2007). That is why the Pretest-Posttest Equivalent Group Design among the True experimental designs was chosen for the present study. Two equivalent groups, the experimental and the control groups, were formed based on pre-test results. Thirty (30) students were allotted to the experimental and thirty (30) to the control group. The experimental design is symbolically represented as follows:

RE=	**T**	**O_1**
RC=	-	O_2
Difference =	O_1	$– O_2$

Where R stands for random selection

E = Experimental C = Control T = Treatment O = Observation

Students in the experimental group were taught social studies topics by working on various projects. In contrast, lecture teaching taught the same topics to the control group.

Research Instrument

A self-prepared test was used as a data collection instrument. This comprehensive test was made after reviewing the relevant literature, methods of constructing test items, and concerned chapters from the social studies textbook for grade 8. The test preparation also considered the opinions of class teachers and experts in test construction. The same test was used for the post-test but with some sequential changes to measure and compare students' academic achievement in both study groups.

Validity of Research Instrument

Experts established face validity and content validity of the academic achievement test through judgmental validation. The doctoral committee consisting of expert researchers approved this test. It was agreed upon that all test items were relevant, truly representing and covering the content selected for the experiment.

Reliability of Instruments

For the instrument's reliability, the split-half method (odd-even) through the product moment formula was used (Gay, 2000). The reliability coefficient of the pre-test of academic achievement was 0.80.

Data Analysis

Data collected through Pre and Post-tests of academic achievement was tabulated and analyzed in the statistical package for social science (SPSS) version 16 using mean, standard deviation and paired sample t-test to compute the significant difference between the two means of the groups at the significance level of 0.05.

3. RESULTS & DISCUSSION

At the elementary level, this study examined the effectiveness of using a project-based learning strategy in Social Studies.

Table 1
Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Experimental pretest	38.83	30	12.679	2.315
	Control group pretest	34.10	30	6.984	1.275

The pretest mean scores are shown in Table 1. The mean score in the experimental group is 38.83 and the standard deviation is 12.979, while in the control group, the mean score is 34.10 and the standard deviation is 6.984. There is very little variance between the scores of these groups, which validates them for the experiment.

Table 2
Paired Samples Test

	Paired Differences				T	Df	Sig.
	Mean	Mean difference	Std. Deviation	Std. Error Mean			
Experimental group pretest –	38.83						
experiment group posttest	83.90	45.067	9.889	1.805	24.962	29	.000

In Table 2, we present paired sample T-tests showing that the mean score of the experimental group on the pre-test was 38.83, whereas their post-test mean score was 83.90. The difference of the experimental group's pre-and post-test scores is 45,067 points, with a tabulated value of 1,699, a computed value of 24,962, and a significance level of 0.05. Since the calculated value is greater than the tabulated value, the H01 "there is no significant impact of project-based learning on students' academic achievement" cannot be accepted because the results indicate that project-based learning methodology considerably affects students' academic performance.

Table 3
Paired Samples Test

	Paired Differences				T	Df	Sig
	Mean	Mean	Std. Deviation	Std. Error Mean			
Control group pretest –	34.10						
control group posttest	48.47	14.367	4.263	.778	18.460	29	.000

The above Table describes the paired sample t-test values. In the Table, the control group's mean score on the pretest is 34.10; on the posttest, its mean score is 48.47; the mean score difference is 14.367. The tabulated value is 1.699, the computed value is 18.460 and its significance level is 0.05, which displays that the computed value is more than the tabulated value; thus, we cannot accept the null hypothesis that 'there is no significant impact of lecture method on the academic achievement of students.'

Table 4
Paired Samples Test

	Paired Differences				t	Df	Sig
	Mean N	Mean	Std. Deviation	Std. Error Mean			
Experimental group posttest –	83.9030						
Control group posttest	48.4730	35.433	12.789	2.335	15.175	29	.000

Table 4 shows that the experimental group's mean score on post-test is 83.90, whereas the control group's is 48.47. The mean score difference is 35.433. A posttest comparison of the two groups results in a computed value of 15.175, greater than the tabulated value of 1.699, which indicates significant differences in the effect of lecture method and project method of teaching on academic achievement. Hence, H1 is that students taught through project-based learning perform significantly better than those taught through traditional lectures. Students who worked on projects did well.

The lecture method is Pakistan's most frequently used teaching method, particularly in public-sector education. In this method, the teacher instructs students and transfers significant information quickly; however, students remain passive listeners, making this method less effective. Zhao and Hodge (2005)also found that social studies teachers mostly teach this subject through lectures. This has made social studies a low-standing subject for students as they find this subject boring and irrelevant to their daily lives. The main reason is that most teachers depend on lecturing to transfer textbook knowledge (Martell & Hashimoto-Martell, 2011). Students of the control group with a mean score of 34.10 on the pre-test and 48.47 on the post-test indicate that this method is effective but not as much as other methods of teaching where students participate and learn things themselves.

On the other hand, in the project teaching method, students practically participate in the learning process. Project-based learning is a student-centered strategy that concentrates on students' interests and needs and encourages them to create something novel (Bell, 2010). It improves students' understanding and other social skills. Moreover, the learning in project-based learning settings is more effective and long-lasting.

Compared to the mean score of 48.47 for students in the control group on the post-test, 83.38 was achieved by the experimental group. It is evident from this high variance in performance that project-based teaching may be able to increase students' achievement. Mehmet GÜLTEKN's (2005) study on the effect of a project-based learning approach on students' learning of social studies courses in fifth grade reached similar conclusions. The study proved that the use of the project method of teaching enhanced the academic performance of primary students in Social Sciences. The present study's findings are also in line with those of Chen 2006 Baş and Beyhan, 2010 Yalçın, Turgut and Büyükkasap, 2009). According to Rak (2006), project-based learning effectively taught elementary English. According to the study, the project-based learning approach is much more useful than traditional instruction for students. GökhanBaş (2011) also found that project-based learning strategies considerably enhanced students' academic achievement.

4. CONCLUSION

These conclusions were pinched from the statistical analysis of the data:

- Project-based learning is a more useful teaching strategy for social studies than traditional instructional methods. The reason is that project-based learning allows students to construct their learning instead of passively receiving knowledge from the teacher's lecture.
- The project method of teaching allows the personal involvement of students in the learning process, which results in better academic achievement. The data analysis of the pretest showed that the basic knowledge of social studies of both the study groups was the same. The major variation between the mean scores of both the study groups after the posttest was mainly due to the exposure of the experimental group students to projects and activity-based learning. That is why project-based learning strategy proved to be a more effective teaching method than traditional methods.
- It is a self-directed learning approach that provides students freedom and free will to select and work on various projects at their own pace. Hence, it creates enthusiasm and motivation among the students.

Recommendations

The following recommendations were presented:

- It is recommended that teachers should use a project-based teaching approach to teach social studies at the elementary level as an effective teaching method. Moreover, its successful applications should spread to other subjects and educational settings.
- To enable teachers to successfully use project-based learning in their classrooms, training and seminars are needed to learn and reflect on project-based teaching methodologies.
- More research is necessary since limited literature is available on project-based learning in social studies, particularly in Pakistan. The researchers experimented with using project-based learning to teach social studies. In addition to evaluating its effectiveness at different levels of education and in other subjects, mixed genders should also be considered.
- Similar studies should be conducted to discover the impact of project-based teaching methodologies on motivational levels, communication skills, students' performance, risk-taking, creativity levels, analytical ability and self-concept, and attitudes toward social studies.

Conflict interests

The authors declare no conflict of interest.

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