

## **EFFECTIVENESS OF DIFFERENTIATED TEACHING TECHNIQUES IN ENHANCING ACADEMIC ACHIEVEMENT OF 9<sup>TH</sup> STANDARD STUDENTS**

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### **Abstract**

The present study was aimed to find out the impact of Differentiated Teaching Techniques on the academic achievement of secondary school students. A sample of 86 students from 9th standard was taken from Shiv Ashish School, Ahmedabad by using Purposive Sampling Method. The study was further replicated on 82 students of 9<sup>th</sup> standard of St Xaviers School, Ahmedabad. Differentiated Teaching technique was used to teach selected topics of Social Science in experimental group and the same topics were taught by the researcher in a conventional method for the control group. The experiment was carried out for 8 weeks of duration and 30 minutes per day in each group. Post test was applied after the experiment.

Data was analyzed by using Mean, SD, SED and t-test. The findings of the study revealed that differentiated teaching technique was more effective than conventional teaching technique in both, experiment (trial-1) and replication of the experiment (trial-2). Also the study showed that the academic achievement of students with graduate and non-graduate parents and students with and without siblings were not significant. On the other hand, differentiated teaching technique showed effectiveness in students in nuclear family than in students in joint family.

**Keywords:** Differentiated Teaching Technique, Conventional Teaching Technique, English medium, 9<sup>th</sup> standard students, Academic Achievement.

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## 1. Introduction

The phenomenal changes such as the tremendous explosion of knowledge, the expansion of population, the burst of technology, worldwide rivalry of ideologies etc., have affected the educational needs in all the countries. These changes have in turn brought the need of two important movements in secondary education. The first has been a new surge of public concern for the quality of education at the high school and secondary school level and the second has been a new movement in experimentation and innovation within the secondary school education itself [1]. As we know that change has become the basic condition of life in a dynamic society, if we have to face the challenge of change and a fast changing world, we must be prepared to bring fundamental changes in our educational system because the education of yesterday does not satisfy the needs of today, and much less for the requirements of tomorrow [2]. Keeping these aspects in mind, there was a need for the reconsideration of the objectives of social science instruction, which is one of the important subjects in the secondary school education in India.

## 2. Overview of Related Literature

A study showed that the differentiated instructional strategy was effective in the achievement of the students in the History of Arts Subject [3]. The outcomes of another study showed that flipped classroom strategy was effective in teaching grammar on EFL Saudi secondary school students. The study also showed that the students' responses towards using flipped classroom strategy were positive and in favor of flipped classroom strategy [4].

A research study concluded that Jigsaw Strategy has a positive effect on teaching grammar among Palestinian 10th graders [5]. Another study proved that the experimental group achievement was higher than the control group achievement which aimed to explore the effectiveness of differentiated instruction [6]. A study revealed that there were statistically significant differences attributed to the experimental approach which was taught by differentiated instructional strategy on the preparatory and secondary stage [7]. A study showed that there were statistically significant differences attributed to the experimental group which was taught by differentiated instructional in teaching reading comprehension skills [8]. Another study showed that there were statistically significant differences in favour of the experimental group that was taught by differentiated instructional strategy in remembering, understanding and

application level in English language [9]. A study showed that 6th graders English teachers do not used appropriate techniques for teaching grammar. It also showed the effectiveness of the suggested differentiated instructional framework for teaching grammar [10]. A study showed the effectiveness of explicit differentiated instruction that the students achieved above average in the achievement test scores [11].

### **3. Statement of the Problem**

The present study mainly focused on the effectiveness of differentiated teaching techniques in teaching Social science subject to 9<sup>th</sup> standard English medium students of Gujarat Secondary Education Board in Ahmedabad with reference to teaching technique (Differentiated teaching Technique and Conventional Technique), parents' qualification (graduate and non-graduate parents), nature of family (nuclear and joint) and siblings (with sibling and without sibling). Hence, the title of the research paper was stated as:

“Effectiveness of Differentiated Teaching Techniques in Enhancing Academic Achievement of 9<sup>th</sup> Standard Students”

### **4. Significance of the Study**

Differentiated instruction is an approach and philosophy of education that aims at addressing and meeting the students' diversity. Considering the purpose of the approach Tomlinson (2000) suggested a comprehensive and concise definition for it: differentiation consists of the efforts of teachers to respond to variance among learners in the classroom. Whenever a teacher reaches to an individual or small group to vary his or her teaching in order to create the best learning experience possible, that teacher is differentiating instruction. The various stakeholders of the study were:

1. **Teachers:** The study provided guidelines to the teachers and researchers to construct the learning material and practice differentiated teaching strategies in class room environment.
2. **Principals:** The research findings helped the principals to understand the effectiveness of differentiated instruction in teaching learning process.

3. **Education policy makers:** The research findings enabled the government authorities to understand the need of differentiated teaching strategies and to help the students to develop higher order thinking by recommending various instructional techniques.
4. **Educational Institutions:** The findings of the research were helpful to the teachers and schools for creating the learner-centered education environment and to enhance the cognitive abilities within the students.
5. **Students:** The students or learners can study at their own speed and can easily understand the difficult topics in Social Sciences subject with the help of differentiated teaching strategies. The study helped in overall development, independent, construct own knowledge and in holistic development in the subject.
6. **Parents:** The study helped parents to understand that differentiated teaching strategies are effective and it enhances the students' higher order thinking skills.
7. **Curriculum developers:** The present study gave an understanding to the curriculum developers to develop more comprehensive curriculum suitable for differentiated teaching environment.
8. **Authors:** The study gave an insight to authors to develop self-learning materials, books and resources for instruction in differentiated classroom environment.
9. **Society:** By understanding the effectiveness of differentiated teaching strategies in classroom, the society provided conducive environment to the students and can develop higher order thinking skills which can be utilized for developing and efficient use of human resource.
10. **Future Researchers:** It was useful to the future researchers, as they can get a right direction and base in this research field as very few studies have been done in the same field.

## 5. Objectives of the Study

1. To compare the effectiveness of Differentiated Teaching technique and Conventional technique in teaching Social Science to 9<sup>th</sup> standard students
2. To compare the effectiveness of Differentiated Teaching technique in teaching Social Science with respect to parents' qualification
3. To compare the effectiveness of Differentiated Teaching technique in teaching Social Science with respect to nature of family

4. To compare the effectiveness of Differentiated Teaching technique in teaching Social Science with respect to with or without siblings

## 6. Hypotheses of the Study

**H<sub>0</sub>1.** There will be no significant difference between the mean scores of academic achievement of students in learning Social Science taught through differentiated teaching technique and conventional technique.

**H<sub>0</sub>2.** There will be no significant difference between the mean scores of academic achievement of students with graduate parents and non-graduate parents in learning Social Science taught through differentiated teaching technique.

**H<sub>0</sub>3.** There will be no significant difference between the mean scores of academic achievement of students in nuclear family and joint family in learning Social Science taught through differentiated teaching technique.

**H<sub>0</sub>4.** There will be no significant difference between the mean scores of academic achievement of students with siblings and without siblings in learning Social Science taught through differentiated teaching technique.

## 7. Delimitations of the Study

The present study was delimited to 9th standard students of Gujarat Secondary Education Board in Ahmedabad city. The study was also delimited to English medium students.

## 8. Operational Definitions of Key Terms

**a. Differentiated Teaching Technique:** Differentiated teaching technique referred to the instructional designs that were developed by the researcher for the students of 9th standard. In the present study, the researcher developed differentiated teaching techniques like cooperative learning-group work, brainstorming, presentation and quiz on certain topics of social science for 9th standard students.

**b. Conventional Teaching Technique:** This referred to ordinary conventional way of teaching taking place in the class room like lecture method.

**c. Parents' Qualification:** This referred to the students with one or both parents graduate and none of them were graduate.

**d. Nature of family:** This referred to the students living in nuclear family and joint family.

**e. Siblings:** This referred to the students with or without one or more siblings.

## **9. Variables of the Study**

### **Independent Variables:**

**Teaching technique** - Differentiated and Conventional Teaching technique

**Parents' Qualification** – One/Both graduate parents and non- graduate parents

**Nature of family** – Nuclear and Joint family

**Siblings** – with siblings and without siblings

### **Dependent Variables:**

Effectiveness of differentiated teaching techniques in terms of scores in achievement test

## **10. Population and Sample of the Study**

The population of the present study encompasses all the 9<sup>th</sup> standard students of English medium Gujarat Secondary Education Board schools of Ahmedabad city of Gujarat.

Purposive sampling technique was used to select the representative sample required for the study. For this study, researcher identified Shiv Ashish School and St. Xavier's High School, Loyola Hall in Ahmedabad city purposively for conducting the experiment (Trial-1) and replicating the experiment (Trial-2), respectively. For the experiment (Trial-1), sample included 86 students of 9th standard studying in Shiv Ashish School and for the replication (Trial-2), sample included 82 students of 9th standard studying in St. Xavier's High School. The students who were included in sample in both trial-1 and trial-2 were divided randomly into two groups separately as Differentiated Teaching Technique group (Experimental Group) and Conventional Teaching Technique Group (Control Group) using lottery method. In trial-1, the sample size in experimental and control groups were 40 and 46, respectively whereas, in trial-2, the sample size was 42 and 40, in experimental group and control group, respectively.

## **11. Research Method and Design**

For the present study experimental research method was used. This method was selected because the researcher used an intervention programme. True Experimental Design- Two equivalent groups post test design only was used to study the effectiveness of the differentiated teaching method in teaching selected topics in Social Science to 9<sup>th</sup> standard students.

## **12. Planning and Execution of the Experiment**

In the present study, the tool, programme and sample for the experiment were decided logically and scientifically. According to the plan the experiment was conducted in Shiv Ashish School, Ahmedabad, and to confirm the results the same experiment was repeated in St. Xavier's High School, Ahmedabad. Differentiated Teaching technique was used to teach selected topics of Social Science in experimental group and the same topics were taught by the researcher in a traditional technique for the control group. The experiment was carried out for 8 weeks of duration and 30 minutes per day in each group. Post test was applied after the experiment.

## **13. Research Tool**

In the present study, the researcher constructed the lesson plans for teaching the selected topics in Social Science in Differentiated teaching strategy. The researcher used class presentations, group work, formative quiz, class discussion, visual presentation, think-pair-share, student's summary of students answer on selected topics of Social Sciences subject.

## **14. Construction of Achievement test**

During the experimental research, evaluation at various stages was necessary. Post-test was required to check the effectiveness of differentiated teaching technique in teaching Social Science. Therefore, in the present study, Achievement test was constructed for administering post-test. Following were the steps followed to construct the Achievement test: Selection of content, construction of questions, feedbacks from experts, final draft of Achievement test with scoring key. The Final draft of the Achievement test included 20 questions. Some questions were to be given with one word answer and other few questions were to be given with string of words. All questions were to be answered objectively. There were no subjective questions in the final question paper. The total mark of the question paper was 30 and the total duration of the test was

30 minutes. The final draft of the achievement test with the personal information of the students was enclosed.

## 15. Data Collection

In the present research, the researcher collected data after seeking permission from the Principals of both the schools. The achievement test was administered to both the experimental and control group. The time given for achievement test was 30 minutes. The answer scripts were collected and scanned according to the scoring key. Along with the Achievement test, the general students information was also collected which included all the necessary variables under the study.

## 16. Data Analysis and Interpretation

### Effectiveness of Differentiated Teaching Technique Vs Conventional Teaching Technique in Teaching Social Science

The scores obtained by the students in the differentiated teaching technique group and conventional technique group were assessed and presented in table 1.

**Table 1: Comparison of Effectiveness of Differentiated Teaching Technique and Conventional Technique in terms of Mean scores, S.D, SED and t-Value**

<b>Trials of the Experiment</b>	<b>Groups</b>	<b>N</b>	<b>Mean</b>	<b>SD</b>	<b>SED</b>	<b>t-value</b>	<b>Remarks</b>
<b>Trial – 1 (Experiment)</b>	Differentiated Teaching Technique Group	40	16.92	2.51	0.71	7.04	Significant at 0.01 level
	Conventional Teaching Technique Group	46	11.86	4.05			
<b>Trial -2 (Replication of the Experiment)</b>	Differentiated Teaching technique Group	42	18.04	2.24	0.78	6.34	Significant at 0.01 level
	Conventional Teaching technique Group	40	13.05	4.47			

The above table 1 clearly showed the comparison of effectiveness of differentiated teaching technique group and conventional teaching technique group in teaching social science in both trial-1, trial-2 and combined trials. In trial-1, i.e., during the experiment conducted for the first time, it was found that the computed t-value was 7.04, whereas the table value was 2.63 at 0.01



level at  $df=85$ . Hence, the computed t-value was significantly higher than the table value at 0.01 level. Thus, null hypothesis 1 was rejected as there was significant difference found in the scores of achievement test of students taught through differentiated teaching technique and conventional technique. It means there was real difference found in the mean scores of achievement of differentiated teaching technique and conventional technique groups.

Similarly, in trial-2, i.e., during replicating the experiment, from the table 3 it was observed that the computed t-value was 6.34 whereas the table value was 2.64 at 0.01 level at  $df=80$ . Hence, the computed t-value was significantly higher than the table value at 0.01 level. Thus, null hypothesis 1 was also rejected in the replication of the experiment as there was significant difference found in the scores of achievement test of students taught through differentiated teaching technique and conventional technique. It means there was real difference found in the mean scores of achievement of differentiated teaching technique and conventional technique groups. Hence, differentiated teaching technique was found to be better effective than conventional teaching technique in teaching Social Science to 9<sup>th</sup> standard students.

## 2. Effectiveness of Differentiated Teaching Technique in Students with Graduate Vs Non-Graduate Parents

The scores obtained by the students in the differentiated teaching technique group were assessed and presented in table 2.

**Table 2: Comparison of Academic Achievement Scores of Social Science in Students with Graduate and Non-graduate Parents in Differentiated Teaching Technique Group in terms of Mean scores, S.D, SED and t-Value**

<b>Trials of the Experiment</b>	<b>Parents' Qualification</b>	<b>N</b>	<b>Mean</b>	<b>SD</b>	<b>SED</b>	<b>tvalue</b>	<b>Remarks</b>
<b>Trial – 1 (Experiment)</b>	Graduate	20	16.65	2.85	0.80	0.68	Not Significant
	Non-graduate	20	17.2	2.16			
<b>Trial -2 (Replication of</b>	Graduate	25	18.32	2.37	0.68	0.98	Not Significant
	Non-graduate	17	17.64	2.03			

<b>the Experiment)</b>							
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The above table 2 clearly showed the comparison of effectiveness of differentiated teaching technique group between students with graduate and non-graduate parents in teaching social science in trial-1, trial-2 and for combined data. From the data, that the computed t-value was 0.68, whereas the table value was 2.20 at 0.05 for  $df=39$  in trial-1. Hence, the computed t-value was not significantly higher than the table value at 0.05 level. Thus, null hypothesis 2 was not rejected as there was no significant difference found in the scores of achievement test of students with graduate and non-graduate parents taught through differentiated teaching technique. It means, there was no real difference found in the mean scores of achievement of students with graduate and non-graduate parents taught through differentiated teaching technique.

Similarly, in trial-2, i.e., during replicating the experiment, from the table 2 it was observed that the computed t-value was 0.98 whereas the table value was 2.20 at 0.05 level at  $df=41$ . Hence, the computed t-value was not significantly higher than the table value at 0.05 level. Thus, null hypothesis 2 was also not rejected in the replication of the experiment as there was no significant difference found in the scores of achievement test of students with graduate and non-graduate parents taught through differentiated teaching technique. Hence, students with graduate and non-graduate parents taught through differentiated teaching technique do not differ significantly in achievement of social science.

### **3. Effectiveness of Differentiated Teaching Technique in Students with Nuclear Vs Joint Family**

The scores obtained by the students in the differentiated teaching technique group were assessed and presented in table 3.

**Table 3: Comparison of Academic Achievement Scores of Social Science in Students in Nuclear and Joint Family in Differentiated Teaching Technique Group in terms of Mean scores, S.D, SED and t-Value**

<b>Trials of the Experiment</b>	<b>Nature of Family</b>	<b>N</b>	<b>Mean</b>	<b>SD</b>	<b>SED</b>	<b>tvalue</b>	<b>Remarks</b>
<b>Trial – 1 (Experiment)</b>	Nuclear	24	18.16	3.05	0.81	2.04	Significant at 0.05 level
	Joint	16	16.5	2.09			
<b>Trial -2 (Replication of the Experiment)</b>	Nuclear	27	18.74	1.97	0.61	3.17	Significant at 0.01 level
	Joint	15	16.8	1.86			

The above table 3 clearly showed the comparison of effectiveness of differentiated teaching technique group between students in nuclear family and joint family in teaching social science in both trial-1 and trial-2. From the data, that the computed t-value was 2.04, whereas the table value was 2.02 at 0.05 level for  $df=39$  in trial-1. Hence, the computed t-value was significantly higher than the table value at 0.05 level. Thus, null hypothesis 3 was rejected as there was significant difference found in the scores of achievement test of students in nuclear family and joint family taught through differentiated teaching technique. It means, there was real difference found in the mean scores of achievement of students in nuclear family and joint family taught through differentiated teaching technique.

Similarly, in trial-2, i.e., during replicating the experiment, from the table 4.6 it was observed that the computed t-value was 3.17 whereas the table value was 2.02 at 0.05 and 2.71 at 0.01 level at  $df=41$ . Hence, the computed t-value was significantly higher than the table value at 0.05 and 0.01 levels. Thus, null hypothesis 3 was also rejected in the replication of the experiment as there was significant difference found in the scores of achievement test of students in nuclear family and joint family taught through differentiated teaching technique. Hence, students with in nuclear family and joint family taught through differentiated teaching technique differ significantly in achievement of social science.

#### **4. Effectiveness of Differentiated Teaching Technique in Students with Siblings Vs Without Siblings**

The scores obtained by the students in the differentiated teaching technique group were assessed and presented in table 4.

**Table 4: Comparison of Academic Achievement Scores of Social Science in Students with and without Siblings in Differentiated Teaching Technique Group in terms of Mean scores, S.D, SED and t-Value**

<b>Trials of the Experiment</b>	<b>Siblings</b>	<b>N</b>	<b>Mean</b>	<b>SD</b>	<b>SED</b>	<b>tvalue</b>	<b>Remarks</b>
<b>Trial – 1 (Experiment)</b>	With Siblings	25	17.28	2.44	0.83	1.13	Not Significant
	Without Siblings	15	16.33	2.60			
<b>Trial -2 (Replication of the Experiment)</b>	With Siblings	20	18.15	2.41	0.70	0.27	Not Significant
	Without Siblings	22	17.95	2.12			

The above table 4 clearly showed the comparison of effectiveness of differentiated teaching technique group between students with siblings and without siblings in teaching social science in trial-1, trial-2 and for combined data. From the data, that the computed t-value was 0.83, whereas the table value was 2.20 at 0.05 for  $df=39$  in trial-1. Hence, the computed t-value was not significantly higher than the table value at 0.05 level. Thus, null hypothesis 4 was not rejected as there was no significant difference found in the scores of achievement test of students with siblings and without siblings taught through differentiated teaching technique. It means, there was no real difference found in the mean scores of achievement of students with siblings and without siblings taught through differentiated teaching technique.

Similarly, in trial-2, i.e., during replicating the experiment, from the table 4 it was observed that the computed t-value was 0.27 whereas the table value was 2.20 at 0.05 level at  $df=41$ . Hence, the computed t-value was not significantly higher than the table value at 0.05 level. Thus, null hypothesis 4 was also not rejected in the replication of the experiment as there was no significant difference found in the scores of achievement test of students with siblings and without siblings taught through differentiated teaching technique. Hence, students with siblings and without siblings taught through differentiated teaching technique do not differ significantly in achievement of social science.

## **18. Conclusion - Major Findings of the Study**

- It was found that the differentiated teaching technique was more effective than conventional teaching technique in experiment (trial-1), replication of the experiment (trial-2).
- Parents' qualification i.e., students with graduate parents and non-graduate parents showed no effect on differentiated teaching technique in teaching social science in trial-1 and trial 2.
- It was found that the differentiated teaching technique in teaching social science showed significant effectiveness in students with nuclear family than students with joint family in both the trials.
- Students with siblings and without siblings showed no effect on the differentiated teaching technique in teaching social science in both the trials.

## **20. Educational Implications**

- This study will give awareness of the importance of the differentiated teaching techniques in teaching social science. Using differentiated teaching techniques, teachers can make students to enhance their learning and thereby the teaching outcome of students, schools and society.
- This study showed importance to the teacher trainees and to the educational administrators for modifying the curriculum according the differentiated teaching techniques.
- This study provided empirical basis for reframing and reconstituting the teaching strategies for learners.

## **21. Suggestions for Further Research**

- The same study can be conducted in different samples and different districts of Gujarat.
- Similar study can be carried out in other subjects also.
- The research study can be conducted in primary and higher secondary school students.
- A comparison of rural and urban schools students in various school subjects can be studied.
- A comparison of grant-in-aid schools and non-grant in aid schools can be studied.
- A study on investigating attitudes of students towards differentiated teaching techniques can be conducted.

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