8.2 Design

The study adopted Pre-experimental design of Single group pre-test post-test design.

O 1 X O 2
Pre-test Treatment Post-test

8.3 Procedure

The procedure of the present study was as follows:

8.3.1 Selection of tools for identification of learning style of the students:

Dr.Venkataraman (1994) is an Indian expert, who has constructed the SOLAT test. This test is an advance version of Torrance SOLAT test. The researcher has selected this SOLAT test for the identification of the learning styles of the teacher trainees as it is simple, easy to understand and best suited for Indian learning environment.

Learning Style Inventory: Dr. D.Venkataraman (1994)

In learning style inventory there are 50 items. Each item is consisting of two statements 'a' and 'b'. In the tool, checking of the statement 'a' indicates right hemisphere, checking of statement 'b' indicates left hemisphere and checking of both the statements indicate integrated hemisphere. After getting responses of the students on Learning Style Inventory, the frequencies of each response on each item was counted. The brain dominance was identified. Based on the hemisphericity of brain and the frequency of responses for a particular learning style, the learner was considered as having that type of learning style. There are total 5 learning styles and 5 thinking styles suggested in the tool [7].

Table 1: Structure of SOLAT tool

S. No	Dimensions	Items
1	Learning style	
	1.Verbal	1 to 5
	2.Content preference	6 to 10
	3.Class preference	11 to 15
	4.Learning preference	16 to 20
	5.Interest	21 to 25
2	Thinking style	
	1.Logical/Fractional	26 to 30
	2.Divergent/Convergent	31 to 35
	3. Creative	36 to 40
	4. Problem solving	41 to 45
	5. Imagination	46 to 50

8.3.2 Administration of Learning Style Inventory

The researcher administered SOLAT learning style inventory to 33 S.Y.D.T.Ed. Teacher trainees. Classification of teacher trainees of the sample into the groups based on the Learning preferences was done.
According to the learning styles of the students, they are classified into 3 groups.

Group1-10 students out of 33 students have preferred **Verbal learning style** (30.30 %)

Group2-12 students out of 33 students have preferred **Content learning style** (36.36%)

Group3-11 students out of 33 students have preferred **Interest learning style** (33.33%)

8.3.4 Interactive teaching program

The learning style was used as criteria to classify the learner, to provide them with different learning experiences. The 3 groups were taught 5 units from Science and Technology text-book using the different interactive teaching strategies. The text-book is based on the New Revised Syllabus (2004) of Maharashtra State Council for Educational Research and Training and was published by Nirali Prakashan, Pune [8].

Table 2: The details of learning style based Interactive strategies

Sr. No.	Name of the Unit/topic	Strategies used and time allotted for each group		
		2:00pm-2:40pm	2:40pm-3:20pm	3:20pm-4:00pm
		Strategies used For Group 1. (Verbal L.S.)	Strategies used for Group 2. (Content L.S.)	Strategies used For Group 3. (Interest L.S.)
1	The teacher teaching Science and Technology	Question-Ans.	Use of teaching Aid-charts	Role play
2	Laboratory for Science And Technology	Lecture	Diagram and Explanation	Visit to the ScienceLab.
3	Syllabus and textbooks	Group discussion	Use of teaching Aids-model textbook & OHP	Role play
4	Teaching methods of Science and Technology	Explanation and discussion	Use of teaching Aids-charts	Quiz
5	Educational Aids for Science and Technology	Question-Ans.	Power-point presentation	Educational Games

8.3.5 Administration of Post-test

The teacher made Post-test was administered. The total marks were 40 and the duration of the test was 1 and half hour.

9. Tools

The Standardized test (SOLAT) constructed by Dr. Venkataraman and the Achievement tests prepared by the researcher were used for the data collection. Mean, t-test and ANOVA were the statistical techniques used for analysis of data.

10. Analysis of Data

10.1. Qualitative Analysis

The learning style inventory (SOLAT test constructed by Dr. Venkataraman.) was administered and the data was collected.

Table 3: The percentage of Teacher trainees and the preferred learning style

Sr. No.	Particulars	Total	Verbal L.S.	Content L.S.	Class L.S.	Learning L.S.	Interest L.S.
1.	No. of Teacher trainees	33	10	12	00	00	11
2	% of the Teacher trainees	100%	30.30%	36.36%	0.0%	0.0%	33.33%

Teacher trainees' feedback/ Opinion

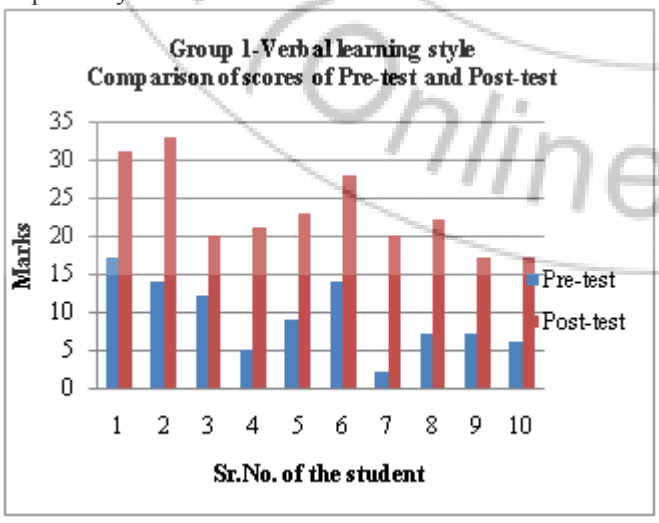
The ten teacher trainees were available for filling the opinionnaire i.e. the 3 teacher trainees from verbal group, 4 teacher trainees form content group and 3 teacher trainees from interest group. The data was then collected and analyzed. 100% of the teacher trainees had good experience of learning Science and Technology using interactive teaching strategies based on the learning styles. All of them felt that using Interactive teaching strategies improved their achievement in Science and Technology

10.2 Quantitative Analysis

The techniques adopted for data analysis were Percentage, Mean, t-test and ANOVA test [9]. Mean value was derive for group 1(verbal learning style), group 2(content learning style) and group 3(interest learning style). T-test was calculated for group 1, group 2 and group 3 separately. ANOVA test was carried out to see which interactive teaching program, based on the learner's. Learning style, was more effective. The F-ratio was calculated.

Graphical representation and Summary table of obtained t-values for the groups.

The comparison of the scores of pre-test and post-test was shown in the Graph 1, Graph 2 and Graph 3. For Group 1 (Verbal learning style group), Group 2 (Content learning style group) and Group 3(Interest learning style group) respectively. The summary table of obtained t-value for Group 1 (Verbal learning style group), Group 2 (Content learning style group) and Group 3(Interest learning style group) is given in the Table 4, Table 5 and Table 6 respectively.



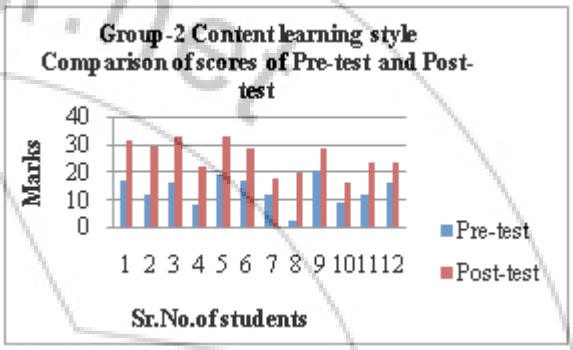
Graph 1

Table 4: A summary table of obtained t-value for group-1(Verbal learning style)

Achievement Test	N	M	SD	SE_M	γ	SE_D	*t-value (Cal.)*	*Table t-value (0.01)*
Pre-test	10	09.3	10.90	3.449				
Post-test	10	23.2	25.09	7.940	1.0272	4.322	3.216	2.821

t-value (cal.) > table t-value at (0.01) level

There is a significant difference between the mean scores of pre-test and post-test at 0.01 and 0.05 levels of significance. So the null hypothesis is rejected. The interactive teaching strategies used for group-1 (i.e. for verbal learning style group) were effective.



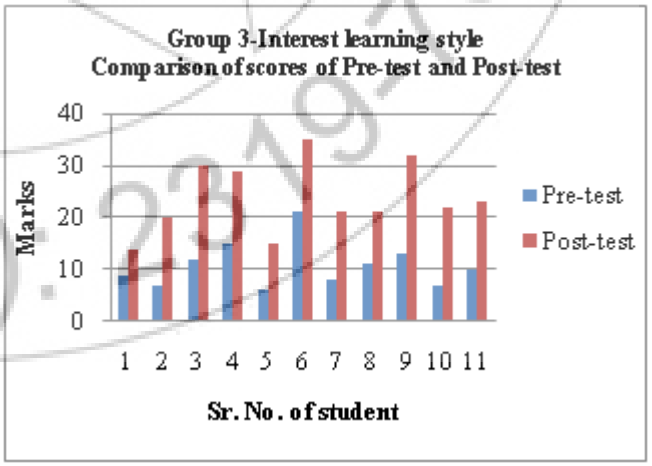
Graph 2

Table 5: A summary table of obtained t-value for group-2(Content learning style)

Achievement Test	N	M	SD	SE_M	γ	SE_D	t-value (Cal.)	Table t-value (0.01)
Pre-test	12	13.167	14.99	4.327				
Post-test	12	25.83	27.63	7.976	0.993	3.714	3.41	2.718

t-value (cal.) > t-value (0.01)

There is significant difference between mean scores of pre-test and post-test at 0.01 and 0.05 levels of significance. So the null hypothesis is rejected. The interactive teaching strategies used for group-2 (i.e. content learning style group) were effective.



Graph 3

Table 6: A summary table of obtained t-value for group-3 (Interest learning style)

Achievement Test	*N*	*M*	*SD*	SE_M	*γ*	SE_D	*t-value (Cal.)*	*Table t-value (0.01)*
Pre-test	11	10.82	12.16	3.66				
Post-test	11	23.82	25.896	7.8	0.979	4.282	3.036	2.764

t-value (cal.) > t-value (0.01)

There is a significant difference between mean scores of pre-test and post-test at 0.01 and 0.05 level of significance. So the null hypothesis is rejected. The interactive teaching strategies used for group-3 (i.e. Interest learning style group) were effective.

Table 7: A summary table of obtained F-ratio

Sr. no.	Description	Symbols	Value
1	Group Mean of post-test Group 1- Verbal learning style Group 2- Content learning style Group 3- Interest learning style	 M1 M2 M3	 23.2 27.6 24.1
2	Correction term	C	18700.033
3	Total sum of squares	St^2	1051
4	Between groups sum of squares	Sb^2	108.1
5	Within group sum of squares	Sw^2	942.9
6	Degree of freedom	df	29
7	Between group sum of squares	Df of Sb^2	02
8	Within group sum of squares	Df of Sw^2	27
9	Mean square variance	Sb^2 / df of Sb^2	54.05
10	Mean square variance	Sw^2 /df of Sw^2	34.92
11	F-ratio (calculated)	F(cal.)	1.5478
12	F-table value at 0.01 level (at 26)	$F(table)_{0.01}$	5.53
13	F-table value at 0.05 level (at 26)	$F(table)_{0.05}$	3.37

F-ratio (calculated) < F (table) $_{0.01}$ and F (table) $_{0.05}$ F-ratio

Our calculated value F (cal.) =1.5478, is not significant at both the levels of significance and hence the null hypothesis. We can say that the interactive teaching strategies based on learning styles of verbal group, content group and interest group are equally effective as far as the teaching program was concerned.

11. Fulfilling the Objectives

Objective 1- To identify the learning styles of D.T.Ed. Teacher trainees using a standardized test constructed by Dr.Venkataraman (SOLAT).

Inference-
The teacher trainees in the sample were identified with three learning styles out of five learning styles. These students were categorized in 3 different groups.
Group 1-Verbal L.S.,
Group 2-Content L.S. and
Group 3-Interest L.S.

10 students out of 33 students have preferred Verbal learning style i.e.30.30 %.
12 students out of 33 students have preferred Content learning style i.e. 36.36%.
10 students out of 33 students have preferred Interest Learning style i.e. 33.33%.

Objective 2- To prepare a teaching program using Interactive teaching strategies based on the learning styles of teacher trainees.

Inferences-For the present study, the researcher has selected the interactive teaching strategies suitable for the Science subject and according to the learning style of the students-teachers. The cluster of Interactive teaching strategies selected for 3 types of learners are given in the table 2.

Objective 3- To study the effectiveness of a teaching program based on learning styles of teacher trainees on the achievement in Science and Technology.

Inferences-The improvement is seen in the mean scores obtained in the post-test after implementation of interactive teaching program based on learner's learning style.

A summary table of obtained t-value for group-1, group-2 and group-3 (Interest learning style) is given in tables 4, 5 and 6 respectively.

12. Major Findings of the Study

The null hypothesis stated that there is no significant difference between mean scores of pre-test and post test in the Science achievement of teacher trainees when teaching program using Interactive teaching strategies based on their learning style was implemented.

Group 1- Verbal Learning Style

From table No. 4 It is seen that for Group 1 (Verbal learning style) t-value (calculated) = 3.216, which is greater than table t-value (0.01 level) 2.821, so the effectiveness of the Interactive teaching program is significant at 0.01 level. The null hypothesis is rejected.

Group 2- Content Learning Style

From table No. 5 It is seen that for Group 2 (content learning style) t-values (calculated) = 3.41, which was higher than table t-value (0.01 level) 2.718, so the effectiveness of the Interactive teaching program is significant at 0.01 level. The null hypothesis is rejected.

Group 3- Interest Learning Style

From table No.6 It is seen that for Group 3 (Interest learning style) t-value (calculated) = 3.036, which was higher than table t-value (0.01 level) 2.764, so the effectiveness of the Interactive teaching program is significant at 0.01 level. The null hypothesis is rejected. The teacher trainees have shown improvement in the achievement of Science and technology when the interactive strategies based on the learner's learning style were used for teaching.

13. Conclusions

Since the obtained t-ratio is significantly greater than the tabulated t –ratio in case of group 1, group 2 and group 3, the null hypothesis is rejected. The interactive teaching

program, based on the learner's learning style, was effective in acquiring better achievement in Science and Technology.

14. Recommendations

The use of the new trend in education i.e. interactive teaching method and Strategies enhances the academic achievement of the teacher trainees in Science and Technology. This teaching program gives more scope for having more interactions in the class-rooms and in making the learning process more interesting and joyful. It is recommended that the similar study can be carried out for teaching other subjects. A comparison between interactive teaching method for Science and other methods of teaching can also be carried out to find out the most effective method. Correlation between learning style and thinking style of the students can also be studied.

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