

# THE EFFECTIVENESS OF VIRTUAL FIELD TRIPS ON ACADEMIC ACHIEVEMENT AND MOTIVATION OF STUDENTS FOR TEACHING FOREST RESOURCES AT HIGHER SECONDARY LEVEL OF WBCHSE

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**Abstract:** The use of virtual reality technologies for rich multi-media presentations of the field sites thus becomes a practical alternative. Because of the Internet medium of virtual field trips, teachers can now expand and enhance their student's learning beyond the walls of the traditional classroom using this form of technology. The aims of the paper are to assess the effectiveness of Virtual Field Trips regarding Academic Achievement in respect to teaching forest resources and to find out the level of motivation among students in relation to virtual field trips. Quasi-Experimental Method was followed and Two-group, Pretest-Post test Design was selected. There are two types of method of teaching such as Conventional Method of Teaching and Virtual Field Trip method of Teaching. The treatment is Virtual Field Trip method of Teaching. The sample consisted of 100 Geography students of class XI from the four schools belonged to rural and urban categories. An achievement test and a five point rating scale were used as tools. A non-interactive one hour Virtual Field Trip (VFT) module based on Equatorial Rain Forests was used. The Virtual Field Trip mode of teaching is more effective than the conventional method of teaching for academic achievement of students because the mean score of achievement test of the VFT exceeds the mean score achievement test of the conventional method. Rural students performed better than the urban students in both method of teaching. But in VFT, the rural students scored higher than the rural students under the conventional method. No interaction is found. Hence, the VFT method of teaching is overall effective method of teaching for better academic achievement irrespective of locale. VFT method of teaching is more effective than conventional method of teaching to arouse motivation in learning among students. There is an interaction effect of methods of teaching and the levels of locale. But the VFT method of teaching is more effective to arouse motivation irrespective of levels of locale.

**Index Terms:** Effectiveness, Virtual field trips, Academic achievement, Motivation, Forest Resources, WBCHSE

## I INTRODUCTION:

A virtual field trip (VFT) is a guided exploration through the World Wide Web that organizes a collection of pre-screened, thematically based web pages into a structured online learning experience. (Foley,2003). In a more narrow sense, 'virtual field trips' can be described as being an electronic exhibition of diverse natural and cultural phenomena that also provide digital simulations of the three-dimensional processes of surveying, observing, exploring and 'adventuring' in some actual field site. The term 'virtual field trip' is often used in a much broader sense. The term is commonly used to describe any activities on computer, that a user browses, step-by-step, link-by-link, click-by-click through a set of linked web-pages to acquire information about a field site or location.

## II THE REVIEW OF RELATED LITERATURE:

Stephen, D. Hurst (1997) designed a series of case studies on VFT which improve the ability of the computer to present a realistic simulation of the field area and allows the student to have more control over the presentation. Stainfield, John. Fisher, Peter. Ford, Bob. & Solem ,Michael (2000) concluded that Virtual Field Trips (VFTs) have a valuable role in supporting and enhancing real Field work and empowering students who are disadvantaged financially or physically. Qiu,Weili. and Hubble ,Tom.(2002) concluded that VFT has many advantages and can be useful in many aspects in teaching the geosciences. Lin, Hui., Chen,Min. and Lu ,Guonian. (2003) in their study prepared a case on the simulation of air pollution and its analysis at different geographic scales is used to demonstrate Virtual Geographical Environment's ability to facilitate computer-aided geographic experiments. The study made by Nix, Rebekah Kincaid (2003) shows that VFT can enable the principles of student-centered inquiry and constructivism for the benefit of all styles and ages of lifelong learners. One mobile learning application prototype created by Kravcik, M., Kaibel, A., Specht, M., and Terrenghi, L (2004) enables data gathering and annotation in the field, together with real time collaboration. Cantwell, Laurie Beth (2004) found that using the VFT as a pre-activity may diminish students' sense of discovery and wonder about the natural world. Rayner ,Gerry. and Sanson, Gordon. (2005) prepared an interactive VFT module to simulate experimental design coupled to Excel for data analysis and graphical presentation of derived parameters for biological learning. Sanchez, Alicia D., Cuevas, Haydee M., Fiore, Stephen M. and Cannon-Bowers ,Janis A (2005) sought to utilize advanced, interactive dynamic media approaches in classroom-based settings and this is more effective in teaching targeted material and also more motivating to students The article made by Cowden, P. A., Martin, J. D. and Lutey, W. E (2006) discusses the complementary relationship that exists between VFT and constructivism. The study attempted by Stumpf, Richard J., Douglass, John. And Dorn, Ronald I (2008) indicates that VFT offers physically disabled students a learning alternative to the local field trip. Robinson, Lilla. (2009) says that VFTs are a way to enable students to be connected, lifelong learners. The article of Stoddard, Jeremy (2009) describes hybrid distance learning models and VFT in the social studies and other areas, as well as a critical case study of one of the most prominent and long lasting Electronic Field Trip program. The article of Yen Chang , Chun., Ming, Chao Lin., Hsiao, Chien Hua (2009) delineates an online 3D Compound Virtual Field Trip (3D-CVFT) system and compares it with an actual field trip. It is discussed by Caliskan, Onur (2011) that the historical background and development of

the VFT in education of earth and environmental sciences, the potential and limitations of it to provide and support student centered, meaningful and deeper learning environment. Kingston, D. G., Eastwood, W. J., Jones, P. I., Johnson, R., Marshall, S. and Hannah, D. M (2012) indicate the mobile technology-based field exercises provide an important opportunity to investigate and evaluate the effectiveness of learning tools across the spectrum of undergraduate Physical Geography subjects. Young, Lee. & Kim (2013) investigated the effects of flash panorama based VFT as a supporting tool for geological field activity on middle school students' spatial visualization ability, conceptual understanding, and perceptions. Hehr, Karl Harven (2014) found out that the VFT did provide some level of increase in interest and motivation and it did allow the students to make deeper connections with the material. Findings from the study made by Oyler, Mary (2014) show that the use of VFT does have a significant impact on student comprehension and vocabulary achievement. Selby, Katherine. & Davis, Simon (2014) found that the students were very positive about the VFT citing that greater information was obtained than a one day trip and the ability to access the VFT frequently at their own pace. The DVD based knowledge package treated by Jaikiran, K.P., Pradeepkumar, A.P. and Santosh, S (2015) shows that Virtual Field Geology by exposing learners to the Tertiary sedimentary section of the Kerala Coast of South West India. Bursztyn, Natalie., Pederson, Joel., Shelton, Brett., Walker, Andrew., Campbell, Todd (2015) shows that Student response to a game suggests a viable method for making geosciences instruction engaging and enjoyable, and hopefully will result in greater motivation to pursue the geosciences. Results of the investigation made by Bursztyn, Natalie., Shelton, Brett., Walker, Andy. and Pederson, Joel (2017) indicate the Augment Reality field trips increase student motivation to pursue geo science learning.

### III THE OBJECTIVES OF THE STUDY:

To conduct the study, it is needed to establish objectives. The study aims to:

1. To assess the effectiveness of Virtual Field Trips regarding Academic Achievement in respect to teaching forest resources.
2. To find out the level of motivation among students in relation to virtual field trips.

**IV HYPOTHESES:** A number of hypotheses have been prepared on the basis of the stated objectives of the study.

H<sub>0</sub>1: There are no significant differences in mean scores between pre-test and post-test with respect of teaching in conventional method.

H<sub>0</sub>2: There are no significant differences in mean scores of tests among rural and urban students with respect of teaching through conventional method.

H<sub>0</sub>3: There are no significant differences in mean scores between pre-test and post-test with respect of teaching in Virtual Field Trip mode.

H<sub>04</sub>: There are no significant differences in mean scores of tests among rural and urban students with respect of teaching through Virtual Field Trip method.

H<sub>05</sub>: There is no significant interaction effect of group and time on academic achievement.

H<sub>06</sub>: There is no significant interaction effect of locale and teaching methods on academic achievement.

H<sub>07</sub>: There are no significant differences in mean scores of Motivation level among students with respect of teaching in conventional method and Virtual Field Trip method.

H<sub>08</sub>: There are no significant differences in mean scores motivation level among rural and urban students with respect of teaching in Virtual Field Trip method.

H<sub>09</sub>: There are no significant differences in mean scores of motivation level among rural and urban students with respect of teaching in traditional method.

H<sub>010</sub>: There is no significant interaction effect of locality and teaching methods regarding Motivation in learning among students.

### III METHODOLOGY:

To conduct the study successfully and systematically, a scientific methodology has been followed.

#### 3.1 Research Method:

Quasi-Experimental Method was followed to measure the effectiveness of the Virtual Field Trip for teaching equatorial rain forest resources of higher secondary level of WBCHSE.

#### 3.2 Research Design:

Two-group, Pretest-Post test Design was selected to conduct the study under the Quasi-Experimental Method.

#### 3.3 Variables:

The method of teaching is considered here as independent variable. There are two types of method of teaching such as Conventional Method of Teaching and Virtual Field Trip method of Teaching. The treatment is Virtual Field Trip method of Teaching. The study is intended to examine the effectiveness of VFT on two dependent variables such as Academic Achievement and motivation. There is one categorical variable i.e. locale includes two levels such as urban and rural.

**3.4 Study Area:** For urban locality, Baranagar Rameshwar High School (H.S) at Baranagar and Tentulberia Anukulchandra High School (H.S) at Garia in Kolkata Metropolitan Region were selected whereas Gabberia High School (H.S) at Lakshmikantapur and Ramgarhut High School (H.S) at Diamond Harbour in South 24 Parganas were taken for rural locality under the state of West Bengal. So the data have been collected from four schools belonged to Govt. aided Bengali medium under the WBCHSE were selected whereas 2 were urban and 2 were rural schools.

#### 3.5 Samples:

The sample consisted of 100 Geography students of class XI from the four schools mentioned above. Two groups of students were selected. The treatment groups were taught using the VFT module and the control groups were taught by conventional

methods. The two groups consisted of 50 students each. There are 25 urban and 25 rural students among the 50 students of each group.

### **3.6 Sampling Techniques:**

The purposive-random sampling technique has been adopted to choose samples from the population belonged to the selected schools.

### **3.7 Tools:**

An achievement test was constructed on the topic of the Equatorial Rain Forests to measure academic achievement of students under control group and experimental group. The achievement test consisted of 20 multiple choice type questions only. Each question carries 1 mark. The test items were prepared on the basis of Revised Bloom's Taxonomy

A five point rating scale consisted of 10 items has been constructed for measuring motivation in learning among students belonged to control groups and experimental groups both. The rating scale has been constructed on the basis of five factors of motivation such as self-efficacy, active learning strategies, learning environment stimulation, performance goal and learning value.

### **3.8 Standardization of Tools:**

The tools were verified by the five experts. The experts verified the face validity of the tools. The suggestions & recommendation made by them have been included wherever necessary. The tools have been constructed by maintaining content validity also.

### **3.9 Designing of the Virtual Field Trip Module:**

A non-interactive one hour Virtual Field Trip (VFT) module was prepared by editing more than 80 Youtube videos, more than 25 photographs, 10 animated videos and Google Earth techniques respective to the topic the Equatorial Rain Forests. It has been designed on the basis of the content structure of the topic according to the syllabus of class XI, WBCHSE to experience location, climatic characteristics, natural vegetation and forest characteristics, faunal characteristics, economic importance of the forest, medical importance of the forest, causes of backwardness of timber industry. The authenticity and content validity of the web contents were verified by experts. This module is a medium of teaching and learning in a multimedia form which helps the students to understand and master the concepts and other aspects or components of learning, with greater clarity and depth eliminating the need for an actual field study to the Rain Forests.

### **3.10 Delimitation of the Study:**

The study is limited to South 24 parganas and Kolkata Metropolitan Area based Govt. aided Bengali medium schools of higher secondary level under WBCHSE only. It is limited to teaching of the Equatorial Rain Forest resources belonged to class XI curriculum.

## **IV ANALYSIS OF DATA:**

On the basis of the data collected by maintaining the stated methodology, a data analysis plan has been prepared to test the hypotheses to reach the stated objectives.

**4.1 Academic Achievement:** In this study, achievement tests were applied to both control and experimental groups to measure the effectiveness of virtual field trip than conventional method of teaching.

- **Conventional Method of Teaching and its Effectiveness in pre and post test scores:**

The conventional method of teaching was associated with control group. The control group is defined as the group in the study that did not receive treatment (i.e. VFT).

**H<sub>01</sub>: There are no significant differences in mean scores between pre-test and post-test with respect of teaching in conventional method.**

Table - 1: Mean and SD of pre & post tests of students taught by conventional method

Time	Number of students	Mean	Standard Deviation
Pre- Test	50	7.7	3.0589
Post-Test	50	12.3	4.0620

t-test: Two-Sample Assuming Equal Variances method was applied to compare the results of pre and post test of 50 students under the control group. p value is found as 0.00000000544 which is less than 0.05 level of significance. Thus, the Null hypothesis is rejected and the result is significant. Hence, the Conventional method of teaching is effective for the academic achievement of the students under the control group for topic of the equatorial rain forests.

- **Locale wise effectiveness of the Conventional Method of Teaching:**

**H<sub>02</sub>: There are no significant differences in mean scores of achievement tests among rural and urban students with respect of teaching through conventional method.**

Table-2: Mean and SD of achievement tests of rural & urban students taught by conventional method

Locality	Number of students	Mean	Standard Deviation
Urban	25	12.56	3.5482
Rural	25	15.6	3.2015

t-test: Two-Sample Assuming Equal Variances method was applied to compare the results of rural and urban students of 25 each under the control group. p value is 0.000280997 which is less than 0.05 level of significance so that Null hypothesis is rejected and the result is significant. It can be said that there are significant differences in mean scores of achievement tests with respect

of teaching through conventional method among rural and urban students. The mean score of rural students exceeds the mean score of urban students. So it is cleared that rural students performed better.

- **Virtual Field Trip Mode of Teaching and its Effectiveness in pre and post test scores:**

**H<sub>03</sub>: There are no significant differences in mean scores between pre-test and post-test with respect of teaching in Virtual Field Trip mode.**

Table - 3: Mean and SD of pre & post tests of students taught by the VFT method

Locality	Number of students	Mean	Standard Deviation
Urban	25	10.32	3.8807
Rural	25	14.28	3.2341

t-test: Two-Sample Assuming Equal Variances method was employed to compare the results of pre and post test of 50 students under the experimental group. p value is 0.0000000000000713082 which is less than 0.05 level of significance so that Null hypothesis is rejected and the result is significant. Hence, the Virtual Field Trip mode of teaching is effective for academic achievement of students under experimental group.

- **Locale wise effectiveness of the Virtual Field Trip Mode of Teaching:**

**H<sub>04</sub>: There are no significant differences in mean scores of achievement tests among rural and urban students with respect of teaching through Virtual Field Trip method.**

t-test: Two-Sample Assuming Equal Variances method was employed to compare the academic achievement of rural and urban students of 25 each under the experimental group.

Table - 4: Mean and SD of achievement tests of rural & urban students taught by the VFT method

Time	Number of students	Mean	Standard Deviation
Pre- Test	50	7.92	3.7787
Post-Test	50	14.08	3.6802

p value is 0.002576316 which is less than 0.05 level of significance so that Null hypothesis is rejected and the result is significant. Hence, there are significant differences in mean scores of achievement tests among rural and urban students with respect of teaching through VFT method. The mean score of rural students exceeds the mean score of urban students. So it is cleared that rural students performed better in terms of academic achievement.

- **The effectiveness of the Virtual Field Trip (VFT) Method of Teaching over Conventional method regarding pre and post test scores:**

**H<sub>05</sub>: There is no significant interaction effect of group and time on academic achievement.**

Here, group means control and experimental groups and time stands for pre- test and post- test. We know already that control and experimental groups were associated with different methods of teaching.

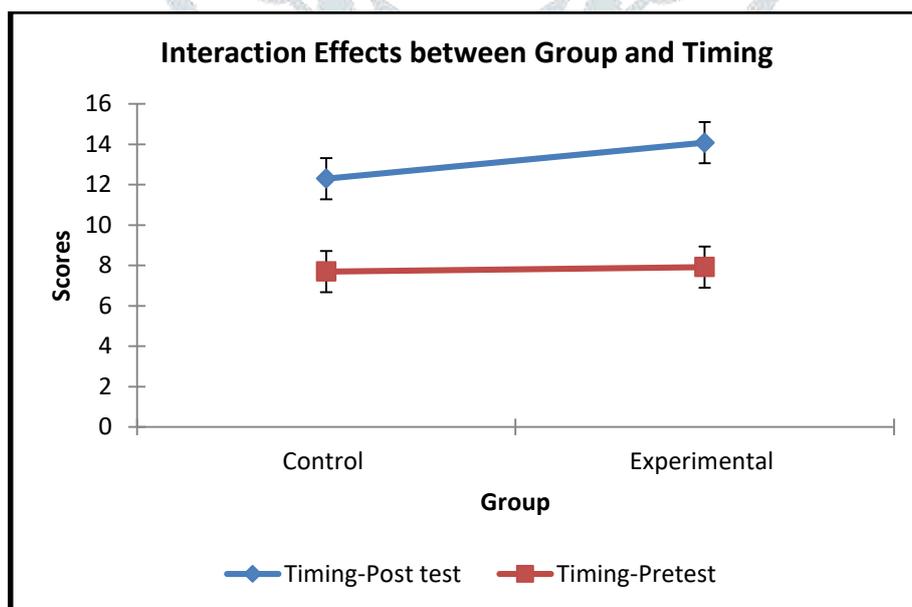
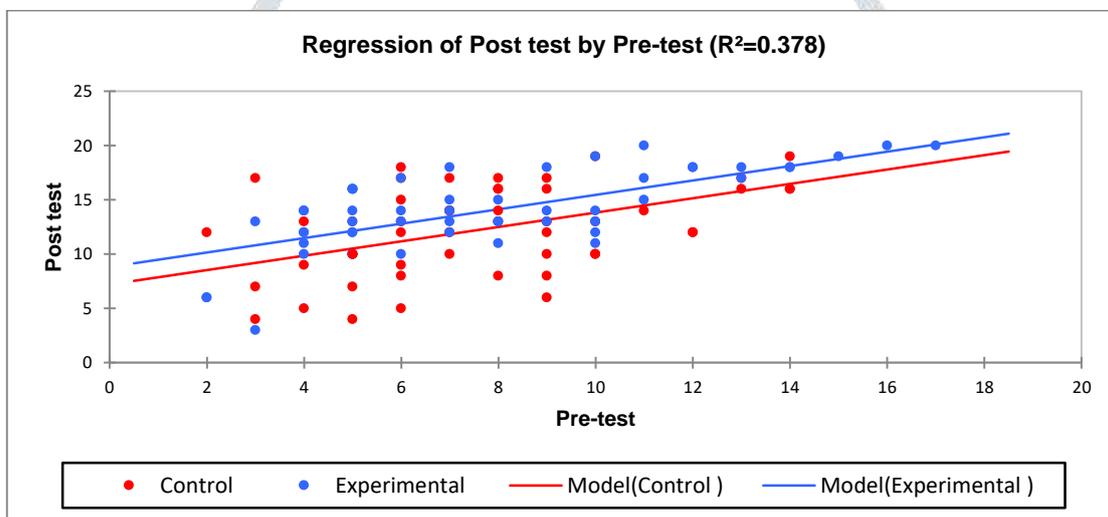
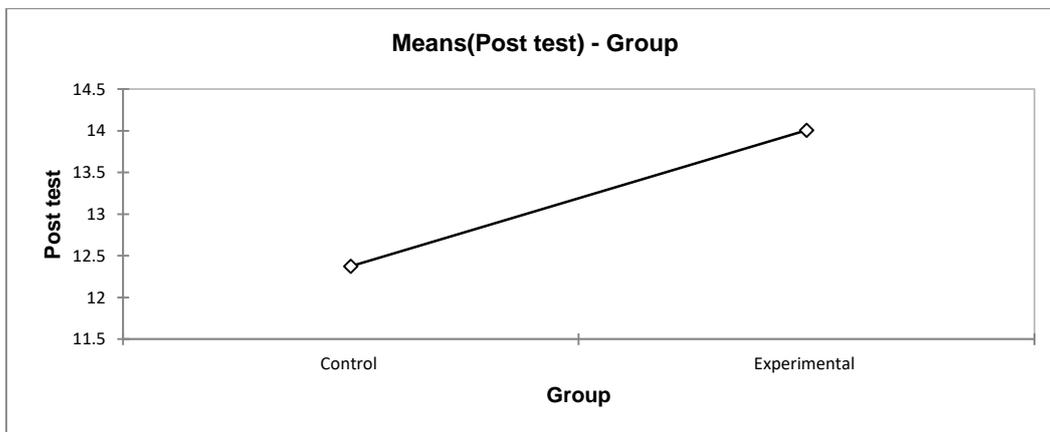
Table - 5: Interaction table of the Methods of Teaching & the Time of Tests regarding Academic Achievement

SUMMARY	Control Group	Experimental Group	Total
<b>PRE-TEST</b>			
Count	50	50	100
Sum	385	396	781
Average	7.7	7.92	7.81
Variance	9.357142857	14.27918367	11.7110101
<b>POST-TEST</b>			
Count	50	50	100
Sum	615	704	1319
Average	12.3	14.08	13.19
Variance	16.5	13.5444898	15.67060606
<b>TOTAL</b>			
Count	100	100	
Sum	1000	1100	
Average	10	11	
Variance	18.14141414	23.35353535	

Table-6: Statistical details of ANOVA: Two-Factor with Replication

Source of Variation	SS	df	MS	F	P-value	F crit
Sample	1447.22	1	1447.22	107.8388966	2.08131E-20	3.889341
Columns	50	1	50	3.725725756	0.055023646	3.889341
Interaction	30.42	1	30.42	2.26673155	0.133788257	3.889341
Within	2630.36	196	13.42020408			
Total	4158	199				

ANOVA: Two-Factor with Replication technique was carried out to identify differences in mean total scores for students who were taught using the VFT with pupils taught by conventional methods.



p value of interaction is 0.133788257 which is greater than 0.05 level of significance so that Null hypothesis is not rejected and the result is not significant. Hence, there is no significant interaction effect of group and time on academic achievement. Since the

two factors do not interact here, it means that changes in the academic achievement can be explained by the two methods of teaching. The total average scores of tests regarding the conventional method of teaching and VFT are 10 and 11 respectively. It is cleared that the mean score of academic achievement of VFT exceeds the mean score of conventional method of teaching. So the VFT method of teaching is effective than conventional method of teaching in term of academic achievement.

- **Locale wise effectiveness of the Virtual Field Trip Method of Teaching over Conventional method:**

We have seen earlier that in both method of teaching rural pupils performed better than urban pupils. Thus the study required to find out the specificity of any method upon locality.

**H<sub>0</sub>6: There is no significant interaction effect of locale and teaching methods on academic achievement.**

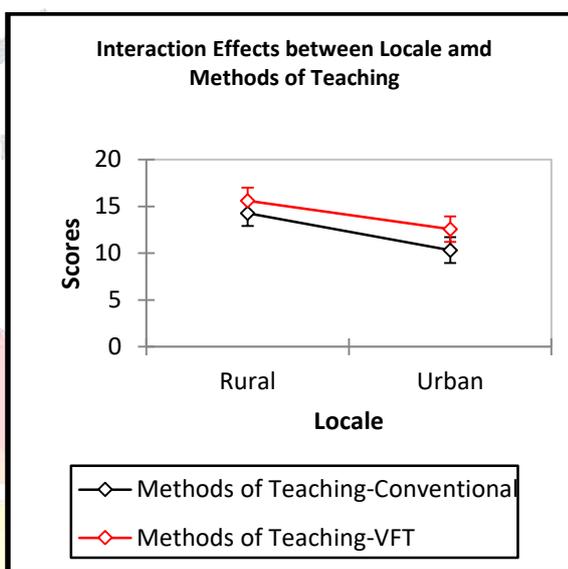
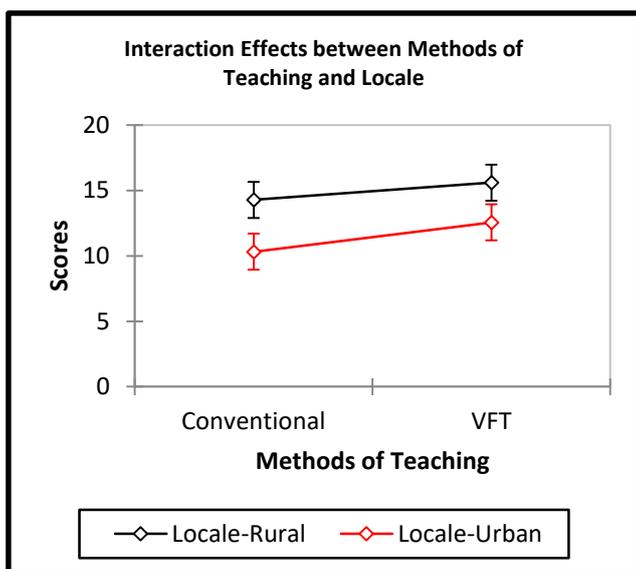
Table-7: Interaction table of the Methods of Teaching & the levels of Locale regarding Academic Achievement

SUMMARY	Control Group	Experimental Group	Total
<b>Urban</b>			
Count	25	25	50
Sum	258	314	572
Average	10.32	12.56	11.44
Variance	15.06	12.59	14.82286
<b>Rural</b>			
Count	25	25	50
Sum	357	390	747
Average	14.28	15.6	14.94
Variance	10.46	10.25	10.58816
<b>Total</b>			
Count	50	50	
Sum	615	704	
Average	12.3	14.08	
Variance	16.5	13.5444898	

ANOVA: Two-Factor with Replication technique was carried out to identify differences in mean total scores for urban and rural students who were taught using the VFT and by conventional method.

Table-8: Statistical details of ANOVA: Two-Factor with Replication

Source of Variation	SS	df	MS	F	P-value	F crit
Sample	306.25	1	306.25	25.33085	2.25316E-06	3.940163
Columns	79.21	1	79.21	6.551696	0.012039343	3.940163
Interaction	5.29	1	5.29	0.437552	0.509891068	3.940163
Within	1160.64	96	12.09			
Total	1551.39	99				



p value of interaction is 0.509891068 which is greater than 0.05 level of significance so that Null hypothesis is not rejected and the result is not significant. Hence, there is no significant interaction effect of locality and teaching methods on academic achievement. Since the two factors do not interact here, it means that changes in the academic achievement can be explained by the two methods of teaching. There was no overall effect of locality upon academic achievement. The mean scores of achievement tests regarding the conventional method of teaching and VFT are 12.3 and 14.08 respectively. It is cleared that the mean score of academic achievement of VFT exceeds the mean score of conventional method of teaching. So the VFT method of teaching is effective than conventional method of teaching upon academic achievement of students irrespective of locality.

**4.2 Motivation in learning:** Learning environment created by various types of teaching methods makes difference in motivation level among students regarding learning. So it is needed to analyze the difference in motivation level among students regarding the two methods of teaching.

- **The effectiveness of the Virtual Field Trip Method of Teaching over Conventional method regarding Motivation in learning:**

**H<sub>07</sub>: There are no significant differences in mean scores of Motivation level among students with respect of teaching in conventional method and Virtual Field Trip method.**

t-test: Two-Sample Assuming Equal Variances method was employed to compare the motivation level of 50 students each under control group and experimental group. p value is 0.00000773502 which is less than 0.05 level of significance so that Null hypothesis is rejected and the result is significant. Hence, there are significant differences in mean scores of motivation level among students with respect of teaching through VFT method and conventional method of teaching. The mean score of students of experimental group exceeds the mean score of students of control group. So it is cleared that VFT method of teaching is more effective than conventional method of teaching to arouse motivation in learning among students.

Table -9: Mean and SD of motivation level of students taught by conventional and the VFT methods

Group	Number of students	Mean	Standard Deviation
Control Group	50	41.52	6.0211
Experimental Group	50	46.02	3.0202

- **Locale wise effectiveness of the Virtual Field Trip Method of Teaching regarding motivation in learning:**

The experimental group includes 25 rural and 25 urban students. So it is needed to find out difference in effectiveness of VFT upon levels of locality regarding motivation.

**H<sub>08</sub>: There are no significant differences in mean scores motivation level among rural and urban students with respect of teaching in Virtual Field Trip method.**

Table-10: Mean and SD of motivation level of rural & urban students taught by the VFT method

Group	Number of students	Mean	Standard Deviation
Urban	25	46.52	2.4684
Rural	25	45.52	3.4655

t-test: Two-Sample Assuming Equal Variances method was employed to compare the motivation level of 25 students each under urban and rural categories regarding experimental group. p value is 0.245734017 which is more than 0.05 level of significance so that Null hypothesis is not rejected and the result is not significant. Hence, there are no significant differences in mean scores of motivation level among urban and rural students with respect of teaching through VFT method. So the method of teaching is effective to motivate rural and urban students equally.

- **Locale wise effectiveness of the Conventional Method of Teaching regarding motivation in learning:**

The control group also includes 25 rural and 25 urban students. So it is needed to find out difference in effectiveness of conventional method of teaching upon levels of locality regarding motivation.

**H<sub>0</sub>9: There are no significant differences in mean scores of motivation level among rural and urban students with respect of teaching in traditional method.**

Table-11: Mean and SD of motivation level of rural & urban students taught by conventional method

Group	Number of students	Mean	Standard Deviation
Urban	25	39.72	7.1386
Rural	25	43.32	4.0385

t-test: Two-Sample Assuming Equal Variances method was employed to compare the motivation level of 25 students each under urban and rural categories regarding control group. p value is 0.033060802 which is less than 0.05 level of significance so that Null hypothesis is rejected and the result is significant. Hence, there are significant differences in mean scores of motivation level among urban and rural students with respect of teaching through conventional method. The mean score of rural students exceeds the mean score of urban students. So it is cleared that the rural students are motivated better than urban students through conventional method of teaching.

- **Locale wise effectiveness of the Virtual Field Trip Method of Teaching over Conventional method regarding Motivation in learning:**

In VFT method we found no significant difference in motivation between rural and urban students but in conventional method of teaching rural students motivated more than the urban students. Again, it has been evaluated that the VFT method of teaching is more effective to motivate students than the conventional method of teaching. So it requires an interaction analysis between methods of teaching and levels of locality.

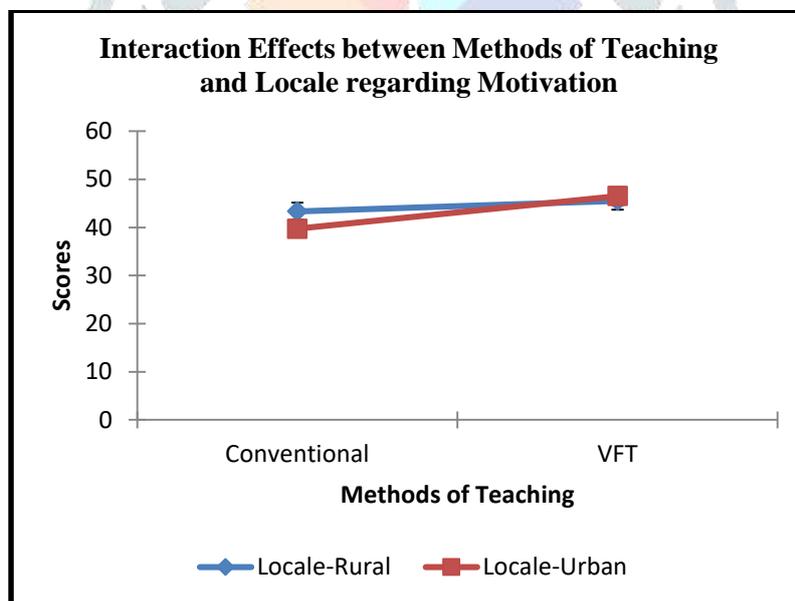
**H<sub>0</sub>10: There is no significant interaction effect of locality and teaching methods regarding Motivation in learning among students.**

ANOVA: Two-Factor with Replication technique was carried out to identify differences in mean total scores regarding motivation in learning for urban and rural students who were taught using the VFT and by conventional method.

Table-12: Interaction table of the Methods of Teaching & the levels of Locale regarding Motivation

SUMMARY	Control Group	Experimental Group	Total
Urban			
Count	25	25	50

<b>Sum</b>	993	1163	2156
<b>Average</b>	39.72	46.52	43.12
<b>Variance</b>	50.96	6.093333333	39.74040816
<b>Rural</b>			
<b>Count</b>	25	25	50
<b>Sum</b>	1083	1138	2221
<b>Average</b>	43.32	45.52	44.42
<b>Variance</b>	16.31	12.01	15.10571429
<b>Total</b>			
<b>Count</b>	50	50	
<b>Sum</b>	2076	2301	
<b>Average</b>	41.52	46.02	
<b>Variance</b>	36.25469388	9.122040816	



p value of interaction is 0.014522234 which does not cross 0.05 level of significance so that Null hypothesis is rejected and the result is significant.

Table-13: Statistical details of ANOVA: Two-Factor with Replication

Source of Variation	SS	df	MS	F	P-value	F crit
Sample	42.25	1	42.25	1.979541	0.162668052	3.940162523
Columns	506.25	1	506.25	23.71935	4.38457E-06	3.940162523
Interaction	132.25	1	132.25	6.196314	0.014522234	3.940162523
Within	2048.96	96	21.34333333			
Total	2729.71	99				

Hence,  
is

there

significant interaction effect of teaching methods and locality upon motivation in learning. Since the two factors interact here, it means that changes in the motivation level can be explained by both the methods of teaching and the levels of locality. The total average scores of motivation level regarding the conventional method of teaching and VFT are 41.52 and 46.02 respectively. It is cleared that the mean score of motivation level of VFT exceeds the mean score of conventional method of teaching. We already found that there are no significant differences in mean scores of motivation level among urban and rural students with respect of teaching through VFT. But the rural students were motivated better than urban students through conventional method of teaching. Hence, there is an interaction effect of methods of teaching and the levels of locality.

## V RESULTS & DISCUSSIONS:

**5.1 Academic Achievement:** The Virtual Field Trip mode of teaching is more effective than the conventional method of teaching for academic achievement of students because the mean score of achievement test of the VFT exceeds the mean score achievement test of the conventional method. In VFT, most of the post test score lies near to the full marks. Some pupils even scored full marks. No student scored full marks in the case of the conventional method of teaching. Most of post test score lies near to 15 marks. Some pupils scored near to the full marks, 20. Rural students performed better than the urban students in both method of teaching. But in VFT, the rural students scored higher than the rural students under the conventional method. Some rural students attained full marks in the case of the VFT and most of the students scored near to the full marks. But in the case of the conventional method, no rural student attained the full marks and most of the score lies within 17. No interaction is found. Hence, the VFT method of teaching is overall effective method of teaching for better academic achievement irrespective of locale.

## 5.2 Motivation in Learning:

The mean score of students of experimental group exceeds the mean score of students of control group. So it is cleared that VFT method of teaching is more effective than conventional method of teaching to arouse motivation in learning among students. The mean score of rural students exceeds the mean score of urban students So that it is cleared that the rural students are motivated better than urban students through conventional method of teaching. So the method of teaching is more effective to motivate rural students than urban students. There are no significant differences in mean scores of motivation level among urban and rural students with respect of teaching through VFT method. So the method of teaching is effective to motivate rural and urban students

equally. Hence, there is an interaction effect of methods of teaching and the levels of locale. But the VFT method of teaching is more effective to arouse motivation irrespective of levels of locale.

**VI SIGNIFICANCE OF THE STUDY:** The present study is important for so many reasons.

- i. In West Bengal, all schools do not arrange actual field trip mandatorily for geographical learning as well as in school levels the arrangement of real field trip is very much difficult. Thus, to bridge up the gap VFT is effective for giving spatial experiences to students.
- ii. There are such areas where actual field trip making is not possible. The study shows a new way to geography teachers to arrange effective learning environment.
- iii. There are so many topics in geography where Students follow rote learning and teachers face difficulty at the time of delivering those topics. The study facilitates effective teaching learning process.
- iv. The results of the study facilitate geography teachers to apply ICT in teaching towards effective geographical learning.
- v. The study facilitates geography teachers to create smart class room for effective geographical learning.
- vi. The VFT mode of teaching is very much cost-effective. Once it is made, it can be used for a long time.

#### **VII CONCLUSION:**

The VFT is very much useful for teaching geography. With the help of VFT a number of topics of geography can be transacted in very well manner. Students love field trips because they can learn knowledge and skills while having unforgettable and irreplaceable experiences. The greatest disadvantage of VFTs is that they cannot simulate many of the real sensory aspects of fieldwork and consequently should not ever be used to replace real field trips. It is possible to design high quality, effective VFTs but the size of the database, money and time required to produce them makes this an expensive process.

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