

# AN EMPIRICAL RESEARCH ON TEACHING THROUGH ANIMATION: A STUDY ON SELECTED STUDENTS OF GOVERNMENT AND PRIVATE SCHOOLS

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**ABSTRACT:** *This study focused on different teaching pattern and types using computer animations and activities for effective learning of students. The animation is a wonderful as well as an innovative new way to encourage students to communicate stories, ideas, and concepts in a creative and original way. It can be a significantly useful tool to encourage the creativity and imagination of students who may find concepts and theories in a challenging way; due to the fact that it liberates them from the anxiety of always worrying about technicalities and enables them just to focus on the story instead. The usage of animation in teaching and learning presents challenges to institutions of higher learning. Animation can be defined as any computer-mediated software or interactive application that integrates text, color, graphical images, audio sound, and full motion video in a single application. Animation learning systems provide a potential venue for improving student understanding.*

*The study has been conducted in four selected schools such as two governments and two private schools in Udaipur district. An appropriate sample size has been chosen for the study. For the purpose of the study to know about the impact of animation on teaching, the topic solar system has been taught to students and then evaluate the before animation (traditional method) and after animation (modern method) impact on students in selected schools.*

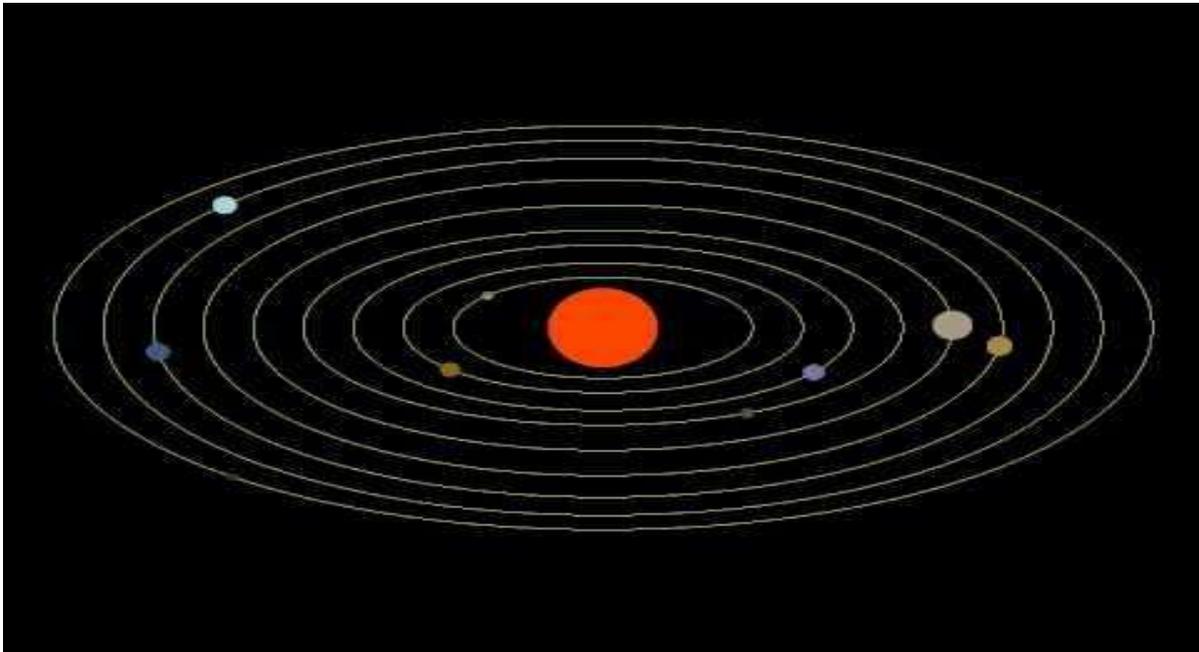
**Keywords:** - Teaching, Animation, Computer Government and Private Schools, Solar system etc.

## INTRODUCTION

The animation is a wonderful character performance synthesized at the end of a pencil, or progressively by using the float and click on or off a laptop, computer mouse, that would win a reward for best functioning.



Firstly, developed the solar system related learning materials using different multimedia tools. Put animated science (solar system) related information along with the voice of a character inside materials who describes the computer system step by step in English and Hindi language as well.



Students have been divided into three groups. Where the first group taught by the traditional method, second by animation method and group third taught by blended method (Animation + Narration), Mix of the traditional and modern method.

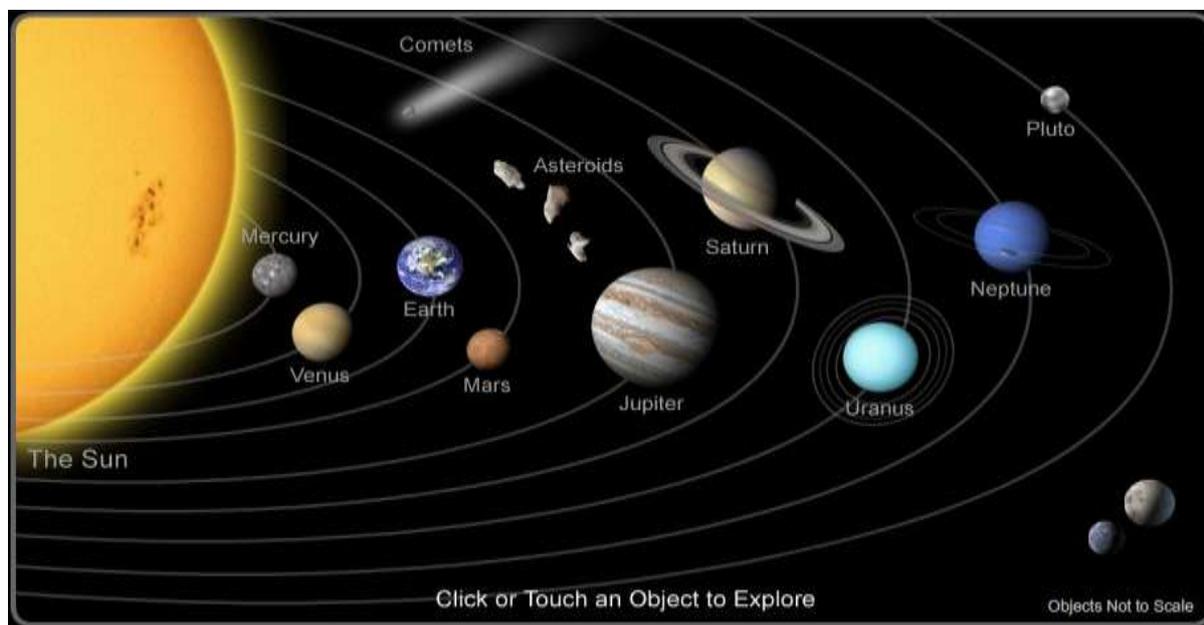


Modern education and communication environment performed alternative methods in the learning process. Technology has been widely used in education. It is extremely near when multimedia tools perfectly utilize in the education sector. Using interactive multimedia in the teaching process is growing in the current context. Animation (Interactive) learning plays an important role in assisting students in learning processes. The animation is a wonderful character perform synthesized towards the end of a pencil, or progressively by using the float and click on or off a laptop or computer mouse, that might or else win a reward for best functioning.

Animations are interesting; it usually has the power to gain the attention of students for hours together without boring them. And sometimes animations are extremely helpful for a better memory of remembrance. It helps to generate interest in a better way otherwise would not entertain.

However, learning is a pretty complicated and difficult procedure, well for most of the students it's a nightmare when it comes to studies. Now whenever it analyze the procedure of learning, "Concentration" stand out to be the major criteria for a better learning, followed by "Understanding" and eventually "Remembering". Every one of these goes hand in hand.

Computer animation possesses a positive effect and impact on memorizing knowledge by students. Used in the process of teaching of technical and practical subjects, it is conducive towards the development of mind. Animation makes it possible for familiarizing the students with the schemes of solving technical problems as well as shows the technique of operation of machinery and equipment. In the technique, animations are used, inter alia, in the procedures of designing, engineering calculations, visualization and monitoring technological processes and likewise visualization of assembly processes.



This research discusses the role of computer animation in the teaching process in school education and of course the examples of applications using computer animation and more than that supporting the teaching process of technical subjects. This thesis is an effort to solve the pitfalls of all the prior research conducted on the same issue and it majorly focuses and targets on the animation teaching in government and private sector schools of Udaipur, Rajasthan and it also put light on the impact of animation teaching on students achievement.

## REVIEW OF LITERATURE ON ANIMATION IN TEACHING

With regards to the **Faraday & Sutcliffe (1996)**, Animations may lack educational effectiveness if target learners cannot process the presented important information sufficiently. Just for example, evidently, when the subject matter is complex, learners may be overwhelmed by animated presentations. This is associated with the role of visual perception as well as cognition in human information processing. Our human perceptual and cognitive systems have limited capacities for processing information. If each of these limits is exceeded, learning may be compromised. For example, the pace at which the animation describes its important information may exceed how quickly the learner can process it effectively. The accompanying animation (part of a pumping system) is problematic for that reason.

“People are fascinated by animation and they enjoy the opportunity to create their own” (**Flux Time Studio, 2010**). More than that, the animation module brochure of VIA University College, claims that “children especially, are said to learn most effectively and most when they enjoy what they are doing”.

Animation, undoubtedly, provides a certain means to capture and maintain students’ interest in the in-class teaching, providing a lot of people grew up watching animations on television are also in movies. But nevertheless, **Trevisan, Oki, and Senger, (2009)** the effectiveness of using animation, along with other Web 2.0 tools in classroom teaching and learning, are likely to depend on the kinds of learning experience which the teacher designs for a class. Understanding the students’ context and interests will help provide a learning environment where a particular educational and learning tool, like animation, can be used, and eventually meet the learning targets set for a class.

Animations have already been very popular even before the internet; and with the developing Web 2.0 applications, it has become a successful and an engaging tool in the classrooms. Creating an animation never has ever been so simple and low-cost. Now we can create different graphics, characters and interesting elements with very little talent (**Tversky, and Morrison, (2001)**).

As stated by the **McCauley, (1998)**, a number of the animation links cataloged here giving educators basic tools and histories of animation while others possess the animation already created and based in motion, it’s just a matter of sharing with students.

According to the **Tversky, Morrison, & Bétrancourt (2002)**, the initial purpose of animation in teachers is to meet a cognitive function. In this particular role, animations are supposed to support students’ cognitive processes that ultimately end in them understanding the subject material. The animation is familiar create terribly exciting and fun animations into that, in fact, education and training will actually be incorporated.

## RESEARCH METHODOLOGY

The first group of 100 students taught the solar system using traditional method and then given the 15 multiple choice type questions to know that how much they understand and remember.

Then group second (100 students) have given the class on the solar system through the animation and then taken a test of 15 multiple choice type questions.

And finally, the last group of 100 students was taught through the blended technique and then again students given the test of which comprised the 15 multiple choice questions as previous two groups have given.

This research also presents the results of statistical analysis of survey data and analysis of the collected data under various questions framed for achieving the established objectives. Also, questions were designed to elicit qualitative responses from students (respondents) about their perception of the animated teaching.

Therefore, data and information are based on both qualitative and quantitative data as well. The presentation of analysis performed was systematically categorized and ordered. The chapter begins with analyzing the significant difference between the demographic variables and usage of animation in teaching.

While applying any test over the responses to a question it was considered that the significance and specificity of the inferences could be maintained and derived.

**ANALYSIS OF RESEARCH CONDUCTED IN SCHOOL ABOUT SOLAR SYSTEM**

The solar system related learning materials have been developed, using different multimedia tools. Put animated science (solar system) related information along with the voice of a character inside materials which describes the solar system step by step in English and Hindi language.

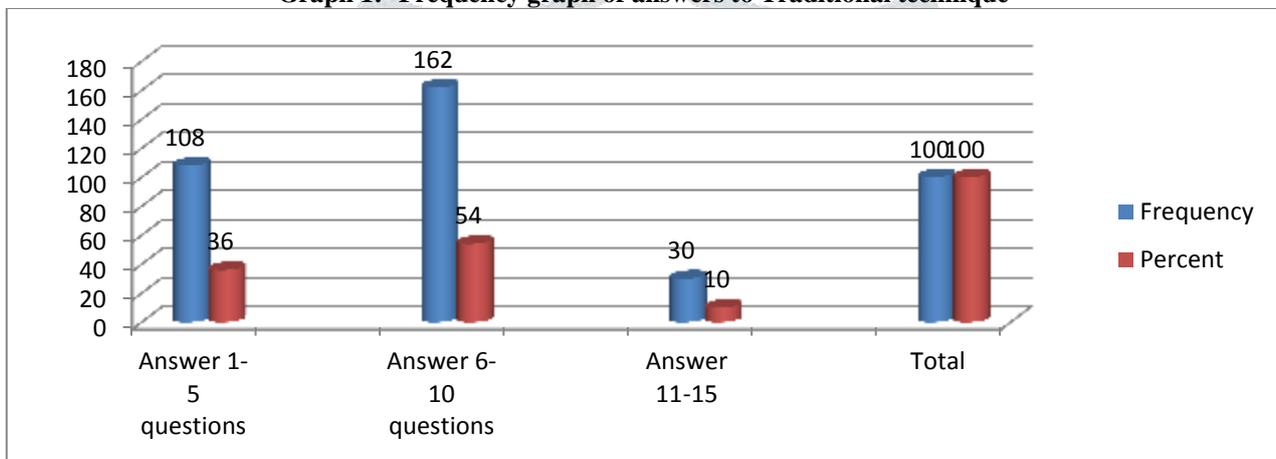
Secondly, visited four primary schools of Udaipur district, there were total 300 students (aged 10-20 years) and categorized students into three different groups.

A number of students in each group were 100. A teacher taught the first group of students about the solar system using traditional lecture method and then students are given the test which comprised of 15 multiple choice questions. The answer to the questions was related to interactive learning video. Another group of students just watched our interactive learning materials and answered the 15 questions. The last group of students visualized our materials along with teacher’s instructions when needed. Then they also have given the answers to the same 15 questions.

**Table 1:- Frequency table of answers through Traditional technique**

		Frequency	Percent	Valid Percent	Cumulative Percent
<b>Valid</b>	Answer 1-5 questions	108	36	36	36
	Answer 6-10 questions	162	54	54	90
	Answer 11-15	30	10	10	100
<b>Total</b>		100	100	100	

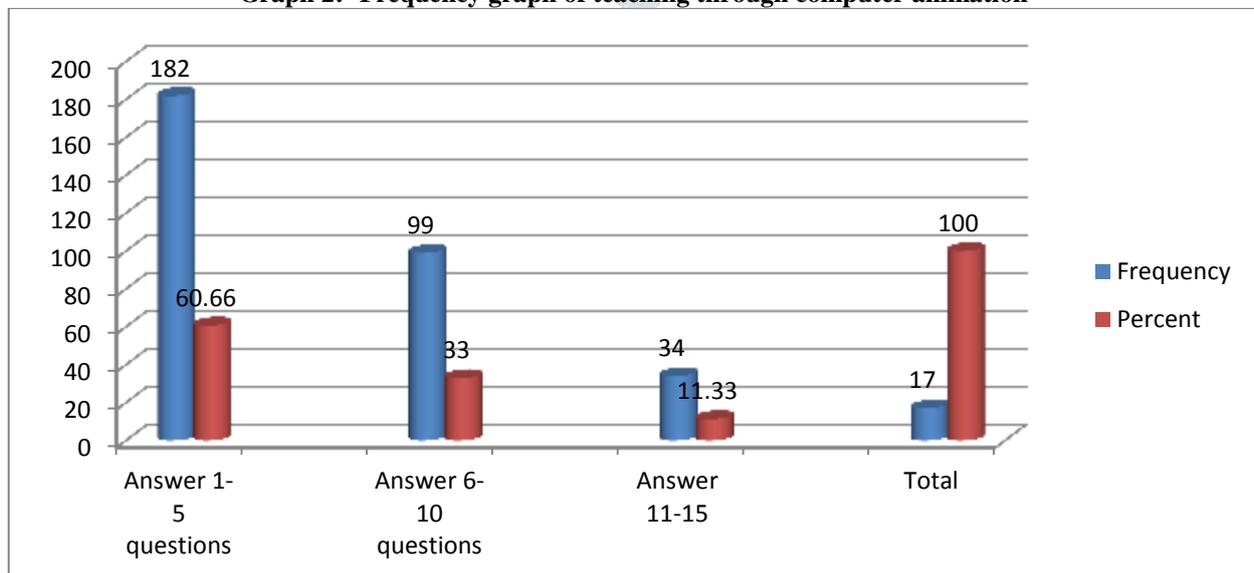
**Graph 1:- Frequency graph of answers to Traditional technique**



**Table 2:- Frequency table of teaching through computer animation**

		Frequency	Percent	Valid Percent	Cumulative Percent
<b>Valid</b>	Answer 1-5 questions	182	60.66	60.66	60.66
	Answer 6-10 questions	99	33	33	93.66
	Answer 11-15	34	11.33	11.33	100
<b>Total</b>		17	100	100	

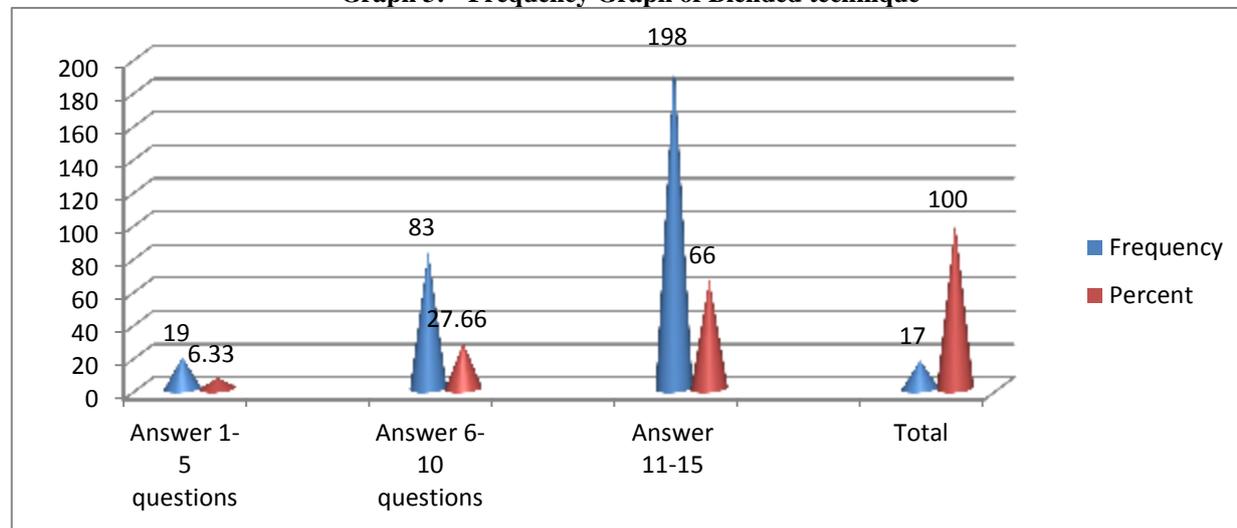
**Graph 2:- Frequency graph of teaching through computer animation**



**Table 3: - Frequency table of Blended technique**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Answer 1-5 questions	19	6.33	6.33	6.33
	Answer 6-10 questions	83	27.66	27.66	33.99
	Answer 11-15	198	66	66	100
Total		17	100	100	

**Graph 3: - Frequency Graph of Blended technique**



According to **table 1 to 3 and graph from 1 to 3**, showing the number of answers given by students during the class conducted after using different methods of teaching. The Researcher notice from the above analysis, form the blended technique, students learn faster and understand the things easily in comparison to traditional technique. As the above table and graph stated, through traditional technique student correctly answer 6 to 10 questions, through the only animation they answer only 1 to 5 questions, but through the blended technique, maximum students gave 11 to 15 correct answers that are really high good as compare to another teaching method.

**ANALYSIS OF RELATIONSHIP BETWEEN DEMOGRAPHIC VARIABLES AND ANIMATION**

This section analyzes the relationships between the independent variables and various factors of animation and their impact on learning of selected students of government and private schools of Udaipur.

In order to investigate the relationship between demographic variables like gender, age class and school by the respondents following hypotheses were formulated.

H<sub>01</sub>: There is no significant difference amongst various age groups of students and usage of Interactive Multimedia Animation in assisting the teaching and learning.

H<sub>11</sub>: There is a significant difference amongst various age groups of students and usage of Interactive Multimedia Animation in assisting the teaching and learning.

H<sub>02</sub>: There is no significant difference between the perception of Gender and usage of Interactive Multimedia Animation in assisting the teaching and learning.

H<sub>12</sub>: There is a significant difference between the perception of Gender and usage of Interactive Multimedia Animation in assisting the teaching and learning.

H<sub>03</sub>: There is no significant difference amongst various class groups of students and usage of Interactive Multimedia Animation in assisting the teaching and learning.

H<sub>13</sub>: There is a significant difference amongst various class groups of students and usage of Interactive Multimedia Animation in assisting the teaching and learning.

H<sub>04</sub>: There is no significant difference between the government and private school students and usage of Interactive Multimedia Animation in assisting the teaching and learning.

H<sub>14</sub>: There is a significant difference between the government and private school students and usage of Interactive Multimedia Animation in assisting the teaching and learning.

**Table: - 4 Descriptive table of respondents**

Descriptive		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Age	Disagree	1	2.00	.	.	.	.	2	2
	Not sure	14	1.57	.514	.137	1.27	1.87	1	2
	Agree	149	1.36	.482	.040	1.28	1.44	1	2
	Highly	136	1.40	.491	.042	1.31	1.48	1	2

Gender	Agree								
	Total	300	1.39	.489	.028	1.33	1.45	1	2
	Disagree	1	1.00	.	.	.	.	1	1
	Not sure	14	1.50	.519	.139	1.20	1.80	1	2
	Agree	149	1.43	.497	.041	1.35	1.51	1	2
	Highly Agree	136	1.43	.496	.043	1.34	1.51	1	2
Class	Total	300	1.43	.496	.029	1.37	1.49	1	2
	Disagree	1	1.00	.	.	.	.	1	1
	Not sure	14	2.57	1.016	.272	1.98	3.16	1	4
	Agree	149	2.46	1.049	.086	2.29	2.63	1	4
	Highly Agree	136	2.60	.976	.084	2.44	2.77	1	4
Type of Students	Total	300	2.52	1.016	.059	2.41	2.64	1	4
	Disagree	1	1.00	.	.	.	.	1	1
	Not sure	14	1.36	.497	.133	1.07	1.64	1	2
	Agree	149	1.47	.501	.041	1.39	1.55	1	2
	Highly Agree	136	1.49	.502	.043	1.41	1.58	1	2
Total	Total	300	1.47	.500	.029	1.42	1.53	1	2

Table 5: - ANOVA table

ANOVA		Sum of Squares	df	Mean Square	F	Sig.
Age	Between Groups	.953	3	.318	1.335	.041
	Within Groups	70.417	296	.238		
	Total	71.370	299			
Gender	Between Groups	.255	3	.085	.344	.079
	Within Groups	73.275	296	.248		
	Total	73.530	299			
Class	Between Groups	3.883	3	1.294	1.256	.032
	Within Groups	304.954	296	1.030		
	Total	308.837	299			
Type of Students	Between Groups	.466	3	.155	.618	.604
	Within Groups	74.321	296	.251		
	Total	74.787	299			

Table 5 presents the variation (Sum of Squares), the degrees of freedom (df), and the variance (Mean Square) given for within and the between groups, as well as the F value (F) and the significance of the F (Sig.). Sig. indicates whether the null hypothesis – the population means are all equal or has to be rejected or not. As it can observe that there is not so much difference between the two Mean Squares (.318 and .238), resulting in a significant difference (F = 1.335; Sig. = .041). The Sig. value is lower than the Sig. the level of 0.05. This means that **H<sub>01</sub> must be rejected** and the alternative hypothesis has been accepted which states that there is a significant difference amongst the various age groups of respondents and usage of Interactive Multimedia Animation in assisting the teaching and learning. The usage of multimedia animation is not equal to the different age group of students.

As it can see in the above table, there is a good difference between the two Mean Squares (.085 and .248), resulting in a non-significant difference (F = .344; Sig. = .079). The Sig. value is higher than the Sig. the level of 0.05. This means that **H<sub>01</sub> must be accepted** which states that there is no significant difference between the gender and usage of Interactive Multimedia Animation in assisting the teaching and learning. Both boys and girls equally use the Interactive Multimedia Animation and show the positive response for it.

As per the above table, there is not so much difference between the two Mean Squares (1.294 and 1.030), resulting in a significant difference (F = 1.256; Sig. = .032). The Sig. value is lower than the Sig. the level of 0.05. This means that **H<sub>01</sub> must be rejected** which states that there is no significant difference between the class and usage of Interactive Multimedia Animation in assisting the teaching and learning. The usage of multimedia animation is not equal to the different class of students.

Finally, we take students from government and private school, the study shows that there is a good difference between the two Mean Squares (.155 and .251), resulting in a non-significant difference (F = .618; Sig. = .604). The Sig. value is higher than the Sig. the level of 0.05. This means that **H<sub>01</sub> must be accepted** which states that there is a significant difference between the students of government and private school and usage of Interactive Multimedia Animation in assisting the teaching and learning. Both type of students either they are from government school and from a private school who taught through animation equally response given on the Interactive Multimedia Animation and shown the positive response for it.

Table 6: - Status of hypothesis

S. No.	Hypotheses	Difference	Status
1.	H <sub>01</sub>	Significant	Rejected
2.	H <sub>02</sub>	Non-Significant	Accepted
3.	H <sub>03</sub>	Non-Significant	Accepted
4.	H <sub>04</sub>	Non-Significant	Accepted

Source: Author's Compilation

Further here applied the pre-post method on a multi-measure self-report questionnaire administrated:

Pre-test: Teach through traditional technique

Post-test: Teach through Blended technique (Animation+ narration)

The questionnaire included the 15 questions relating to computer science.

$H_{05}$ : - There is no significant impact on students towards the pre (Traditional) and post (Animation) techniques of teaching.

$H_{15}$ : - There is a significant impact on students towards the pre (Traditional) and post (Animation) techniques of teaching.

**Table 7: - Effects of animations on mental ability in elementary schools students.**

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre (Traditional, B1)	2.57	300	.757	.044
	Post (Animation, B3)	3.48	300	.803	.046

**Table 8:- Paired Samples Correlations**

Paired Samples Correlations				
		N	Correlation	Sig.
Pair 1	Pre (Traditional, B1) & Post (Animation, B3)	300	-0.068	.237

**Table 9:- Paired Samples Test**

Paired Samples Test		Paired Differences				t	df	Sig. (2-tailed)	
Pair	Traditional – (and) Animation	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower				Upper
1		-.907	1.065	.062	-1.028	-.786	-14.740	299	.000

Table 7, shows the mean, standard deviation and standard error value for pre and post groups of teaching for elementary and secondary schools students. **Table 8** given the negative correlation between the methods of teaching (As it has already observed that animation giving more impact on learning of students).

Table 9 given the t-value (-14.740 with 299 degree of freedom) and significant value 0.000 which is less than 0.05 p-value, so we reject the null hypothesis and accept the alternative hypothesis which could interpret that **there is a significant impact on students towards the pre (Traditional) and post (Animation) techniques of teaching.**

#### CONCLUSION:-

The basic concept of classroom centered study will be in conjunction with interactive multimedia resources. Blended learning is available in many patterns and types. It could possible that used to improve the traditional lecture along with additional readings, electronic instructor notes, and pictures of charts, graphs, or other handouts in a single course. Actually, teaching is the passion in addition to relationship amongst the teacher and of course the student. Technology is viewed as being possibly useful in supporting face-to-face teaching, enabling students to interact with learning material. The main objective of this research is to investigate primary and secondary level students' responses on multimedia contents in learning science (solar system) with animated models and information.

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