

CHAPTER IV

RESULTS AND DISCUSSION



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4.0 INTRODUCTION

The main objective of the present study was to investigate the effectiveness of teaching through Web 2.0 Tools on students of higher classes in Physics. Since the effectiveness was defined as obtaining more scores in the post test, the data was collected from students of class IX, one of experimental group, and the other of control group using an awareness questionnaire and an achievement test modelled on the chapter 'Work and Energy'. The post test of experimental and control group were measured and ANCOVA was applied using pre-test as co-variate. The summary of F value has been given in Table 4.2 and 4.3. The summary of awareness and the reasons given by the students of class IX have been tabulated in the Table 4.1. The directional hypothesis of the study has been tested at 0.01 level.

The mean scores of post test of both the groups have been presented graphically using the Graph 4.1.

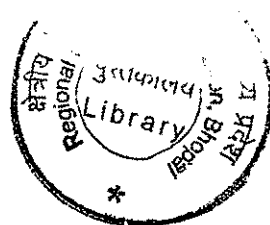
4.1 Objective 1: To find out the awareness of students of class IX about Web 2.0 tools.

The first objective of the present study was to find out the awareness about Web 2.0 Technology and tools. The awareness was found using the tool developed in the form of a check list. The students of both experimental and control group were administered the test to get an idea of their knowledge in this field as well as the uses they put the mentioned tools to in their daily lives. The percentages of students who used different Web 2.0 tools were found to be as under:

Table 4.1 Summary of Awareness Test about Web 2.0 Tools of the Sample

Sl. No.	Web 2.0 Tool	Percentage of Students Using	Uses Of the Web 2.0 Tool
1	Facebook	83.58	<ul style="list-style-type: none">• To stay connected with friends• To share pictures, videos etc

			<ul style="list-style-type: none"> To find entertaining pages
2	Wikipedia	61.19	<ul style="list-style-type: none"> To find useful material for assignments To study the plot of a movie
3	YouTube	65.67	<ul style="list-style-type: none"> To watch entertaining videos To upload and share personal videos with friends and acquaintances
4	Twitter	6	<ul style="list-style-type: none"> To get news and whereabouts of friends and famous personalities To share views and personal feelings with friends
5	Pinterest	0	NA
6	SlideShare	3	<ul style="list-style-type: none"> To upload self made slides To download slides for referring in assignments and presentations
7	Dropbox	0	NA
8	Blogger	3	<ul style="list-style-type: none"> To learn about different views on the same topic To improve writing skills by expressing written views and getting comments for improvement
9	WordPress	0	NA
10	Edublog	0	NA
11	Any Other	Whatsapp Webutorials	For communicating For coaching purpose



4.1.1 Findings

The following can be concluded from Table 4.1

1. The most popular Web 2.0 tool among the students of Class IX was found to be **Facebook** (83.58%), a social networking site. The students used it for a variety of purposes, the most prominent of which was sharing photos and communicating.
2. The second most popular Web 2.0 Tool was found to be **YouTube** (65.67%), a sharing website exclusively for Videos. Students used it for uploading and downloading videos relevant to them, which ranged from entertainment to educational.
3. The third most popular Web 2.0 Tool was found to be **Wikipedia** (61.19%), a website which is wholly informational and a web-based encyclopedia. It allows, in addition to providing information, editing whenever the users come across faulty or inadequate information over a particular topic.

The students used this website mostly to get materials for their school assignment and also to find out other information not strictly relevant to their syllabus, like the plot of a movie or extended knowledge over a topic. No students were found to indulge in editing materials on Wikipedia.

4. The fourth most popular Web 2.0 tool was found to be **Twitter** (6%), a social networking site that allows real time news on the whereabouts and personal information of friends and celebrities. The researcher could not incorporate this particular tool in her lessons due to any obvious lack of implications of this tool.
5. The fifth most popular Web 2.0 tool was found to be **Blogger** and **SlideShare** (3% each) with very few students using them. Blogger is a Web 2.0 tool which is used to share one's own views over a particular topic, usually a social one with everyone on the website, and get their suggestions and views over it. This tool was considered by the researcher as being extremely useful in improving students' vocabulary and writing styles. But it wasn't a very popular tool owing largely to neglect by the teaching staff of the school.

SlideShare is an interactive website that allows uploading and downloading of Power Point Presentations made by the user. This Website was also not very

popular as only four students were found using it. But, on the bright side, when informed about the utility of this Web 2.0 Tool, a large percentage of students, by the end of the teaching period were found to be active users of SlideShare.

6. The Web 2.0 Tools- DropBox, EduBlog, and Wordpress did not find any takers at all in class IX. It was found through verbal inspection that most of the students hadn't even heard about these tools. The reason might be again attribute to the fact that these websites are not entertainment centered, a prerequisite for teenagers to be attracted to any new Web tool.

As of yet, these have been used by professionals to share work related ideas and maintain a virtual network, which the teenagers can do using Facebook and WhatsApp. Another reason which can be cited is the non involvement of subject teacher in these tools; hence the children remain largely unaware of their existence.

4.2 Objective 2: To study the effectiveness of Web 2.0 tools on learning achievement of students of class IX in Physics.

The second objective of the present study was to find out the effectiveness of teaching Physics through Web 2.0 tools on learning achievement of class IX students. The achievement test for this purpose was developed by the researcher. The test was administered to both the experimental and the control group before and after administering the treatment. The data was analysed using One-Way ANCOVA.

The results of the analysis are given as under:

Table 4.2 Summary of ANCOVA for Achievement in Physics

SOURCES OF VARIANCE	df	SUM OF SQUARES	MEAN SUM OF SQUARES	F VALUE
AMONG	1	3399.923	3399.923	145.698**
WITHIN	54	4912.373	90.970	
TOTAL	55			

****SIGNIFICANT AT 0.01 LEVEL**

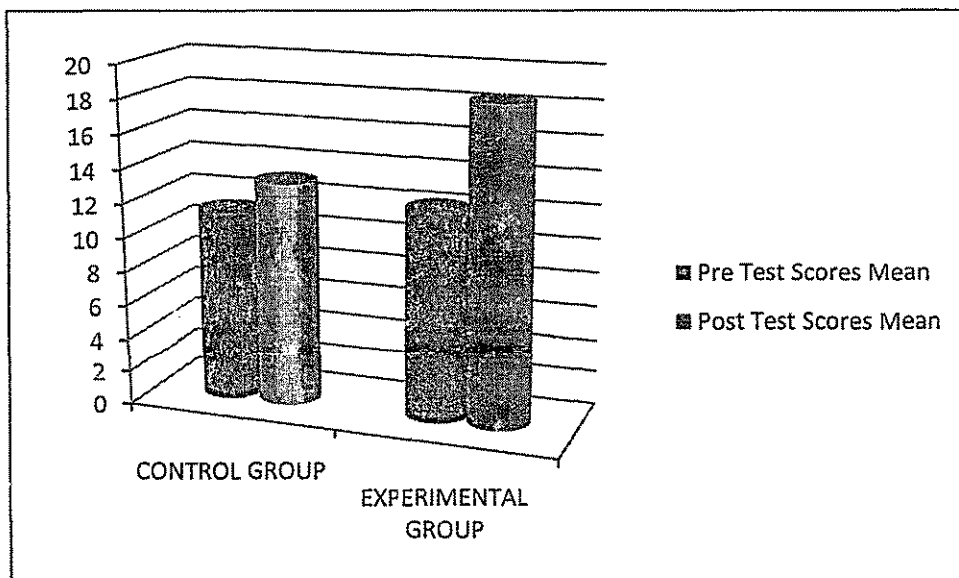
Table 4.3 Mean and SD of the Experimental and Control Groups for Achievement in Physics

GROUPS	N	SD	MEAN
EXPERIMENTAL	27	18.309	74.07
CONTROL	30	18.052	53.33
TOTAL	57	20.822	63.16

Table 4.1 indicates that the F-value of **145.698** with $df=1/54$ is significant at 0.01 level, which indicates that the treatment, i.e. teaching through Web 2.0 tools has produced a significant effect on the achievement of students in Physics.

Further, the mean achievement score in Physics of students taught through Web 2.0 tools (74.07 with SD 18.309) is higher than students taught through traditional approach (63.16 with SD 18.052). Therefore, it can be said that teaching Physics through Web 2.0 tools was more effective than the traditional approach of teaching.

Graph 4.1 Graph showing the comparison of means of Pre-test and Post test



Comparing the means of the groups from the graph 4.1, we find that there is little difference between the means of pre-test of experimental and control group. Similarly, the little difference is obvious when we compare the means of pre and post test of control group which was taught using traditional method. But this difference is significant (refer Table 4.2) when we compare pre and post test of experimental group, taught through the Constructivist

Approach using Web 2.0 tools. Also, we find that post test scores of control group and that of experimental group differ significantly. This points clearly that the method through which the learners were taught in the experimental group, i.e., using Web 2.0 tools is more effective and the difference can be attributed to it.

Thus the researcher can conclude that teaching through Web 2.0 is more effective than through Traditional method. Hence the hypothesis

H₁ : Students of class IX taught Physics through Web 2.0 tools will gain significantly higher scores as compared to their counterparts in the control group.

is not rejected.

4.2.1 FINDINGS

Teaching to students of class IX through Web 2.0 tools (M=74.07 with SD 18.309) was found to be more effective in terms of Learning Achievement in Physics than the Traditional approach of teaching (M=63.16 with SD 18.052).

4.3 Discussions

This finding is supported by Prescott (2014), Prestridge (2014), Stocks and Freddolino (2013) and others mentioned with similar results in the review. The above-mentioned researchers are of the opinion that Web 2.0 is a very effective tool in teaching learning process. Prestridge has shown through her research, how other Web 2.0 tools can be extremely potent in increasing the effectiveness of teaching learning.

The reasons of this result might be the fact that teaching through Web 2.0 tools is more student- friendly, and in turn, more student-centred. This is in-sync with the idea of constructivism, seeing the child as a lone scientist, as Piaget suggests. Web 2.0 tools allow every child to experiment and express as themselves and not as a concretisation of her teacher's 'perfect' answer. Independence is a pre-requisite of meaning making in constructivism (Stocks and Freddolino, 2013)

This finding is not supported by the researchers Buzzard, Crittenden, William F. Crittenden & McCarty(2013). According to them, students prefer and respond more to the traditional approach of teaching. The differences in both these research findings might be attributed to demographical differences and difference in sample characteristics. The researcher of the present study found students to be more responsive as well as scoring higher when it came to teaching through Web 2.0 tools.

From the data interpreted in the section 4.2, one can conclude that the results are positive. It may be due to the fact that there is a greater level of familiarity of learning methodology by the students in case of Learning through Web 2.0 tools. The student is mostly familiar with the tools used in the treatment and hence was able to feel a larger sense of freedom to explore the arena assigned to them.

Web 2.0 increases the creativity. Any student can write record and publish a video or an audio. YouTube and Google video are used by our students' every day. They watch more videos on YouTube than they watch on T.V. or cinemas. It promotes student centered learning. It allows users to become the producers of the knowledge. It enables us to share our work with other audience. For example, E-pals project is considered to be the world's largest online classroom. It provides many opportunities for language practice. Students can play with language and the context and it is more informal. They can get involved in the writing process by posting blog entries, editing to other pages, creating their own e-portfolios. It engages students. In fact, technology is always engaging. When we use these tools in classes, it doesn't seem like a required assignment for students. It also helps us to motivate our shy students to participate more in our lessons and the willingness to create and share is a great opportunity to learn and participate.

This method provided students an opportunity to express their views and participate freely in the researching of the topics provided to them. The climate of the classroom was stress-free, cooperative, and encouraging. There was a lot of active ask and tell going around in the class. This approach provided the students to hone their creative skills, compete in a healthy manner, and come up every day with their own projects. These projects were in the form of presentations which provided a platform for the students to exhibit their hard work and at times, sheer luck in finding good material through interactive websites. This approach also provided for maximum student participation and student autonomy which resulted in a greater sense of responsibility towards learning and in a self motivated way.

It was found that many of the otherwise well-known Web 2.0 tools remained largely neglected by the students, as Table 4.1 suggests. The biggest cause of this is the teacher's neglect of this tremendously important and rich arena of possibilities. Most of the teachers currently prefer the 'good-old way' of teaching, the lecture method. Some are bold enough to occasionally use ICTs. But not many teachers have ventured into blogging and other options of making learning more student-exclusive. Therein lays the need to educate

teachers too about the reforms in the field of World Wide Web, and equip them with the knowledge of using them to the benefit of the learner. The researcher of the present study suggests a change in the teachers embracing constructivism towards a balanced and well-meant matrimony between constructivism and Web 2.0 tools to stay, if not ahead, then at least at par with the knowledgeable learners of today.