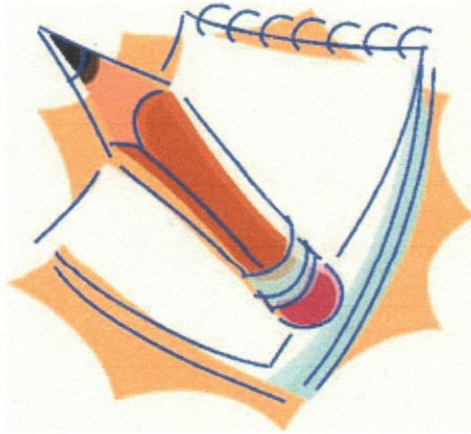


CHAPTER I

INTRODUCTION



CHAPTER -I

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1.0 INTRODUCTION

“The most profound impact of the Internet is its ability to support and expand the various aspects of social learning.”

John Seely Brown and Richard P. Adler

According to Daniels (2002) ICTs have become within a very short time, one of the basic building blocks of modern society. Many countries now regard understanding ICT and mastering the basic skills and concepts of ICT as part of the core of education, alongside reading, writing and numeracy. However, there appears to be a misconception that ICTs generally refers to ‘computers and computing related activities’. This is fortunately not the case, although computers and their application play a significant role in modern information management, other technologies and/or systems also comprise of the phenomenon that is commonly regarded as ICTs. Pelgrum and Law (2003) state that near the end of the 1980s, the term ‘computers’ was replaced by ‘IT’ (information technology) signifying a shift of focus from computing technology to the capacity to store and retrieve information. This was followed by the introduction of the term ‘ICT’ (information and communication technology) around 1992, when e-mail started to become available to the general public (Pelgrum, W.J., Law, N., 2003).

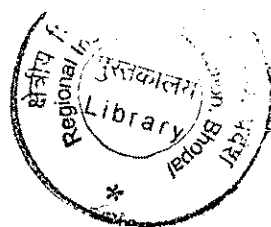
According to a **United Nations report (1999)** ICTs cover Internet service provision, telecommunications equipment and services, information technology equipment and services, media and broadcasting, libraries and documentation centres, commercial information providers, network-based information services, and other related information and communication activities. According to **UNESCO (2002)** information and communication technology (ICT) may be regarded as the combination of ‘Informatics technology’ with other related technology, specifically communication technology. The various kinds of ICT products available and having relevance to education, such as teleconferencing, email, audio conferencing, television lessons, radio broadcasts, interactive radio counselling, interactive voice response system, audiocassettes and CD ROMs etc have been used in education for different purposes (Sharma, 2003; Sanyal, 2001; Bhattacharya and Sharma, 2007)..



The field of education has been affected by ICTs, which have undoubtedly affected teaching, learning, and research. A great deal of research has proven the benefits to the quality of education (Al-Ansari, 2006). ICTs have the potential to innovate, accelerate, enrich, and deepen skills, to motivate and engage students, to help relate school experience to work practices, create economic viability for tomorrow's workers, as well as strengthening teaching and helping schools change. As Jhurree (2005) states much has been said and reported about the impact of technology, especially computers in education. Initially computers were used to teach computer programming but the development of the microprocessor in the early 1970s saw the introduction of affordable microcomputers into schools at a rapid rate. Computers and applications of technology became more pervasive in society which led to a concern about the need for computing skills in everyday life. Hepp, Hinostroza, Laval and Rehbein (2004) claim in their paper "Technology in Schools: Education, ICT and the Knowledge Society" that ICTs have been utilized in education ever since their inception, but they have not always been massively present. Although at that time computers have not been fully integrated in the learning of traditional subject matter, the commonly accepted rhetoric that education systems would need to prepare citizens for lifelong learning in an information society boosted interest in ICTs.

Today's world is a world of technology and education is not indifferent to it. We always tell our teachers to use ICT in education. Use of ICT in education depends on availability of hardware/software and the knowledge of using these hardware/ software. It can be said that the first part related to infrastructure is beginning to reach to the schools due to intervention of SSA and ICT@ schools project.

However, there is a need to concentrate on second part related to effective use of ICT in education. There are many situations encountered by a teacher while performing her task, the solutions of which can be found by the effective use of ICT in education. Take for example a rural biology teacher. She will have no problems telling her students what's and how's of agriculture. But the same topic may seem an uphill task for a teacher in an urban school, but for the aid of ICT. ICT has revolutionised education like never before. And with that it has made it simpler for students to understand, but more complex for a teacher used to the traditional chalk-and-talk teacher. Furthermore, teachers have often been provided with inadequate training for this task. Many approaches to teachers' professional development offer a *one size-fits-all approach* to technology integration when, in fact, teachers operate in *diverse contexts* of teaching and learning.



Faced with these challenges, how can teachers integrate technology into their teaching? An approach is needed that treats teaching as an interaction between what teachers know and how they apply what they know in the unique circumstances or contexts within their classrooms. There is no “one best way” to integrate technology into curriculum. Rather, integration efforts should be creatively designed or structured for particular subject matter ideas in specific classroom contexts. Honouring the idea, that teaching with technology is a complex, ill-structured task; it is proposed that understanding approaches to successful technology integration requires educators to develop new ways of comprehending and accommodating this complexity.

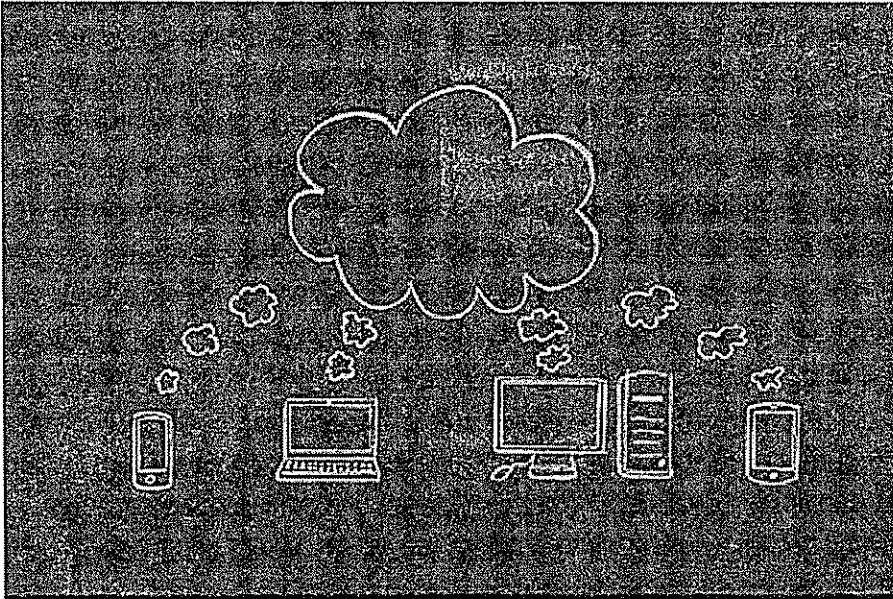
At the heart of good teaching with technology are three core components: **content, pedagogy, and technology**, plus the relationships among and between them. These three knowledge bases (content, pedagogy, and technology) form the core of the technology, pedagogy, and content knowledge (TPACK) framework. An overview of the framework is provided in the following section, though more detailed descriptions may be found elsewhere (e.g., Koehler, 2008; Mishra & Koehler, 2006). This perspective is consistent with that of other researchers and approaches that have attempted to extend Shulman’s idea of pedagogical content knowledge (PCK) to include educational technology.

The latest Avatar in the field of education is the **Web 2.0**. Web 2.0 refers to a perceived second generation of web-based applications and services and in particular the use of the web as a platform for **user-generated content** and web-based communities, including particularly social networking, wikis and folksonomies (O’Reilly, 2005).

Students communicate daily by texting and posting on Facebook pages and other social media avenues to stay in touch with friends. Teachers can help students make the connections between their recreational writing and the kinds of writing they need to become successful beyond the classroom.

There is no doubt that the Web 2.0 changed and transformed access to information and communication. It provides user-created content platform applications allowing users to contribute their knowledge in different formats like text, data, video and audio. This term was also developed and associated with other terms like Library 2.0, Learning 2.0, etc. These terms reflect the implementation of Web 2.0 in different domains. Garcia et al. (2009) noted that Web 2.0 has the potential for universities in developing new models of interaction and new forms of exciting education.

1.1 What is Web 2.0 Technology?



The term Web 2.0 was coined in 1999 to describe web sites that use technology beyond the static pages of earlier web sites. It is closely associated with Tim O'Reilly because of the O'Reilly Media Web 2.0 conference, which was held in late 2004. A Web 2.0 site may allow users to interact and collaborate with each other in a social media dialogue as creators of user-generated content in a virtual community, in contrast to websites where people are limited to the passive viewing of content. Examples of Web 2.0 include social networking sites, blogs, wikis, video sharing sites, hosted services, etc.

Web 2.0 websites allow users to do more than just retrieve information. By increasing what was already possible in "Web 1.0", they provide the user with more user-interface, software and storage facilities, all through their browser. This has been called "network as platform" computing. Major features of Web 2.0 include social networking sites, user created web sites, self-publishing platforms, tagging, and social bookmarking. Web 2.0 offers all users the same freedom to contribute.

1.1.1 The emerging field of web science

Web science is an emerging discipline, recently proposed by Tim Berners-Lee and his colleagues at the University of Southampton and MIT. Its goal is to understand the growth of the Web, its emerging topology, trends and patterns and to develop new scientific approaches to studying it (Berners-Lee *et al.*, 2006). Increasingly, given the importance of the Web as a social tool, there will be more research into the social and legal relationships behind information. To conclude we will try to proceed to synthesize from a general viewpoint the results obtained, taking into consideration the relevant aspects of the

literature. The results provided by both the quantitative and qualitative analysis of the literature obtained will be exposed especially regarding those aspects which are related to ICTs for Education and ICTs in Education. ICTs for education refers to the development of information and communications technology specifically for teaching/learning purposes, while the ICTs in education involves the adoption of general components of information and communication technologies in the teaching learning process.

The adoption and use of Web 2.0 in education have a positive impact on teaching, learning, and research. Web 2.0 can affect the delivery of education and enable wider access to the same. In addition, it will increase flexibility so that learners can access the education regardless of time and geographical barriers. It can influence the way students are taught and how they learn. It would provide the rich environment and motivation for teaching learning process which seems to have a profound impact on the process of learning in education by offering new possibilities for learners and teachers. These possibilities can have an impact on student performance and achievement. Similarly wider availability of best practices and best course material in education, which can be shared by means of Web 2.0, can foster better teaching and improved academic achievement of students.

Though there were many enlightening and informative studies were found online and in journals, which pointed out to the use of Web 2.0 in education of teachers, but there was very little space given to exploring how students use Web 2.0 and if at all they are aware of different Web 2.0 sites, especially in a developing country like India.

1.2 Rationale of the Study

Conventional teaching has emphasized content. For many years course have been written around textbooks. Teachers have taught through lectures and presentations interspersed with tutorials and learning activities designed to consolidate and rehearse the content. Contemporary settings are now favouring curricula that promote competency and performance. Curricula are starting to emphasize capabilities and to be concerned more with how the information will be used than with what the information is. Web 2.0 tools are able to provide strong support for all these requirements and there are now many outstanding examples of world class settings for competency and performance-based curricula that make sound use of the affordances of these technologies (Oliver, 2000).

The integration of information and communication technologies can help revitalize teachers and students. This can help to improve and develop the quality of education by

providing curricular support in difficult subject areas. To achieve these objectives, teachers need to be involved in collaborative projects and development of intervention change strategies, which would include teaching partnerships with ICT as a tool. According to Zhao and Cziko (2001) three conditions are necessary for teachers to introduce ICT into their classrooms: teachers should believe in the effectiveness of technology, teachers should believe that the use of technology will not cause any disturbances, and finally teachers should believe that they have control over technology.

Here are some reasons why to use Web 2.0 in our classes:

- * It increases the creativity. Any student can write, film 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's collaborative. We can easily create social networks and communities of internets. Wikipedia and Ning are the best examples for this and they are all free.

- * It promotes student centred 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.

- * It creates freedom and independence in learning which we can't find in our traditional education systems. Internet is available 24/7 and this encourages our students to share information to a greater extent which is not available in our classes. It also reminds us that learning is not only limited to school boundaries.

- * It helps our students to become familiar with technology by engaging.

- * We can find more authentic audience. When students do paper work, teachers or other students can see it but when it is online, many other people can read, comment and contribute, so Web 2.0 improves communication skills because students have a wider audience.

As teachers we need to find our own ways to use these technologies in our classes and consider the security issues and the copyright. It is a given that new technologies will come up but teachers will always be in the centre of education because our students will need our guidance more than ever. Teachers will be the ones who encourage and motivate the students to become better learners

Web 2.0 technologies provide teachers with new ways to engage students, and even allow student participation on a global level. By allowing students to use the technology tools of Web 2.0, teachers are giving students the opportunity to share what they learn with peers. Web 2.0 calls for major shifts in the way education is provided for students. One of the biggest shifts that Will Richardson points out in his book *Blogs, Wikis, Podcasts, and Other Powerful Web Tools for Classrooms* is the fact that education should be collaboratively constructed. This means that students, in a Web 2.0 classroom, are expected to collaborate with their peers. By making the shift to a Web 2.0 classroom, teachers can create a more open atmosphere where students are expected to stay engaged and participate in class discussions.

From the above discussion, it can be concluded that , as Web 2.0 is an emerging field, more so is its use in teaching, very few researches were found in the field if teaching through Web 2.0 no research was found in teaching through Web 2.0. Still no research was found till the date of submission regarding the teaching of Physics at school level. Hence the researcher has taken up the effort in this direction with a view to come up with methods to make web 2.0 tools moulded into the classroom teaching.

1.3 Statement of the Problem

The present study seeks answers to such questions as (i) what kind of and to what level are the students of class IX acquainted with Web 2.0 tools, and (ii) whether teaching through Web 2.0 tools if more effective than the traditional method of teaching, particularly in the Physics. The effectiveness was measured in terms of learning achievement.

The above two main questions constituting the problem of the present study have been investigated under the title

Effectiveness of Teaching through Web 2.0 Tools on Learning Achievement in Physics in Students of Class IX

1.4 Operational Definition of Terms

1. **Web 2.0:** A group of web-based applications and services serving as a platform for **user based content** and **web based communities**, including particularly social networking sites and wikis.
2. **Awareness of Web 2.0:** The score on achievement test specifically constructed for this purpose, based on Web 2.0 Technology
3. **Achievement in Physics:** The score obtained in the achievement test before and after administering various teaching approaches.

1.5 Objectives of the Study

The following were the objectives of the present study:

1. To find out the awareness of students of class IX about Web 2.0 tools.
2. To study the effectiveness of Web 2.0 tools on learning achievement of students of class IX in Physics.

1.6 Hypothesis of the study

The first objective was qualitative in nature and hence it needed no hypothesis.

The following hypothesis was formulated keeping in view the second objective which was quantitative in nature.

H_1 : 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.

1.7 Delimitations of the Study

The study has some unavoidable limitations arising out of the constraints of human and physical resources and the time of the investigator. In view of the research constraints under which the study was conducted, it remained confined to the following:

1. The study of awareness was delimited to the tools selected by the investigator only.
2. The study was delimited to the learning achievement of Class IX only.
3. The subject was delimited to Physics only.
4. Entire Physics syllabus was not considered. Only one chapter was taken into account.
5. The study was confined to the use of selected tools of Web 2.0 technology in teaching.
6. The study was delimited to a single school, i.e. Demonstration Multipurpose School, Bhopal.

