

CHAPTER II

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RELATED
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2.0 Introduction

The present chapter is devoted to the review of related literature. The studies reviewed were related to ICT in education, Web 2.0 Technology, previous researches in Web 2.0 tools and their integration in Education as well as Web 2.0 tools and Science teaching. The studies reviewed are presented below:

2.1 Studies Related To Web 2.0 And Teaching

Prescott(2014), in her paper ‘**Teaching style and attitudes towards Facebook as an educational tool**’ has delved into the topic of Facebook and Adult education. The aim of this study was to gain an understanding of how teaching staff at one UK university use Facebook, and their attitudes towards Facebook and online professionalism, in terms of the student–staff relationship. An online survey was developed that included the Principles of Adult Learning Scale to explore whether attitudes towards the use of Facebook as an academic tool differed between teaching staff with a teacher-centred style and teaching staff with a learning-centred style. This article offers insight into teaching staff attitudes towards the use of Facebook in an educational context. The results shed light on whether or not teaching style is related to attitudes towards use. Differences in attitude were found which indicate those with a teacher-centred style do not view online and offline identities blurring as much.

Prestige (2014), in her study titled ‘**A focus on students' use of Twitter-their interactions with each other, content and interface**’ found twitter as a very useful tool. This study offers new knowledge about conceptualising Twitter as a knowledge construction tool leveraged through mobile devices. A qualitative approach was conducted to investigate the learning outcomes of students’ use of Twitter when it was implemented as a learning device. The use of Twitter was investigated to provide insight into the ways students and instructors interacted in this environment, how the content was made active and how the functionality of the tool and its conceptualisation impedes and/or supports the learning process. The results indicate that student-initiated

interaction supported by instructor use of participatory pedagogies enables substantive dialogue through Twitter and that paraphrasing was the most common way students made learning active.

Stocks and Freddolino(2013), in their study titled '**Enhancing Computer-Mediated Teaching Through Interactivity: The Second Iteration of a World Wide Web-Based Graduate Social Work Course**' stated their objective to evaluate the effects of increasing opportunities for interactivity on student attitudes and behavior over two iterations of an Internet-based graduate social work research methods course. Method: In both iterations, lectures and class discussions were carried out over the Internet. In the second iteration, additional opportunities for interaction (self-tests, automated feedback, discussion questions, and links to an Internet discussion list) were added. Type and frequency of class participation were measured for both iterations as well as attitude toward the course. Results: Students in the second iteration participated in class list discussions more frequently than their first iteration counterparts. Students in the second iteration also tended to rate their experience more positively than did their counterparts in the first class. Conclusion: The incorporation of interactivity into a Web site served to make it easier to create an active learning environment for students.

Buzzard, Crittenden, Crittenden & McCarty (2013) had a different opinion on the web 2.0 technology in classroom. Today's college students often referred to as the "digital generation," use an impressive assortment of technological tools in a wide variety of ways. However, the findings reported here suggest that students prefer more traditional instructional technology for effective engagement and learning. Faculty members, however, prefer the use of course-learning technology offered by their universities or publishers. In addition to this potential mismatch between preferences of students and teachers, the research finds that there are vast differences in preferences and usage across disciplines, in particular, business and economics instructors and students having stronger technology preferences than instructors and students of the fine arts and life sciences.

Reich, Murnane and Willett(2012), published a paper titled **The state of Wiki Usage: Leveraging Web 2.0 Data Warehouses to Assess Quality and Equity in Online Learning Environments**'. To document wiki usage in U.S. K-12 settings, this study examined a representative sample drawn from a population of nearly 180,000 wikis. The authors measured the opportunities wikis provide for students to develop

21st-century skills such as expert thinking, complex communication, and new media literacy. The authors found four types of wiki usage: (a) trial wikis and teacher resource-sharing sites (40%), (b) teacher content-delivery sites (34%), (c) individual student assignments and portfolios (25%), and (d) collaborative student presentations and workspaces (1%). Wikis created in schools serving low-income students have fewer opportunities for 21st-century skill development and shorter lifetimes than wikis from schools serving affluent students. This study illustrates the exciting potential that Web 2.0 data warehouses offer for educational research.

Brown(2012) in her research titled ‘**Mathematics, Secondary Students With Disabilities, and Web 2.0 Technologies**’ explored the possibilities of incorporating web 2.0 tools in teaching Mathematics to disabled students at school level. The Internet and Web 2.0 technologies [i.e., (micro-) blogs, wikis, social networking sites, Voicethreads, etc.] allows today’s students to access mathematics and other general education curricula like never before. Since they already have the expertise in using the Internet, digital technologies, and other media compared to previous generations, it is imperative that teachers and students access these technologies to increase students’ understanding of and connections with the general education mathematics content. This article discussed

- (1) The mathematics performance of secondary students with disabilities;
- (2) Technologies available for use in secondary mathematics classrooms;
- (3) Web 2.0 tools that secondary students with disabilities can access and use in their mathematics classrooms and/or at home.

It suggested that it is the responsibility of the teachers and students to continually update their bookmarks with the tools that are appropriate for their specific needs. Finally, although the use of technology to support students’ mathematics and other content-area learning is encouraged, it should not make traditional instruction unessential. A balanced approach to traditional and technology instruction is probably the best approach.

Kassens - Noor(2012), in her paper ‘**Twitter as a teaching practice to enhance active and informal learning in higher education: The case of sustainable tweets**’ states that while most instructors have used Twitter for in-class discussions, this study

explores the teaching practice of Twitter as an active, informal, outside-of-class learning tool. Through a comparative experiment in a small classroom setting, this study asks whether the use of Twitter aids students in learning of a particular subject matter. And if so, in which learning contexts Twitter offers advantages over more traditional teaching methods. This exploratory study showed potential opportunities and pitfalls that Twitter could bring to the e-learning community in higher education.

Kidd(2012) titled his paper '**Utilising podcasts for learning and teaching: a review and ways forward for e-Learning cultures**'. In his article, he explores the usefulness of podcasts as a pedagogic tool. It situates the adoption of podcasts for learning and teaching within the context of a brief history of e-Learning itself and briefly reviews the suggestion that e-Learning and social media suit the construction of a new learner – the digital native. While treating much of the 'digital native' debate with some caution, the argument is made that podcasting – as one pedagogic choice among many – is a fruitful avenue for practitioner exploration. It goes on to develop both an ideal-type of podcasting and some suggestions for a 'podagogy' (Rosell-Aguilar, 2007). The article argues that podcasting is a simple, cheap, accessible and powerful means to explore learning opportunities through the adoption of social media.² At the same time, podcasting represents a useful starting point for institutions, senior managers and e-leaders to develop e-cultures among teaching practitioners, within a context of leadership for creativity.

Granitz and Koernig (2011) in their research titled **Web 2.0 and Marketing Education: Explanations and Experiential Applications**, say that although both experiential learning and Web 2.0 tools focus on creativity, sharing, and collaboration, sparse research has been published integrating a Web 2.0 paradigm with experiential learning in marketing. In this article, Web 2.0 concepts are explained. Web 2.0 is then positioned as a philosophy that can advance experiential learning through greater student construction of pedagogical materials, by bringing more of the outside world into the classroom and by modifying the role of the professor. Next, Web 2.0 principles are applied to create specific class marketing activities. Finally, using technology champions and incentives, strategies to motivate faculty adoption of the Web 2.0 paradigm are presented.

Meinecke, Smith, Lehmann-Willenbrock(2011) in their study titled **Developing Students as Global Learners “Groups in Our World” Blog** approach the subject through case study method. This case study investigates the use of online blogs as a teaching tool. A collaborative blog was implemented in parallel classes on group processes in the United States and Germany. Our goal was to connect American and German graduate students by helping them to talk about group communication and meeting behaviors. Collected data included transcripts of the messages, as well as students’ evaluations of the blog (collected at the end of the project). Quantitative analyses assessed students’ participation rates and the content of their postings. Qualitative analysis examined the use of the blog as a teaching and learning tool. The results showed that students interacted more on the blog than was required by the instructor. Students valued blogging as a new learning experience. We discuss the pedagogical implications of blog usage for teaching about groups and provide recommendations for instructors interested in using blogs in their own courses.

Bridges and Laché DeVaul(1999), in their study titled **Now That We Have It, What Do We Do with It?: Using the Web in the Classroom** explore the possible applications of Web tools in classroom. It proposed the use of various dot-coms and ‘www’s in the everyday classroom, and focused mostly on the ‘Explore’ part of 5Es. The study also gave illustrations how to develop a lesson plan using internet technologies for the purpose of more effective teaching. It provided a list of Web tools for the new age educators. Its findings were based on previous researches and concluded that web was a very effective technology in teaching-learning at school level.

Sawant (2013) pursued a research in the use of Web 2.0 in LIS. Purpose of the study was to investigate LIS teacher’s familiarity with web 2.0 concepts, tools and services and applications related to LIS education. The survey method was used. The data collection tool was a web questionnaire, which was created with the help of software provided by surveymonkey.com. It was found that LIS teachers have a low level of familiarity regarding the use of web 2.0. Most of the teachers use web 2.0 for video sharing via YouTube. Nearly half of teachers never used Wikis. The main problem in use of web 2.0 in teaching was the lack of training programmes organized by universities and other institutions for teachers to use/teach web 2.0 tools.

2.0 Critical Appraisal

There is significant debate over the alleged advantages and disadvantages of incorporating social software into mainstream education. This is compounded by the fact that there is very little reliable, original pedagogic research and evaluation evidence and that to date; much of the actual experimentation using social software within higher education has focused on particular specialist subject areas or research domains.

This literature review has sought to explore the role of ICT in education as we progress into the 21st century. In particular ICTs have impacted on educational practice in education to date in quite small ways but that the impact will grow considerably in years to come and that ICT will become a strong agent for change among many educational practices. Extrapolating current activities and practices, the continued use and development of ICTs within education will have a strong impact on ICT and teaching learning process; quality and accessibility of education; learning motivation, learning environment and ICT usage and academic performance.

One of the most in-depth reviews undertaken in the UK of the potential impact of social software on education has been carried out by the Nesta-funded FutureLab. Their recent report, *Social Software and Learning* (Owen *et al.*, 2006), reviews the emerging technologies and discusses them in the context of parallel, developing trends in education. These trends tend towards more open, personalised approaches in which the formal nature of human knowledge is under debate and where, within schools and colleges, there is a greater emphasis on lifelong learning and supporting the development of young people's skills in creativity and innovation.

Within higher education, wikis have been used at the University of Arizona's Learning Technologies Centre to help students on an information studies course who were enrolled remotely from across the USA. These students worked together to build a wiki-based glossary of technical terms they learned while on the course. At the State University of New York, the Geneseo Collaborative Writing Project deploys wikis for students to work together to interpret texts, author articles and essays, share ideas, and improve their research and communication skills collectively. Using wikis in this way provides the opportunity for students to reflect and comment on either their work or others. Wiki-style technology has

also been used in a tool developed at Oxford University to support teachers with ‘design for learning’.

Bryan Alexander (2006) describes social bookmarking experiments in some American educational research establishments and cites Harvard’s H₂O as an exemplar project. Alexander also believes that wikis can be useful writing tools that aid composition practice, and that blogs are particularly useful for allowing students to follow stories over a period of time and reviewing the changing nature of how they are commented on by various voices. In these scenarios, education is more like a conversation and learning content is something you perform some kind of operation on rather than ‘just’ reading it.

In the UK, Warwick University has provided easy to use blogging facilities to allow staff and students to create their own personal pages. The intention is that the system will have a variety of education-related uses such as developing essay plans, creating photo galleries and recording personal development.

But these developments are not without debate. Apart from concerns around learner attention (in an ‘always-on’ environment), identity, the emerging digital divide between those with access to the necessary equipment and skills and those who do not, there are other, specific tensions. While some experts focus on the idea of ‘self production’ to argue that learners find the process of learning more compelling when they are producers as much as consumers, others argue that the majority of learners are not interested in accessing, manipulating and broadcasting material. Indeed, there is serious concern that ‘techno-centric’ assumptions will obscure the fact that many young people are so lacking in motivation to engage with education that once these new technologies are integrated into the education environment, they will lose their initial attraction.

Firstly, folksonomies are starting to be used in scientific research environments. One example is the CombeChem work at Southampton University which involved the development of a formal ontology for laboratory work which was derived from a folksonomy based on established working practices within the laboratory. However, there is, to put it mildly, some debate about the role and applicability of folksonomies within formal knowledge management environments, not least because of the lack of semantic distinction between the uses of tags. A recent JISC report *Terminology services and technology* (Tudhope *et al.*, 2006) reviewed some of the characteristics of ‘social tagging’ systems and

the report notes that 'Few evaluative, systematic studies from professional circles in knowledge organisations, information science or semantic web communities have appeared to date' (p. 39).

Secondly, although evidence is only anecdotal, blogging seems to be becoming more popular with researchers of all disciplines in order to engage in peer debate, share early results or seek help on experimental issues. However, it has had no serious review of its use in higher education (Granitz, 2011). Meinecke et al (2011) argue that blogging tends to be used by younger researchers and that many of these make use of anonymous names to avoid being tracked back to their institutions. Some disciplines are so fast-moving, or of sufficient public interest, that this kind of quick publishing is required.

There has also been a trend towards collective blogs (Meinecke et al, 2011) such as ScienceBlogs and RealClimate, in which working scientists communicate with each other and the public, as well as blog-like, peer-reviewed sites such as Nature Protocols. These tools provide considerable scope to widen the audience for scientific papers and to assist in the process of public understanding of science and research. Indeed, Alison Ashlin and Richard Ladle (2006), argue that scientists need to get involved in the debates that are generated across the blogosphere where science discussions take place. These tools also have the potential to facilitate communication between researchers and practitioners who have left the university environment.

Thirdly, social tagging and bookmarking have also found a role in science. An example of this approach is CiteULike, a free service to help academics share, store, and organise the academic papers they are reading.

Finally, there have also been developments in scientific data mash-ups and the use of Web Services to link together different collections of experimental data (Sawant, 2013). Examples include AntBase and AntWeb, which use Web Services to bring together data on 12,000 ant species, and the USA-based water and environmental observatories project (Liu *et al.*, 2007). This corresponds to moves in recent years to open up experimental data and provide it to other researchers as part of the process of publication and the Murray-Rust Research Group is particularly well known for this. The E-bank project is also looking at integrating research experiment datasets into digital libraries.

However, opinion is divided over the extent to which social software tools are being used by the research community. Declan Butler, for a recent article in Nature (2005), conducted interviews with researchers working across science disciplines and concluded that social software applications are not being used as widely as they should in research, and that too many researchers see the formal publication of journal and other papers as the main means of communication with each other.

Though the idea of integrating education with Web is not very new, researches on the effectiveness of Web 2.0 tools is of recent origin. From the above review it is clear that not a lot of research has been done in this direction, especially in Science Education. The researchers also point out to the inevitable fact that Web 2.0 tools have been more used for non-educational purposes by learners than otherwise. Though in theory, and in social circles, Web 2.0 opens up a wide variety of possibilities, not much has been done to give them a concrete shape, and it is a very less researched upon topic. The studies have been mainly conducted in the west. And India is yet to gain prominence, not only in research level, but also in terms of the teacher's awareness about his exponentially growing technology. It is of eminent importance that today's teacher and students remain on the same page in terms of technology.

The present review indicates a dire need of research in this direction. This study is but a small step in fulfilling that need by exploring the possibilities of integrating teaching and Web 2.0 tools.