CHAPTER 2

TEACHING AND LEARNING IN WEB 2.0

2.1 INTRODUCTION

In the classical mode of teaching and learning as shown in Figure 2.1, the teacher delivers lectures and the students listen. Oral communication is the one and the only method of delivering lessons, using verbal components like the tempo of speech, voice dynamics, facial expressions, gestures and body movements. These tools are used to transfer information (which include emotions and aesthetic), to hold the attention of students, to impress and engage them in the learning process. The teacher interacts with the students directly by tracking their signs of interest and other emotions. At the end of the lesson, students deliver feedback on the subject, taught by the teacher. The feedback can be oral or written. Depending on the feedback, the teachers shape them by the process of teaching and learning.

Figure-2.1: Traditional Learning – Teacher Centric
The learning paradigm was shifted from the teacher centric instruction to online mediated learning environment with the innovative ICT revolution. This revolutionary learning method using media, Internet and Web is called, on line learning towards learner centric environment and is shown in Figure 2.2.

The innovations in Web 2.0, shown in Figure-2.3, are integrated with Virtual Learning Environment (VLE). Virtual Learning Environment (VLE) maximizes the utilization of Information and Communication Technology. The Information and Communication Technology (ICT) integrates with Web 2.0. It is not just adding a new user interface, into an existing Web page. It is about, attracting the users and changing the entire functions, concept, delivery mechanism and support. Web 2.0 is enhanced with steady network and efficient databases, so that, more people interact with them and use them to communicate with peers effectively. They are smart applications that are driven by user experiences and feedbacks. All these contribute towards enhancement of online learning. This endless connectivity and potential has given rise to creation of an open social order and system with interaction and collaboration. This is made possible through Information and Communication technology.

Figure-2.2: Collaborative Learning – Learner Centric
The access to Web 2.0 increases the ability, to publish or broadcast information free, on the Internet. This has facilitated the openness which is associated with values of tolerance, individual freedom, lifelong learning, participation, empowerment and cooperation. Such innovations and values have given rise to the open innovations, open standards, open paradigm and open architecture [23].

![Web 2.0 and its components](image)

**Figure-2.3: Web 2.0 and its components towards Teaching and Learning**

The development of open source is characterized by zero cost, modularity and regenerative capacity of Web 2.0 with higher level of interaction, deeper and more user experience. Some of the tools that are available in Web 2.0 are as follows:

- Wikis.
- Blogs.
- Personalization
- Streaming media like audio and video formats.
- Open access to open source and open content.
Teaching and learning are compliments of one another which rely on the tools and techniques that are used in the process. The above tools and techniques enabled by Web 2.0 are used in the educational environment. In the olden era, it was hierarchical portals and restricted groups of content creators. In a later advancement of Web 2.0, the development of search engines with more interaction and better learning space made a student to learn at his/her own pace, time and place. The above tools help to divide the race, age, gender, culture and geographical boundaries. Web 2.0 helps in managing, organizing and repurposing the information and knowledge sharing, that is wanted by the people of all ages.

Web 2.0 tools appear promising and valuable in educational settings. However, more care and attention has to be taken for pedagogy 2.0 to emerge and establish itself.

Many e-learning websites commonly employ a number of Web 2.0 tools with rich features:

1. **Wikis:** Wiki is a website that allows users to add or update the contents from a website. Eg: Wikipedia is a educational web site which supports collaborative work and shares educational information among students.

2. **Blogs:** A blog is a way of distributing knowledge by more than one author, by adding comments in the content, or receiving new entries from Really Simple Syndication (RSS) readers.

3. **RSS (Really Simple Syndication):** This is used for sharing information on a collective or collaborative basis and shares information using RSS Syndication rules. An RSS document
which is called a "feed" or "channel" that includes full or summarized text, metadata for publishing dates and authorship.

4. **Online Office**: It is also known as Web desktop which allows applications to run on a browser. Online office includes word processors, data sheets and multimedia presentations. E.g. Google Docs.

5. **Social book marking**: Social book marking is used, for saving book marks to a public web site and tagging them with key words. It is used, for organizing information and categorizing resources. It gives the user, the significance and the opportunity of expressing different perspectives, on information and resources. Thus through informal organizational structures which allow users to find the existing community or create a new community of users. It continues to influence the ongoing evolution of folksonomies and common tags for resources. The information and resources that are stored as tags can be shared with peers and colleagues. Social book marking simplifies the distribution of reference lists, bibliographies, papers and other resources among the peers and the students.

6. **Shared Videos**: Video sharing is a software that enables a user to publish and Share his/her video content on the Web, which has a capability of editing video online and also provide an effective way for the students to communicate, demonstrate and deliver learning.
7. **Pod casting:** Pod casting is a fusion of two words, I pod and broadcasting. It has revolutionized education by updating the content, addressing multiple methods and also allows anywhere / anytime delivery of instructional content. It does not replace traditional method of learning but certainly facilitates and accelerates the learning process.

8. **Video Online:** It acts as an open source of learning, which allow educators to distribute their educational content videos, for distance learning or coaching sessions.

9. **Social Networks:** A type of social network, primarily for the educational environment, used as Communities of Practice, for instance ICUBE Education, India’s social networking education Website for preschool & primary students[50].

### 2.2 EXTENSIBLE SUPPORT TOWARDS TEACHING AND LEARNING

Learning Management Systems (LMS) that integrates, geographically dispersed students in asynchronous educational interactions are widely available for a number of years. Many higher educational institutions are discovering new models of teaching and learning. They are required to meet the needs of a new generation of students. Today younger generations seek greater autonomy, connectivity and socio experiential process of learning and activities. Affordability like sharing, collaboration, customization and personalization has given rise to a number of alternative paradigms towards learning.
Downes (2005) came out with an idea of Personal Learning Environment (PLE) which describes the learning environment is an approach and not an application. It protects and supports, multiple levels of socializing and encourages the development of communities of inquiry [101]. PLE is an example of such a learning environment, where in, students manage their own learning by selecting, integrating and using various software tools and services. It provides contextually appropriate toolsets. It enables individuals to adjust and choose the options, based on their needs and circumstances rather than technology which would drive the learning process.

The current generation of LMS allows each student to have his /her personal view of the course he/she is enrolled in. It does not accommodate the social connectivity tools and personal profile spaces that the students might choose. Many e-learning systems, simply replicate traditional models of learning and teaching, in the online environment. In contrast, Web 2.0 tools and technologies offer, rich opportunities to move away from the highly-centralized industrial model of learning of the past decade. It is by achieving individual empowerment of students, through designs that focus on collaborative, networked communication and interaction [9].

In addition to PLE the alternative mode of pedagogical approach is an advantage of Web 2.0 affordability. It is a knowledge building paradigm, which was proposed by Scardamalia and Bereiter (2003), based on the dynamics of how communities work. It postulates a less hierarchical form of learning based on small teams, sharing, content creation and the use of ICT. It helps to access, create, share and continually improve the ideas of learning. Learning processes evoke a number of possible scenarios. Sfard (1998) came out with two different types of learning, which are the acquisition and participation. The former views, the learning as a process of acquiring chunks of information, typically delivered by a teacher. The latter views the learning
as a process of participating in, various cultural practices and shared learning activities. According to the participation methods, cognition and knowledge are distributed over both individuals and their environments [101].

The participation of learning would be more, by using social software tools. The idea perceived by Lave & Wenger (1991) & Vygotsky (1978) The students engage themselves in the process of social interaction, dialogue and sharing, all of which are linked to socio-cultural theory [101].

However, students are capable of developing, creating and generating novel ideas, concepts and knowledge. The ultimate goal of learning is to enable the form of creativity. Current views of learning, regard the teacher-centered classroom as obsolete curriculum. It would take the shape of student centered environment, wherein the students can take control of their own learning, make connections with peers, and produce new insights and ideas through inquiry. Paavola and Hakkarainen (2005), proposed the knowledge creation metaphor of learning, which builds upon common elements of Bereiter’s (2002) theory of knowledge building, Engeström’s (1987, 1999) theory of expansive learning, and Nonaka and Takeuchi’s (1995) model of knowledge creation[77,39,50,42].

In order to overcome the limitations of existing models of teaching and learning, the present system would exploit more fully the affordability and potentiality for connectivity. It enables social software tools, to depict how an individual might operate and learn in a networked society by having access to ideas, resources and communities, and engage primarily, in the knowledge creation rather than on consumption.
2.3 PEDAGOGY 2.0-TEACHING AND LEARNING FOR THE KNOWLEDGE AGE

Pedagogy 2.0 shows the individual’s link construction with communities and networks in the process of knowledge sharing and understanding and is shown in Figure 2.4. The interdependence between ideas, individuals, communities and information networks, supported by technology, underpin the demands of Pedagogy 2.0. It offers a range of wide choices to individuals to suit their personal needs and goals. This reiterates the core principles of the Web 2.0 era which would link the minds of communities and ideas, which promote personalization, collaboration and creativity leading to a chain of knowledge creation [12,57].

Figure-2.4 Key Components of Pedagogy 2.0
Pedagogy is a framework which aims to focus on desired learning outcomes in order to exploit more fully affordable and potential for connectivity, enabled by Web 2.0 and social software tools. The learner’s choice, preferences and learning strategies characterize the effective learning environment. It is based on Teacher, Content, Communication, Process Learning & Resources, Social Interaction, Peers, Personalization, Students, Communities and Technology which has to be addressed as follows:

1. **Teacher:** For the teacher, technology with Web 2.0 can be used as teacher’s knowledge-management tool and media for multiple sides’ dialogue. For the students, Web 2.0 can be used as convenient way for learning from course designed by the teacher and an open platform for discussion among classmates and teacher.

2. **Content:** The content must be in the form of small granular units, as the thinking and cognition has a wide variety of learner-generated resources. It enables the students to create, share and revise their ideas of learning process.

3. **Communication:** The students should be offered an open, social, peer-to-peer and multi-faceted forms of visual, verbal and auditory communications, using different media.

4. **Social Interaction:** It aims to create opportunities for learning social media and to promote social interaction and a shift from “Knowledge-receiving” role to a “Knowledge-creating” role.

5. **Process of Learning & Resources:** The learning process should be contextualized, reflective, iterate, dynamic and
inquiry based and must have a variety of resources in rich media forms.

6. **Scaffolds:** It provides a wide variety of temporary platforms for students to share their views and knowledge across the network of experts, teachers, peers and virtual communities.

7. **Personalization:** With respect to the learning processes, teaching approaches and methods and resources in social computing, provides a collection of tools that are effective in educational practices at different levels. An increase in the personalization of learning paths is widely acknowledged. Learners are becoming active stakeholders who are empowered to shape their own learning spaces and resources (by actively creating content) and to define their own learning pace.

8. **Peers – Students & Communities:** Web2.0 applications are enablers of collaborative learning process, where peers and more knowledgeable actors function as scaffolds for the development of new abilities, and competences by the learners.

9. **Technology:** With respect to the e-learning paradigm, the Web2.0 approach is far less technology centered and far more learner-centered. This shift of focus carries important changes in the way, the teaching is understood. Teachers are seen more and more as “scaffolding” the one who guides and help the students to learn and perform (cognitive) activities which they could not master themselves.

Some of social software used for pedagogical applications as stated by Meijas (2005) are given in Table 2.1 [17].
Table 2.1: Social Software uses and its Pedagogical Applications

<table>
<thead>
<tr>
<th>Social Software’s</th>
<th>Examples</th>
<th>Pedagogical applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discourse Facilitations</td>
<td>Messenger, Email,</td>
<td>Communication in the form of verbal and typed, engaging multiple global communities,</td>
</tr>
<tr>
<td>Systems</td>
<td>Bulletin boards,</td>
<td>socialization, peer-to-peer exchange and feedback.</td>
</tr>
<tr>
<td></td>
<td>Discussion boards,</td>
<td></td>
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<tr>
<td></td>
<td>Google chat</td>
<td></td>
</tr>
<tr>
<td>Content Management</td>
<td>Blogs, Wikis</td>
<td>Creation and dissemination of ideas, collaborative writing,</td>
</tr>
<tr>
<td>Systems</td>
<td></td>
<td>publishing and peer review</td>
</tr>
<tr>
<td>Learning Management</td>
<td>Atutor, Moodle,</td>
<td>Group work, Communication distribution and sharing of resources.</td>
</tr>
<tr>
<td>Systems</td>
<td>Claroline</td>
<td></td>
</tr>
<tr>
<td>Relationship Management</td>
<td>Orkut, Face book</td>
<td>Establishment of social contacts, connectivity, spaces for communication and creation of</td>
</tr>
<tr>
<td>System</td>
<td></td>
<td>identity.</td>
</tr>
</tbody>
</table>

Social networks are the remaking of the society, because they enable us to have more relationships. Relationships give us more diverse kinds of information, and the information leads to more dynamic action. As per the idea of Kirschner, Strijbos, Kreijns, & Beers (2004) the generic model consists of ten key components: the Teacher, Student, Communities Content, Communication, Process Learning & Resources, Social Interaction, Peers, Personalization and Technology [13]. In an educational system, there exists, a combination of pedagogical, social, and technological components In an educational context, pedagogy often refers to the teaching strategies, techniques or approaches. The teachers use to deliver instruction to facilitate learning. Pedagogical design is an ongoing process, which cannot be simply
be pre-determined before a lesson. In addition to the selection of proper content or activities, a pedagogical design must deal with the use of these resources in an effective way, in order to manifold student’s cognitive structure during learning process. In terms of pedagogical design, a learning environment ought to, support and satisfy the needs and learning intentions of the students with different backgrounds. Chen (2003), Kirschner et al(2004) are of the view, it should also use the various learning resources and activities which support students learning, and allow the teachers to facilitate learning[14].According to Jonassen,Peck & Wilson(1999)and Wilson &Lowry(2000) social activities are crucial in the daily life. People naturally live and work in various communities, in which they turn to others for help when they encounter problems[15,113]. In many situations, students use stand-alone computers, which only allow them to interact with embedded learning resources. With the advent of technological development in the field of Computer-Mediated Communication (CMC), computers are connected world-wide.Khine,Yeap&Tan(2003) states that social activities become more convenient and flexible through the support of CMC [83]. Students may still use computers individually. However, they have the opportunity to work collaboratively in solving the real-life problem. Uribe,Klein&Sullivan(2003) are of the view that computer-Supported Collaborative Learning (CSCL) has shown tremendous effects on the students’ performance, in solving the problem-based tasks [45]. The social design of a learning environment must provide a safe and comfortable space, where the learners are willing to share information and they can also easily communicate with one another. The technological component becomes more prominent in a technology-enhanced learning environment, where many learning activities are conducted through the support of a computer. According to Salmon(2004), an online learning environment must be available at all times, and access must be convenient and fast[29]. Availability and easy accessibility are initial requirements for an effective online learning environment. In addition, the human–computer
interface design is crucial for the same, as it determines the usability of a technology-based learning environment. Wang & Cheung (2003) are of the view that the interface design of a computer program ought to focus on ease of learning, ease of use and aesthetics [83]. Ease of learning is critical for beginners, while ease of use becomes more important for the users, to gain experience over time. Certainly, the interface must be attractive, so that it can motivate and engage learners.

2.4 SOCIAL INTERACTION

Social interaction has many motivations, but most social activity revet back to assessing people and determining, how much we can trust them. Each interaction is a learning opportunity, to gauge how much and under what conditions, we can trust others.

Pedagogy 2.0 makes use of the affordability of social software tools and networking. Thus it leads to connectivity, communication, participation and development of dynamic communities of learning, at any time and place.

Connectivism describes the learning as a process of creating a network of personal knowledge, a view that is congruent with the ways in which people engage in socialization and interaction in the Web 2.0. It is a world which links knowledge, minds, communities and ideas that promotes personalization, collaboration and creativity. It leads to the knowledge creation. Such process lead, to an interdependence of ideas, individuals, communities and information networks, all supported by technology [75].
2.5 LEARNER'S CHOICE AND CONTROL

Social software enables choice and allows learners to make decisions. The learners can choose which tools are best suited for their goals and needs. They can find out the connection and social interaction of choosing which resources and sites, to subscribe and contribute for the same. They can also find which tools to use, and how and where to use them. Text alone is not always preferred mode of communication. The Web-based multimedia production and distribution tools, incorporates rich audio, photo and video capabilities. They provide two-way experiences for users, while empowering them as "prosumers" of the multimedia content. Recent research reveals, a growing appreciation of the learner’s control over the whole learning process. Evidence suggests that one can improve learning effectiveness, by giving the learner, the control and responsibility. This is the foundation for such approaches as problem-based and inquiry-based learning, as mentioned by Desharnais & Limson (2007). It is a central theme to the grand vision of Pedagogy 2.0, where learners have the freedom to decide as to how to engage in personally meaningful learning, through connection, collaboration and shared knowledge building [16].

2.6 PRINCIPLES UNDERLYING IN PEDAGOGY 2.0

As social software tools become ubiquitous, several questions are being asked by educators and researchers who observe the changing trends and the power of Web 2.0 for connecting teachers, learners, technology and resources. As stated by Bryant (2006) the responsiveness and possibilities of what, some call ‘e-Learning 2.0’ is based on the shared environments and micro content, wherein the learning can be achieved [72,24]. It would be to reiterate the conventional principles of social constructivist learning, which tell us that the effective learning is conversational in nature, and that it necessitates a social dimension, including communication, dialogue and
shared activity. The benefits of network connections with peers and others is the facility of communication, through the instant messaging and social networking. They can provide an impetus for the inquiry-based approaches and collaborations. Other aspects of social software can also be embedded in the learner-centered pedagogical frameworks. Apart from the social and conversational affordability of social software tools, there are further social constructivist principles that apply to Pedagogy 2.0. Learning occurs as a socio-cultural system, within which many learners interact to create a collective activity, framed by cultural constraints and practices. Typically, learners receive scaffolding through the help of others (peers, teachers, virtual community sources and technology). Social software can provide the building blocks for an environment that enables multiple forms of support, as it allows people to connect, interact and share ideas in a fluid way. The pod casting technology and software tools allow easy broadcasting of audio files which can support community building and enable the dissemination of learner-generated content. In turn, it acts as a catalyst and support for the authentic, peer-to-peer learning as per McLaughlin & Lee (2007). The essential component of the effective learning is, the active participation with others, including peers, instructors, experts, students and the community. Collaboration and cooperation have long been recognized as ingredients of effective pedagogy [30]. Wikis and collaborative writing and editing tools such as Write board, Google Docs and Spreadsheets are useful extensions to the conventional writing approaches. Linked with this principle of collaborative production, there is the additional facility of sharing and publishing the artifacts produced. It also results in the learning activity, inviting feedback from peers. Williams & Jacobs(2004) confirms that by publishing and presenting their work to a wide audience, learners benefit from the opportunity to appropriate new ideas and transform their own understanding through reflection [18]. Researchers recognize, that the communication is often shaped by different tools and technologies. As viewed
by Farmer (2004), that the blogs offer “new opportunities in the development of social, cognitive and teacher presence online” [17]. In examining the potential for social software tools to support social constructivism, Farmer is guided by Garrison, Archer and Anderson’s (2003) framework for the creation of a successful community of inquiry consisting of teachers and students transacting with the specific purpose of facilitating, constructing and validating understanding and developing capabilities which will lead to further learning.[17]. A fourth link between current social software applications and the established theory is, evident in the principles of active participation, learner self-direction and personal meaning construction. The primary goal of learning is that learners should learn and become capable of making their own decisions with respect to their learning. For instance, though they are often viewed negatively, social networking sites and the “blogosphere” are nevertheless social interactive spaces. The learners can choose to explore facets of their own identity, as well as engage in the personal[58] self-expression, dialogue and knowledge sharing with others. By engaging in these forms of conversation and interaction, learners explore and develop facets of their own identity and personal learning styles. They are afforded the ability to shape their own informal learning trajectories as well as becoming actively involved in those of others.