

Blended Learning: A Flexible e-Learning component in Higher Education



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ABSTRACT

e-Learning is a method that uses online learning resources to facilitate information sharing outside the constraints of time and place among a network of people. It is a student-centred approach that emphasizes the importance of peer-to-peer interactions which combines self-study with continuous interactions to promote learning.

In this research, it is discussed and analysed how to enhance the higher education system with the use of Information and Communication Technology (ICT). The aim is to highlight the use of synchronous and asynchronous learning systems with the time changes. This paper suggests that the two learning types should be integrated and utilized to support student needs within an online learning environment called blended learning. Blended learning creates strong online learning environment when it integrates Face-to-Face, synchronous conversations and asynchronous Interactions together. It is also investigated how the e-learning education system can create Knowledge Society with the help of Knowledge Management System (KMS) and facilitate the interaction through Computer-Mediated Communication (CMC) in higher education. It also points out the re-definition of the educational process through modern ICT infrastructure. The paper concludes by overturning the teacher-student relation and the distinguished role of the pedagogical framework for the effective exploitation of e-learning education in an institution of higher education.

While e-Learning can be made flexible by using Learning Management System (LMS), Learning Management System can be enhanced by adding open source technology to it. Open Source Software (OSS) is a software application which is used to plan, implement, and assess a specific learning process. A learning management system may also provide students with the ability to use interactive features such as threaded discussions, video conferencing, and discussion forums.

Keywords - Synchronous Education and Asynchronous Education, Blended Learning, LMS, CMC, Knowledge Society, KMS

1. INTRODUCTION

With the emergence and widespread use of technology, education has expanded to cater the diverse needs of learners. The impressive development of the Information and Communication Technologies (ICT) has huge impact on transforming education. e-Learning is one of the best outcomes of this on-going journey of ICT development. Depending on the mode of delivery the e-learning can be categorized as synchronous and asynchronous. Synchronous learning is supported by video conferencing and chat whereas Asynchronous learning is facilitated by e-mail, discussion boards etc. The aim of this paper is to discuss the need of synchronous and asynchronous learning in knowledge transformation. These two techniques compensate each other by playing its inevitable role in various learning needs. Each one has its own uniqueness as well as challenges.

There are three types of communication important for building and sustaining e-learning communities: Content-related communication, Planning of tasks, and Social support. Firstly, communication related to the course content is essential for learning. e-Learners need to be able to ask questions and share information and ideas. Secondly, support for planning tasks is essential, especially when learners produce some kind of product, such as an assignment, in collaboration with peers. Finally, social support relations are desirable for creating an atmosphere that fosters collaborative learning.

Type of Exchange	Example
<i>Content Related</i>	Ask or answer a content-related question Share information Express an idea or thought
<i>Planning of Task</i>	Plan work, allocate tasks, coordinate joint efforts, or review drafts Negotiate and resolve conflicts
<i>Social Support</i>	Express companionship, emotional support, or advice Provide support when problems arise (such as when having technical difficulties) Talk about things other than class work

Table 1: Different Types of Communication

2. ICT: A POSITIVE CATALYST IN HIGHER EDUCATION

The advent of Information and Communication Technologies (ICTs) has added a new dimension to teaching, learning and research. ICTs enhance the quality of education by integrating information with digital communication medium. ICTs are transformational tools which convert the information to digitized information in more interactive and innovative way. The use of ICT revitalized the teaching assistants and learners. ICT emphasizes on how the students should learn so that the content delivery can be shifted from “teacher centred” forms of delivery to “student-centred” forms of delivery. ICT fosters collaborative learning through e-Learning. e- Learning includes a wide variety of learning strategies and ICT applications for exchanging information and gaining knowledge.

Such ICT applications include television and radio; Compact Discs (CDs) and Digital Versatile Discs (DVDs), audio and video conferencing, mobile technologies; web-based technologies; and electronic learning platforms. Mobile e-Learning (sometimes called 'm-Learning') is a new way to learn, using small portable computers such as handheld computers, two-way messaging pagers, Internet-enabled cell phones, as well as hybrid devices that combine two or more of these devices into one. These technologies have enormous potential as learning tools.

3. DEFINING SYNCHRONOUS AND ASYNCHRONOUS E-LEARNING

Synchronous learning allows the faculties to take classes by creating an online class room environment. This online classroom can be managed by developing virtual classrooms, conducting audio and video conferences, sharing white board, application sharing, encouraging chatting and instant messaging. Virtual classrooms create a virtual place in computers where the entire student can attain the same lecture at the same time. To conduct the classes in the virtual classroom environment the attendance of students are recorded, Q & A sessions are conducted and assignments are given where students can work together online. Faculties can demonstrate the use of software applications by sharing it among remote learners. The on-line interaction becomes very informative when the learners and the teacher assistants share their ideas and information by drawing, pointing and highlighting the concepts in shared white boards. Apart from that conducting audio and videoconferencing allows the learners to login at the same time to partake in the discussion. Instant messaging and chatting, has the potential to support e-learners in the development of learning communities.

Asynchronous Learning can be termed as self-paced learning. The main idea behind this learning is to enhance lifelong learning which is not restricted by time and space limitations. The learner should be motivated enough to take up and complete the course. In this case the self-motivation plays a vital role as the learner

continues the learning process without any direct guidance from the teacher assistant. Meanwhile if doubts need to be clarified the learner can post the message on common discussion boards and later on the learner can read the message and again post the queries if needed. The advantage here is the learner can take its own time to communicate. Because of this freedom, many learners opt for asynchronous e-learning. There is another way to communicate that is communication through e-mail where the communication takes place through sending or receiving messages. We can say that the content of asynchronous outcomes is expected to be more constructive as the e-learners take their own time to think, rethink and frame the ideas.

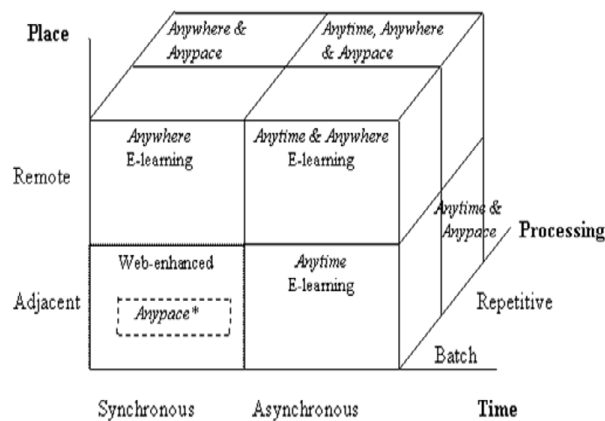


Figure 1: Three Dimensional e-Learning Model

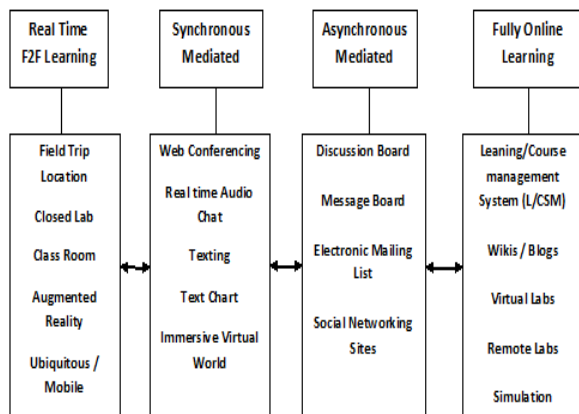


Figure 2: Different Types of Learning Process

4. COMPARATIVE STUDY OF REAL-TIME F2F LEARNING & E-LEARNING METHODS

Developments in Information and Communication Technologies (ICTs) have impacted all sectors of society, including the education sector. In higher education, application of ICTs in form of e-learning is already changing teaching and learning processes. Selection between face to face learning (F2F) and e-learning (Synchronous, Asynchronous and Online) depends on various factors.

From the comparative study we can say that each learning method contribute in their own way towards learning process. Choosing a particular learning method depends on two factors - content of the material and the learners who are going to be benefited out of that. So before opting for a particular method a proper need assessment needs to be done which will be followed by consumer environment creation and content delivery.

The comparative study is depicted below:

Fact ors	Face-to-Face	Fully Online	Synchr onous	Asynchron ous
Establishment Cost	To deliver F-to-F lecture a minimum setup is needed which incurs cost.	Only technical setup required. No need of infrastructural setup.	Only technical setup required. No need of infrastructure.	No need of infrastructural setup. Anywhere learning can take place.
Time	The faculty and learner must be present at the same time.	The faculty and learner must be present at the same time.	The faculty and learner must be present at the same time.	Anytime learning can happen.
Geographic Location	Same Place.	Remote location.	Remote location.	Any location depends on learners' choice.

Flexibility	As time and place are the major factors involved here so it is not flexible.	The learner has to login at a particular time .It does not provide flexibility.	Synchronous learning offers a kind of flexibility by avoiding the place constraint.	Asynchronous learning offers the highest flexibility because it does not take time and place into consideration.
Rigidity	It is very rigid in nature. It is time bound and it does not give relaxation to the learner.	It is time bound.	Rigidity wise it is mild.	Most of them opt for this learning because of its nature i.e.; flexibility and learner's preference i.e. learn according to learner's convenience. Less rigid.

Table 1: Comparative Study of various learning Techniques

5. ADVANTAGES OF USING BOTH ASYNCHRONOUS & SYNCHRONOUS TECHNOLOGIES

5.1 Synchronous Learning:

Synchronous learning environments support learning and teaching and offer students and teachers with multiple ways of interacting, sharing, and the ability to collaborate and ask questions in real-time through synchronous learning technologies.

Student Engagement

Synchronous technology types include virtual worlds and chat rooms. In order to successfully participate in these environment students must be engaged in student-learning, which is the most important learner characteristic a student can demonstrate.

Synchronous Collaboration

The higher a learner perceives the level of collaboration the more satisfied they are with e-

learning overall. In both the traditional and online classroom environments, interaction and collaboration are identified as a major factor in successful learning outcomes. In an online learning environment the teacher's role becomes more about facilitating, guiding, and motivating the learner and can be successfully achieved through feedback and collaboration.

Instructional Pacing

Online learning environments provide flexibility and offer students personalized learning opportunities Students learning online have the opportunity to express their thoughts without judgment or interruptions Online learning experiences can be developed to provide advanced educational opportunities for the learning needs of individual students.

5.2 Asynchronous Learning

In an asynchronous learning environment students are able to actively participate in their own learning, giving them the opportunity to interact with their peers, provide peer feedback, and reflect on the status of their personal learning goals and outcomes. In many learning environments there are learning activities and expectations that require students to create, synthesize, explain, and apply the content or skills being taught. Asynchronous technologies support learning and allow more time for student reflection, collaboration, and student-to-student interactions.

Student Portfolios

Electronic portfolios (e-folios) demonstrate a student's skill and knowledge level over a specific topic. Online learners often create e-folios that combine text, images, presentations, video, audio, links, and a discussion space to demonstrate mastery of a specific content area or subject matter. Many institutions have begun viewing e-folios as a replacement for traditional classroom high stake assessments. E-folios help facilitate the exchange of ideas, discourse, and subject area feedback between student and teacher creating a meaningful learning experience for the student. Due to the success of these e-folios some higher education institutions have also started using them to document and archive student's academic careers.

Asynchronous Collaboration

A sense of community is necessary to sustain the educational experience over time and this can be achieved through collaborative learning communities. In this learning environment the teacher's role is still about developing and facilitating a student's learning experiences. This facilitation can be successfully achieved through asynchronous collaboration, allowing students to thoughtfully consider learning objectives because they have the time to critically synthesize their learning.

Individualized Pacing

Asynchronous learning technologies have been defined as personalized learning tools. With these tools, the teacher can assess what students understand and adapt future course assignments to facilitate a higher level and more in-depth understanding of the content. These online learning environments create an opportunity for online students to become highly self-reflective.

6. BLENDED LEARNING

The integration of synchronous and asynchronous learning types is utilized to support student needs within an online learning environment is called blended learning. It supports different components

1. The first class should always be Face-to-Face (or at least Real-Time) if possible
2. Assessments should be real-time and the choice of F2F or online should be available.
3. There must be multiple times throughout the class which is synchronously conducted.
4. It should be Differentiated the Content Delivery with Discussion Methods.

Blended Learning equation:

Face-to-Face + Synchronous Conversations + Asynchronous Interactions = Strong Online Learning Environment

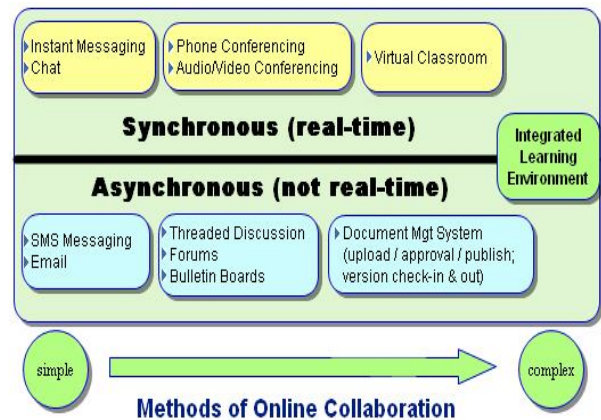


Figure 3: Blended Learning Process

7. COMPUTER-MEDIATED COMMUNICATION

The initiation of Computer mediated communication enhanced time management in various ways. With the help of CMC, the travel time and meeting place constraint for interaction are minimized in a large scale. CMC is just like a common electronic area where the participants share their ideas and information in written messages. But through written communication the tone of the text and the body language of the communicator cannot be measured. Therefore, this non-verbal part is considered as a challenge in Computer mediated communication. In traditional learning process, the participation of the students is quite high whereas in the e-Learning process the participation of the students is difficult to measure.

In Synchronous CMC (S-CMC) all the participants are committed to be present at the chat or videoconferencing at the same time. So it can be said that synchronous learning supports greater participation and interactivity. In the contrary the asynchronous learning gives the freedom to learn according to learners' choice of time and place, so the Asynchronous CMC (A-CMC) takes place through e-mail communication, discussion boards where the participants can interact according to their convenience. So the quality of participation and interaction of the two major dimensions of CMC are less.

8. CREATING KNOWLEDGE SOCIETY USING KNOWLEDGE MANAGEMENT SYSTEM (KMS)

Knowledge management System refers to an IT based system for managing knowledge in organizations for supporting creation, capture, storage and dissemination of information. It can comprise a part of a Knowledge Management initiative. Knowledge management systems refer to any kind of IT system that stores and retrieves knowledge, improves collaboration, locates knowledge sources, mines repositories for hidden knowledge, captures and uses knowledge, or in some other way enhances the KM process.

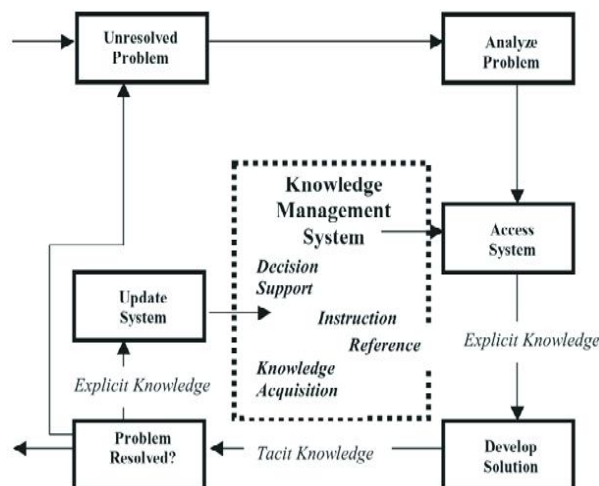


Figure 4: Knowledge Management System Life Cycle

The idea of a KM system is to enable students to have ready access to the study documents base of facts, sources of information, and solutions. KMS systems deal with information (although Knowledge Management as a discipline may extend beyond the information centric aspect of any system) so they are a class of information system and may build on, or utilize other information sources. Features of a KMS can be included as follows:

The KMS offers integrated services to deploy KM instruments for networks of participants in knowledge-intensive business processes along the entire knowledge life cycle.

The KMS can be used for a wide range of cooperative, collaborative, adhocracy and hierarchy communities, virtual organizations, societies and other virtual networks, to manage media contents; activities, interactions and work-flows purposes; projects; works, networks, departments, privileges, roles, participants and other active users in order to extract and generate new knowledge and to enhance, leverage and transfer in new outcomes of knowledge providing new services using new formats and interfaces and different communication channels. The KMS can be associated to Open Source Software, and Open Standards, Open Protocols and Open Knowledge licenses, initiatives and policies.

9. THE ROLE OF LMS (LEARNING MANAGEMENT SYSTEM) IN BUILDING KNOWLEDGE SOCIETY

To manage the e- Learning process systematically the “Learning Management Systems” (LMSs) are introduced. The function of LMSs focuses mainly into two areas:

- Administration Area
- Content Delivery Process

Administration Area:

- It enrolls and Keeps track of student names who opted for the online course
- It allows the e-Learners to access the course materials.
- Once the learning is over, the assessment takes place to grade the learners.

Content Delivery Process:

- E-tutors teach the learners in virtual environment. Arrangement of the online classes in virtual environment is taken care of by LMSs.
- Learning Content Management Systems (LCMS) helps creating learning materials.
- LCMS reuse, locate, deliver, manage, and improve learning content.

The LMS allows the teachers and learners to access the course materials. So the knowledge base can be framed in four different ways:

- Student-content: This is basically considered as independent way of study.

- **Teacher-content:** Teachers refer the content and the content can be refined as per the need.
- **Student-student:** This encourages collaborative learning.
- **Student-teacher:** It clarifies various queries generated by students to the teachers.

The LMS helps in designing and refining the structures learning resources, delivering the course content in synchronous or asynchronous mode, clarifying the queries and generating new ideas and information. All these functionalities add up to create a good knowledge base. Developing a knowledge society and strengthening it is a continuous activity in Learning Management System.

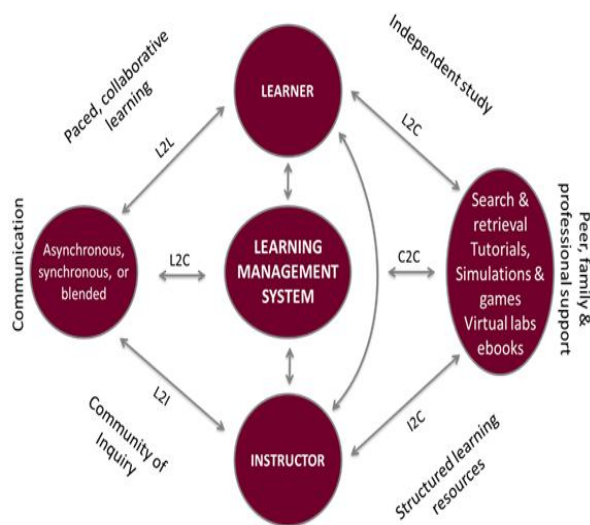


Diagram 5: How does the learning take place in online learning process?

10. OPEN-SOURCE SOFTWARE (OSS)

Open Source Software, whose source code is published and made available to the public, enabling anyone to copy, modify and redistribute the source code without paying royalties or fees. The copyright holder provides the rights to study, change and distribute the software for free to anyone and for any purpose. Open-source software is very often developed in a public, in a collaborative manner. Open-source software is the most prominent example of open-source development and often compared to (technically

defined) user-generated content or (legally defined) open-content movements. Open source code evolves through community cooperation. These communities are composed of individual programmers, users as well as very large companies. Advantages of OSS are discussed below:-

Free Redistribution: The license does not restrict any party from selling or giving away the software as a component of an aggregate software distribution containing programs from several different sources.

Source Code: The OSS includes source code, and allows distribution in source code as well as in a compiled form.

Derived Works: Most licenses allow modifications and derived works, and allow them to be distributed under the same terms as the license of the original software. The license does not restrict anyone from making use of the program in a specific field of endeavour.

Not specific to a Product: The rights attached to the program do not depend on the program's being part of a particular software distribution. If the program is extracted from that distribution and used or distributed within the terms of the program's license, all parties to whom the program is redistributed have the same rights as those that are granted in conjunction with the original software distribution.

Not Restrict Other Software: The license does not place restrictions on other software that is distributed along with the licensed software.

Technology-Neutral: Most of OSS is technology neutral.

11. CONTRIBUTION OF OPEN SOURCE TECHNOLOGY IN LMS

Open Source Technology gives a greater height to e-learning. Open Source Software (OSS) can be easily accessed, downloaded by the learners. The advantage of using Open Source software over Proprietary software is that it can be easily managed and it can be customized according to the need of the learner. Some of the widely used open-source e-learning software programs are Claroline and Moodle. Organisations can add extra functionality after downloading the open source software at their own pace rather than

waiting for another development cycle to get it. The level of flexibility of open code architecture allows OSS developers to create an application that works the way instructors teach and students' learn. Users now can interact in the most effective way for teaching and learning, allowing the software to change rather than changing their way of conducting instruction and learning. E-learning OSS provides a framework for collaborative development. This collaborative development helps in

- Designing and developing the course content.
- As the teacher assistant and the learners get freedom to customize the software. So, the effective delivery of course content is achieved at the maximum level.
- The collaborative learning encourages divergent ideas.

12. CONCLUSION

It is clear from the research that the technologies associated with synchronous and asynchronous learning can improve the quality of student-teacher interactions, foster increased student engagement, and improve learning outcomes. Some students like a synchronous online learning environment because they need face-to-face instruction. For other students, an asynchronous online learning environment provides more time to consider all sides of an issue before offering their own educated input. Both learning types have very unique benefits and limitations to online learning.

The paper demonstrates that the asynchronous and synchronous e-learning complements each other. Combined approach of these two types of e-learning supports different learning activities, provides a platform for collaborative learning and also helps the learners and teaching assistants to exchange information. This paper suggests that the two learning types should be integrated and utilized to support student needs within an online learning environment called blended learning.

E-learning provides social support. The study shows that the synchronous learning encourages personal participation through chatting, instant

messaging, conferencing and asynchronous e-learning addresses complex issues by reflective participation through e-mail, discussion boards, blogs, etc. The e-learning education sector has become more adaptable and flexible by Open Source Software (OSS). OSS works along with Learning Management System (LMS) for better management of online learning process. The paper concludes by overturning the teacher-student relation and the distinguished role of the pedagogical framework for the effective exploitation of e-learning education in an institution of tertiary education.

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