



Analysing E-learning: An Experience with Synchronous Tools

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Abstract

E-learning Market in India is growing at steady pace. Since its inception into Indian education sector, it is recognized as an alternative for traditional distance education and continued education mode. E-learning is easy to join, readily available to everyone, cost effective, has time flexibility and provides quick and easy way for knowledge up-gradation. Synchronous E-learning is a mode of e-learning where a trainee and a trainer join through ICT and interact with each other through video-conferencing. This mode of learning is very popular among trainees as it gives them a way to interact and solve their doubts with experts. Through this paper, authors explain the tools available in India for this method of learning and will discuss its relevance and pedagogy. Authors also wish to share their experience on attending one such week long module using synchronous e-learning. In this paper authors will also discuss the advantages, limitations and scope of improvements in synchronous e-learning.

Keywords: *Synchronous E-Learning, tools, A-View, online short term course.*

1. Introduction

In a dynamic environment where learning has become essential to every organization's competitiveness, the rise of e-learning has precipitated a dramatic change in the way continuing education was perceived.

Digital media play a pivotal role in this transformation. They enable necessary changes – not only to how people learn within organizations but also to how organizations themselves can become much-heralded “learning organizations.”[1]

Demand is growing fast for new learning approaches that support performance and can be initiated and accessed on the fly from the workplace. Supply, on the other hand, has not kept up. This is largely because learners, and the professionals who initiate learning, lack sufficient experience in integrating modern media. This is largely due to the unavailability of modes of cost effective continuing education tools in Indian perspective. With limited resources and due to professional commitments, it becomes very difficult for a professional to take a break from his existing routine and join a short term course to upgrade his knowledge and skills. To overcome the demands of the new technologies, E-learning comes in handy with both asynchronous and synchronous modes.

Synchronous training modules promote and integrate interaction which eliminates the isolation that asynchronous online training lacks [3]. As the former promotes collaboration, and fosters a sense of community, it is widely accepted by trainees. In the corporate world, where effective team work among distributed workforce is considered especially with high value, synchronous learning can help eLearning professionals develop significantly engaging online training courses.[3]

Synchronous Learning is the term which describes the form of the education, Learning and instructions that occur at same time but not at the same place [2]. The synchronous learning involves various forms of digital and online learning techniques. Through these learning techniques the learner can learn from instructors, colleagues, and peer in real time through video conferencing, web conferencing, chat, instant messaging and audio content sharing.



Before the adoption of the internet based learning, synchronous learning was called as either the distance learning or distance education. Where distance learning uses the techniques like radio or closed circuit television systems which involves lots of funding to have class rooms equipped with the audio visual technologies, [2] later when the resources were required for the higher education to form the specialized courses, the asynchronous – learning technology for students with specialized expertise.

Synchronous learning is live, real-time (and usually scheduled), facilitated instruction and learning-oriented interaction. In contrary to the asynchronous leaning this is more effective and easy to adapt which is accessed by students on demand [4]. Synchronous e-Learning is about utilizing tools to achieve effective training and education.

2. Root of the Synchronous E learning

The root of the Synchronous e-Learning derive from the following influences:

- Classrooms
- Media
- Conferences/meetings
- Presentations/Discussions
- Trainings

Virtual Classrooms were developed for highly interactive form of synchronous e learning to eliminate the classrooms practices. The classroom helps to provide a similar context where the learner and the trainer can easily interact. Trainers are also focussing on the mass media techniques for presenting effective and simulating E learning. E learning is being used in the form of talk shows, expert panels using various high end devices like layered audios, serialized episodes etc. The conferences or meetings are taken place in the big organisations to transfer the knowledge and to interact with the other members in difficult department, therefore the adoption of audio/video conferencing act as a means to reproduce the face to face interaction. Also the trainings which was earlier held at the campuses or places located at remote areas, now it can be possible at the same premise through various Synchronous tools. Synchronous e-Learning is most fundamentally about connecting people through technology to enhance competencies and promote understanding. Used appropriately, synchronous e-Learning tools permit instructional designers and facilitators to create truly engaging learning experiences. Designed effectively, synchronous e-Learning energizes and enables participants to enhance competencies and develop their skills, attitudes and behaviours. [4]

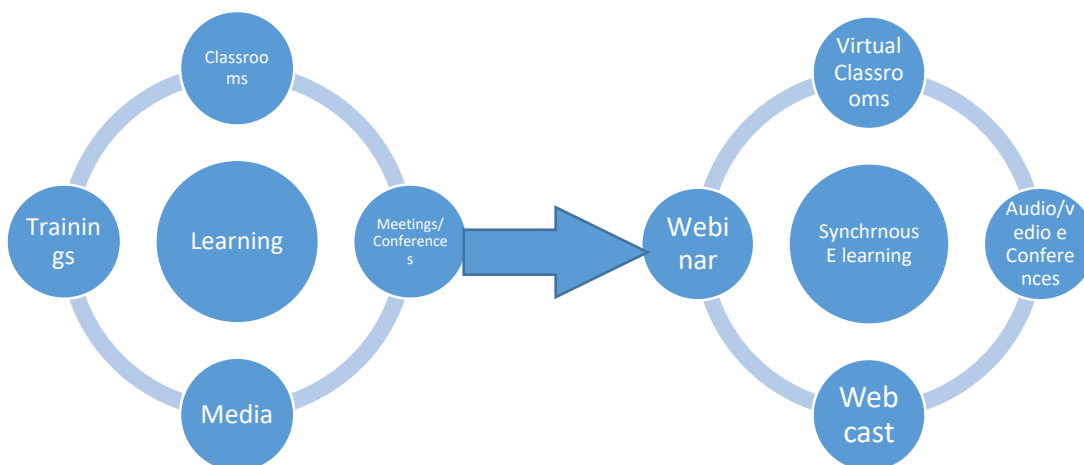


Fig 1 Root of Learning

Fig 1.1 Synchronous E learning techniques

3. Tools of the Synchronous E learning

The various tools which are available for the synchronous E Learning. It becomes easy for the Learner to adapt these tools and learn.

3.1. **Video conferencing:** It is the platform where the two way discussion and learning is possible between two or more locations. This tool is effective when the learner and trainer fix the timings and the discussion topics in advance where in the trainer is all the time available for the learner to explain and solve the doubts there and then. It is little expensive because the high internet bandwidth is required to make the conference more interactive and effective. Also the availability of the trainer and learner is a time consuming process. The basic advantage is all the presentations and the audio discussions or demonstrations can be easily recorded for the further referencing. It becomes easy for the learner to relearn the topics.

3.2. **Web conferencing:** It is a tool which provides live audio / video communication between two or more locations for conferences, meetings and presentations via internet. In this conferencing it is important for the participant to login via internet in the web conference and stay connected to all other members. It is an interactive medium where all the members can easily discuss and present the various outcomes. It is effective only when the high speed of internet is available. It is little expensive and time consuming.

3.3. **Audio conferencing:** Audio conference is the tool used for the audio conference between two or more persons sitting in different locations. It involves two or more parties using the devices like phone or computer which allow the sound to be sent and received, for the purpose of communication simultaneously. The devices are either connected to the telephone line or the internet. [6]. This tool of the synchronous learning is cost effective because sitting at your place the learner can interact with the trainer and also the saves lot of time because it is easily accessible . The only drawback with this tool is it is not reliable because both the parties had to depend on the service providers for the speed of the internet.

3.4. **Chat:** Chat is also one of the tool for the Synchronous E learning as with the help of chat forums the groups can be created where the discussion can be taken place. Discussion takes place only in the form of the text, images and animated content. There is no audio/video messages that are being exchanged. It is very cost effective and can be reused as per the requirements.

3.5. **Instant messaging :** It is a tool of E learning in which messaging can be one of the learning technique where the data or content is exchanged in form of the text or images via internet or telephone line using the devices like computer or mobile phones . It is not at all mandatory that both the parties should be present for the interaction at the same time. It is very cheap to share the data using the instant messaging. The content can be used as many times as required.

3.6. **White boarding:** White boarding is a teacher directed process designed to probe a student's prior understanding, and to construct strategies to bring the student to a more complete comprehension. Students can and are encouraged to participate in the discussions, but it is still teacher directed. That direction may be so subtle as to be invisible, but it is, nevertheless, a key ingredient in the process. The whiteboard should contain just enough information to demonstrate understanding.[7] White boarding involves representations, it is expensive to use this tool.

3.7. **Application sharing:** It is a tools which is used for sharing the resources which is used to develop the documents and the demonstrations which will help all the users and the members to learn and interact on the

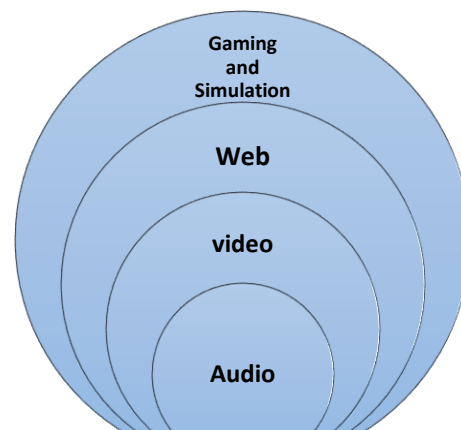


Figure 2: Authors view on e-conferencing tools



same platform. It is expensive due to the fast and high speed connection. It is effective with the audio/video conferencing [5]

Following are the two tables i.e. table 1 and table 2 which show a comparison between various synchronous learning tools. Table 1 presents a comparison based as a perception of a common trainee based on usability and limitations while using these tools. On the other hand table 2 presents a comparison of various tools as perceived from an organizer’s or coordinators perspective.

Table 1: Comparison of the synchronous e-learning tools w.r.t. the usability by end-user and limitations to adopt [5]

SNO	Tool	Usability	Limitations
1	Video Conferencing	It is used for the real time interaction , doubt solving and taking queries	Expensive as the quality defer because of the poor bandwidth
2	Audio Conferencing	Interaction is done in a group with many people around	The interactive can be deferred if the members of the group are from other distant countries
3	Chat	Information can be easily shared with text, images and animations	Heavy documents and long messages cannot be shared. It is cheap but time consuming
4	Instant Messaging	It is used for immediate announcements. it is 1:1 or 1:n interaction mode	Special applications and devices are required
5	White board training	It is linked with the audio-video conference , mainly used for the demonstrations , presentations etc.	It is expensive as it depends on the internet bandwidth speed and also it is less effective since sometimes it is difficult to strictly follow the schedule when you speak extempore.
6	Application Sharing	It is mainly used for the application Demo’s	Completely depended on the internet
7	Web conferencing	Helps in downloading documents , presentations and live demo’s	Presence of members is required, time constraint.

Table 2: Authors compilation of comparison of e-learning tools in relation to the adaptability and Effectiveness for coordinator or organizer.

SNO	Tool	Effective	Reusability	Interactive	Easy to Adapt	A/V Quality	Cost Effective
1	Video Conferencing	Yes	Yes	Yes	Yes	No	No
2	Audio Conferencing	Yes	Yes	No	Yes	No	Yes
3	Chat	Yes	Yes	Yes	Yes	Yes	Yes
4	Instant Messaging	No	Yes	No	Yes	Yes	Yes
5	White board training	Yes	No	Yes	Yes	No	No
6	Application Sharing	Yes	Yes	No	No	No	No
7	Web conferencing	Yes	No	Yes	Yes	No	No



4. Advantages of Synchronous E Learning [3][4]

- 4.1. **Cost effective:** Synchronous E Learning is very much effective because the trainer and the learner don't have to travel, they have to be present at the same device for the interaction using the devices and high speed internet.
- 4.2. **Convenient:** Learning becomes convenient and easy when it is delivered and gained in a comfortable environment. Using the various tools of the synchronous Learning technique learning becomes easy, effective and convenient for the learner as well as for the trainer.
- 4.3. **Provides immediate feedback:** Simultaneous interaction helps the learner to get the immediate reply from the trainer and trainer gets the feedback for session.
- 4.4. **Highly motivating :** This source of learning is highly motivating when all the members sitting in different locations are keen to only learn , with the presence of other members in the closed group motivates to gain knowledge from the trainer.
- 4.5. **Interactive:** All the discussions using the tools audio/web or video conferencing are always interactive, as all the members are present in the group to response, discuss and reply.
- 4.6. **Understanding is more :** In comparison to the Asynchronous E learning tools, Synchronous E learning tools make the learner understanding better because Asynchronous tools involves presentations , forums and Live chatting forums where the trainer is not always present to solve the queries and also reliability is limited.
- 4.7. **Doubt sessions:** Doubt sessions are more effective in the Synchronous as the trainer and learner are present for discussion at the same time. The trainer replies to the queries as soon as the Learner ask the same.
- 4.8. **Recordable:** All the presentations and the live sessions can be recorded and downloaded for the further reference.
- 4.9. **Timely delivery:** The trainer and learner follow the time constraint, as all the members who are in the conference need to be present.
- 4.10. **Reusability:** All the contents which are downloaded and recorded can be used for the further reference by the learner or by the trainer.

5. Limitations of Synchronous E learning

- 5.1. **Technology based:** It is based on the simple technology where the devices that are being used for the Synchronous E learning should be enabled with the applications, sending and receiving voice. It is user friendly but the devices can be little expensive. The adaptability with these devices and applications require little knowledge and hands on experience to start connected.
- 5.2. **High speed internet:** The devices with the high speed connection of internet is required for the disturbance free communication and break free downloading.
- 5.3. **Time constraints:** All the members from both the different locations need to be present at the same time when the conference, meetings or presentations have to start.
- 5.4. **Careful planning:** Before initiating these sessions in the Learning, trainer should be careful in planning that need to be done, to decide the number of members present, the time and no of days the training or conference would be held.
- 5.5. **Depends on quality of trainer:** All the learning through the synchronous Learning is completely dependent on the trainer, so if the trainer is not fully equipped in the subject the training would not be at its best.

6. An evaluation of a synchronous learning experience

National Institute of Technical Teachers' Training, Chandigarh is a pioneer in organizing short term courses for benefits of technical teachers all over India. A short term course on wireless communication was organized by NITTTTR in last week of May 2017. Course was organized at Chandigarh city, in the state of Punjab, India, but was well coordinated and was attended by hundreds of participants along 18 remote centres through use of



E-learning tools. Authors attended this course at a remote centre in New Delhi and are sharing their observation and comments about it.

6.1 Learning through ICT (A-view experience)

E-learning modules are not new in education world but it is not yet exposed to the majority of population. Whenever you start working with a new technology or methodology, it is always exciting initially. Same happens with e-learning. The concept of learning from the best minds in respective domains, without travelling to them, in itself is exciting but sustainability is a key factor for its success. There are several tools available which are used for synchronous e-learning including iVocalize, Civi etc. but NITTR and all other government funded training institutes prefer A-View [8][9][10]. A-View is a versatile e-learning and video conferencing tool developed by IIT-Bombay and Amrita Vidyapeetham under NMEICT project of Ministry of Human Resource and Development, Government of India. It provides all the facilities of live streaming, desktop view, live chat on web, live interaction between various centres and video session recording. Every remote centre need to install A-view which is available free of cost on internet. For a synchronous learning session, a webcam and speakers are also required at every remote centre. Throughout the week long training program, experience with A-view was good but audio quality and broadband speed may offer constraints. Some trainers use presentations and hence their desktop is visible to remote stations and their voice explains the concept. Some trainers, on the other hand prefer the good old 'chalk and talk' technique in which they explain concepts while writing on touchpads or using simple text editors. In both ways, trainee is well connected with trainer.

6.2 Hands-on experience

When training is based on certain software tools, it becomes interesting to see how a trainer maintains his pace of teaching and how trainees react to it. Software hands-on training is different from a regular lecture. While understanding a concept as explained by the trainer, a trainee need to practise that using the software tool. This practice has to be in two different modes. First he has to repeat the command as viewed in the demonstration given by the trainer, and second he has to apply that tool in the practical application of a problem or situation as prescribed by the trainer or as perceived by his own intelligence. During the mentioned training on wireless networks, hands-on session were organized on NS2 and NS3 tools with scripts and codes to be written in programming languages like C or Python. Any trainee who has a prior knowledge of using these software tools and is attending this workshop for solving certain problems or is trying to explore new application areas of networking using these software tools, found himself in very hospitable environment. But for a trainee who is new, or has a very minimum interaction with these tools has to face a lot of challenges. It certainly not easy to learn and consume a series of commands while learning them in a span of few hours, and finding that the trainer is not there to solve the minor glitches you have ignored. Understandably, a trainer cannot focus on all his trainees and solve their problems, especially when they are geographically dispersed. Trainees have to be ready to rely on sources other than the online session to cover the technical part for a better understanding.

6.3 Interaction with trainers

A major disadvantage with asynchronous form of e-learning is the minimal interaction of trainee and trainer. Where synchronous form of e-learning offers a regular interaction of a trainee with trainer, in an asynchronous e-learning, a trainee is either having minimum interaction through e-mail or open forums, or does not have interaction at all. Video courses are recorded once and are delivered hundreds of times till its usability is maintained. In a synchronous module, a trainee is directly interacting with his trainer, through video conferencing which helps to clear doubts and seeking guidance. Authors observed that sometimes it becomes difficult for a trainer to coordinate between various remote training locations, so to avoid chaos in live streamed environment, they postpone the interactive session or questions and answers sessions till the session is over. From a coordinators or a trainers' point of view, it may be a good strategy but trainees sometimes feels left out on various issues. Trainees have to wait for the one hour or two hour session to get over and only then the interaction may start. Though most tools allow remote centres to continuously providing live



responses to trainer using online-chat and messages which everyone can read in the chat room but it is observed that most trainers do avoid reading text messages until the session is over.

6.4 Interaction of trainees with other remote centres

In any synchronous module on e-learning, where many remote centres are connected to a single session, its very important to know viewpoints of people studying at other regional centres. A video conferencing session, of a trainer and a trainee is no doubt helpful for both, but latter learns more if he is able to understand the viewpoint of his fellow mates. This was observed in the mentioned training session, where every training session was followed by a question answer part and authors felt that some questions asked by other remote centres were really interesting and knowledgeable. This directly puts everyone in a tight spot where you feel the need to explore new ideas and discuss matters of common interest with peer group.

6.5 Role of coordinators of remote centres

After attending a week long workshop through e-learning, where many aspects opened up for study, one effort which goes mostly unnoticed is of the remote centre coordinator. As a coordinator, your job is to not only ensure smooth conduct of sessions (which is visible effort), but also to coordinate pre-training and post-training work. Few required features of job profile of an e-learning coordinator are as follows:

- Identify the knowledge requirement of staff or aspirants and propose the e-learning training modules accordingly.
- Organize staff development activity in form of e-learning which brings maximum knowledge using minimum resources.
- Act as a liaison officer and identify and arrange the physical infrastructure for the forthcoming trainings.
- Attend all training session and take feedback from trainees. Forwarding feedback taken from trainees and sharing it with e-learning resource centre.
- Preparing reports regularly about all e-learning modules and knowledge output from them.
- Ensuring audio video media availability and smooth functioning of all electronic devices.
- In many Indian Universities and education institutes, it is noted that availability of funds is limited and setting up of system for a synchronous e-learning module can be a difficult job for a coordinator.

6. Authors view on advantages and limitations of synchronous e-learning workshop

Synchronous e-learning is definitely bringing a wave of change in Indian continuing education perspective. India is a country of big population but limited resources. There is a huge section of students who are either withdraw from regular school and college education to fulfil their family needs or even if they complete their education, but cannot update it due to professional and economic reasons.

Advantages: Through e-learning, updation of knowledge and skill set is easy, economical, flexible, viable and fast. Using synchronous e-learning, a candidate can directly interact with his trainer using video conferencing tools like A-view and can have a feel of a classroom session. This method is affordable as it require a very nominal fee and candidate need not go to any college or university while compromising on his regular professional work. This method provides a direct interaction of an expert with trainees from across geographical locations without need for anyone to travel.

Limitations: while attending, one such session, authors observed that it has minor areas of improvement. One area is content. While delivery method is generally good and acceptable at every standard, but the content has to be regularly upgraded and updated otherwise it will not serve its basic purpose. Secondly, since training session goes on live, in case a candidate has an Internet broadband connectivity problem, which is not unusual in India or other developing countries, it ensures that the session is lost for ever. Through many conferencing tools provide ways of recording sessions, but they take a trainee into an asynchronous mode. Thirdly, authors also experienced that learning concepts are relatively easy in e-learning environment but working with practical tools and software can be troublesome.



7. Conclusion

Through this paper, authors are trying to share their personal experience with synchronous e-learning. Observations have clearly been recorded and authors would like to acknowledge the potential of synchronous e-learning in updation of knowledge of employees, knowledge seekers, researchers, teachers and students. Although it has its own set of limitations, but considering the advantages it provides especially in case of short term courses to update knowledge, interactive sessions with experienced faculty and pace of learning a module, authors believe the disadvantages are negligible and can be rectified. Authors also believe that there is lot of scope of improvement in area of synchronous e-learning in India, considering the popularity of similar modules run by many Universities around the world. Certainly Indian government is putting a lot of effort in this direction but similar modules are available in very limited number from non-government institutes. We see a scope of investigation and research in the area of MOOCs from non-government institutes.

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