Research Paper

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Study of User Preferences amongst online learning modes

Computer Science

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ABSTRACT

Online learning is a rapidly growing tool to enhance the mode of education especially in higher educational institutions. Online Learning opportunities are usually accessed via the internet; though other technologies are also used in this technology. Many universities have started using online learning as a tool to enhance learning among students. The acceptance of online learning category by higher institutions and their students is somewhat unknown .In the growing trend of online learning, the much preferred assumption is that the asynchronous learning mode which gives good flexibility is the preferred mode. As online learning starts to gain popularity, consideration needs to be given to the delivery system to be used, the instructors and also students who will be using the system. This paper deals with identifying the preferred category in online learning; where-in a survey is used in arriving at the key findings with appropriate methods and approaches.

Introduction:

Online learning popularly called as e-Learning is learning that is enabled or supported by the use of digital tools and content. It typically involves some form of interactivity, which may include online interaction between the learner and their teacher or peers [4]. Learning Online or E-learning or internet based learning has emerged as one of the fastest moving trends in today's education. The usage of online learning has seen a rapid growth in developed countries like United States (US) and the United Kingdom (UK). In a developing country like India, computer usage in higher education institutions has positive impact and development in learning. There is a need for institutions to expose and train their instructors before adopting an online learning system. In short, all stakeholders should be taken into consideration [2].

Need for Study:

In today's growing technology driven learning techniques, there is phenomenal usage of asynchronous learning category and its associated tools. While there are many tools based on synchronous category of learning, the students, educational institutions and instructors primary usage has been only on asynchronous learning. Will there be a need for and usage of synchronous learning category and its tools? Would the students and instructors ever use them? This question has led to this detailed study of this paper.

Research Objective:

The main objective of this study is to evaluate and determine key data points which could be utilized by instructors or institutions to identify tools (either synchronous / asynchronous learning categories) for a given target audience so as to maximize their usage.

Learning Online – Categories of Learning

Learning online is an approach to administering education and training through the use of modern technology. Video conferencing, shared chat, and digital course materials make it possible for entire classes to be held in the cloud rather than in a lecture hall.

In order to make online learning effective one should know the subject matter well and the courses provided should be appealing to all learning styles to facilitate contact. The Platform should be easy to navigate and fully functional and course documents should be available to every student enrolled to set and communicate the clear goals of the course.

The modern day e-learning environment can be divided into two categories: synchronous learning and asynchronous learning.

Synchronous Learning

e-learning software or online courses can easily interact with fellow students and their teachers during the course. The classes are placed at particular intervals that must be completed according to a specific schedule [5]. Online learning applications can be personalized for the individual learner's needs, provide communication tools that foster collaborative work, and offer anywhere/anytime transfer of information.

Common Features of Synchronous Learning include:

The common features of this learning model include Shared Whiteboard (The environment allows multiple students/instructors to collaborate on a discussion with text and drawings), Virtual Classrooms (Instructors lead classes that are broadcasted in real time to remote students over an internet connection) and Scheduled Online Examinations (More like a traditional approach, exams are scheduled to be completed at a specific time and date, but are administrated online). Some of the common examples include listening to a live radio broadcast, watching live a television broadcast, audio/video conferencing, Internet telephony, online lectures and two-way live satellite broadcast [5].

Advantages of Synchronous Learning

Synchronous learning permits immediate feedback and detailed collaboration both with instructors and fellow students. Various real-time activities can be carried out, providing continuous motivation for students. Synchronous online learning promotes a sense of community between the students and teachers. Teaching quality is another advantage. Because the physical barriers of distance are eliminated, it becomes possible to deliver educational sessions from the most reputable and knowledgeable instructors, anywhere in the world [3].

Disadvantages of Synchronous Learning

Synchronous learning requires a confidence level with technology, which some students may lack. The reality of different time zones is a factor that should be considered. It may be very convenient for students in one time zone to participate, but students, several time zones away may encounter scheduling issues. Bandwidth may be a consideration, especially when collaborative technologies are being used along with live video feeds, demands reliable broadband connections. While this may not be an issue in many areas, it may not be readily available or affordable to some students, and a dial-up line may prove inadequate very quickly [3].

The programs that have used synchronous models have not often used voice as part of the learning model. Often this is because teleconferencing between students and instructors is trou-

blesome and quite expensive. However, new solutions feature built in Voice Over Internet (VoIP), which does away with the need for a telephone, enables interaction over an Internet-connected computer equipped with a microphone and speakers (or headset). This added voice component provides increased human interaction that improves results with increased meaning and understanding

Impact of Synchronous Learning
Studies indicate that interactions between students and instructors as well as student-to-student interaction greatly enhance distance education by improving student attitudes and motivation, increasing completion of coursework, enabling better performance on tests, and facilitating greater retention. Moreover, increased interaction provides a sense of community for students.

Asynchronous Learning
Asynchronous learning can be carried out even while the student is offline. Asynchronous online learning involves coursework delivered via web, email and message boards that are then posted on online forums. In such cases, students ideally complete the course at their own pace, by using the internet merely as a support tool rather than volunteering exclusively for e-learning software or online interactive classes [5].

Characteristics for Asynchronous Learning
The fact that the trainer prepares the courseware material before the course takes place. The learner is free to decide when he wants to study the courseware. On average, asynchronous learners are older than typical undergraduate students. The age of traditional undergraduate student is around to 18-23 years old, whereas the nontraditional program is designed for students who already had jobs, families and community responsibilities. More than 45% of nontraditional students are over 25 years old and this percentage will continue to increase. Gender also plays an important role. Most studies report that more women than men are enrolled in courses delivered at a distance. Many women have to confront gender-based stereotypes about their attitude towards learning [6].

Common Features of Asynchronous learning include:
The common features of this learning mode include Message Boards (Courses are tailor made with message boards, allowing learners to post questions and comments on a central board for other users to see), Discussion Groups (Going one step further than message boards, discussion groups allow students in the same course to discuss the material in the real time), Self-Paced Courses (These courses can be taken by an individual at their own pace, there can be assessments along the way, but there are no deadlines for the completion). Some of the common examples include self-paced courses taken via Internet or CD-ROM, videotaped classes, stored audio/video Web presentations or seminars, recorded audio tapes, Q & A mentoring, reading e-mail messages [5].

Strength of Asynchronous Learning
To a healthy respect for the individual, not all learners absorb material in the same way, so autonomous learning means they can brush up on the stuff they need and skip the material they already know. It is also the most flexible method for learning, which is ideal for tight schedules and large groups. It is learner-led; students can read material, think and reflect before answering questions or joining discussions [1].

Weakness of Asynchronous Learning
The lack of a classroom atmosphere can sometimes cause disconnect between the learner, the material and the other people involved – both instructor and other students. That can result in a lack of motivation to log in, read the material and finish the course while flying solo and the lack of instant feedback that asynchronous learning offers. In short, a learner could be completely misunderstanding the material and demonstrating that misunderstanding with incorrect discussion questions, but because the course isn't live, the instructor might not catch that misunderstanding until it's too late [1], sense of being disconnected from the group that students may potentially develop.

Impact of Asynchronous Learning
For many educational institutions, the majority of distance courses use asynchronous tools, possibly in conjunction with synchronous text chat or streaming video. With asynchronous distance education programs, students often experience a feeling of isolation. Isolation can be a serious detriment to learning.

Survey definition and methodology
With the given facts, advantages and disadvantages of both the categories of online learning, a detailed survey was conducted in few women's colleges in and around Hyderabad and a total of 171 students participated in the survey.

The following four independent variables were defined and had values assigned to the same as mentioned in Table 1. They were expected to prima facie moderate the learning preference – either synchronous or asynchronous modes:

Table 1: Survey parameter definition and values

Criteria	Value	Description
Economic Status*	Above	Monthly household income more than 25000Rs, student owns smart phone and also possess a personnel computer with internet connection
Economic Status*	Below	Monthly household income less than 25000Rs, student does not own a personnel computer with internet connection
Learning Ability**	High	Achieve more than 60% marks in class tests and board exams
Learning Ability**	Moderate	Obtain less than 60% marks in class tests and board exams
Rural / Urban	Rural	Mostly Resided at a place more than 30kms from an urban city limit in the previous 10 years
Rural / Urban	Urban	Mostly Resided at a place less than 30kms from an urban city limit in the previous 10 years
Conservative /Open-minded	Conservative	Self-reported based on factors like frequency of going out with friends for dinner / lunch, group studies with friends, outing to movie etc. Any frequency less than once in 2 months is considered as conservative.
Conservative /Open-minded	Open-minded	Self-reported based on factors like frequency of going out with friends for dinner / lunch, group studies with friends, outing to movie etc. Any frequency more than once in 2 months is considered as open minded.

-* since economic status was not easily revealed in surveys, the items owned was used as a proxy and primary classifier, whenever there was a contradiction between declared monthly income and items possessed
-** The learning ability classification was on the authors' course performance only

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Material used for Survey: A cross sectional study was conducted on the students of final year under graduate course. To meet the objectives of the study, questionnaire was created. Parameters associated with the questionnaire were explained to the students. The responses by the students to the given questionnaire were recorded to study the student preferences for the learning categories.

Methodology: The students participated in the survey were probed with a set of questions. Based on the parameters that they satisfied, the student responses / choice for one of the two learning category were recorded in a spread-sheet. Based on the data collected, different tables have been generated to show the preferences amongst various categories. Also, tables are plotted to show inter-independence amongst the chosen parameters. Pivot tables are plotted for the obtained data.

Survey Analysis & Findings

The analysis done on the sample data of 171 students indicate that the majority preference is for asynchronous learning, which is as expected. However, there are certain factors that drive a synchronous learning preference.

The responses are summarized in the Table 2.

Table 2: Survey analysis and results

Learning capability	(All)		
Count of Student	Column Labels		
Row Labels	Asynchronous	Synchronous	Grand Total
Economic Status Above	102	23	125
Conservative	28	11	39
Rural	4	3	7
Urban	24	8	32
Open minded	74	12	86
Rural	11	5	16
Urban	63	7	70
Economic Status Below	24	22	46
Conservative	2	12	14
Rural		2	2
Urban	2	10	12
Open minded	22	10	32
Rural	5	2	7
Urban	17	8	25

The overall preference for synchronous learning in the whole respondent set was 26%. However, students from high economical background have a preference of 18% for synchronous learning, and 48% of students from below economical background prefer for synchronous learning. Similarly 43% of students from conservative family prefer synchronous learning and 18% of students from open-minded family prefer synchronous learning. 38% of rural background students prefer synchronous learning, while 23% of their urban counterparts prefer synchronous learning. The statistics mentioned in Table 2 are distinct combinations and not inter-related. Learning ability made no difference to student preference for synchronous learning and reflected the same characteristics as the whole respondent set

It was further decided to test whether the three parameters viz economic status, conservative / open-minded family and rural / urban are independent amongst each other. Tables 3, 4 & 5 show that the three variables are indeed independent. A pivot of 2 of the 3 variables proves the same

Conservatism Vs Economic Status:

Table 3: Inter-independence between Conservatism and Economic Status

Learning Capability	(All)		
Synchronous / Asynchronous	(All)		
Rural / Urban	(All)		
Count of Student	Column Labels		
Row Labels	Economic Status Above	Economic Status Below	Grand Total
Conservative	39	14	53
Open minded	86	32	118
Grand Total	125	46	171

Table 4: Inter-independence between Rural / urban and Economic Status

Learning Capability	(All)		
Synchronous/ Asynchronous	(All)		
Conservative / open minded family	(All)		
Count of Student	Column Labels		
Row Labels	Economic Status Above	Economic Status Below	Grand Total
Rural	23	9	32
Urban	102	37	139
Grand Total	125	46	171

The inter-independence between the parameters economic status Vs Rural/Urban geographies is shown in table 4.

Table 5: Inter-independence between Rural / urban and conservative / open-minded families

Learning Capability	(All)		
Synchronous/ Asynchronous	(All)		
Economic Status	(All)		
Count of Student	Column Labels		
Row Labels	Conservative	Open minded	Grand Total
Rural	9	23	32
Urban	44	95	139
Grand Total	53	118	171

Similar to other variables, the inter-independence between the parameters rural / urban geographies Vs conservative / open-minded families is arrived in table 5. .

Conclusion: Economic Status, Conservatism and Rurality in that order drive a preference towards the synchronous learning modes, this despite the popular perception that asynchronous learning mode would be the preferred mode for online learning.

The following reasons were speculated for the preference for synchronous learning mode which was confirmed in the focus group discussions that followed the survey.

Students with poorer economic background prefer the idea of a fixed start-stop and outcome certainty. They are investing hard earned money in online learning. This drives their preference for synchronous learning. Students who are from conservative families find it easy to provide to their elders visibility on what they are up to online. The synchronous mode offers the structure required to participate in online learning. This is the reason for such students to prefer the synchronous mode. Students from rural backgrounds are getting used to the idea of online learning. They find characteristics of synchronous learning which is akin to the classroom as prima facie more valuable than you can start anytime and end anytime kind of loose structure

Instructional designers, online learning mode designers might benefit from the insight the study offers – that in certain back-

grounds, they may do well to introduce online tools in the synchronous mode to attract such students to the online mode of learning.

In hindsight, the author feels that rural background is not a major variable but the fact that you have migrated is a bigger variable. In the focus group, those who migrated from bigger cities like Mumbai and Delhi into Hyderabad had a distinct preference for asynchronous mode. Those who migrated from in and around Hyderabad or Andhra /Telengana had a preference for synchronous mode, though their rural or urban status as defined in the study is incidental.

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