SELECTING A RIGHT ONLINE EDUCATIONAL PARADIGM IN COVID-19 PANDEMIC

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ABSTRACT: Educational Systems are broadly divided into three categories of conventional, online and blended. The CoViD-19 pandemic has squeezed the world to rely almost completely on online educational systems (OES) and the choice of proper educational paradigm has become very critical. There are a number of key aspects associated with such OES but the two most important are learning management systems (LMS) and video conferencing systems (VCS). In this paper, we have critically analyzed various OES with respect to LMS and VCS. The analysis is presented in the form of parametric comparisons and it would play a vital contributing role in the selection of a proper OES.

INTRODUCTION

The spread of panademicnew Coronavirus, also known as COVID19, has pointedly disordered human activities. All the educational activities had been suspended throughout the world due to this pandemic. As per UNESCO report more than 157 crore students across 191 countries were seriously affected by shutting of educational institutions. The effect of this closure on higher education is a growing discourse worldwide (Dawadi, Giri & Simkhada, 2020). To repair the damage caused by COVID-19's interruptions to learning trajectories, institutions, teachers, and students started to look for flexible ways. Various countries have adopted a range of measures to respond to the pandemic depending on their available resources. These circumstances make us realize that scenario planning is an urgent need for academic institutions (Rieley, 2020)

It focuses particularly on technology that is at par with country resources. For example, countries which are technologically advanced, such as Italy, France, Germany, Australia, the UK, and the US, have shifted to online learning as a means to recompensing for the damage. They quickly enhanced their e-learning platforms (Moodle, LMS, cloud systems, etc.) to create common distance learning centre portals and provided students access to e-content and repository through mobile devices. In these countries, all stakeholders, institutions, teachers, publishers, and parents have joined hands together to create digital resources (e.g., textbooks and learning materials) so that they could be delivered through virtual classrooms (Azzi-Huck & Shmis 2020). According to Kubiatko, that the correct use of ICT in the learning process is a very important part of education, because if students do not quickly obtain reliable types of information from a teacher, they are able to find the required information alone, and the information could be from an unverified source and can create a wrong understanding of the phenomenon. Underdeveloped countries having lack of infrastructure are turning to old-style technologies, such as radio and TV, as a means to compensate for the loss. Because these countries are facing difficulty. Radio, television, YouTube channels, recorded lessons and digital educational resources/materials on-demand are combined together to provide lessons to students who do not have reliable access to the internet (IAU 2020).

The educational systems practiced worldwide can be divided into three main categories namely Conventional (face to face), Online and Blended (hybrid), with respect to delivery modes. The approaches adopted by these systems have different pros and cons in different situations however irrespective of any disadvantages associated with Online Educational System (OES), the world is left with no other option during the pandemic caused by CoViD-19. So, the only choice available to the world to keep intact the educational paradigm in this pandemic situation is to use OES. During this era of pandemic, the education community has implemented, customized, configured, evolved, upgraded, extended and expanded existing OES. Sun and Chen (2016) provided hands-on proposals for those who are planning to develop online courses. According to Sun and Chen (2016) effective online instructions is dependent upon well designed course content and creation of learning community. Classroom teaching dependent upon body language, facial expressions, and teachers' voice and considered as important teaching tools. While switching on online teaching teacher lost tools such as body language and facial expressions, so, it is difficult to use these tools through screens, and only "voice" could be fully functioned (Bao,2020). One should not merely

focus on the pros attached to the adoption of online learning during the crises but should also take account of developing and enhancing the quality of virtual courses delivered in such emergencies (Affouneh *et al*., 2020)

The pivotal element in any such OES is Learning Management System (LMS). Nie, D., *et al*. (2020) demonstrated that higher education institutions could largely benefit from the implementation of Learning Management Systems (LMSs). From a social standpoint, universities would be able to better train individuals, develop knowledge and share updated information. LMS is three folded, i-e; Courseware, Delivery and Assessment & Evaluation. There are a number of LMS available worldwide with certain merits and demerits. A major drawback with most of LMS is lack of face to face interactive environment and to cope with this drawback, either an independent or an integrated Video Conferencing System (VCS) is augmented with these LMS. In this paper, we have critically evaluated various aspects associated with OESs. Section 2 gives a parametric comparison of educational systems categories while Section 3 provides the analysis of various LMS. In Section 4, we evaluate different VCS while Section 5 winds up the discussion over a flow summary.

Educational Systems Categories: As discussed earlier, the educational systems can be categorized into (a) Conventional (face to face), (b) Online and (c) Blended (hybrid). Conventional and Online systems are ideally at two extremes. In case of conventional systems, the whole courseware is delivered and assesses & evaluated in physical classrooms with face to face interaction. On the other hand, a perfect online system should be capable of incorporating all the pedagogy without any physical interaction which is extremely difficult in the situations where a physical laboratory is inevitable. But theory-based subject can be taught online effectively. Halili at al. (2018) investigated that the students' level of interaction in varied learning environments, i.e., traditional and virtual. They undertook four dimensions; behavioral, cognitive, emotional, and agentic engagement. Their findings predicted the high level of engagement of the virtual learning environment in comparison to the traditional learning environment. Likewise, Colis & Moonen (2001) have argued that the shift from TLE to VLE has given the flexible learning environment to both teachers and students. Another group of researchers conducted the study at an Australian university to investigate the students' satisfaction and scores for traditional and mixed (traditional combined with e-learning) learning methods.

The third category of educational systems can be tagged as blended systems where the delivery and assessment paradigm is divided into components. These components are sorted out depending upon their best candidature for online versus physical delivery. An experiment was organized comparing the scores and satisfaction level of two distinct groups of tertiary level students. One group experiences the traditional learning model, whereas, another group received the mixed learning method. The results depicted the significantly improved scores and satisfaction of students who were part of the mixed learning method in comparison to the traditional learning method. Based on these results, they suggested integrating the virtual learning tools to increase the confidence level, competence, and satisfaction level of students (Ariana *et al*., 2016).

A parametric comparison of these educational systems categories is presented in Table 1.

Major drawbacks with OES are minimum interaction and absence of pure real time environment however, these drawbacks can be overcome by coupling these systems with suitable VCS. These systems tend to get handicapped where physical laboratory requirements are inevitable and the best remedy is to conduct such laboratories using simulations as a minimum acceptance strategy. Another vital threat to such systems is provision of fair and fool proof evaluation mechanism which is essentially very complex and requires huge efforts in terms of data bank, technological aids and intelligent executions.

Learning Management Systems: The backbone of any OES is LMS and there are a number of LMS available today for the purpose. Choosing a right LMS becomes very tricky due to highly diverse range of education systems and the associated requirements. Generally available features in almost all LMS include lesson plans, calendar, course materials, discussion boards and assessment tools. Online assessment is an important step inside the e-learning process because gives convenient feedback to all participants in the process, helping to improve the learning and teaching experience. Since tests for assessments in e-learning are perhaps done with the use of intermediary, it will be troublesome, if not impossible to control or regulate terrible activities like cheating (Valarmady, Pradeepa and Rajasekar, 2018). LMS triangulate the three stakeholders; course (passive), student (active) and instructor (active) for effective delivery and should be handy for both the active stakeholders. Table 2 analyze various LMS available worldwide and identifies key features critical to the selection of a particular LMS.

Video Conferencing Systems: The major drawbacks of minimum interaction and absence of pure real time environment associated with OES can be overcome by the use of a proper VCS. There are several metrics important to the selection and suitability of a particular VCS. Some of salient features determining the success of a VCS are number of participants, bandwidth consumed, provision of recording, provision of screen sharing,

provision of audio / video toggling, meeting time constraint and integration with LMS. Another aspect on which selection of VCS is heavily dependent is its cost in terms of technical configuration complexity. Comparison of various freely available VCS on the basis of salient metrics is performed in Table 3.

Table 1. Parametric Comparison of Educational Systems Categories.

Parameters		Educational Systems Categories		
		Conventional	**Online**	**Blended**
Courseware Resources	Hard	Yes	No	Yes
	Soft	Yes	Yes	Yes
Interactive		Maximum	Minimum	Medium
Real Time		Yes	Partially	Partially
Laboratory		Yes	Partially through Simulation	Yes
Assessment		Yes	Yes	Yes
Evaluation		Simple	Complex	Hybrid

Table 2: Analysis of Various LMS.

SN	Learning Management Systems	Selected Features
1.	Canvas	• Customizable user profiles • Audio and video messages • Web browser • Integrated tools • External service integrations • Collaborative workspaces • Course notifications • Graphic analytics reporting • Mobile support • Integrated media reporting • Analytics
2.	Blackboard	• Collaborate integration • Group management • Grading enhancements • Enhanced cloud profile • Blackboard drive • Active collaboration • Calendar • Content editor
3.	SAP Litmos	• Embedded content tools • Intuitive user interface • Multi language support • Surveys • Custom branding • Assessment • Real-time reporting • Mobile support
4.	Schoology	• Advanced analytics • Automate grading • Performance based analytics • Calendars • Curriculum management • Open access integration • Mobile support

5.	Docebo	• Third party integrations
		• Supports text / audio / video
		• Gamification
		• Learner enrollments
		• Customized reports
		• Dashboards
		• Alerts and notifications
		• Mobile support
6.	Moodle	• User friendly interface
		• Personalized dashboard
		• Collaborative tools
		• Calendar
		• File management
		• Intuitive text editor
		• Notifications

Table 3: Comparison of Various VCS.

Features	Video Conferencing Systems				
	Zoom	**Skype Meet Now**	**Google Hangouts**	**Google Meet**	**Cisco Webex**
Participants	100	50	10	100	100
Recording	Yes	Yes	No	Yes	Yes
Screen Sharing	Yes	Yes	No	Yes	Yes
Audio Toggling	Yes	Yes	Yes	Yes	Yes
Video Toggling	Yes	Yes	Yes	Yes	Yes
Meeting Time	Limited	Unlimited	Unlimited	Unlimited	Unlimited

Skype Meet Now and Google Hangouts allow less number of participants while Zoom, Google Meet and Cisco Webex allow more participants however the meeting time is limited for Zoom. Moreover, recordings and screen sharing features are not available in Google Hangouts.

Summary: In this section, we present an overall flow of OES along with its auxiliaries; LMS and VCS, as depicted in Figure 1. The figure shows the correspondence of LMS and VCS with OES as well as the association of active and passive stakeholders (course, student and instructor) with OES.
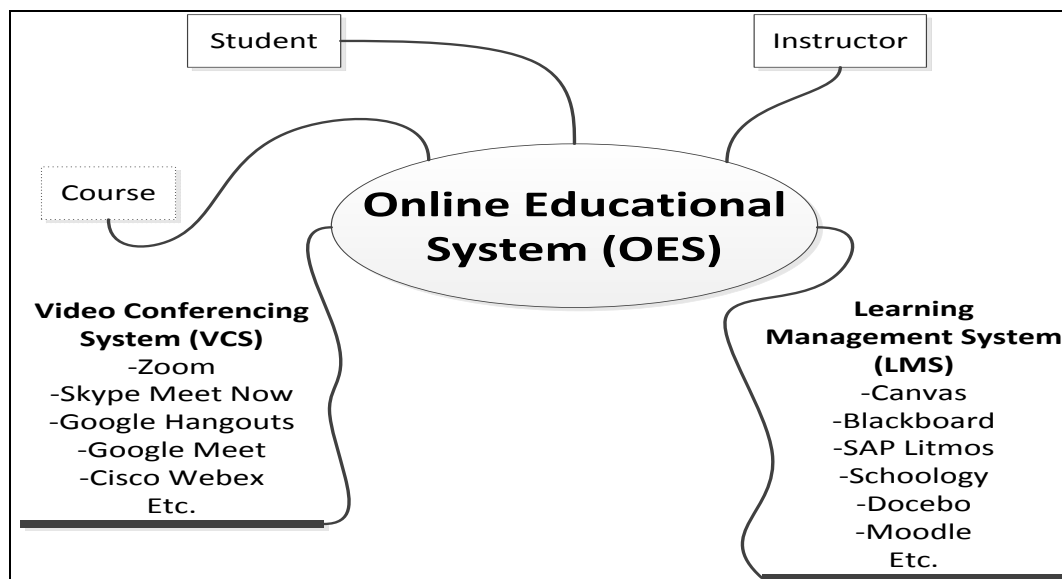

Figure 1: Overall Flow of OES

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