Critical Evaluation of Tools for Online Learning in Higher Education during COVID-19: With Reference to LMS (Learning Management Systems)

[1]Amit Sharma , [2]Dr. Manish Dwivedi

Research Scholar, Associate Professor and Dy. Director, CDOE
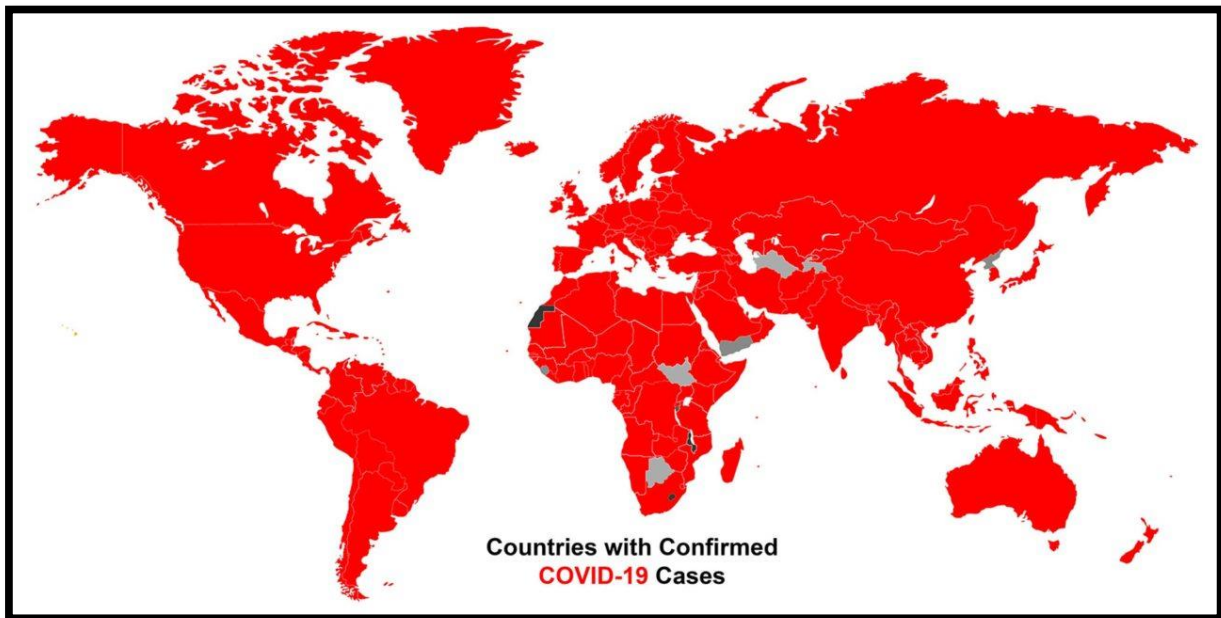
Suresh Gyan Vihar Univeristy, Jaipur

Abstract

COVID-19 has not just affected the health of citizens but also the economic wheel of the world stopped. All the import-export activities were sieged, schools, colleges, malls and any other similar place, where there is a chance of gathering, has been locked down. Education system all over the world has collapsed for time being with the advent of COVID-19, restrictions like complete lockdown and closure of colleges and universities has dragged all the educationalists and students in dilemma. In such a scenario online mode of learning is considered as the safest and legitimate mode of learning. This present study will evaluate the scenario of online learning and also find the applicability of LMS (*Learning Management System*) in the times of COVID-19 and even beyond that. This study is based on primary data and location of study is Jaipur, Rajasthan. Data is collected through questionnaire and analyzed by using SPSS ver. 23.0. Chi Square test is being used to test the hypothesis.

Keywords: COVID-19, Pandemic, HEIs, LMS, Online learning.

Introduction

It was the month of December, 2019 when some of the patients were diagnosed COVID-19 positive in Wuhan city of China with a new and deadly virus named as 'Corona'. Since then it has been declared as a global pandemic and in the present scenario i.e. August, 2020 there is no country in the world which is free from this disease. At the initial level scientist were confident that they will be able to stop the spread and tried all the possible methods to control the pandemic but nothing worked. By the end of May, 2020 there were more than 1.20 cr. cases all over the world and countless deaths occurred.

COVID-19 has not just affected the health of citizens but also the economic wheel of the world stopped. All the import-export activities were sieged, schools, colleges, malls and any other similar place, where there is a chance of gathering, has been locked down. From March, 2020 to May, 2020 most of the countries announced complete lockdown, where people were not allowed to come out of their houses. This was an unexpected situation for people all over the world; they have never thought of such a scenario and don't know how to deal with the same.

Correspondence to: Amit Sharma, Suresh Gyan Vihar University, Jaipur
Corresponding author. E-mail addresses: amit.sharma@mygyanvihar.com

Figure 1: Global Spread of COVID-19

Till July, 2020 more than 170 countries of the world were infected by COVID-19 and the respective positive cases are increasing with every passing day. As given in the above figure, it can be seen that in case of Africa there are still some countries that are safe i.e. there are no positive cases in 7 countries out of total 54 countries. Then there are some countries in Western Asia that are not infected by COVID-19. Other than this all the countries in the world are facing the curse of pandemic.

This pandemic of COVID-19 has affected the people's lives in following ways:

Table 1: Various Effects of COVID-19

S.No.	Effect of COVID-19
1	More than 36% of the global workforce became unemployed within three months of the pandemic,
2	Current growth rate of global economy is -3.17% in the present scenario, only some of the countries like Japan, UK, Spain, etc. were able to maintain their growth rate for second quarter of 2020.
3	In most of the developed economies, the present rate of growth is -6.08%,
4	Due to complete lockdown there was no travelling and all the industrial activities have stopped, because of which the demand of fuel dipped by 62%,
5	Due to minimum purchases at wholesale and retail level, the prices of food items reduced by 3.93%

Sources: https://indianexpress.com/

Correspondence to: Amit Sharma, Suresh Gyan Vihar University, Jaipur
Corresponding author. E-mail addresses: amit.sharma@mygyanvihar.com

Apart from affecting the economic wellbeing of the world, COVID-19 has also brought about some major changes in the routine life of people all around the world. Some of the examples can be stated as follows:

- Social distancing has changed the behavior of people in a number of ways, now people are afraid of communication with each other,
- Doctors and health workers all over the world are facing the threat of COVID-19 with every passing day,
- People are more concerned about their health supplies as compared to other household items,
- Cash flow in the market has almost stopped,
- All the sports, tourism and entertainment avenues have been closed for indefinite period,
- Level of stress in increasing in people with every passing day,
- All the educational avenues are being closed till further notice,

It can be said that COVID-19 has taken the independence of people all over the globe and restricted them to their houses. In such a scenario work from is one avenue that is still available for people to work and earn to support their families. It is not so that this culture of work from has emerged in the period of pandemic, rather the trails of same can followed from the starting years of 21st century. It started from IT and ITES based companies where the employees were given the option to work from, this was done to increase the productivity of the employees. In the present scenario work from has become the way of life and all the fields including education are very closely related to the same.

Higher Education and COVID-19

Education system all over the world has collapsed for time being with the advent of COVID-19, restrictions like complete lockdown and closure of colleges and universities has dragged all the educationalists and students in dilemma. The reason behind this slowdown or timely shutdown of education activities were the restrictions raised by government for maintaining social distancing, physical presence, etc. during the period of spread of COVID-19 a number of studied were conducted in this regard and the respective findings stated and all the students, worldwide were affected by the spread of COVID-19 as they are facing the issues of

isolation, physical distancing and threat of community spread if they attend or are called to attend the college at any level. **Symonds (2020)**. This means that all the students and teachers are contained in their respective houses and it is not possible for all of them to gather at any common place. In some of the developing economies including India, this was a cause of concern that what will be mode of imparting education and how the skills of the students will be tested for promoting them to the next class.

The rapid remedy answer to all these issues was '*Online Education*' but the experts and the related stakeholders were divided into two groups i.e. one group was in favor of online education and other was against it. The group of experts who were against the online education reasoned that in a developing country like India where only 49% of the population is having access to internet services (*either broadband or mobile service*) and more than 62% of the population is residing in rural, tribal and semi-Urban areas, will it be possible to reach the bottom of pyramid and ensure the spread of education, secondly they also stated that using the technology for communication, entertainment and record keeping is another thing and considering the same for conducting classes for long hours is another thing, as most of the students are not in the practice of online classes and most of them have never used the same as a mode of study.

As per **Arenliu et al (2020)** stated that student may face psychological distress and lack motivation during online sessions, this happens because in any given case the online format of learning considers every student at same standard of understanding and skill but in reality every student is different in his or her approach. This psychological barrier is required to be broken and motivate the students to take active part in online sessions and try to learn via this mode. Along with

slowdown in economy COVID-19 has affected the education sector to great extent as all the c COVID-19 has affected the education sector to great extent as all the colleges, schools and universities have been closed till further notice, the personal feel of education in the form of face to face interaction has stopped. In such a scenario, some of the resourceful stakeholders have started online lecturing and tried to continue the education of students to a certain extent. Now the experts have different

Correspondence to: Amit Sharma, Suresh Gyan Vihar University, Jaipur
Corresponding author. E-mail addresses: amit.sharma@mygyanvihar.com

opinion in this regard, they say that there is a state of uncertainty for regular teaching methods and the alternative of the same is not fully prepared yet. There are a number of hurdles in the way of online teaching as well, some of the issues can be stated as follows:

- The 47% of the rural population of India is not in a position to buy and install broadband in their respective houses as it is not possible for them to afford the same and even the supply of electricity is not proper in their areas.
- There are a number of places in the country where mobile network is not available, in those areas online teaching is never going to work,
- In the urban and semi-rural areas people are having smart phones and are able to take classes on the same but then again the avenues are so costly that they are not in a position to afford the

same and if free version of the same is being used then it has its own limitation in the form of limited time, poor internet connection, voice modulation, etc.

- Students below 12th standard have never been in the practice of using online mode of learning, watching an educational video is a different thing and taking 3-4 hours of online classes is a different thing,
- Mental state of the stakeholders is not supportive enough to handle the pressure of online learning and teaching methodologies.
- This present study will evaluate the state of higher education in the period of COVID-19 and critically analyze the role of LMS (*Learning Management System*) in online education, both for students and teachers.

LMS (Learning Management System)

There are a number of terms and jargons associated with online learning system and with every passing day technology are forwarded to next possible stage. In this regard there are two different systems which are being followed, one is Content Management System and other is Learning Management System. The first one is collaboration of application software and related to developing, creation and administration of content in

digital form and in digital platforms. **Johnson (2007).** When a CMS is appended to a broader means it is called LMS or Learning Management System, this system is able to track the progress of the student in true form and the mode of learning is online. A number of universities and colleges are using LMS in their routine learning system, they use to provide the LMS login and ID to each and every student at the time of admission itself and it is considered that they are in a position of appearing in exams after a certain period of time.

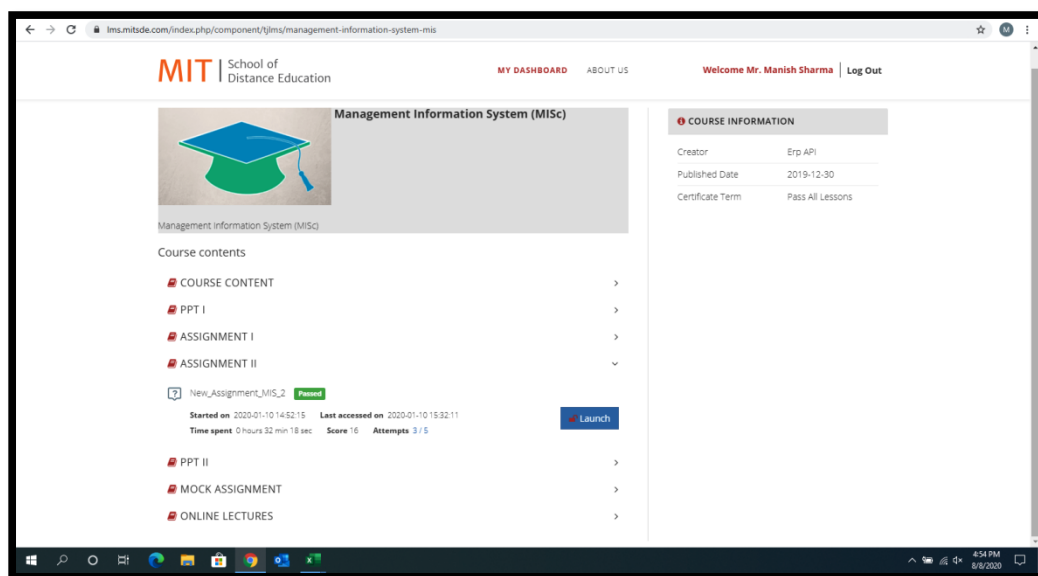Some of examples of LMS can be stated as follows:

Figure 2: LMS of MIT, Pune

Correspondence to: Amit Sharma, Suresh Gyan Vihar University, Jaipur
Corresponding author. E-mail addresses: amit.sharma@mygyanvihar.com

Benefits of using LMS as tool of learning
- Course Management
- Assessment
- Tracking progress
- Grade book
- Better communication
- Security and Privacy
- Easy and safe access

Literature Review

Rieley (2020) in the present times of COVID-19, social distancing is the new way of life and it is not possible for the authorities to allow the students and teachers to gather in school, colleges and universities. As of now it is evident that we were never ready for such a scenario and because of weak infrastructure all the stakeholders are not getting benefitted i.e. only the resourceful parties are able to take part in the spree of online education. 37% of the workmen have lost their jobs at global level and it hard for them to arrange for internet based peripherals for their children.

Cojocariu et al (2014) stated that online learning is a tool that can assist the process the imparting education. This system of education has made the system more flexible and innovative, this can be said in the light of facts that most of the popular colleges have launched their own Learning Management Systems and students have seen new form of teaching system where it is not necessary to be in communication directly with their respective teachers and they can reach to all the lectures, videos, documents, curriculum, etc. in just a few clicks. This system of LMS has made all the stakeholders capable enough to deal with the present situation of COVID-19.

Singh et al (2019) the beauty of online learning lies in the fact that teachers and learners are in direct interaction with each other, this mode of learning has made the system of feedback and control much easier for the respective stakeholders. Real time analysis of all the teachers and performance of the students can be judged in real time and corrective measures can be taken. There is another side of this online system of learning where shortcomings of the poor IT infrastructure are coming forth and even the linguistic and behavioral shortcomings of teachers and students are also being discovered on regular basis.

J. Little et al (2018) has already conducted a study in the rural states of Arizona and stated that social and online platforms have created a great opportunity for all the people living in their houses during the lockdown period. He also stated that the psychological framework of the people have changed a lot, the respective behavior of the students and teachers is going in negative direction and there is a need to motivate them and prevent them from the threat of COVID-19. He proved by the way of analysis that this online system of learning has brought people near and now they are interacting more than before. This interaction has started a new drive of social interaction between people. Emotional quotient among the people has raised now they are caring for each other as compared to any instance.

Objective
The main objective of this study is to evaluate the scenario of higher education in the period of COVID-19 and applicability of LMS (*Learning Management System*) as a tool in this regard.

Hypothesis

Hypothesis 1
H_0: Online teaching and learning has a significant impact on the present education system.
H_1: Online teaching and learning does not have a significant impact on the present education system.

Hypothesis 2
H_0: LMS (*Learning Management System*) is having a positive effect on the learning quotient of the students.
H_0: LMS (*Learning Management System*) does not have a positive effect on the learning quotient of the students.

Research Methodology
Sampling
As in the present times of COVID-19, it was not possible to follow a structured sampling system so the rese3racher has followed Judgmental and purposive sampling.

Sample Size
The researcher has approached all the housing society in Jaipur city and found that students are enrolled in different colleges and universities all over the country and even abroad. Of the basis of random selection 234 respondents were contacted but due to erroneous questionnaires and for the ease of calculation and

Correspondence to: Amit Sharma, Suresh Gyan Vihar University, Jaipur
Corresponding author. E-mail addresses: amit.sharma@mygyanvihar.com

analysis the researcher has considered 200 respondents. Hence the actual sample size is 200 for this present study.

Data Collection

As this study was based on primary data hence the researcher has constructed a structured questionnaire and mailed to all the selected respondents. This questionnaire includes question based on 1 to 5 scales, where '1' states Strongly Disagree and '5' states Strongly Agree. Most of the questions are based on Likert scale.

Statistical Tools Used

As the responses are collected in categorical form hence χ^2 test is used to analyze the data and the parameter of '*Goodness to Fit*' was considered.

Software Used

SPSS Ver. 23.0

Data Analysis and Interpretation
Table 2: *Summary of χ² test* **(H1)**

		Learning Capability							
		Gender				**Age**			
		Problem in understanding	**Voice modulation is an issue**	**Language is one of the main issues**	**Missing personal connect with teachers**	**Problem in understanding**	**Voice modulation is an issue**	**Language is one of the main issues**	**Missing personal connect with teachers**
Test Statistic		.219	1.315	1.144	2.675	.673	.780	2.679	1.788
Table Value		3.415	3.699	4.019	1.590	1.707	2.105	4.506	3.107
		Follow ups							
		Gender				**Age**			
		Problem solving is poor	**Audio and video quality is main issue**	**Able to match the online and offline content**	**Able to discuss problem within class**	**Problem solving is poor**	**Audio and video quality is main issue**	**Able to match the online and offline content**	**Able to discuss problem within class**
Test Statistic		2.456	1.507	2.122	1.108	1.787	2.008	2.566	1.679
Table Value		5.626	2.108	5.126	3.716	3.153	4.603	4.618	3.506
		Test of Learning							
		Gender				**Age**			

Correspondence to: Amit Sharma, Suresh Gyan Vihar University, Jaipur
Corresponding author. E-mail addresses: amit.sharma@mygyanvihar.com

	Fair evaluation	Scope of cheating	Standards are compatible	Marking is genuine	Fair evaluation	Scope of cheating	Standards are compatible	Marking is genuine
Test Statistic	1.659	1.613	2.409	2.673	2.183	2.414	2.707	1.515
Table Value	3.818	6.708	5.604	4.709	6.093	4.408	4.106	3.401
Level of Satisfaction								
	Gender				**Age**			
	Study material is good	Looking better content	Online tests are of good standard	Satisfied with learning	Study material is good	Looking better content	Online tests are of good standard	Satisfied with learning
Test Statistic	1.806	2.528	1.307	2.108	1.571	1.416	2.109	2.508
Table Value	4.608	3.512	3.142	4.603	3.433	5.312	3.127	3.408

Interpretation

Online teaching and learning is the need of the hour, where ever education is in progress, all the stakeholders are making the use of online avenues. Though the results are not very satisfying but then again it is like 'something in place of nothing'. This is a well-known fact that all the students have been promoted to their consecutive classes due to the effect of COVID-19, except candidates of board exams and final year.

In case of higher education, it is a different scenario, in case of UG and PG courses there is a provision of online exams but then again agencies are not confident on their own infrastructure and related peripherals. UGC is willing to conduct the exams online but the state and central universities are not sure about the same. In this present study the researcher has collected data on willing and preference of students and other stakeholders regarding online education.

The test results state that on the basis of gender there is minimum variation in the responses and but on the other hand on the basis of age variation is more than expected. This can be seen in the case of learning capability and follow ups where the difference between test statistics and table value is more and even in the case evaluation or test of learning the level of variation is high. This states that the female respondents are not much satisfied with the evaluation process and they suggest that the stakeholders must be more specific in this regard as their careers are dependent on this evaluation.

As far as satisfaction from the online system of learning is concerned, most of the respondents were moderately satisfied; rather they suggest that there is a vast scope for changes and betterment. Problems of video drop, voice modulation, clarity of screen, etc. are some issues that are required to be taken care off.

Result

On the basis of above given analysis and interpretation, it can be said that all the respondents are not fully satisfied with the online form of learning and still there is scope for changes, hence the null hypothesis '*Online teaching and learning has a significant impact on the present*

Correspondence to: Amit Sharma, Suresh Gyan Vihar University, Jaipur
Corresponding author. E-mail addresses: amit.sharma@mygyanvihar.com

education system.' can be accepted and the alternate hypothesis can be rejected.

Hypothesis 2

Table 3: *Summary of χ^2 test (H2)*

	Regarding LMS (*Learning Management System*)							
	About videos							
	Gender				**Age**			
	Videos in LMS are related to curriculum	**Videos contain partial material**	**Practical application of concept is missing**	**Content is more than required**	**Videos in LMS are related to curriculum**	**Videos contain partial material**	**Practical application of concept is missing**	**Content is more than required**
Test Statistic	1.457	1.151	1.502	2.508	1.618	1.357	1.279	1.757
Table Value	3.128	2.286	3.119	3.474	3.565	3.575	3.254	2.558
	About live lectures							
	Gender				**Age**			
	Lectures are tailor made	**Covers all the related concepts**	**Voice modulation and video quality is good**	**Teachers are knowledgeable**	**Lectures are tailor made**	**Covers all the related concepts**	**Voice modulation and video quality is good**	**Teachers are knowledgeable**
Test Statistic	1.790	.381	.596	.990	2.796	.690	.597	.785
Table Value	3.190	3.294	3.249	3.195	4.158	4.898	3.486	2.453
	Opinion for Continuing After COVID-19							
	Gender				**Age**			
	Certainly	**Some structura**	**Human**	**May be Multi-**	**Certainly recomme**	**Some structur**	**Human**	**May be Multi-**

Correspondence to: Amit Sharma, Suresh Gyan Vihar University, Jaipur
Corresponding author. E-mail addresses: amit.sharma@mygyanvihar.com

	recommend for future use	l changes are required	intervention is necessary	Lingual in nature	nd for future use	al changes are required	intervention is necessary	Lingual in nature
Test Statistic	1.771	.311	.560	.907	2.762	.683	.572	.751
Table Value	3.089	3.204	3.224	3.153	4.118	4.883	3.462	2.431

Interpretation

As stated above, LMS (Learning Management System) is a unique and self-administered platform of learning and most of the established institutions of India are using the same in their process of teaching and learning since 2010. As of now, in COVID-19 period, the applicability of LMS has increased and HEIs' are focusing on re-formulating their LMS to make it compatible enough for all sorts of queries. The researchers has surveyed the users of LMS in a close proximity and analyzed the data using chi square test. The test components were age and gender. The main focus of the study was to find the applicability of LMS as a tool of learning after the period of COVID-19.

The test result stated that there is a certain amount of variation ion the responses on the basis of age and gender of the respondents. Most of the male respondents were found to be satisfied with the present structure of LMS they are using but they also suggest that there is a need to make some structural changes and make it more compatible as a substitute of classroom physical classroom teaching. Students from the age group of 18-25 are more enthusiastic in this regard and suggested that more and more AI (Artificial Intelligence) based material should be added but on the other hand students from the age group of 25 and above stated that live lectures are more informative and there is a chance to interact with and getting the doubts clear.

Regarding continuing to learn from LMS after COVID-19, most of the respondents were positive, they stated that this is an easy mode of learning and except live lectures they can access the study material as per their choice and leisure. On the other hand the respondents also suggested some structural changes like use of multi-language, application of concepts and even live examples for the betterment of LMS.

Result

LMS (*Learning Management System*) is the best tool used by the agencies for the sake of online learning, it is even having a better use in the present times of COVID-19. All the stakeholders are positive in this regard and willing to continue with the same even after the pandemic of COVID-19 is over. Hence the null hypothesis '*LMS (Learning Management System) is having a positive effect on the learning quotient of the students*' can be accepted and alternate hypothesis can be rejected.

Conclusion

This study was based on the assessment of online system of learning in the COVID-19 period and applicability of LMS (*Learning Management System*) after the pandemic of COVID-19 is over. Online system of learning is in existence since last 10 to 15 years, LMS is a new addition in the process. Many of the popular and established universities and institution are having their own LMS and student world-wide are using the same on regular basis. Down the line in developing economies like India only 22% of the HEIs are using LMS and online mode of learning and prior of COVID-19 period many of the stakeholders were not even familiar with the terms 'LMS' but in the CORONA times every second student and teacher has understood the importance and strength of this system and is recommending the same to each other for better learning experience. Most of the respondents in this present were moderately satisfied with the LMS; rather they suggest that there is a vast scope for changes and betterment. Problems of video

Correspondence to: Amit Sharma, Suresh Gyan Vihar University, Jaipur
Corresponding author. E-mail addresses: amit.sharma@mygyanvihar.com

drop, voice modulation, clarity of screen, etc. are some issues that are required to be taken care off.

References

1. Chang-Richards, A., Vargo, J., Seville, E. (2013). Organisational resilience to natural disasters: New Zealand's experience (English translation). China Policy Review, 10, 117–119.
2. Huang C., Wang Y., Li X. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. Lancet. 2020;395(10223):497–506.
3. Brianna, D., Derrian, R., Hunter, H., Kerra, B., Nancy, C. (2019). Using EdTech to enhance learning. International Journal of the Whole Child, 4(2), 57–63.
4. Wang M., Cao R., Zhang L. Remdesivir and chloroquine effectively inhibit the recently emerged novel coronavirus (2019-nCoV) in vitro. Cell Res. 2020;30(3):269271.
5. Baytiyeh, H. (2018). Online learning during post-earthquake school closures", Disaster Prevention and Management. An International Journal, 27(2), 215–227.
6. Jin Y.H., Cai L., Cheng Z.S. A rapid advice guideline for the diagnosis and treatment of 2019 novel coronavirus (2019-nCoV) infected pneumonia (standard version) Mil Med Res. 2020;7(1):4.
7. Di Pietro, G. (2017). The academic impact of natural disasters: Evidence from the L'Aquila earthquake. Education Economics, 26(1), 62–77.
8. Ali, W. (2018). Transforming Higher Education Landscape with Hybrid/Blended Approach as an evolving Paradigm. Journal of Advances in Social Science and Humanities, 3(7), 143-169.
9. Levitt, H. M. (2018). How to conduct a qualitative meta-analysis: Tailoring methods to enhance methodological integrity. Review PMID, 28(3), 367-378.
10. Mark, G., Semaan, B. (2008). Resilience in collaboration: Technology as a resource for new patterns of action. In Begole, B., McDonald, D. W. (Eds.), Proceedings of the 2008 ACM Conference on Computer Supported Cooperative Work (pp. 127–136). Association for Computing Machinery.
11. Ertmer, P. A., & Otternbreit-Leftwich, A. T. (2019). Teacher technology change: How knowledge, confidence, beliefs, and culture intersect. Journal of Research on Technology in Education, 42, 255-284.
12. Yuen, A., & Ma,W. (2002). Gender differences in teacher computer acceptance. Journal of Technology and Teacher Education, 10(3), 365-382.
13. Briggs, B. (2018). Education under attack and battered by natural disasters in 2018. *TheirWorld*
14. Campbell D., Bannock . 2020. 'Unlike Anything Seen in Peacetime': NHS Prepares for Surge in Covid-19
15. Favale, T., Soro, F., Trevisan, M., Drago, I., Mellia, M. (2020). Campus traffic and e-Learning during COVID-19 pandemic. Computer Networks, 176, 107290.
16. Chinazzi M., Davis J.T., Ajelli M. The effect of travel restrictions on the spread of the 2019 novel coronavirus (COVID-19) outbreak. Science. 2020 doi: 10.1126/science.aba9757.
17. yebi-Arthur, K. (2017). E-learning, resilience, and change in higher education: Helping a univety cope after a natural disaster. E-Learning and Digital Media, 14(5), 259–274.
18. Kebritchi, M., Lipschuetz, A., Santiague, L. (2017). Issues and challenges for teaching successful online courses in higher education. Journal of Educational Technology Systems, 46(1), 4–29.
19. Keeton, M. T. (2004). Best online instructional practices: Report of phase I of an ongoing study. Journal of Asynchronous Learning Networks, 8(2), 75–100.
    Affouneh, S., Salha, S., N., Khlaif, Z. (2020). Designing quality e-learning environments for emergency remote teaching in coronavirus crisis. Interdisciplinary Journal of Virtual Learning in Medical Sciences, 11(2), 1–3.
20. Barboni, L. (2019). From shifting earth to shifting paradigms: How webex helped our university overcome an earthquake. *CISCO, Upshot By Inflictive*.
21. Basilaia, G. Dgebuadze, M., Kantaria, M., & Chokhonelidze, G. (2020). Replacing the classic learning form at universities as an immediate response to the COVID-19 virus infection in Georgia. *International Journal for Research in Applied Science & Engineering*.

Correspondence to: Amit Sharma, Suresh Gyan Vihar University, Jaipur
Corresponding author. E-mail addresses: amit.sharma@mygyanvihar.com