

Effectiveness in Online Professional Education: Influences of Technology, Lms, Personal Factors and Teaching Aids

D Ramesh Babu^{1,2}, Gurunadham Goli¹, K V Narasimha Rao², N Sambasiva Rao³

¹ S R University, Warangal, Telangana, India

² Department of Mechanical Engineering, Koneru Lakshmaiah Education Foundation, Guntur, AP, India

³ Department of CSE, Institute of Aeronautical Engineering, Dundigal, Hyderabad, Telangana

¹rameshdamarla2009@gmail.com

Abstract: Student learning through online tools during the pandemic covid-19 situation has been studied and reported in this paper. Students pursuing engineering under graduation and business management post graduation were given a Google form to respond to questions related to type and kind of online platform used, difficulties in teaching-learning, expectations of students etc. Suggestions were invited for better learning online. This paper presents the results of the feedback of students on technical and non-technical issues during online learning. The online environment is sub-divided into four broad categories viz., technological, personal, teaching aids and learning management system. Influence of these parameters on effectiveness of online teaching and feedback from students are discussed. Students had difficulties in internet network, bandwidth, clarity of audio-visual, interruptions in power supply, wifi-networks, poor infrastructure and affordability. 57 percent of respondents are dependent on mobile phone instruments for online class work. Majority of students felt that online certification courses can reduce burden to some extent. The results can be used

for designing better online tools for effective online learning for students.

Key words: Online learning platform, teaching-learning, difficulties in learning,

Introduction:

Covid19 has posed tough challenges for students of professional education. Most of the technical institutes started using online platforms like Microsoft Teams, Zoom, Webex, Google meet, etc., for online teaching. [1] Almost two to three semesters of professional courses has been conducted through online mode including conduction of examinations. There are many areas of concern for students to meet the requirements for completing course online. Some of the concerns include, availability of electronic gadgets (mobile instrument, tablet, laptop or desktop), basic knowledge of using these instruments for online learning, interrupted internet service, band width of internet in rural areas, Cost of accessing internet service, disturbances in power supply, background noises on speakers end, effectiveness in understanding concepts through online , communication failure etc., especially for medical students technological, student personal, home based, educational institutions and teacher and student community barriers should be overcome to make medical students online TLP result oriented [2]. At

D Ramesh Babu

S R University, Warangal, Telangana, India
rameshdamarla2009@gmail.com

the same time teachers has to transform from merely teaching in online to online evolution of students. For this dedicated, caring and worthy teachers are needed ready to transform themselves to serve all types of students accordance their needs. Innovative teaching training programmes are needed to train teachers to add weight age for online learning [3].

Technological issues: Rural background students cannot afford to the smart mobiles/tabs/laptops to access to online classes/examinations. Sufficient bandwidth is another issue in rural areas. Interruption in power supply or poor quality of power supply hampers the online learning. Sufficient networks are not available in villages and semi-urban areas, causing students unable to access online classes. Poor signals are another issue to make 3G or 4G network accessibility [4].

Technical issues during online learning: Audio-video clarity from teaching end are reported by students, creating lack of interest in students, poor understanding of concepts, difficulty in understanding practical courses even though some practical oriented platforms are used. Poor communication signals causes interruptions for the listener are either causes from teaching end or listeners' end [5].

Enthusiasm: Students physically sitting in a class environment along with classmates and presence of mentor/teacher can surely create enthusiasm in majority of students. Under controlled environment in a class room, students are forced to involve in the teaching-learning process. But in online the physical environment literally missing and kills the students enthusiasm in TLP. It further leads to absentness and drop out from online course. This can overcome by anticipating student dropouts from online courses. This is possible by Logic Leaf Model (LLM) [6].

Personal touch by faculty: Motivational levels of majority of students are better in the presence of a tutor/mentor/teacher. Students expressing freely is also hampered in online mode. In a class room faculty can interact with students with a personal touch depending on the motivational level of students apart from enthusiasm shown by individual student. Faculty can deal with students based on individual requirements of students. Online classes transform students less enjoyable, not interested, reduced value of learning, reduced efforts, enthusiasm and less cultural towards their courses [7]. Teacher can

observe students physically and can generate interest and focus to involve in the teaching-learning.

Personal issues: Students in proper attire and accompanied with class mates under controlled environment can definitely learned better. There can be issues for students while attending classes online at home like poor cooperation from family member, non-availability isolated/separate room for listening to online classes, non-availability dedicated instrument for accessing classes, etc.,

In the technology enhanced learning, some of the major platforms observed to be used are Microsoft Teams, Google meet, Webex, Zoom, etc., Main social platforms Viz. Face book, What App, Twitter and you tube have been in the forefront to create better interaction between instructor and student for their teaching and learning practices [8].

Zoom is found to be very user friendly compared to any other professional online platform for meetings or classes. Zoom found to have features to accommodate large number of students, recording of classes, better time limits for meetings compared to other apps, easy to create an account and access. Use of desktop/laptop/tab and mobile instrument is quite easy to login to the zoom application. Some of institutions have taken the commercial logins to use for longer usage hours, recordings. However this did not affect student's access. A personal mail id with a created password would make student easily attend the classes.

Learning management systems (LMS) are used for conducting quizzes, assignments, internal and external examinations online. Some of most used Learning Management Systems are Canvas, Moodle, Black board, Google class room, SAP litmos, Abode captivate prime, Schoology etc. Findings showed taht majority of student online course asynchronous with moodle [9]. These systems allow faculty-student interaction for tests. Assign project based assignments, innovative based activities, Creation of question papers/quizzes with pre-set dead lines along with auto-declaration of result is the useful features of LMS. This could benefit more number of students [10]. Faculty can share syllabus, notes and other relevant material through this. Innovative quizzes in different time intervals needed to evaluate students performance especially in hybrid virtual classrooms [11]. Data protection and security are ensured along with auto-evaluation and result communication

features. Some institutes have developed their own online platforms for conducting class work. This is helpful from security and cost point of view. Some of the un-authorized attendees usually cause disturbance in online platforms during meetings/class work. However this is taken care of most of reputed online service providers. Schools, colleges, universities including NITs and IITs found to use the google meet and Microsoft teams for conducting their classes securely. The cost-benefit ration need to be considered before going to develop own software platform compared to using readily available platforms.

Continuing education through online platforms can be good alternatives for some of the courses. Portals like NPTEL Swayam, Coursera, AICTE sponsored agencies offers, and Distance education centres of most of universities offer certification courses. The distance education success depends on instructor rich knowledge and his/her technical knowledge. Whose instructor can make teaching videos with utmost care and with rich content has positive impact on teaching learning outcome [12]. During the pandemic time, students can take these courses on behalf of regular

courses of their respective curriculum. In this case the institutes/universities need to permit the students to do the courses from those online platforms and obtain certificate and submit as part of credit requirements for the program undergoing. The provision need to be incorporated in the curriculum. Due to standardized protocols of the online certification agencies, student can benefit to reduce the burden of full credit courses of the present program. Studies revealed that students feel psychological distress due to anticipation of their academic loss and ineffective online learning. Governments should focus on these aspects and do implement needed measures to reduce psychological distress of students [13].

Literature review:

The objectives of present study are

1. To find the issues associated during online learning
2. To analyze the results of the survey conducted on student feedback

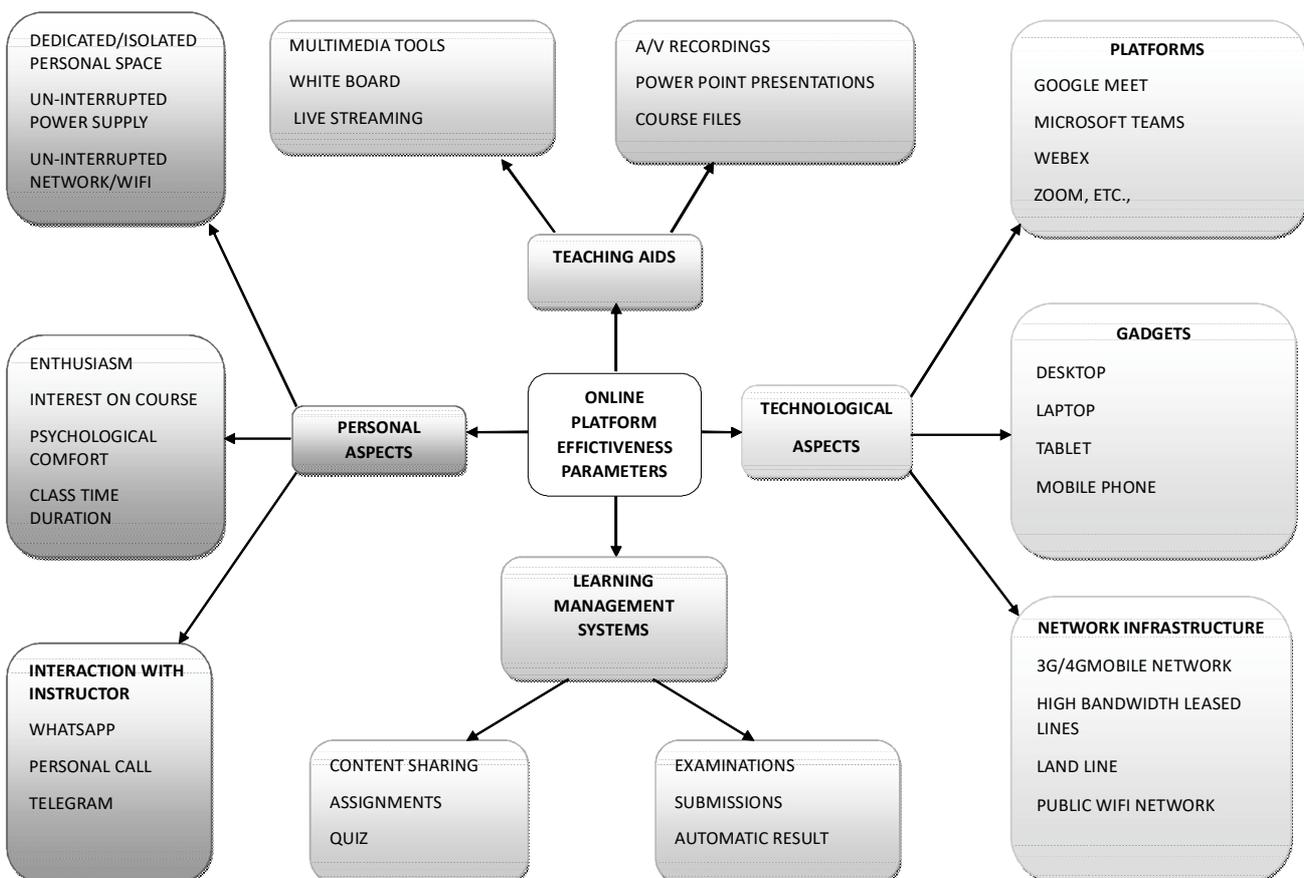


Fig. 1 : Flow chart showing parameters for effective online teaching

Methodology:

A structured survey is designed using google form. The form has been sent to about 160 students of B.Tech and MBA students studying in the campus of S R University, Warangal, Telangana. Responses are recorded in Microsoft excel for further analysis.

Data analysis

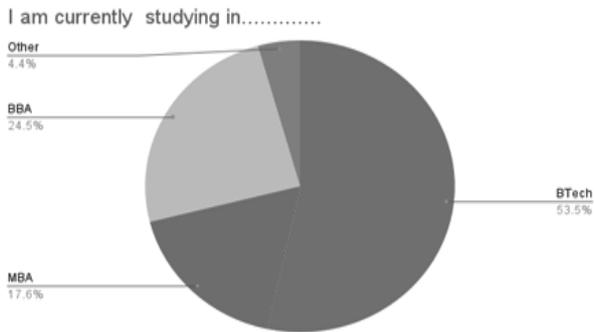


Fig. 2 : Currently studying details of respondents

Our research has focused to gather responses about on online classes utmost from B.Tech students. For our study gathered responses from B.Tech, MBA, BBA and other educational backgrounds. Amongst those 53.5 percents accounted from B.Tech students. MBA and BBA students accounted 17.6 and 24.5 percentages respectively. The other educational background only accounted to 4.4 percentages.

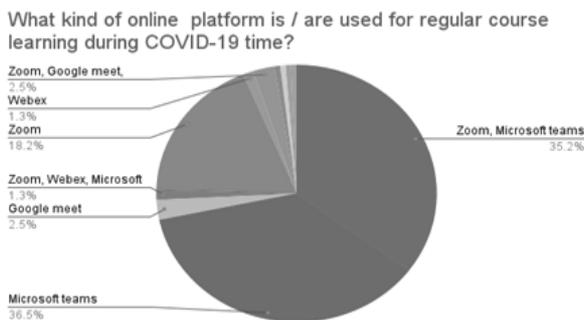


Fig. 3. Details of online platforms used by students

Based the question raised that the platforms have been used for students online classes, The students answered that they are utilising different platforms with combinations based on their need, availability and convenience. 36.5 portion of the respondent students are utilising alone microsoft teams platform. Zoom and microsoft teams combinidly are utilised by 35.2% of the student respondents. Only 2.5 and 1.3

percentage of students availed Google meet and Webex respectively. Zoom platform alone is used by 18.2 % of students. Zoom along with webex and microsoft are used by 1.3 percentages of respondent students. Google meet with combinaton of Zoom have been used by 2.5 portions of students from overall respondents.

Do you agree that online learning is effective compared to class room interaction?

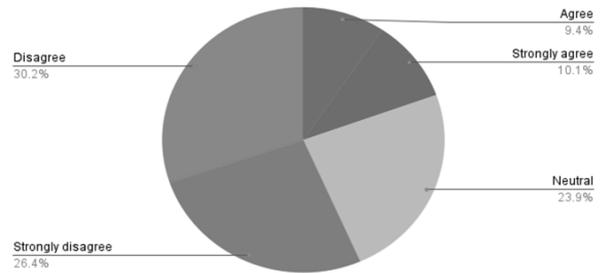


Fig. 4: Student responses on effectiveness through online classes compared to class room interaction

Opinion on effectiveness of online classes than class room interactions, only 9.4 portions of the students agreed that online classes have been effective. 10.1% of student respondents strongly agreed on the same aspect. But 30.2 and 26.4 percentages of the respondents expressed Disagree and strongly disagree respectively on effectiveness of online classes. This clearly indicated that most of the students are not well about online classes and they would prefer face to face class room teaching. 23.9 % of responses have been neutral regarding effectiveness online and class room interactions.

Has there been better personal comfort along with learning during online classes?...as there is no need for formal preparation to attend physical classes.

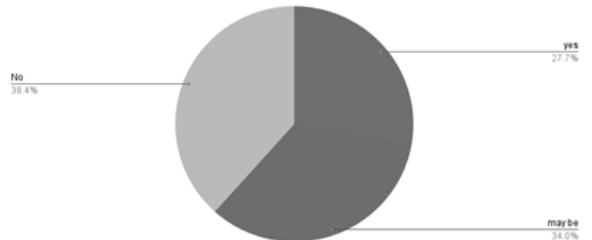


Fig. 5 : Responses on personal comfort and grooming

The personal comfort to learn during online classes and no formal preparation to attend physical classes, on these statement students gave mixed responses. 38.4 % of students not supported the above statement. The statement not be given proper response either to support or against to such by 34.0% respondents. 27.7 segments of respondent students are favoured to

statement that personal comfort to learn while online classes and no need formal preparation to attend physical classes.

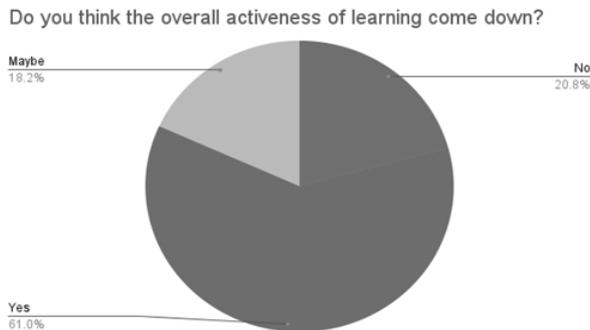


Fig. 6: Responses on overall activeness of learning

The students strongly agree that their overall activeness of learning come down during online learning. Out of 160 students 61.0 % of students opined that their active learning interest has been reduced because of online classes. Only 20.8 portion of the students highlighted that their interest level to learn not at all affected during online classe. But 18.2 percentage of respondent students heve not been in the position to decide on this issue.

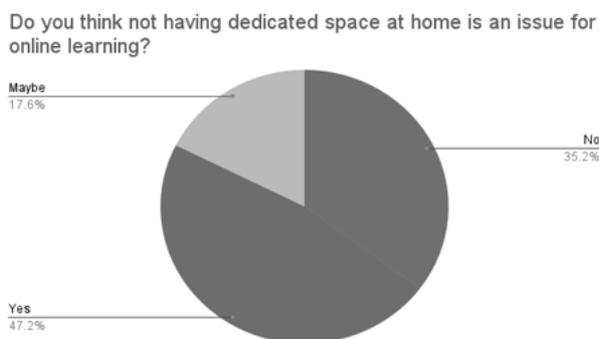


Fig. 7: Responses on availability of dedicated/private space at home for online learning

The dedicated space not available in home can distract their online learning for this statement 47.2 percentage of the student's favoured statement. Not availability of dedicated space can kill their enthusiasm to learn at home while online classes learning. 35.2% respondents emphasised that they have not deviated because of such not availability of isolated space for them for online classes listening. 17.6 portion of the students neither support nor favour to such statement.

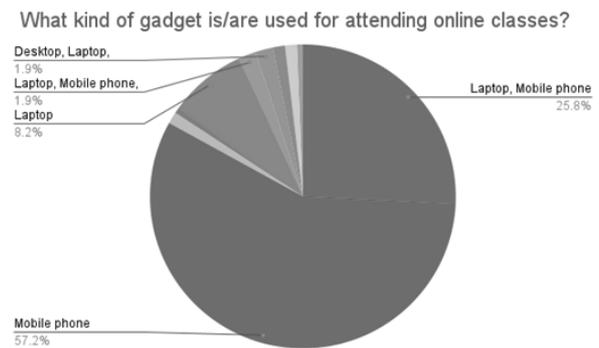


Fig. 8: Responses on type of instrument used to attend online classes

Using gadjets for onine ckses, most of the students depand on mobile phones for online classes and learning. Only few respondent students have been in the positin to use laptops for online classes. 57.2 percentage of the students exclusively utilising mobile phones. 8.2 portions of the students amongst respondents are using laptop exclusively for their online learning. Laptop and mobile phones both gadjets are used by cosiderable segment of the students i.e, 25.8 %. Desktop and laptop combindely are availing accordance their conveneance by 1.9 % of students from overall respondents.

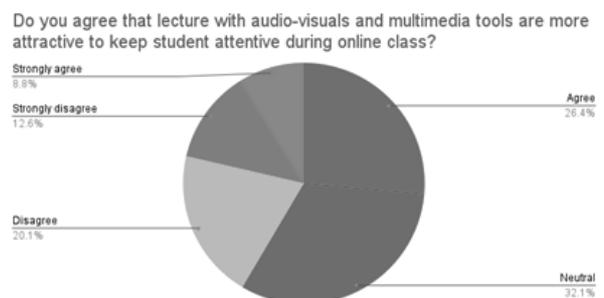


Fig. 9: Responses on utility of audio-visual and multimedia tools for student attentiveness

To keep online classes more attractive to students inculcating audio- Video visuals, multimedia tools in lecture is inevitable. For this concern 8.8 % of students strongly agree for such above statement. 26.4 portion of the students agreed audio- video and multimedia tools in online lessons are more attractive to concentrate on such lessons. 12.6 And 20.1 % of the student responses are strongly disagree and disagree respectively towards audio, video and multimedia tools application in online lectures for their better understanding. Almost 32 percentages of responses of the students from over all 160 student respondents are neutral because such students have not been in the site to confirm how extent those multimedia tools are helpful to understand online classes.

Do you think online classes are helpful for less outspoken students to express easily?

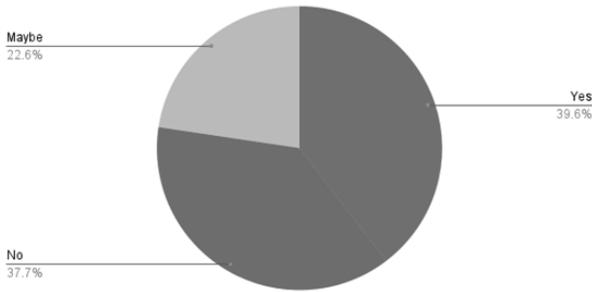


Fig. 10 : Responses on helpfulness of online classes for less outspoken students

Online classes might be helpful for less outspoken students to express freely. This statement got good response from students. Almost 39.6 % of the student respondents opined that they have been expressing their thoughts in online classes freely without any hesitation because the same students might have felt coy feeling in physical class to express their thoughts in front of class audience. 22.6 segment of the respondents expresses online environment could not improve their view expressive ability as same as in physical class. 22.6 portions of the student respondent's responses are neutral regarding the above said statement.

What should be the duration for a theory class to keep the students attentive?

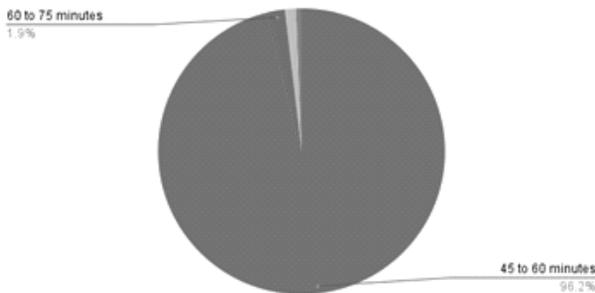


Fig. 11: Responses student attentiveness based on class duration for theory classes

This is indeed big debate in teaching community that how long a teacher can keep his/her students attentive in a class. Now that discussion has been again ignited more because of online classes are mandatory approach during the pandemic. This discussion is never ending but the students expressed 45 to 60 minutes are the ideal time to keep themselves attentive to the online classes. From overall respondents of our study almost 97 percentage of the students supported this ideal time (45 to 60 minutes) for their attentiveness towards online class. Only 2

percentage of respondents confirmed 60 to 75 minutes are preferable time for their concentration in online classes.

Do you think existing internet resources available in rural places suitable for online classes?

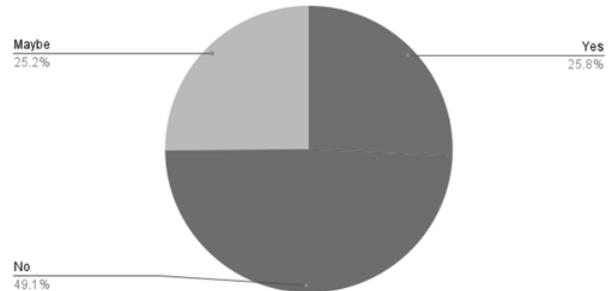


Fig. 12: Responses on sufficiency and availability of internet resources at rural places

Net work issues are posing greater challenges to students for continuing their learning in online especially from remote areas. This declaration is also supported by the student responses. From overall respondents 49.1 percentage of students agreed that they are facing network issues and assuming the supporting infrastructure for net connectivity is also poor in remote areas. Only 26.8 portions of the students from respondents have the greater access for uninterrupted net connectivity to continue their online learning. These respondents are from urban and semi urban areas. 25.8 % of respondents could not give their clarity regarding net work issues impact on online learning.

Do you think urban places are having sufficient internet resources for online classes?

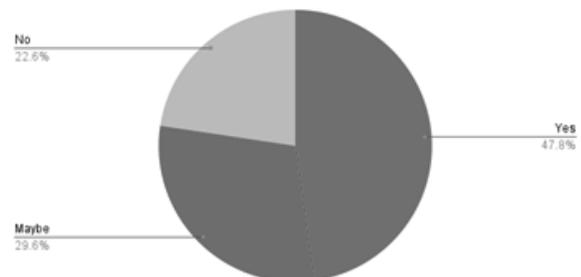


Fig. 13: Responses on availability of internet resources at urban places

Students believe that urban areas well equipped with internet resources those are helpful to connect better with online classes. 47.8 percentages of students have accepted that urban places having better internet connectivity with assisted internet resources. The same orientation has not been recognised by 22.6

segments of the students from overall 160 total respondents. 29.6 % of respondent students have not given any clarity regarding internet resources in urban areas.

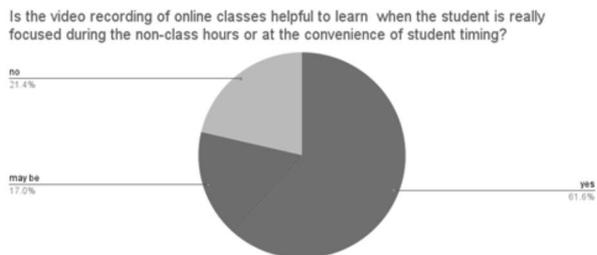


Fig. 14: Responses on video recording of class for post-class usage

Video recording of online classes are handy to the students to learn missed classes at their convenient time. For this proclamation 61.6 % of the students accepted that video recording lectures are indeed accommodating to listen such lessons repeatedly as well as when they missed online classes they can go through video recording lecturers at their convenient. Only small portion of the students from over all respondents (i.e. 21.4%) responded that video recording lectures not helpful with respect to their expectations. 17 percentage of respondents has not given any clarity on usefulness of video recording lectures for them.

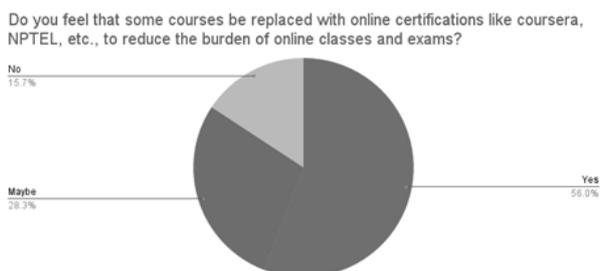


Fig. 15: Students opinion on compensating courses with online certification courses by Coursera, NPTEL. etc.,

56 percentages of students expressed that online certification courses from Viz. Coursera, NPTEL can reduce burden from online classes and exams. During pandemic students especially from technical background are attracted to do online courses from several online courses provider platforms to enhance their technical capability. For this concern 15 percentages of respondents believe that the online certification courses are not been in the stage to improve their capability like regular courses in their academics. 28.3 portions of the students not gave their opinion properly regarding online certification courses advantages to them.

Do you think online exams should be only multiple choice instead of descriptive along with online invigilation by the college/university?

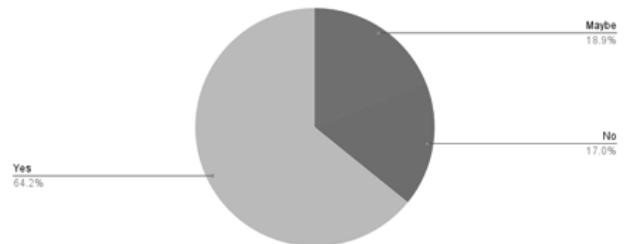


Fig. 16: Responses on online examination pattern

The students are showing willingness to write exams in online only by multiple choice format majority of students (i.e. 64.2%) are expected to write their exams in online only in the formate of multiple choicce questions and against to descriptive formate of the exam patterns. Only 17 perentages of the respondent students expressed that they are ready to write exam in descrive formate against to multiple choice exam pattern. Nearly 19 portions of the student respondents has not favored either descreeptive nor multiple choice from overall answeres for the above question.

Have you missed any exam due to internet issues? or not able to submit the papers online due to internet failure or low bandwidth?

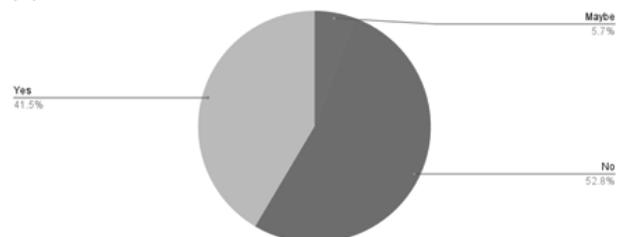


Fig. 17: Responses on effect of internet failure on submission of examination papers

For the above statement it is cleared that student respondents gave mixed responses. But from their responses it is observed that internet failure and low bandwidth could create troubles to students to submit their exam papers in online with in time frame dead line. 41.5 percentages of the students from respondents experienced such situation and failed to submit exam papers in time they shared. 52.8 portions of students said that they could not face such glitches like network issues and low bandwidth to submit their exam papers. They submitted exam papers on time without any difficulty.

Student suggestions for online environment:

1	Class recording and notes should be available to every student after the completion of each and every class. Concerned faculty has to take care for this practice.
2	Allow students into online class even the class being continued if there are any internet issues and the reason is genuine.
3	Online classes are suitable for only theoretical courses the same are not preferred for practical courses.
4	Continuous online classes all the days in a week somehow would be distracted attention of students. Frequent breaks between class to class and one or two days off are recommended.
5	The teacher has to instruct students to jot down class notes and provide reasonable time to do it. This may improve involvement of the students in online class.
6	The Government (State/Central) should support poor students by providing gadgets through that they can get access to the online classes. At the same time the Government has to take care to strengthen internet infrastructure in rural areas.
7	Putting some interesting tasks on to the students and supporting them, looking over more effective methods for theory and problematic subject for better understanding like more live examples, extra knowledge about professional development and try new interesting ways to teach.
8	In online not even half of the students are attending the class. Students are least bothered about courses what are taught in online. Some students just keep their mobile aside and continue doing their other works so what I feel is it's better to make offline as soon as possible with proper measures if not students are going to be the losing side.
9	It would be better if teachers spend some time on everyone to know whether they are able to get concept understand or not...
10	Usually virtual sessions will be a bit boring. But this depends on the activeness of the faculty and student as well.
11	The teaching staff should have a good network when they're facing network connectivity issues during class students would loosen their interest.
12	Each online class duration should be in between 40 to 50 minutes. Ten minutes break in between class to class is suggested.
13	Faculty must ask questions in the middle of the class and an exam must be conducted in a week based on lectures was taught in the earlier classes.
14	I request college/ University management to stick to only one online teaching platform for online classes. Changing apps frequently are creating access issues for students.
15	It is a time taking process that students and faculty has to adopt themselves to online classes. For one class the students' strength must be not more than 40 to make it feasibly success.
16	Assigning more assignments rather than teaching would make everyone attentive, instead of teaching everything, few topics should be given to students for research, analyze, understand and make presentation on such topic and explain it to fellow classmates so that they would be attentive as well as development their presentation skills.

Conclusion:

Effect of several parameters related to Technological, LMS, Teaching aids and Personal factors on student learning have been reported in this paper. Based on a structured survey feedback from 159 students of UG and PG, it has been reviewed thoroughly about the hurdles for proper learning have been identified. Poor networks, gadgets, interruptions in power supply, network bandwidth, un-supportive environment at home for online learning have been reported by students. Zoom and Microsoft Teams have been used by majority of students due to its simplicity and ease to login and use. Students feel that urban places are better connected with internet facilities compared to rural areas. Poor mobile network infrastructure in rural areas may be a strong reason for interruptions in connectivity affecting learning online. 57 percent of students are dependent on mobile phone instrument, which indicates that they cannot afford laptops/desktop systems. It is recommended that high bandwidth networks at affordable prices need to be made available to both rural and urban population, so that students can learn better through online in case of pandemic situations like Covid-19.

References:

- [1] Wargadinata, W., Maimunah, I., Eva, D., & Rofiq, Z. (2020). Student's responses on learning in the early COVID-19 pandemic. *Tadris: Journal of Education and Teacher Training*, 5(1), 141-153.
- [2] Baticulon, R. E., Sy, J. J., Alberto, N. R. I., Baron, M. B. C., Mabulay, R. E. C., Rizada, L. G. T., ... & Reyes, J. C. B. (2021). Barriers to online learning in the time of COVID-19: A national survey of medical students in the Philippines. *Medical science educator*, 31(2), 615-626.
- [3] Rice, M. F., & Deschaine, M. E. (2020, April). Orienting toward teacher education for online environments for all students. In *The Educational Forum* (Vol. 84, No. 2, pp. 114-125). Routledge.
- [4] Morgan, H. (2020). Best practices for implementing remote learning during a pandemic. *The Clearing House: A Journal of Educational Strategies, Issues and Ideas*, 93(3), 135-141.
- [5] Kapasia, N., Paul, P., Roy, A., Saha, J., Zaveri, A., Mallick, R., ... & Chouhan, P. (2020). Impact of lockdown on learning status of undergraduate and postgraduate students during COVID-19 pandemic in West Bengal, India. *Children and Youth Services Review*, 116, 105194.
- [6] Coussement, K., Phan, M., De Caigny, A., Benoit, D. F., & Raes, A. (2020). Predicting student dropout in subscription-based online learning environments: The beneficial impact of the logit leaf model. *Decision Support Systems*, 135, 113325.
- [7] Garris, C. P., & Fleck, B. (2020). Student evaluations of transitioned-online courses during the COVID-19 pandemic. *Scholarship of Teaching and Learning in Psychology*.
- [8] Olowo, B. F., Alabi, F. O., Okotoni, C. A., & Yusuf, M. A. (2020). Social media: Online modern tool to enhance secondary schools students' academic performance. *International Journal on Studies in Education*, 2(1), 26-35.
- [9] Miller, T., MacLaren, K., & Xu, H. (2020). Online learning: Practices, perceptions, and technology. *Canadian Journal of Learning and Technology/La revue canadienne de l'apprentissage et de la technologie*, 46(1).
- [10] Zheng, B., Lin, C. H., & Kwon, J. B. (2020). The impact of learner-, instructor-, and course-level factors on online learning. *Computers & Education*, 150, 103851.
- [11] Raes, A., Vanneste, P., Pieters, M., Windey, I., Van Den Noortgate, W., & Depaepe, F. (2020). Learning and instruction in the hybrid virtual classroom: An investigation of students' engagement and the effect of quizzes. *Computers & Education*, 143, 103682.
- [12] Harrison, T. (2020). How distance education students perceive the impact of teaching videos on their learning. *Open Learning: The Journal of Open, Distance and e-Learning*, 35(3), 260-276.
- [13] Hasan, N., & Bao, Y. (2020). Impact of "e-Learning crack-up" perception on psychological distress among college students during COVID-19 pandemic: A mediating role of "fear of academic year loss". *Children and Youth Services Review*, 118, 105355.