

## COVID19 PANDEMIC AND ONLINE CLASSES: STUDENT'S EXPERIENCE OF DEPARTMENT OF LIBRARY AND INFORMATION SCIENCE, BABASAHEB BHIMRAO AMBEDKAR UNIVERSITY, LUCKNOW, INDIA

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### ABSTRACT

*The COVID-19 Pandemic created an unprecedented situation for the teaching learning environment and the whole world was affected especially the developing countries where students were forcefully instructed to attend the online classes by the respective academic institutes without considering the ground realities in terms of physical and mental health of the student's community, their ordeals in terms of availability of a suitable gadget(laptop/computer/smart phone), Internet connectivity, payment of Internet connection, etc. The study is a sincere attempt to check the ground realities and the impediments faced by the student's. Accordingly, researchers designed a Google form structured questionnaire and forwarded to the students through WhatsApp groups and after sincere persuasion received the 83 responses which presents the observation, experience and problems faced by them. So, in present study N-83 means 100% population.*

**Keyword:** COVID-19 classes, Online Classes and COVID-19, Online Teaching Learning, Online Classes in India, Student's Experience of Online Classes.

### 0. INTRODUCTION

Online teaching and learning is in vogue in developed countries for the past many years and in India also this pedagogy is being used in selective academic institutions as however the classroom teaching-learning with one to one interaction is very much prevails and is well tested and accepted mode of education system in all corners of India. In 2020, the whole world was affected by COVID-19 and every sector was badly hit due to lockdowns round the corner to which India was not an exception. The worst affected segment was Education System of every country as the students were confined to their houses and were forced to attend online classes to read and learn which affected student's community mentally and physically. On one side they had to be worried about the suitable gadget and Internet connectivity and on other to cope up with family problems, issues, oneself mindset and other hardships. The educational institutions ranging from preprimary to the secondary classes in a hurried manner started the online classes without visualizing the effect and impact on the receiving student's community who were suddenly and abruptly asked to join the bandwagon without serious thinking of merits and perils. As from the past one and half year, online classes are very much reality and though student's are facing many ordeals but they do not have any immediate succor.

### 1. OBJECTIVES OF THE STUDY

- i. To find out the student's observation and experience of Online Classes.
- ii. To check the effectiveness of online classes.
- iii. To check the impediments faced for attending online classes.
- iv. To study the satisfaction level of student's for online classes.
- v. To study the data security concerns/issues of student's while attending online classes.

### 2. SCOPE AND LIMITATIONS

The study has been conducted in the Department of Library and Information Science of Babasaheb Bhimrao Ambedkar University, Lucknow, Uttar Pradesh, India. Though there are more than 100 students in varied courses but only 83 students of Bachelor's, Master's, M.Phil. & Ph.D. courses responded to the questionnaire forwarded through student's WhatsApp groups.

### **3. RESEARCH METHODOLOGY**

An online survey was conducted between October and November 2020 through a well-structured online questionnaire designed through Google Form to collect the responses from the participants. The link to the survey was sent to all participants using WhatsApp and in response 83 participants responded. The data received was further analysed using MS Excel and presented in graphs and tabular forms with interpretation. For the citation and references, MLA 8<sup>th</sup> edition has been used throughout the study.

### **4. LITERATURE REVIEW**

There are many articles existing on various facets of paper reviewed articles related to Information seeking behaviour in covid-19 pandemic. Few studies are mentioned here. Adedoyin and Soykan (2020) covered the rampant use of online learning due to pandemic and the challenges and opportunities associated with and the new lessons learnt.

Bhatt and Manish (2021) in their work investigated the first-time experience of students' attending the online classes in University of Delhi which was not their choice but compulsion due to closure of academic institutes because of COVID-19 pandemic. The researchers tried to read the mind and observe the students' experience of department of library and information science in terms of availability of suitable gadget, Internet connectivity and other physical and mental hardships. The study revealed that 87.9% students found that it a good initiative to be connected with learning environment; 69.35% respondents found Zoom Software is a good tool for free web conferencing with 87.09% successfully downloaded it. Further in terms of the constraints faced 45.16% responded of not having a PC/ Laptop/Tablet at home; 8.06% not having a Smartphone; 32.25% reported of not having Internet connection at home; 59.67% stated difficult to attend through phone; 51.61% respondents reported poor audible quality with 41.93% poor video quality and 66.12% reported frequent interruptions. The most important revelation by 70.96% respondents was feeling and thinking of compromising their personal data by use of free web conferencing software especially Zoom software.

Manish and Sharma (2021) in their research conducted in Jamia Millia Islamia, New Delhi investigated about the online classes and its success scenario and comprehensively covered essential issues viz. students opinion and perception about online classes and open source web conferencing software, devices used compatibility, effectiveness and constraints faced regarding them. Chaturvedi et al. (2021) in their study, examined the effect of Covid-19 on Education, Social Life and Mental Health of the students'. They conducted a survey among 1182 students of different institutions from Delhi and NCR region to find out the age groups, time spent on online classes, medium of instruction, sleeping habits, exercise routine, mental health and social life. It was found that average time spent on online classes was 3.20 hours a day. About 38.3% percent of students had a negative response toward online classes compared to conventional mode of studies. With 57.3% the smartphones were the preferred choice to take online classes. The average time spent on sleep stood 7.87 h/day among different age groups of students. The study further revealed about the presence on social media platforms by students and it was found that between the age group 18-22, Instagram was the most preferred networking site with 39% respondents while age group 23-59 responded WhatsApp as their preferred choice with 38% response. The government-imposed restrictions such as social distancing and lockdown further affected students' mental and psychological health. They further recommended that after prevailing normalcy Government should ensure proper Internet connectivity with gadgets to bridge the digital divide among socially disadvantaged students' of the society. The study deals with Agricultural Student's perception and preference regarding online learning through an online survey of 307 students. The findings revealed that majority of respondents (70%) are ready to opt for online classes to manage the curriculum during this pandemic. Majority of the students' preferred use of smart phone for online learning and also opined that flexibility and convenience of online classes makes it attractive option, whereas broadband connectivity issues in rural areas makes it a big challenge. However, in agricultural education system where many courses

are practical oriented, shifting completely too online mode may not be possible and need to device a hybrid mode.

Karim (2020) did a study on 276 students of Kardan University and found out that majority of the students (66.3%) were in favour of the online classes. It was further revealed that most of the students felt there is a significant difference in Online and Offline Learning. It was found that students favoured some online training to maximise the utilisation of online teaching learning process. This study concluded that there was dire need for proper communication, workshop and training especially for female students. Nambiar (2020) in her study found out that there are certain areas for teacher's and student's pertaining to online classes, which include improved and timely interactions, technical compatibility, structured teaching modules, and changes to adapt in new mode of teaching learning environment. An online survey with 76 teachers and 412 students showed that the majority of the teachers (86.9%) preferred Classroom/ offline teaching over online teaching. The majority of students (54.9%) found that online classes are less effective than offline classes; they also felt that they are less interactive than offline classes, discussion is quite low in online classes and they are more unstructured than offline classes.

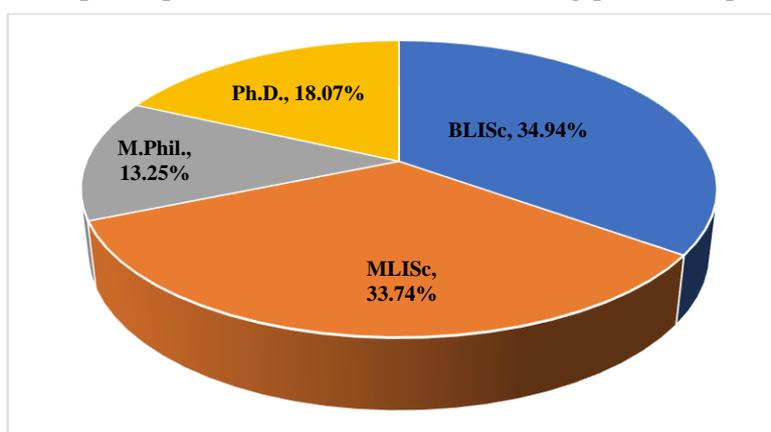
Dhawan (2020) research includes the importance of online learning and Strengths, Weaknesses, Opportunities, & Challenges (SWOC) analysis of e-learning modes in the time of crisis. The work dwell upon growth of EdTech Start-ups during the time of pandemic and natural disasters and includes suggestions for academic institutions of how to deal with challenges associated with online learning. Martin (2020) investigated and focus on the 5 major areas viz. Instruction, Content, Motivation, Relationships and Mental Health regarding online learning. Mahyoob (2020) highlighted the challenges and obstacles faced by English Language Learners (EFL) in Science and Arts College in Taibah University, Saudi Arabia. The researcher through survey method investigated the technical, academic and communication challenges faced by the learners. Mishra, Sahoo and Pandey (2021) showed that online learning and teaching became the first choice and compulsion during pandemic, critically analysed the publications using scientometric techniques and also focused on new technologies being used, teacher capacities and institutional preparations and support.

## 5. DATA ANALYSIS AND PRESENTATION

**Table 1: Gender-wise Distribution**

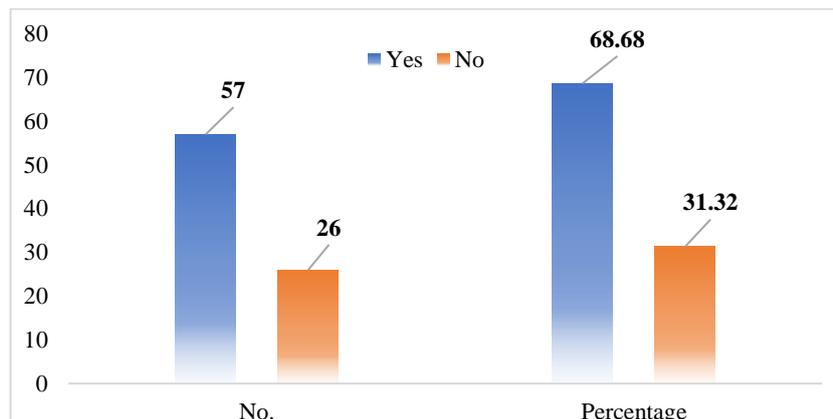
Sr. No.	Gender	No.	Percentage (%)
1	Male	39	46.98
2	Female	44	53.02
<b>Total</b>		<b>83</b>	<b>100</b>

Table 1 exemplifies the Gender-Wise Distribution of the participants which indicates that females 44 (53.02%) were more responsive to the survey in comparison to males 39 (46.98%). It is a paradigm of more attentiveness and participation of female student's during pandemic period.



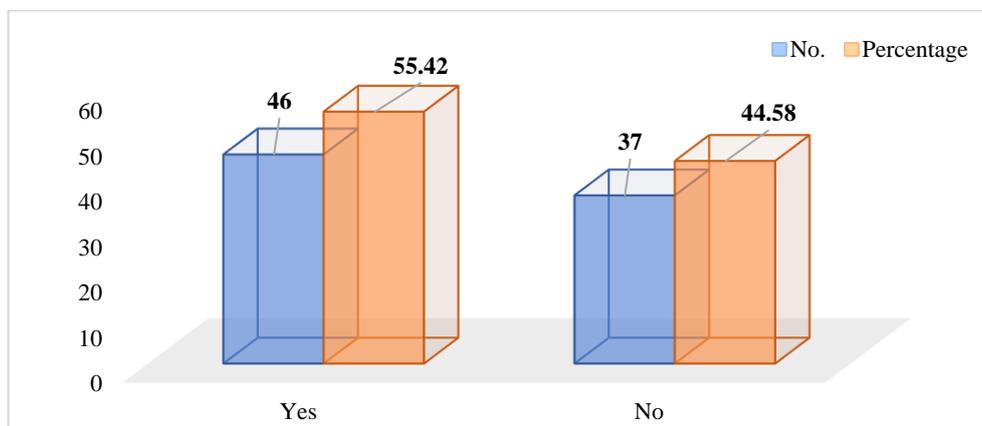
**Graph 1: Student's Category**

Data of Graph 1 tangibly shows that maximum BLISc (34.94%) student's responded to the questionnaire, seconded by MLISc (33.74%). Further, Ph.D. (18.07%) and M.Phil. (13.25%) scholars responded and this indicates that the new student's were highly responsive in comparison to senior students.



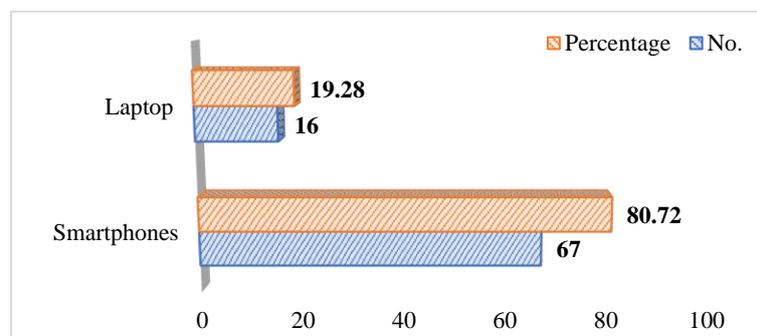
**Graph 2: Initiative to Learn through Online Classes**

Graph 2 data clearly reflects that the online class is a good initiative for continuous learning in this pandemic as 57 (68.68%) respondents agreed and responded affirmative and 26 (31.32%) disagreed to it.



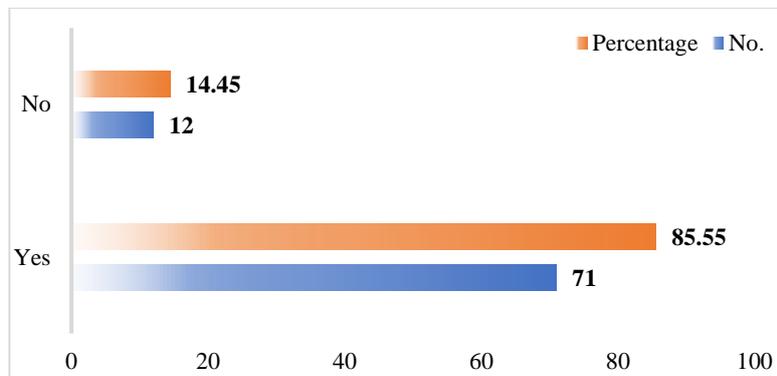
**Graph 3: Online Class through any Free Web Conferencing Software**

Data of graph 3 shows that majority of the respondents 46 (55.42%) were in favor of online classes through any free web conferencing software and responded in affirmation whereas 37 (44.58%) respondents disagreed to it.



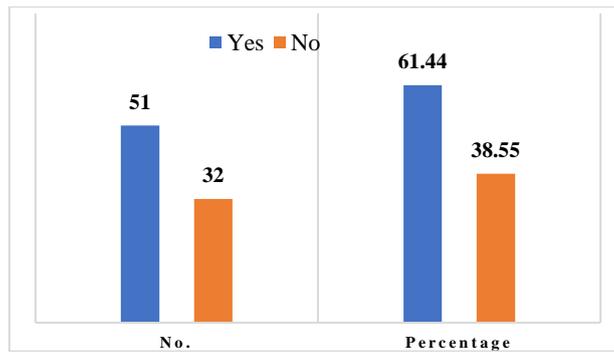
**Graph 4: Gadget Used for Attending Online Class**

Graph 4 data reflects that the majority of the respondents 67 (80.72%) used their Smartphone to attend online classes whereas 16 (19.28%) used their laptops. Since Smartphone's are handy and easy to carry than laptops so that is the reason respondent's used them in a very easy manner.



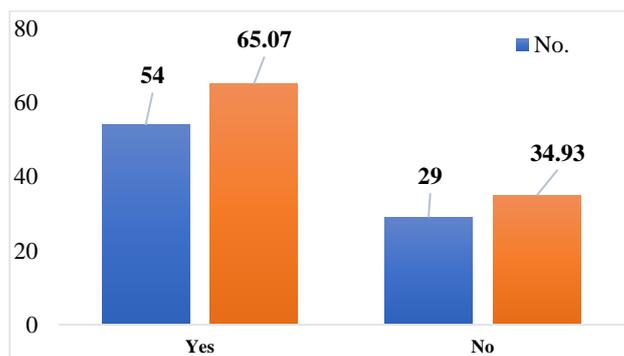
**Graph 5: Gadget Compatible to Download the Free Web Conferencing Software**

Data of graph 5 shows that majority of the respondent's 71 (85.55%) have suitable gadget compatible for downloading the Free Web Conferencing Software /application and only 12 (14.45%) were not having such gadget.



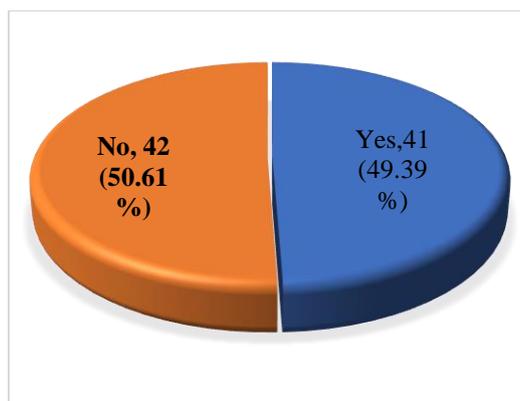
**Graph 6: Understanding of the Concept**

Graph 6 data indicates that 51 (61.44%) respondent's understand the concept properly taught by the teacher while 32 (38.55%) did not.



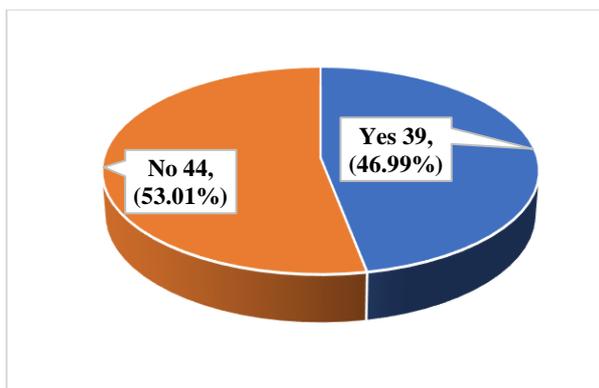
**Graph 7: Content Coverage in a Session**

Graph 7 indicate towards the content coverage fairness of session where 54 (65.07%) of the respondent's admit that concept/content fairly covered in the session while 29 (34.93%) didn't.



**Graph 8: Opportunity for asking a Question**

Graph 8 data shows that more respondents i.e. 42 (50.61%) respondents did not get an opportunity to ask a question while 41 (49.39%) were fortunate in this regard.



**Graph 9: Opportunity to clear their doubt(s) in a session**

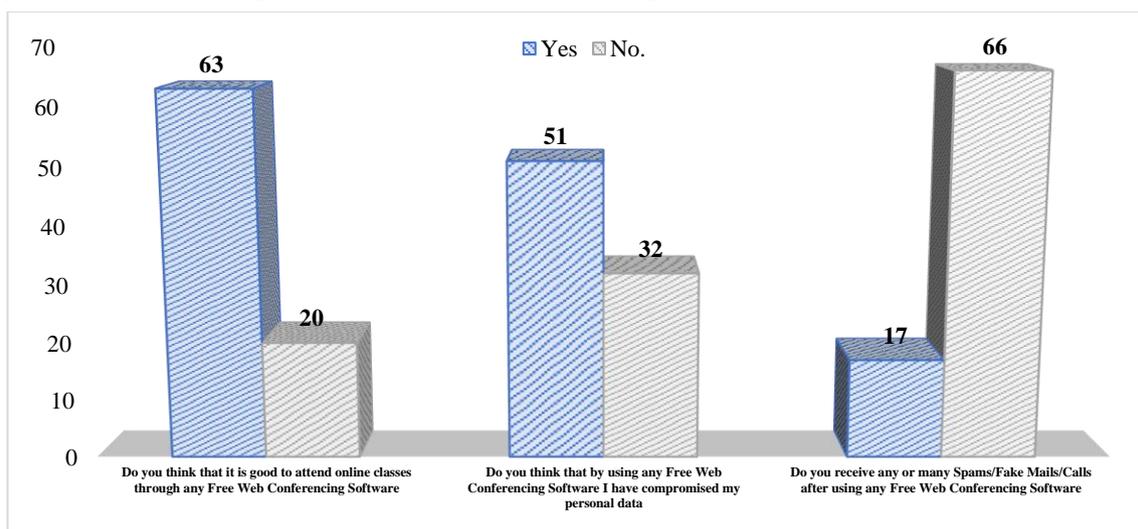
Graph 9 data depicts those 39 (46.99%) respondents got an opportunity to clear their doubt(s) in a session whereas 44 (53.01%) respondents did not.

**Table 2: Problems/Constraints Regarding Online Classes**

Sr. No.	Problems/Constraints Faced to Join Online Classes	Yes	Percentage	No.	Percentage
1	Poor Internet connectivity at my place	76	91.56	7	8.43
2	I am not having Internet connection at home	73	87.95	10	12.04
3	Poor Video Quality	59	71.08	24	28.91
4	Difficult to re-join the class/session after time ends or an interruption	57	68.67	26	31.32
5	Limited Session Time	47	56.63	36	43.37
6	Difficult to attend/continue class/session through phone	27	32.53	56	67.47
7	Poor Audio Quality	23	27.71	60	72.28
8	I tried many times but could not connect the class/session	21	25.3	62	74.69
9	Difficult to read on screen the ppts/text	19	22.89	64	77.10
10	Problem to connect any Free Web Conferencing Software	18	21.68	65	78.31
11	Frequent Interruptions	16	19.27	67	80.72
12	I am not having a PC/ Laptop/Tablet at home	15	18.07	68	81.92
13	Too much waiting to join the class/session	13	15.66	70	84.33
14	Many times, the meeting code shows incorrect	9	10.84	74	89.15
15	I am not having a Smartphone	2	2.40	81	97.59

Data of table 2 shows the problems faced by the respondents in attending online classes. The major problem was Poor Internet Connectivity faced by 76 (91.56%) of the respondent's. Further, other constraints faced by respondent's were No Internet Connection at Home 73 (87.95%), Poor Video Quality 59 (71.08%), difficulties in rejoining class/session through phone 57 (68.67%), Limited Session Time 47 (56.63%). In addition to that Difficult to Attend/Continue Class/Session through Phone 27 (32.53%) responded Yes and 56 (67.47%) stated No. For another question Poor Audible quality 23 (27.71%) responded yes and 60 (72.28%) opined no; For Tried Many Times but Could Not Connect the Class/Session 21(25.3%) have responded Yes whereas 62 (74.69%) stated No. With regard to other questions Difficult to Read on Screen the PPTS/Text 19 (22.89%) responded Yes and 64 (77.10%) stated No; Problem to connect any Free Web Conferencing Software 18 (21.68%) respondents stated Yes and 65 (78.31%) opined No; Frequent Interruptions 16 (19.27%) respondents responded Yes whereas 67 (80.72%) stated No; Not Having A PC/ Laptop/Tablet At Home 15 (18.07%) responded Yes and 68 (81.92%) opined No; Too Much Waiting To Join The Class/Session 13(15.66%) responded Yes and 70 (84.33%) opined No; Many Times, The Meeting Code Shows

Incorrect 9(10.84%) responded Yes and 74(89.15%) stated No and for the question Not Having A Smartphone 2(2.40%) responded Yes and 81(97.59%) opined No.



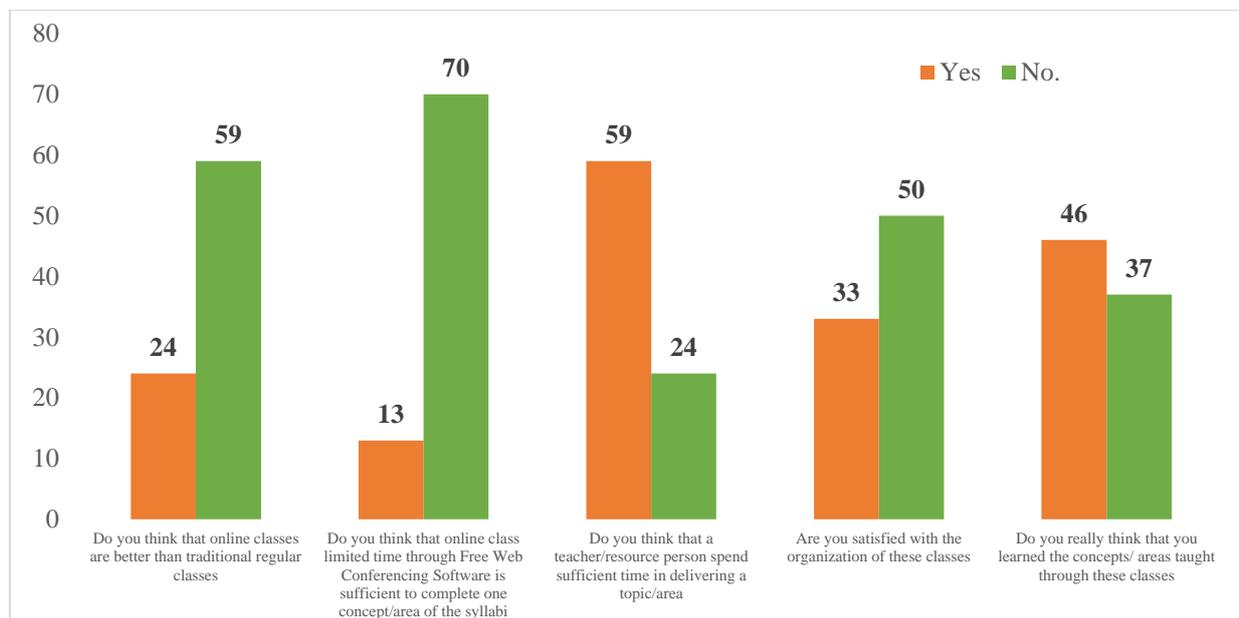
**Graph 10: Data Security Issues/Concerns**

It is evident from Graph 10 data that regarding data security issues 63 (75.90%) of the respondents admitted that they feel good to attend online classes through free web conferencing software but 20 (24.09%) responded in negative. Further, 51 (61.44%) respondents admitted that by use of Free Web Conferencing Software they compromised with personal data but 32 (38.55%) did not think so. For another question that did they received any or many Spams/Fake Mails/Calls after using any Free Web Conferencing Software 17 (20.48%) admitted yes and 66 (79.51%) responded in negative.

**Table 3: Observation/Experience**

Sr. No.	Observation/Experience	Yes	Percentage	No.	Percentage
1	Do you think that a teacher/resource person spend sufficient time in delivering a topic/area?	59	71.08	24	28.92
2	Do you really think that you learned the concepts/ areas taught through these classes?	46	55.42	37	44.58
3	Are you satisfied with the organization of these classes?	33	39.76	50	60.24
4	Do you think that online classes are better than traditional regular classes?	24	28.92	59	71.08
5	Do you think that online class limited time through Free Web Conferencing Software is sufficient to complete one concept/area of the syllabi?	13	15.66	70	84.34

Table 3 data tangibly shows the observation/experience of the respondent's towards online teaching and learning through free web conferencing software(s). Majority of the respondent's 59 (71.08%) admitted that the concerned teacher/resource person spend sufficient time for teaching or explaining the concept. Further, 46 (55.42%) of respondent's admitted that they learned the concepts taught through the online classes. For another question regarding organization 33 (39.76%) of the respondent's were satisfied with the organization of classes. Further only 24 (28.92%) respondent's affirmative that online classes are better than traditional regular classes. For another question that whether online class limited time through Free Web Conferencing Software is sufficient to complete one concept/area of the syllabi only 13 (15.66%) responded in yes and maximum 70 (84.34%) in negative.



**Graph 11: Observation/Experience**

Graph 11 data clearly shows that only 24(28.91%) respondent's agreed and responded affirmative for online classes are better than traditional regular classes but 59(71.08%) responded in negative. 70 (84.33%) respondent's opined in negative that they do not agreed with limited timings of online classes through free web conferencing software is sufficient to complete one concept/area of syllabi and only 13(15.66%) responded in affirmation. 59(71.08%) respondent's agreed that a teacher/resource person spend sufficient time in delivering a topic/area but 24(28.91%) did not. Only 33(39.75%) respondent's agreed to be satisfied with the organization of online classes whereas 50(60.24%) did not think so. 46(55.42%) admitted of learning the concepts/areas taught through online classes but 37(44.57%) responded in negative.

**Table 4: Rating of the Free Web Conferencing Software(s)**

Sr. No.	Please rate the following in terms of	Average		Good		Excellent	
		No.	Percentage	No.	Percentage	No.	Percentage
1	Free Web Conferencing Software User Interface	8	9.64	47	56.63	28	33.73
2	Free Web Conferencing Software Audio Quality	19	22.89	41	49.40	23	27.71
3	Free Web Conferencing Software Video Quality	38	45.78	27	32.53	18	21.69
4	Free Web Conferencing Software Features in terms of invite, screen share, etc.	16	19.27	53	63.86	14	16.87
5	Free Web Conferencing Software Connectivity	11	13.25	60	72.29	12	14.46

Data of Table 4 shows the perception of the respondent's towards the features of the free web conferencing software(s) and it was found that only 28 (33.73%) respondents admitted that these software's had excellent user interface while 47(56.63%) responded as good and only 8 (9.64%) as average. Further, 41 (49.40%) respondents admitted that these had good audio quality, 23 (27.71%) responded as excellent and only 19 (22.89%) as average. With regard to Free Web Conferencing Software Video Quality 38 (45.78%) responded average, 27 (32.53%) good and only 18 (21.69%) as excellent. With regard to Free Web Conferencing Software Features in terms of invite, screen share, etc. maximum 53 (63.86%) respondents responded good, 14 (16.87%) excellent and 16 (19.27%) as average. For another question regarding Free Web Conferencing Software Connectivity maximum 60 (72.29%) responded as good, 12 (14.46%) as excellent and only 11 (13.25%) as average.

## 6. MAJOR FINDINGS

- i. It is found that 53.02% females and 46.98% males responded to the questionnaire.
- ii. The research found that maximum *BLISc* (34.94%) student's responded to the questionnaire, seconded by *MLISc* (33.74%), *Ph.D.* (18.07%) and *M.Phil.* (13.25%) only.
- iii. 57 (68.68%) respondents agreed and responded affirmative that online classes is a good initiative for continuous learning in this pandemic environment.
- iv. The study shows that 46 (55.42%) respondents were in favour of online classes through any free web conferencing software.
- v. The study revealed that 67 (80.72%) respondent's used their Smartphone to attend online classes as they are handy and easy to carry than laptops.
- vi. The study revealed that 71 (85.55%) respondent's have suitable gadget compatible for downloading the Free Web Conferencing Software /application.
- vii. The study shows that 51 (61.44%) respondent's understood the concept properly taught by the teacher while 32 (38.55%) did not.
- viii. 54 (65.07%) of the respondent's admitted that concept/contents were fairly covered in the session.
- ix. It is found that 42 (50.61%) respondents did not get an opportunity to ask a question while 41 (49.39%) were fortunate in this regard.
- x. The study revealed that 39 (46.99%) respondents got an opportunity to clear their doubt(s) in a session whereas 44 (53.01%) respondents did not.
- xi. With regard to the problems faced by the respondents in attending online classes, the major problem was *Poor Internet Connectivity* faced by 91.56% of the respondents. Further, other constraints faced by respondents were *No Internet Connection at Home* (87.95%); *Poor Video Quality* (71.08%); *difficulties in re-joining class/session through phone* (68.67%); *Limited Session Time* (56.63%). In addition to that *Difficult to Attend/Continue Class/Session through Phone* (32.53%) responded *Yes* and 56 (67.47%) stated *No*. For another question *Poor Audible quality* 23 (27.71%) responded *Yes* and 60 (72.28%) opined *No*; For *Tried Many Times but Could Not Connect the Class/Session* 21 (25.3%) have responded *Yes* whereas 62 (74.69%) stated *No*. With regard to other questions *Difficult to Read on Screen the PPTS/Text* 19 (22.89%) responded *Yes* and 64 (77.10%) stated *No*; *Problem to connect any Free Web Conferencing Software* 18(21.68%) respondents stated *Yes* and 65 (78.31%) opined *No*; *Frequent Interruptions* 16(19.27%) respondents responded *Yes* whereas 67 (80.72%) stated *No*; *Not Having A Pc/ Laptop/Tablet At Home* 15(18.07%) responded *Yes* and 68 (81.92%) opined *No*; *Too Much Waiting To Join The Class/Session* 13 (15.66%) responded *Yes* and 70 (84.33%) opined *No*; *Many Times, The Meeting Code Shows Incorrect* 9 (10.84%) responded *Yes* and 74 (89.15%) stated *No* and for the question *Not Having A Smartphone* (2.40%) responded *Yes* and 81 (97.59%) opined *No*.
- xii. The study revealed the issues/concerns regarding data security and 63 (75.90%) of the respondents admitted that they feel good to attend online classes free web conferencing software. Further, 51 (61.44%) respondents admitted that by use of Free Web Conferencing Software they compromised with personal data and 17 (20.48%) respondents admitted that did they received any or many Spams/Fake Mails/Calls after using any Free Web Conferencing Software.
- xiii. With regard observation/experience of the respondents towards online teaching and learning through free web conferencing software's majority 59 (71.08%) admitted that the concerned teacher/resource person spend sufficient time for teaching or explaining the concept; 46 (55.42%) of respondents admitted that they learned the concepts taught through the online classes; 33 (39.76%) of the respondents were satisfied with the organization of classes; 24 (28.92%) respondents affirmative that online classes are better than traditional regular classes and 70 (84.34%) responded negative that online class limited time through Free Web Conferencing Software is sufficient to complete one concept/area of the syllabi.

- xiv. The study shows the perception of the respondents towards the characteristics of the free web conferencing software's 28 (33.73%) respondents admitted that these software's had excellent user interface while 47 (56.63%) responded as good and only 8 (9.64%) as average; 41 (49.40%) respondents admitted that these had good audio quality, 23 (27.71%) responded as excellent and only 19 (22.89%) as average; For Free Web Conferencing Software Video Quality 38 (45.78%) responded average, 27 (32.53%) good and only 18 (21.69%) as excellent; For Free Web Conferencing Software Features in terms of invite, screen share, etc. maximum 53 (63.86%) respondents responded good, 14 (16.87%) excellent and 16 (19.27%) as average and Free Web Conferencing Software Connectivity maximum 60 (72.29%) responded as good, 12 (14.46%) as excellent and only 11 (13.25%) as average.

## 7. CONCLUSION

The study overtly reveals the practical experience of online classes being attended by the students' and comprehensively presents the online classes concept, issues, students' observations, firsthand experience and the constraints faced by them. The study also highlights data security issues, Free web conferencing software pros and cons and the paradigm shift through online learning. Though the free web conferencing software(s) are an asset but still good Internet connectivity and suitable gadget for attending the classes was a major concern for the students' community especially from the poor connectivity and distant remote places across India. Indeed, online teaching and learning served as a boon in pandemic environment but it was not the first choice of the students' community as they came across many impediments and was actually not prepared for it.

## REFERENCES

- Adedoyin, Olasile Babatunde and Emrah Soykan. Covid-19 pandemic and online learning: the challenges and opportunities. *Interactive Learning Environments*. Sept. 2020. <https://doi.org/10.1080/10494820.2020.1813180>
- Bhatt, R. K. and Manish Kumar. Online Classes during COVID-19 Lockdown in India: A Study from Students' Perspective of University of Delhi. *Indian Journal of Information, Library & Society*.34, 1-2(2021). 111-119. Print.
- Chaturvedi, Kunal, et al. "COVID-19 and Its Impact on Education, Social Life and Mental Health of Students: A Survey." *Children and Youth Services Review*, vol. 121, February 2021, Elsevier Ltd, 2021, 105866, doi:10.1016/j.chilyouth.2020.105866.
- Dhawan, Shivangi. Online Learning: A Panacea in the Time of COVID-19 Crisis. *Journal of Educational Technology Systems*. June 20, 2020. <https://doi.org/10.1177/0047239520934018>
- Karim, Sarfaraz. "An Assessment of Online Education During COVID-19 Pandemic : Case of Kardan University". *Kardan Journal of Economics and Management Sciences*. 3(3). 2020. 44-57. <https://kardan.edu.af/data/public/files/KJEMS-3.3-2020-0414102020083346.pdf>
- Mahyoob, Mohammad. Challenges of e-Learning during the COVID-19 Pandemic Experienced by EFL Learners . *Arab World English Journal (AWEJ)* Volume 11. Number4 December 2020 Pp. 351-362 . DOI: <https://dx.doi.org/10.24093/awej/vol11no4.23>
- Manish Kumar and Sandeep Sharma. "Online Classes During COVID-19 Period. A Study of Students' Experience at Jamia Millia Islamia, New Delhi, India." *Library Herald*. vol 59, no. 3, September 2021. 144-163 Print DOI: 10.5958/0976-2469.2021.00029.4
- Martin, A. (2020). *How to optimize online learning in the age of coronavirus (COVID-19): A 5-point guide for educators*. [https://www.researchgate.net/publication/339944395\\_How\\_to\\_Optimize\\_Online\\_Learning\\_in\\_the\\_Age\\_of\\_Coronavirus\\_COVID-19\\_A\\_5-Point\\_Guide\\_for\\_Educators](https://www.researchgate.net/publication/339944395_How_to_Optimize_Online_Learning_in_the_Age_of_Coronavirus_COVID-19_A_5-Point_Guide_for_Educators)
- Mishra, Lokanath, et al. "Online Teaching-Learning in Higher Education during Lockdown Period of COVID-19 Pandemic." *International Journal of Educational Research Open*, vol. 1, 2020, Elsevier Ltd, 100012, doi:10.1016/j.ijedro.2020.100012.

- Mishra, Sanjay, Sidhartha Sahoo and Shriram Pandey. Research Trends in Online Distance Learning During the COVID19 Pandemic. *Distance Education*. Vol.42, issue 4, 2021. PP 494-519; <https://doi.org/10.1080/01587919.2021.1986373>
- Muthuprasad, T. et. al. Student's Perception and Preference for Online Education in India during COVID-19 Pandemic. *Social Sciences and Humanities Open*. Volume 3, Issue 1, 2021 <https://doi.org/10.1016/j.ssaho.2020.100101>
- Nambiar, Deepika. The Impact of Online Learning during COVID-19: Students' and Teachers' Perspective. *The International Journal of Indian Psychology*. 8 (2), 2020, 783–93 doi: 10.25215/0802.094