Sentiments, Concerns, and Perception of Students Regarding Online Learning amid Coronavirus (Covid-19) Pandemic

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Abstract

As the novel Coronavirus (COVID-19) spread across the globe and in India, alarm bells are sounding in the education sector. The closedown of educational institutes has severely affected the teaching-learning processes across the globe. Student concerns are rising, be it regarding their pending exams, further higher education, plans of studying abroad, job searches, appearing for various competitive exams or hindrance in the learning process. As far as learning is concerned, many private and government higher educational institutes have suddenly shifted to online teaching-learning. To best utilize the time on hand in this lockdown period and to continue learning, increasing number of students are opting online mode of teaching butat the same time there are certain issues and concerns regarding online teaching-learning which have surfaced. As the close down of educational institutes amid the current Covid-19 pandemic gets further prolonged for an uncertain period, there has been a radical change in the learning processes in all educational institutes. The perception of educators and students altogether play a pivotal role in determining their attitudes and actual behaviour towards virtual classrooms.

Broadly, the current empirical study attempts to explore and gauge the sentiments, concerns and perception of students regarding the sudden shift to online learning amid the Covid-19 pandemic. The study initially focuses on student's familiarity and level of competence (i.e., knowledge & skills) regarding the use of digital tools and computer-based technologies, and online learning applications/tools. The focus of current study is to determine students' awareness, usage, and their level of competence in using them. Further, the research paper tries to determine students 'perception towards online learning vis-à-vis class room learning experience. Finally, the study tries to analyse differences in the level of competence (i.e., knowledge skills) regarding the use of digital tools and computer-based technologies across gender. **Since the study undertaken is quite elaborative in nature, the major findings of the study are presented and discussed.**

Keywords: *Corona virus, COVID-19, Students Perception, Students Sentiments, Students Concerns, Online learning*

1. INTRODUCTION

Corona virus disease 2019 (Covid-19), an infectious disease caused by severe acute respiratory syndrome corona virus 2 (SARS-CoV-2) was first identified in December 2019 in Wuhan, the capital of China's Hubei province, and has since spread globally, resulting in an ongoing pandemic.

Schools, colleges, and universities across the globe are shut and students are stranded at home, with extremely limited contact with friends and virtually no physical activity, thanks to the Covid-19 pandemic raging across the world. IB, A Levels, ICSE, CBSE all known and recognized boards have postponed or cancelled examinations.

Likewise, top colleges like MIT, Harvard, and Princeton have closed. Closer home, institutions like IITs, IIMs, and many reputed colleges and universities across India have all closed their campuses and moved classes online. Even standardized tests like GMAT, GRE, SATs, ACT remain suspended and the future of many students hangs in balance! Clearly, there is panic all around and educators and students alike are confused as to next steps and continuity with respect to educational objectives. With the ongoing spread of the corona virus, technology and online learning platforms have become increasingly essential. When adapting to this new normal, universities have quickly evolved their digital tools and platforms to ensure uninterrupted educational delivery to their isolated students. These changes have certainly caused a degree of inconvenience, but they have also prompted new examples of educational innovation. Although it is too early to judge how reactions to Covid-19 will affect education systems around the world, there are signs suggesting that it could have a lasting impact on the trajectory of learning innovation and digitization.

The first case of Covid-19 disease was recorded in India on January 30, 2020. Since then the cases have increased steadily and significantly. Given the nature of the disease which is highly contagious, the ways to contain the spread include policy actions such as imposition of social distancing, self-isolation at home, closure of institutions, and public facilities, restrictions on mobility and even lockdown of an entire country. These actions can potentially lead to dire consequences for economies around the world. In attrition to it, to curb the spread of the virus, the government of India announced a three week long nationwide lockdown starting March 25, 2020. All non-essential services and businesses, including retail establishments, educational institutions, places of religious worship, public utilities and government offices across the country will stay closed during this period and all means of travel have been stopped. This is by far the most far-reaching measure undertaken by any government in response to the pandemic. Despite rigorous global containment and quarantine efforts, the incidence of COVID-19 continues to rise, with increased deaths. The first COVID-19 vaccine is yet to be researched. However, governments and pharmaceutical companies are struggling to quickly find an effective drug to defeat the corona virus.

2. EDUCATION SECTOR: DIGITAL IS THE FUTURE POST-CORONAVIRUS

- *Dr. Mousumi Mukherjee, Associate Professor & Deputy Director, International Institute for Higher Education Research & Capacity Building (IIHEd), OP Jindal Global University*

"Modern Indian universities have been historically more theoretical because of its colonial legacy. Now with the online transition; we need to think seriously how we can deal with the practical component of teaching and learning to prepare respectful professionals for the "world of Corona". "Moreover, uninterrupted power and internet supply will pose a challenge for online education.

If we have to run online classes in full-swing for the rest of the academic year in the context of COVID-19 with social distancing as the new norm, all students and faculty will need access to a personal computer, uninterrupted power and internet supply. This is a huge challenge in a large populous country like India."
"From personal experience of teaching and learning online, I know that even the most tech-savvy faculty needs a good deal of hand-holding by trained instructional designers to offer their courses online and to learn the learning management systems- both synchronous and asynchronous platforms. I wonder how this hand-holding will be literally possible now, where social-distancing is the norm! Faculty will need to be proactive in viewing online tutorials and seeking consultation from colleagues, who have had past experience with online teaching and learning abroad."

- ***Mr. Sharad Mehra, Chief Executive Officer, Global University Systems (GUS) – Asia Pacific***

"Education of around 300 million students have been disrupted globally owing to the closure of educational institutions. Adoption of tech-led holistic solutions can help tide over the challenge and keep the classes going without a halt", he says adding "what could have taken five years may now probably happen in 30 days".

- ***K G Suresh, Founder Dean, School of Modern Media, UPES and former Director General, Indian Institute of Mass Communication.***

"Virtual Reality is another technology that can make learning much more immersive and take students to far away and inaccessible locations while Augmented Reality can help in contextual learning. Artificial Intelligence too can help in making learning more adaptive and personalized. Teachers are finding AI driven Chatbots very useful at different stages to enhance the student experience. Social media platforms such as Instagram and WhatsApp, are also being put into use extensively for more informal and interactive learning. Many students are also increasingly using podcasts and Youtube for learning."

- ***Dr Francisco Marmolejo, advisor to Qatar Foundation in India, during his webinar, held by the Jio International Institute, India.***

Higher education should be re-designed. It should be flexible, more innovative, more international but more locally connected and socially responsible, more collaborative and less risk-averse. Innovative models should be introduced. Universities/institutes could be online- providing internet-based flexible offerings (open universities); traditional learning with hand-on work; collaboration with other schools. True international engagement comes with curriculum integration and active participation by the faculty. Faculty need to be motivated and actively involved in curriculum integration.

- ***Professor Soumyakanti Chakraborty at IIM-C articulates the latent opportunity that's present amid the crisis:***

"Many institutes of higher education in India have been quick to embrace digital technologies to keep the ball rolling. Although primarily driven by immediate needs, this would help us gain valuable

experience. Changes which otherwise take years may now be forced upon us in months; programs we've been conducting in campus may now have to be shifted online, partially or completely. What we need to do now is to make pedagogical adjustments to adapt our regular courses to online teaching."

3. STATEMENT OF THE RESEARCH PROBLEM:

The speed and scale at which the Covid-19 pandemic has hit the world is something that we have seen so far only in doomsday movies. As we are seeing it today, this is way more frightening than fiction. The costs are going to be unimaginably high and the worst, it's going to end up having a long tail too. The world order is changing and changing dramatically.

The corona virus pandemic has spurred adoption of online learning at all education levels. Some primary and secondary schools and most colleges plan to move class online and in response there is a surge among students adopting online mode of learning.

There are many factors that affect online learning such as organizational preparedness, technological factors, intrinsic motivation, perceived learning outcome, service quality, content quality to name a few. Students of all ages in countries around the world are adjusting to the abrupt close of schools and colleges in the past few weeks. Online learning varies between countries and institute. Some adopt synchronous while some adopt asynchronous learning. At this stage there is a constant conflict, worry and fear of uncertainty and mental struggle to suddenly adapt to online mode of learning among students.

Given the above context, it is important to understand the sentiments and students view towards online learning, hence, this research focuses on the problem statement "Sentiments, Concerns,and perception of students regarding Online Learning amid Corona virus (COVID-19) Pandemic.

4. RATIONALE FOR THE STUDY:

The novel corona virus (COVID-19) has severally impacted the lives of billions and has triggered deep economic crisis. The global economic impact could be broader than any that we have seen since the Great Depression. The pandemic has sickened hundreds of thousands of people, shut down major cities, prompted unprecedented global travel restrictions, making things worse for people working on daily wages and also creating a fear among the citizens about its implications on employment. Majority of people have taken to work from home just as the Indian Government imposed the lockdown to control the spread of Covid-19 in the country. Education sector is disrupted across the globe temporarily shutting down schools and colleges. The lockdown has created uncertainty over the exam cycle, beginning of new academic year, placements, students counselling and the most important student learning. To facilitate student learning schools and colleges have adopted web based teaching and learning. The immediate solution of corona virus is necessary or if like these days pass then closure of schools, colleges, and universities does not even have short term impact in India but can even cause far-reaching economic and societal consequences.

Since, students are at the receiving end, it becomes more imperative to understand sentiments, concerns, and perception of students regarding online learning during this period.

5. SCOPE OF THE RESEARCH STUDY:

The current research focuses on exploring and analysing sentiments, concerns and perception of students regarding online learning amid the coronavirus (Covid-19) outbreak. Primary data for the said research is collected by connecting and surveying people who were in close contacts with the researchers. From among the total respondents of this study, majority of respondents belonged to Vadodara.

6. RESEARCH OBJECTIVES:

Amid the current corona virus (Covid-19) pandemic, the current research focuses on following objectives:

- Determine students' familiarity and level of competence (i.e., knowledge & skills) regarding the use of digital tools, computer-based technologies, and online learning applications/tools.
- Determine students' overall outlook towards online vis-à-vis classroom learning.

- Based on the experiences of sudden shift to online learning due to Covid-19 pandemic, explore students' concerns and issues about online learning,
- Determine the differences if any, in the level of competence (i.e., knowledge & skills) regarding the use of digital tools and computer-based technologies across gender.

7. RESEARCH METHODOLOGY:

The study undertaken is descriptive in nature. Amid the Covid-19 crisis lockdown, the researchers of the study decided to adopt convenience method of sampling. Accordingly, primary data was collected by surveying people who were in close contact with the researchers. Primary data was collected towards the end of 3rd phase of lockdown. A structured non-disguised questionnaire was prepared and then administered as a Google Form. The link of this Google Form was shared with the undergraduate and post-graduate students of the researchers. The Google link was shared with students studying different disciplines at various colleges and universities in and around Vadodara. The Google link of the questionnaire was shared with around 300students. However, 266students responded to the Google link questionnaire. The final data analysis of 266 respondents is presented in the study. From among the total students surveyed, majority of the students belonged to Vadodara and Gandhinagar. However, students from higher educational institutes located in cities like Ahmedabad, Surat, Anand, Rajkot, Mumbai, Jaipur etc. responded in fairly good numbers.

The questionnaire consisted of four sections: Demographic details, Familiarity with and use of ICT and online learning tools, Students' overall outlook towards online vis-à-vis classroom learning, Students' actual level of usage of digital tools and computer-based technologies (i.e., ICT knowledge and skills) was measured using 11 items, 5-point scale (ranging from 0-No knowledge to 5-Expert knowledge). Further, level of familiarity regarding various online learning applications / tools was measured for 10 most popular applications on 3-point scale (0-Low level to 3-High level). Actual usage of specified applications/online tools was measured on a 4-point scale, ranging from 0-Never to 4-Always. Students' overall outlook towards online vis-à-vis classroom learning was measured on 21 dimensions. Finally, issues and concerns regarding online learning was measured on 20 dimensions, 5-point Likert scale anchored with (1) Strongly Disagree to (5) Strongly Agree. A pilot test was conducted locally, on 30 students before administering the final draft of the questionnaire to the targeted respondents. Some minor changes were made in the first draft of the questionnaire to improve the accuracy of the responses. Cronbach's Alpha was applied to check the internal consistency of scales and all scales showed satisfactory scores ranging between 0.61 to 0.79.

IBM SPSS Statistics – Trial Subscription Package was used to analyse the collected primary data. To begin with the analysis part, descriptive statistics, average means, and standard deviations were calculated. Further analysis was carried in accordance with the research objectives framed for the study. Finally, T-test was conducted to explore the differences in the level of competence (i.e., knowledge and skills) regarding the use of digital tools and computer-based technologies across gender.

8. DATA ANALYSIS AND FINDINGS:

Table 1 presents a brief on the demographic profile of the respondents surveyed

Table 1: Demographic Details of Respondents

Gender	Frequency	Percent	Valid Percent	Cumulative Percent
Female	150	56.4	56.4	56.4
Male	116	43.6	43.6	100.0
Total	266	100.0	100.0	
Age (in Years)	**Frequency**	**Percent**	**Valid Percent**	**Cumulative Percent**
18-21	171	64.3	64.3	64.3
21-23	69	25.9	25.9	90.2
Above 23	26	9.8	9.8	100.0
Total	266	100.0	100.0	
Different Disciplines	**Frequency**	**Percent**	**Valid Percent**	**Cumulative Percent**
Arts	16	6.0	6.0	6.0
B tech. CSE	1	.4	.4	6.4
Commerce	170	63.9	63.9	70.3
Home science	1	.4	.4	70.7
Law	3	1.1	1.1	71.8
Life Span Development (HDFS)	1	.4	.4	72.2
Management	36	13.5	13.5	85.7
MBA	1	.4	.4	86.1
Medicine	1	.4	.4	86.5
Science	9	3.4	3.4	89.8
Social Work	11	4.1	4.1	94.0
Technology	16	6.0	6.0	100.0
Total	266	100.0	100.0	

From among the total respondents (266) surveyed, 150 (56.4%) were females and 116 (43.6%) were males. The convenience sampling method coincidentally resulted into not much difference in terms of percentage among both the genders which will help in analyzing differences in the ICT knowledge & skills and usage of applications/online tools across gender.

More than half i.e. 64.3% (171 respondents) of the respondents surveyed, belonged to the age group of 18-21. Whereas, 25.9 % (69 respondents) of the respondents belonged to the age segment of 21-23 and 9.8 percent 26 respondents are above the age of 23 years. During the Covid-19 outbreak lockdown, convenience method of sampling was adopted and the link of Google form questionnaire was shared with students. From among the total 266 respondents surveyed, 63.9% (170 respondents) belong to commerce stream followed by management 13.5% (36 respondents). Arts, science and social work accounts for nearly 14 percent of respondents. Students from other streams like, medicine, technology, law, fine arts, performing arts, home science etc. also responded. From the total respondents more than half i.e. 54.9% (146 respondents) are from Government College. Regarding the types of educational institutions, around 24.8 % (66 students) are from private colleges, 16.5% (44 students) are from Grant- in- Aid Colleges/Universities, and 2.3% students are from Deemed Universities.

- ***Knowledge & Skills Regarding the Use of Digital Tools and Computer-Based Technologies***

As depicted in Figure 1a and 1b, majority of students are having their basics clear regarding the usage of various digital devices, Microsoft applications and activities regarding browsing of internet. Thus, the actual level of knowledge and skills regarding the digital tools and computer-based technologies possessed are found to be above average level.

Figure 1a: Knowledge & Skills regarding the Use of Digital Tools and Computer-based Technologies

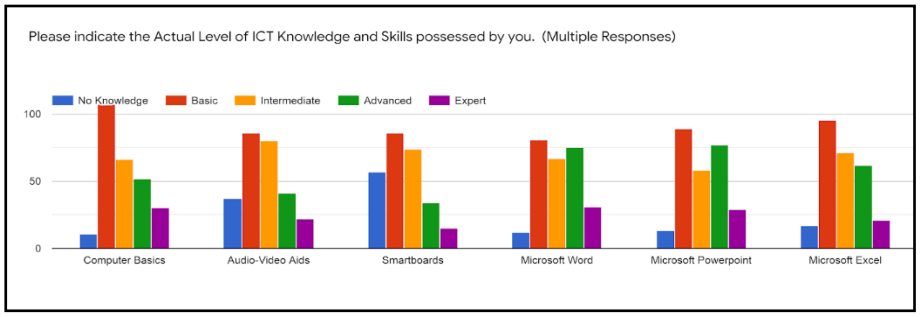
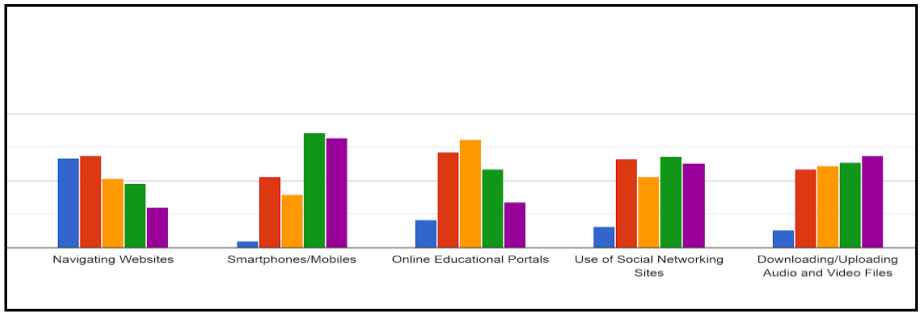


Figure1b: Knowledge & Skills regarding the Use of Digital Tools and Computer-based Technologies

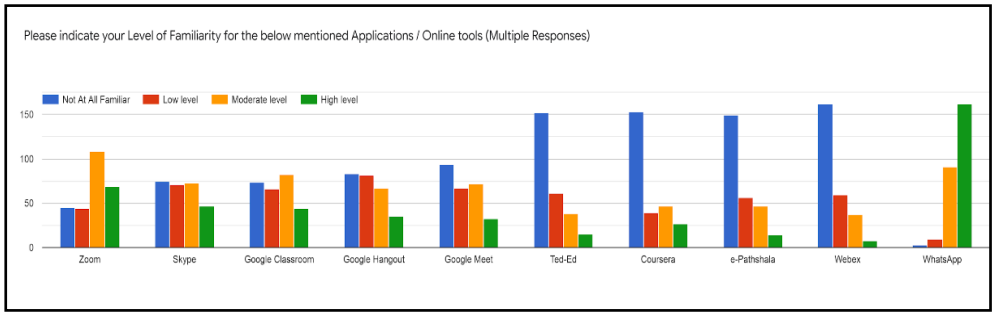


And the respondents having no knowledge is high on more technical or not much used tools such as smart boards and navigating websites. It shows almost equal numbers with less difference on Intermediate parameters, but slightly on a higher side on Audio-visual aids and online educational portals. Students are more expert in using smart phones, social networking and downloading and uploading files. Students are advanced in using Microsoft word, PowerPoint, smart phones and social networking.

- ***Familiarity & Usage of Online Learning Application/Tools***

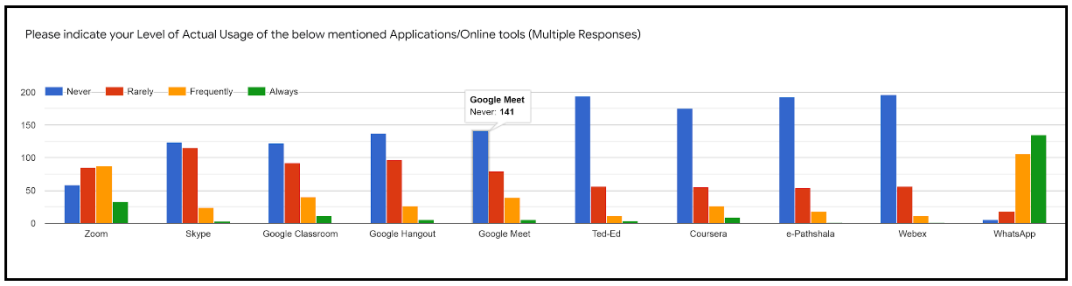
From among the options given, majority of students have stated their high level of familiarity for WhatsApp, Zoom, Skype, and Google Classroom in the order of sequence. Majority of students stated moderate familiarity for Zoom, and WhatsApp.

Figure2: Level of Familiarity to Online Learning Applications/Tools



Whereas, around 58% of the students are not at all familiar with Webex, Ted-Ed, Coursera, and E-Pathshala. There was a low level of familiarity noted for Google Hangout, Skype, and Google Classroom. Among all, WhatsApp has the highest level of familiarity.

Figure3: Level of Actual Usage of Online Learning Applications/Tools



Individually, WhatsApp, Zoom, and Google Classroom are the three most widely used tools by students for online learning. Coursera and Google Meet were used by very few students. Also, Skype, Google Hangout, and Google Classroom recorded high responses as rarely used online learning applications. High number of responses was recorded for Webex, Ted-Ed, e-Pathshala, and Coursera as 'Never used' online tools.

Regarding attending of online classes before and after Covid-19 pandemic, there is a drastic change noted in the behavior of students. Around 73% of students i.e. 196 students did not attend online classes before Covid-19 pandemic but, around 291 students i.e.82% percent attended online classes after Covid-19 pandemic. This shows that students have suddenly shifted to online classes due to the closure of educational institutions.

From among the total students surveyed (i.e., 266), around 78 students only attended webinar during the initial period (first two weeks) of the lockdown. But, after the third week of lockdown, there was a whooping increase in the number of students attending webinars i.e., almost doubled from 78 to 144 students. As Covid-19 lockdown period prolonged, students realized about how much they have missed on academics and now they started looking for other options to cope up with the loss on academics, and thus they shifted to webinars for academic purpose.

Figure4: Most Suitable and Effective Applications / Tools for Online Learning

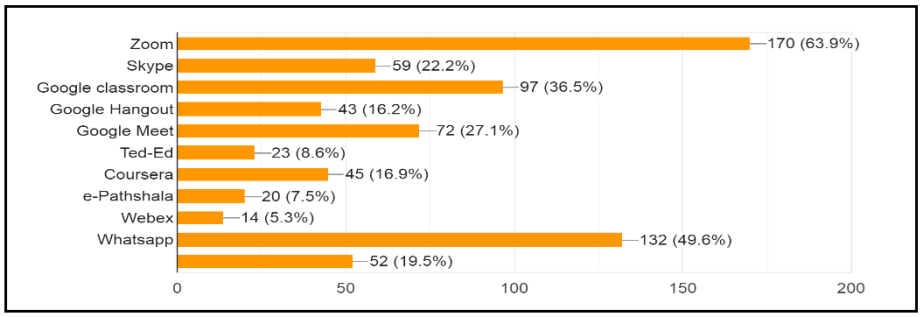


Figure 4 reveals that Zoom, WhatsApp, Google Classroom, Google Meet, and Skype are the top five online learning applications/tools found to be the most suitable and effective by majority of the students. The least suitable applications are Webex, e-Pathshala, and Ted-Ed.

➢ ***Students Overall Outlook towards Online Learning vis-a-vis Classroom Learning***

Figure5a: Preferences for Online Learning Against Classroom Learning

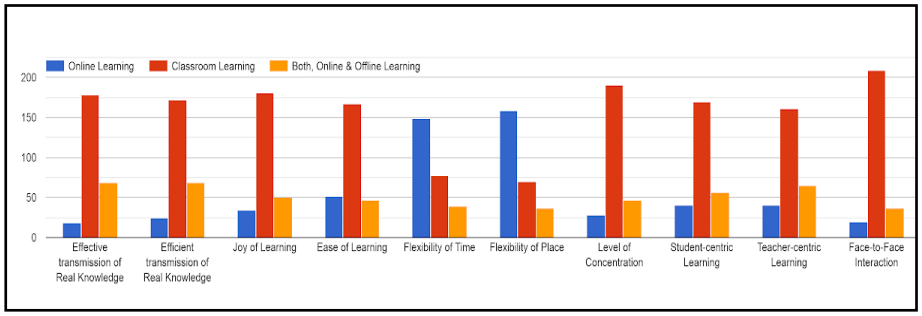
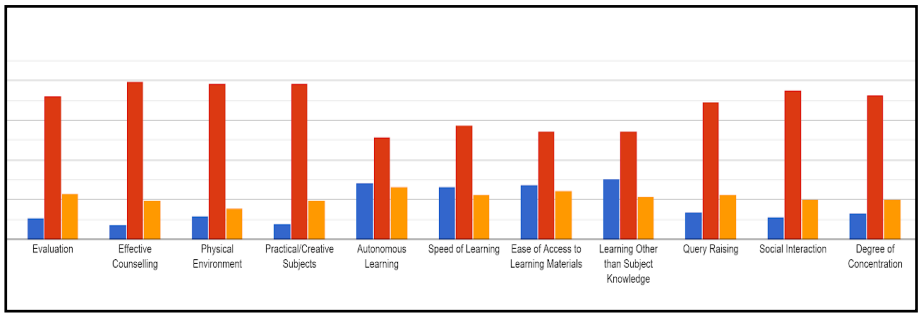


Figure5b: Preferences for Online Learning Against Classroom Learning



Students' overall outlook towards online vis-à-vis classroom learning was measured on twenty-one important dimensions of an effective learning process. For each dimension, students were supposed to give their preferences for online, offline, or both online and offline learning. Across all the listed dimensions, classroom learning was most preferred for face-to-face interaction, effective counseling, physical environment, practical/creative subjects, and level of concentration.

Whereas, online learning was more preferred because of flexibility of place, flexibility of time, learning other than subject knowledge, autonomous learning, and ease of access to learning materials. However, online as well as classroom learning both, were preferred by reasonably good number of students for effective transmission of real knowledge, efficient transmission of real knowledge, autonomous learning, teacher-centric learning, and ease of access to learning materials. Also, when each of the dimension is individually analyzed, the preferences to online and offline learning gives the real picture. Out of the total twenty-one dimensions, except for two dimensions (flexibility of time and flexibility of place), for all the remaining nineteen dimensions, classroom learning has outscored online learning with a huge margin.

There is a strong affinity or preference for classroom learning almost on all the dimensions be it effective transmission of real knowledge with 67%, Joy of learning with around 68%, ease of learning with 63% and few others with similar percentage for level of concentration, student centric learning, face-to-face interaction, evaluation, effective counseling, social interaction and query raising. Flexibility of time and place is the biggest advantage of online learning as per the student's response.

In order to gauge the reaction of students towards the traditional classroom learning which is deeply rooted since their childhood, they were asked to strongly reflect on the statement "Remote learning can never replace traditional classroom learning".No surprise, around 71% of the students strongly agreed and agreedto the statement. Surprisingly, around 20% students were neutral to the statement. Around 9% of the students strongly disagreed and disagreed to the statement. Well, the reasons for the agreement to the statement are already stated in immediate previous analysis.

➢ ***Concerns & Issues about Online Learning During Covid-19 Pandemic***

- Students when asked about the reason to shift to online learning, 74% i.e. 198 students of the total surveyed, stated that they have shifted to online mode of learning because of Covid-19 outbreak.

- Regarding the preferences towards various e-learning platforms, 59% of the total students preferred both, synchronous as well as asynchronous learning platforms. This finding justifies that whatever works best for the course, the students and the instructor should use them. There is no rule stating that your online courses need to consist of one mode or the other exclusively. Blended learning or the "flipped classroom" model make heavy use of asynchronous online coursework combined with synchronous in-classroom time. Depending upon the course, it's contents, practical component, creativity etc. accordingly a particular mode or a combination of both can really work very well.

- Around 48.5% (129) students remained engaged with online learning for less than 2 hours, 45.5% (121) students for 3-4 hours', and 6% (16 students) for more than 4 hours per day.

- ***Frequency of Usage of e-Learning Platforms Before and After Covid-19:***

Regarding the frequency of usage of e-learning platforms before Covid-19, from among the surveyed only 17 students regularly used e-learning platforms. This number then straightaway increased to 74 students (more than 4 times) after Covid-19. Also, there was a significant increase in the number of

students (from 34 – before Covid-19 to 100 – after Covid-19) who 'often' used e-leaning platforms. Also, a significant decrease was observed for those who never used e-learning platforms - from 67 before the pandemic to 17 after the pandemic.

There was a significant decrease in the number of students who rarely used e-platforms – from 59 to 19 students, before and after pandemic. Number of occasional users also declined from 83 to 55 students. Thus, Covid-19 pandemic has resulted into a significant increase in the usage frequency of students of e-learning tools.

- ***Major issues / Concerns about Online Learning:***

Students were asked to mark their agreement/disagreement on specified twenty major issues and concerns they experienced during online learning.

An individual analysis (Fig. 6a and 6b) of all twenty possible issues/concerns was done through frequency analysis. To simplify our analysis, we categorize the findings in two groups: Moderate Concerns (percentages ranging below 55%) and Major Concerns (percentages ranging from 55% and above).

Following are some moderate concerns noted: (Percentage of responses below 55%)

- Around 48% students feel isolated.
- Around 52% miss face-to-face interaction with their classmates.
- 45.8% of students surveyed, lack ICT knowledge and skills

Figure6a: Major issues / Concerns about Online Learning

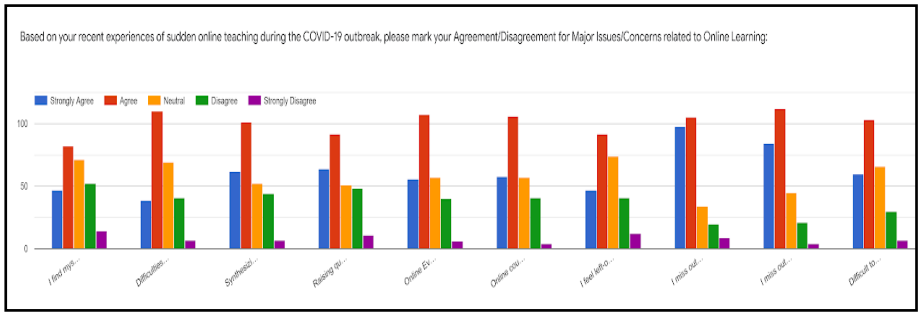
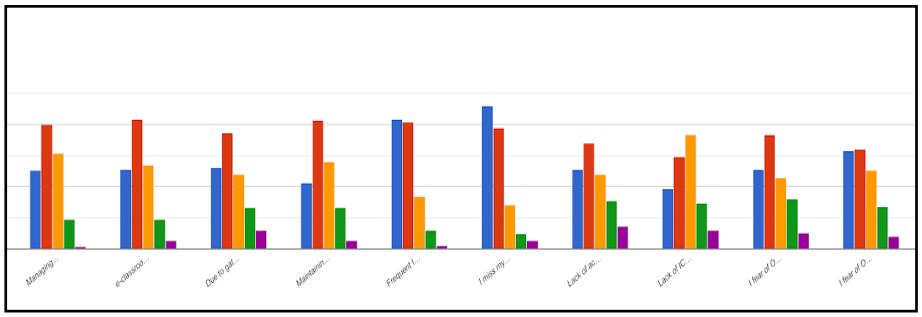


Figure6b: Major issues / Concerns about Online Learning



Following are some major concerns noted: (Percentage of responses of 55% &above)

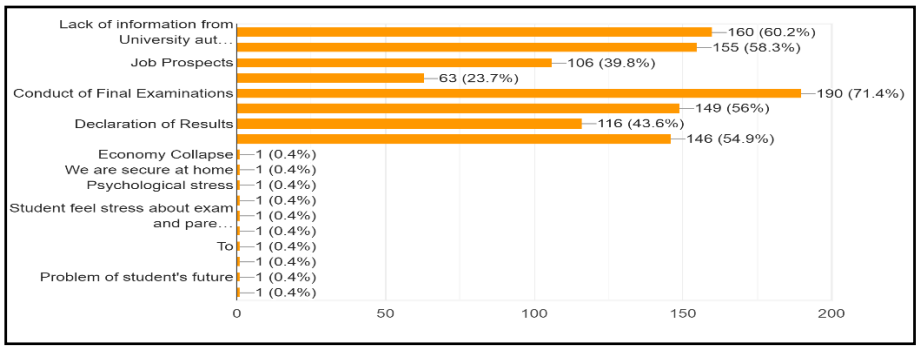
- Around 56% students find difficulty in comprehending online teaching contents.
- 61% students face difficulties in synthesizing online instructions and reading materials.
- 58.7% feel that raising queries in e-classrooms is difficult.
- Approximately 61% students perceive that online evaluation of progress and online student counselling is difficult.
- Around 76% students miss out on socialization with their classmates, and 73.7% miss out on socialization with their teachers.
- Around 61% find it difficult to keep themselves engaged during online sessions; and also 61% believe that managing students online is difficult.

- 63% perceive that e-classroom etiquettes of students are missing, and 58.7% believe that maintaining discipline in e-classrooms is really difficult.
- 59% do acknowledge the problem of Gate-crush.
- 77% strongly opine that frequent internet connectivity problem disrupts online classes.
- 79.7% do miss the on-campus environment.
- 56% students experience the problem of access to personal laptops and other essentials, and around 59 - 60% fear about online security and privacy issues.

- ***Major Concerns of Students During Corona virus Pandemic:***

Based on the individual responses obtained for the eight specified concerns, following are the top five major concerns in their order of responses: (Refer Fig.7)

Figure7: Major Concerns of Students During Corona virus Pandemic



- Conduct of final examinations (190 responses); and Lack of information and updates from university authorities (160 responses)
- Academic loss (155 responses); Pattern and structure of examinations to be conducted (149 responses); and Beginning of the new academic year (146 responses)
- Other major concerns in the form of open ended responses were: collapse of Indian economy, psychological stress experienced by both, students as well as parents, uncertainty about job, stress about students' future.

- ***Students' Final Opinion on Concluding Statements:***

- 59% of the students are of the opinion that learning from the current Covid-19 outbreak experiences, educational institutions from the new academic year should fix some portion of the syllabus to be compulsorily taught through online classes.
- Around 61% of students was well as teachers are really finding it difficult to cope up with the whole new way of teaching-learning.
- 76.3% students believe that access to devices, technology and internet connectivity are the major concerns of online learning.
- 79% of students believe that social interaction plays a very important role in teaching-learning process.
- Around 47% of students are of the opinion that online teaching-learning has to be the future of Indian education.
- 55% students are in favour of online education since it will allow a better balance between work and education.
- Only 47% agree that online learning has improved upon their learning skills.
- Surprisingly, only 27% of the students are of the opinion that e-learning platforms are better than traditional learning, and 30% students preferred e-learning over traditional learning.

➢ ***Differences in the Level of Competence (i.e., Knowledge & Skills) regarding the Use of Digital Tools and Computer-Based Technologies across Gender***

Below given Table 2 shows the t-test results for the differences in level of competence regarding the use of digital tools and computer-based technologies across gender. Findings in Table 2, show that (for computer basics, smartboards, and navigation of websites) the Levene's Test for Equality of Variances is statistically significant ($p<0.05$), which indicates that the group variances are unequal in the population.

Table 2: Differences in Level of Competence (Use of Digital Tools and Computer-based Technologies) Across Gender

		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Computer Basics	Equal variances assumed	13.997	.000*	3.966	264	.000
	Equal variances not assumed			3.848	213.544	.000
Audio-Video Aids	Equal variances assumed	1.705	.193	1.938	264	.054
	Equal variances not assumed			1.905	229.548	.058
Smartboards	Equal variances assumed	6.223	.013*	1.570	264	.118
	Equal variances not assumed			1.535	223.084	.126
Microsoft Word	Equal variances assumed	.255	.614	1.461	264	.145
	Equal variances not assumed			1.458	245.401	.146
Microsoft Power Point	Equal variances assumed	.140	.708	1.024	264	.307
	Equal variances not assumed			1.022	245.237	.308
Microsoft Excel	Equal variances assumed	.277	.599	.678	264	.499
	Equal variances not assumed			.677	246.283	.499
Navigating Websites	Equal variances assumed	4.298	.039*	3.054	264	.002
	Equal variances not assumed			3.006	230.769	.003
Smartphones/ Mobiles	Equal variances assumed	1.016	.314	1.872	264	.062
	Equal variances not assumed			1.872	247.665	.062
Online Educational Portals	Equal variances assumed	1.444	.231	1.937	264	.054
	Equal variances not assumed			1.924	240.728	.056
Social Networking Sites	Equal variances assumed	.533	.466	3.021	264	.003
	Equal variances not assumed			3.044	253.873	.003
Downloading/ Uploading Audio and Video Files	Equal variances assumed	.000	.989	2.960	264	.003
	Equal variances not assumed			2.964	248.437	.003

This indicates the violation of assumption of homogeneity of variances. We correct for this violation by not using the pooled estimate for the error term for the *t*-statistic, but instead using an adjustment to the degrees of freedom using the Welch-Satterthwaite method. Surprisingly, SPSS Statistics hides this information and simply labels the two options as "Equal variances assumed" and "Equal variances not assumed" without explicitly stating the underlying tests used. The effect of not being able to assume equal variances is evident in the second-last column of the above table where we see a slight reduction in the degrees of freedom (df) (for computer basics - from 264 to 213.544; for smartboards - from 264 to 223.084; and for navigation of websites – from 264 to 20.769). Excluding computer basics and navigation of websites, the two-tailed significance values (last column) for smartboards is p>0.05. This has the effect of increasing the *p*-value above the critical significance level of 0.05. Hence, in such

cases (with unequal variances in population), we accept that there are no statistically significant differences between means since p>0.05. The smartboard usage competence mean for females is 3.86 which is a little bit lower than that for males i.e., 3.92. Thus, regarding the competence of using smartboards we conclude that there are no statistically significant differences between male and female students. For the remaining two competence areas i.e., computer basics and navigation of websites, the two-tailed significance values (last column) are p<0.05. Hence, we conclude that for these areas, there are statistically significant differences between male and female students. Male students are more competent than their female counterparts in terms of their computer basics and navigation of different websites.

The Levene's Test for Equality of Variances is statistically insignificant (p>0.05) for audio-video aids, Microsoft Word, PowerPoint, Excel, smartphones, online educational portals, use of social networking sites, and downloading/uploading of audio/video. This indicates that the group variances are equal in the population and hence the assumption of homogeneity of variances is confirmed. The specified F-values against each of these are statistically insignificant i.e., p>0.05. Thus, we conclude that except for computer basics and navigation of websites, there are statistically no significant differences

9. CONCLUSIONS:

Broadly, the current empirical study aimed to explore and gauge the sentiments, concerns and perception of students regarding the sudden shift to online learning amid the Covid-19 pandemic. The study initially focused on student's familiarity and level of competence (i.e., knowledge & skills) regarding the use of digital tools and computer-based technologies, and online learning applications/tools i.e., to determine students' awareness, usage, and their level of competence in using them. Further, the study was an attempt to determine students' perception towards online learning vis-à-vis class room learning experience. Also, the researchers wanted to analyse the differences in level of competence (i.e., knowledge & skills) regarding the use of digital tools and computer-based technologies across gender.

The findings of the study reveal that the students' actual level of knowledge and skills regarding the digital tools and computer-based technologies possessed are found to be above average level.

Majority of students have their basics clear regarding the usage of various digital devices, Microsoft applications and internet browsing activities. Students didn't possess much of technical knowledge regarding the use of digital tools like smart boards.

Students were more knowledgeable regarding audio-visuals aids and online educational portals. Students are more expert in using smart phones, social networking and downloading and uploading files. Hence, a general feel is that teachers should increase the use of smart boards in their traditional classrooms so that students get more acquainted with such digital tools. Also, more focus should be laid on improving the digital literacy of students to increase them accept online learning. Educational institutions should align their course designs with this lack of homogeneity in students' familiarity with technology in order to effectively accommodate their differences. Regarding the familiarity of online learning applications/tools, around 60% of the surveyed students were familiar with and actually using Zoom, and WhatsApp. Again, majority of students were not at all familiar with Webex, Ted-Ed, Coursera, and E-Pathshala. Thus, there is always a scope for educational institutions to spread the awareness and increase the use of other learning applications like Google Hangout, Skype, and Google Classroom.

Further, in the third week of lockdown there was an increase in the number of students who attended webinars as compared to those who attended webinars during the first week. This shows a positive shift of students to online learning to stay in touch with their academics. Regarding students' overall outlook towards online vis-à-vis classroom learning, it was found that for the listed dimensions, classroom learning was most preferred for face-to-face interaction, effective counselling, physical environment, practical/creative subjects, and level of concentration, whereas online learning was more preferred because of flexibility of place, flexibility of time, learning other than subject knowledge, autonomous learning, and ease of access to learning materials. The overall findings reveal that on majority of the important dimensions of effective teaching, even in this digital era, classroom learning has deeper roots than online learning! However, a proper blend of these two modes of student learning can certainly add more value to Indian higher education.

Regarding the preferences towards various e-learning platforms, majority of the surveyed students preferred both, synchronous as well as asynchronous learning platforms. This finding justifies that whatever works best for the course, the students and the instructor should use them. There is no rule

stating that your online courses need to consist of one mode or the other exclusively. Depending upon the course, it's contents, practical component, creativity etc. accordingly a particular mode or a combination of both can really work very well. Further, the findings revealed that Covid-19 pandemic has resulted into a significant increase in the usage frequency of students of e-learning tools.

Based on the findings of this study, we conclude that students face some real major issues when it comes to online learning. From among the major issues, socialization with classmates and teachers, missing the on-campus environment, and frequent internet connectivity are demanding an immediate attention. We have our own doubts regarding the tackling of socialization issues of students during online learning. Machines and technologies can never transmit the personal and real human feel from one end to other, in spite of humans interacting at both the ends.

Though, online applications and learning tools can be made more interactive to reduce the problem of socialization to some extent. Regarding frequent internet connectivity problems, colleges and universities need to update and upgrade the basic infrastructural facilities to support and facilitate online teaching-learning processes. Major focus is demanded for online security issues and online privacy. Online application developers and software companies should come out with more stringent security measures and protocols to facilitate online teaching-learning.

Regarding the specified eight major academic concerns of students during Covid-19 pandemic, the top listed five were the conduct of final examinations, lack of information and updates from university authorities, academic loss, pattern and structure of examinations to be conducted, and beginning of the new academic year.

Finally, students' opinion on some concluding statements revealed that based on the suffering of academic loss, majority of students opined that educational institutions from the new academic year should fix some portion of the syllabus which should be compulsorily taught through online classes, though they found it difficult to cope up with the new way of teaching-learning. Almost two-third believed that access to devices, technology and internet connectivity are the major concerns of online learning and educational institutions and government should really work hard on improving the current infrastructure related to online education. Surprisingly, only half of the surveyed students are of the opinion that online teaching-learning will be the future of Indian education! Regarding the differences in the level of competence (i.e., knowledge and skills) of using digital tools and computer-based technologies, it was found that except for computer basics and navigation of websites, no statistically significant differences were noted between male and female students.

The rapid spread of COVID-19 has demonstrated the importance of building resilience to face various threats, from pandemic disease to extremist violence to climate insecurity, and even, yes, rapid technological change. The pandemic is also an opportunity to remind ourselves of the skills students need in this unpredictable world such as informed decision making, creative problem solving, and perhaps above all, adaptability. To ensure those skills remain a priority for all students, resilience must be built into our educational systems as well.

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