Teachers' Experience on Use of ICT In Online Teaching-Learning Process of Higher Education Institutions During The COVID-19 Lockdown

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ABSTRACT

COVID-19 has changed the life of human beings. The entire world was locked down due to the COVID-19 pandemic. India specifically was locked down from 23rd March 2020; since then, it continued till 31st May 2020. Colleges and Universities were closed, and the entire Teaching-Learning process shifted from a physical classroom to an online class. Information and Communication Technology (ICT) has played a significant role in the Teaching-Learning process during the lockdown. Teachers have started using ICT tools for online Teaching-Learning. This was the time when many teachers have used ICT tools in the Teaching-Learning process. This research work emphasized the use of ICT tools in online Teaching-Learning process during the lockdown. Data collected through google form from the teachers of the Chhattisgarh state of India is based on ten different questions. Data were analyzed in two different groups: Male and Female. The analytical results reveal that teachers of both groups were involved in ICT-based online Teaching-Learning during the lockdown. It was also identified from the collected data that many teachers had used the ICT tool first time during the lockdown. This research work shows that COVID-19 has provided an opportunity to learn ICT in the Teaching-Learning process.

Keywords: Information and Communication Technology (ICT), Teaching-Learning, Lockdown, COVID-19.

1. INTRODUCTION AND LITERATURE REVIEW

COVID-19 pandemic started in India in January 2020 and has spread worldwide and affected most parts of human life. This Global Pandemic has paralyzed the entire Teaching-Learning process of Higher Education Institutions (HEIs), and all the HEIs have been closed. To keep the functioning of HEIs, it was necessary to think about alternative ways of Teaching-Learning. Information and Communication Technology (ICT) based Teaching-Learning was the only alternative and played a significant role. The entire world started shifting from physical classroom-based Teaching-Learning to ICT-based online Teaching-Learning. In a country like India, where ICT infrastructure and internet connectivity are comparatively slow, and in most colleges and universities, the Teaching-Learning process is carried out in physical mode,has also switched towards ICT-based online Teaching-Learning. ICT based teaching is, however, being used by the teachers, but online teaching is the least preferable. India lacks ICT-related infrastructure; therefore, it has been somehow difficult to conduct online classes in the country's rural and remote places. COVID-19 has imposed on HEIs the utilization of ICT tools in the Teaching-Learning process. On the other hand, teachers and students were not aware of the utilization of ICT tools to be utilized in the online Teaching-Learning process. To make students and teachers more comfortable and compatible with the utilization of ICT tools, many HEIs have conducted online trainings and workshops.

ICT is a collection of techniques, tools, and resources to further relation, creation, distribution, reservation, and information management, including traditional ICT tools like radio, television, telephone, etc. Also, advanced ICT tools like the Internet, software application, Wi-Fi, smartphones, and computers/laptops are included in ICT (Bidarian et al., 2011).

Many authors have studied about the use of ICT in the Teaching-Learning process and studied students' and teachers' perception of the utilization of ICT in the Teaching-Learning process as well as its impact on academic

performance of students, personality development of teacher and students, employability enhancement, and relationship with improvement in Teaching-Learning (Ahmadi et al., 2011). Authors (Bidarian et al., 2011) have suggested many models for applying ICT in the teaching-learning process. Multimedia-based E-content, among others, is also very popular. Many Massive Open Online Course (MOOC) platforms provide multimedia-based E-content for teachers as well for students. Authors (Abdulrahaman et al., 2020) have reviewed multimedia tools as ICT tools in the Teaching-Learning process. The study was carried out in Mizoram University, India.

However, very few researchers (Joshi et al., 2020) have carried out their research in the Indian context to analyze the use and impact of ICT in the Teaching-Learning process, especially during COVID-19 lockdown. COVID-19 has provided an opportunity to learn ICT tools for Teaching-Learning and enforced teachers and students of the HEIs to utilize them during the lockdown (Gabriela et al., 2020; Lorente et al., 2020; Nuere & de Miguel, 2020). Many teachers were not prepared for the utilization of ICT tools, but the COVOD-19 pandemic forced many of the teachers to learned and adopt the ICT tools during the lockdown period. A recent study (Mishra et al., 2020) reflects how ICT was utilized during the lockdown.

As per the above literature survey, it can be concluded that very few articles are available on the utilization of ICT during the lockdown, especially in the Indian context. This research work is based on a survey on the utilization of ICT tools by the teachers during the lockdown of the COVID-19 pandemic. The research is totally based on the state of Chhattisgarh, India where internet connectivity is comparatively slow, and most of the HEIs are in rural and tribal areas where ICT-based Teaching-Learning is difficult resulting from inadequate access. A total of 735 samples were collected based on three different groups for both teachers as well as for students: (i) Male and Female, (ii) UG, PG and both UG and PG, and (iii) Science and Non-Science students and teachers. As stated above the current research work focuses comparative analytical study between Male and Female teachers and was found satisfactory in utilizing ICT-based online Teaching-Learning during the lockdown.

2. METHODOLOGY

The survey-based method was adopted to collect data from students and teachers.

2.1 Survey Tool: A questionnaire was developed with all necessary information after taking advice from the Information Technology experts. Since movement was restricted and virtually impossible to move from one HEI to another HEI to collect samples during the lockdown, hence google form was developed. Google form provides interactive options to generate different types of questions like multiple choice, open-ended question, etc., and also easily transmitted to respondents through E-mail or WhatsApp group. This type of ICT-based survey tool provides a rapid collection of samples from the larger population. We have restricted the survey to the state of Chhattisgarh, India only. However, this ICT-based survey has been criticized by many authors as respondents are invisible to the researchers and may go beyond the population. Despite many drawbacks, this mode of conducting a survey is widely being used by researchers. There are five different parts of the questionnaire, which are as below:

S. No.	Section	Detail
Table 1: Details of questionnaire		
1	Part 1: Demographic detail	This section consists of questions related to respondents like name, E-mail, Gender, Institute type, level of class studying and teaching, discipline and nature of respondents like student or teacher. On the basis of nature of respondents this part splits into two different parts :Part 2 for teacher and Part 3 for student.
2	Part 2: Teacher	This Part consists of a question related to class of teaching: UG, PG and both
3	Part 3: Students	Similar to Part 2, this section also consists of one question

		related to the label of class a student is studying either in UG or PG.
4	Part 4: Perception on utilization of ICT in Teaching-Learning process during the lockdown	This part receives input from the teachers and students regarding the utilization of ICT tools in the online Teaching-learning process during the lockdown and consists of 10 questions.
5	Part 5: Opinion on utilization of ICT in Teaching-Learning process during the lockdown	Similar to part 4, this part receives input from the students regarding utilizing ICT tools in the online Teaching-Learning process during the lockdown.

2.2 Sample: The study is based on the state of Chhattisgarh, India where there are many HEIs affiliated to universities along with 21 universities. Only universities and colleges under the higher education department of Chhattisgarh, India were considered for the study population. The detail of HEIs in Chhattisgarh, India are as bellow:

Table 2: Details of HEIs in Chhattisgarh	
Particular	**Number (Approximate)**
University	State University: 08, Private University: 13, **Total: 21**
College	Government college:253, Private college: 256, **Total: 509**

Out of this population, randomly 735 samples received from the teachers have been selected for the analytical study. These samples were collected in a window of four months from May 2020 to August 2020 during lockdown 4.0 (18th May 2020 to 31st May 2020), unlock 1.0 (1st June 2020 to 30th June 2020), unlock 2.0 (1st June 2020 to 30th June 2020) and unlock 3.0 (1st July 2020 to 31st July 2020). These periods were chosen intentionally because teachers have started teaching online through ICT tools during these periods. Many HEIs have conducted a workshop on ICT during the first lockdown, lockdown 2.0, and lockdown 3.0; teachers have learned to utilize these tools during these periods.

The frequency of demographic detail of samples collected through google form is as below:

Table 3: Frequency of collected data		
Particular	**Frequency**	**Percentage**
Gender	Male: 393	53.5
	Female: 342	46.5
Institute type	University: 101	13.7
	College: 634	86.3
Discipline	Science: 581	79.0
	Non-Science: 154	21.0
Target Class	UG: 320	43.5
	PG: 39	5.3
	Both: 376	51.2

3. ANALYTICAL STUDY

This research work focuses on a comparative study between Male and Female teachers on using ICT tools in the online Teaching-Learning process. There were total 10 questions related to the use of ICT tools during the lockdown. Question wise details of responses of Male and Female teachers are as follow:

Question 1: Are you aware of software tools for Teaching-Learning /ICT (Give your answer as Yes if you know at least three tools)?

Question 2: How are you interacting with your students during the lockdown?

| Table 4: Statistics related to question No. 1 and 2.				
	Question 1		Question 2	
Gender	Frequency	Percentage	Frequency	Percentage
Male	Yes: 345	87.78	E-Mail: 56	14.30
	No: 48	12.22	Social Media: 68	17.35
			VC tool: 94	23.96
			Combination of above: 140	35.65
			Not interacting:34	8.74
Female	Yes: 288	84.20	E-Mail: 45	13.15
	No: 54	15.80	Social Media: 76	22.22
			VC tool: 72	21.05
			Combination of above: 125	36.55
			Not interacting 24	7.01
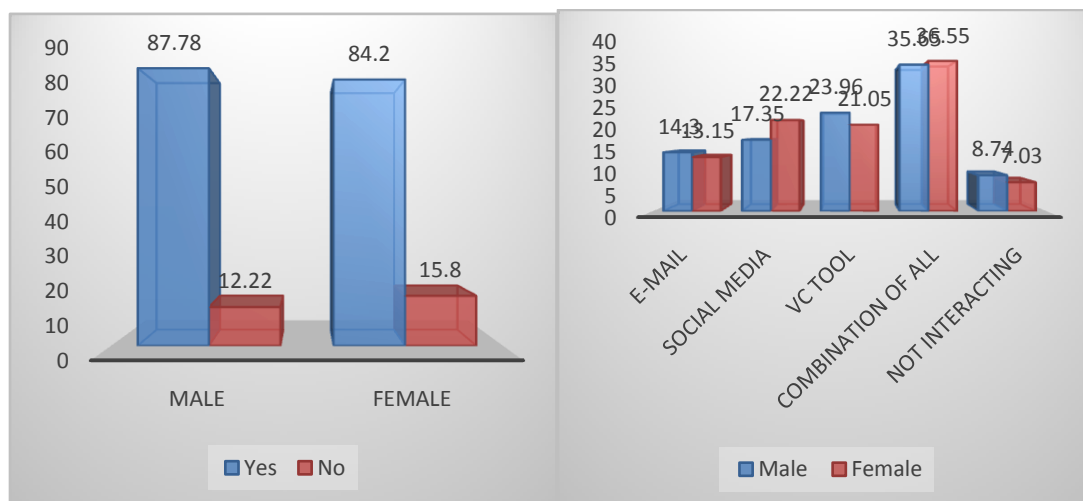
Figure 1: A comparative graph of Male Vs. Female teachers for Question 1 (Left) and Question 2 (Right).

The first question is about awareness of ICT tools. It is assumed that without knowing ICT tools it is difficult to utilize it. Teachers were experienced about ICT tools during the lockdown periods and started using its during unlock. As per the Table 1 most of the male teachers (87.78%) and female teachers (84.2%) were aware about ICT tools, very few were not aware. Similarly question No. 2 is about interacting with students through ICT tools. In response to this question, it has been observed that most preferable ICT tool for interacting with students is social media like WhatsApp and video conference (VC), however the combination of above was also used frequently by the teachers. It was also observed that 8.74% male teachers and 7.01% female teachers we not interacting with their students. Graphical view of data presented in Table 4 can also be seen in Figure 1.

Question 3: Are you using ICT tools (Device and Software) for Teaching-Learning during the lockdown?

Question 4: How much time are you spending in ICT-based Teaching-Learning during the lockdown?

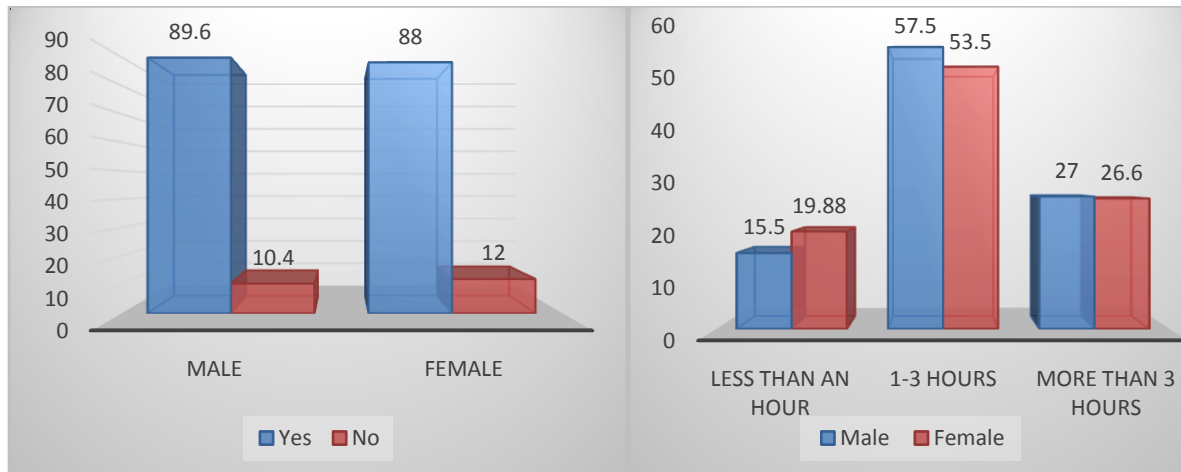| Table 5: Statistics related to question No. 3 and 4.				
	Question 3		Question 4	
Gender	Frequency	Percentage	Frequency	Percentage
Male	Yes: 352	89.6	Less than an hour: 61	15.50
	No: 41	10.4	1-3 Hours: 226	57.50
			More than 3 hours: 106	27.00
Female	Yes: 301	88.0	Less than an hour: 68	19.88
	No: 41	12.0	1-3 Hours: 183	53.50
			More than 3 hours: 91	26.60

Figure 2: A comparative graph of Male Vs. Female teachers for Question 3 (Left) and Question 4 (Right).

In response to the third question shown in Table 5 and comparative bar graphs in Figure 2, 89.6% of male teachers indicate that they are using ICT tools in Teaching-Learning while 88 % of female teachers indicate using ICT tools in Teaching-Learning. The percentage of using ICT tools in Teaching-Learning by male teachers is a little higher (1.6%) than female teachers. This may be possible because of other family assignments of the female teachers during the lockdown.

Similarly, in response to question 4, more time spent by the male teachers than female teachers towards online Teaching-Learning.

Question 5: Have you enrolled in any online courses like SWAYAM, NPTEL, etc. during the lockdown?

Question 6: Are you taking classes of your students online using any Video conferencing or online meeting tool during the lockdown?

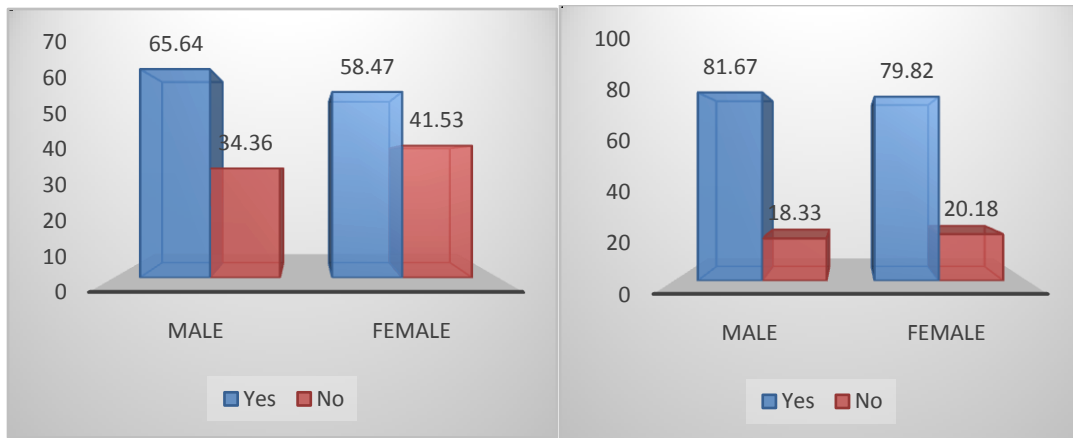| Table 6: Statistics related to question No. 5 and 6.				
	Question 5		Question 6	
Gender	Frequency	Percentage	Frequency	Percentage
Male	Yes: 258	65.64	Yes: 321	81.67
	No: 135	34.36	No: 72	18.33
Female	Yes:200	58.47	Yes:273	79.82
	No: 142	41.53	No: 69	20.18

Figure 3: A comparative graph of Male Vs. Female teachers for Question 5 (Left) and Question 6 (Right).

Many commercial online international platforms like Coursera and Edx have opened online portals for the teachers and students free of cost during the lockdown. SWAYAM platform of India was also available, and many courses were launched during the lockdown. These online learning platforms have provided an opportunity to learn courses for the students as well as for the teachers. Keeping this in mind, question 5 was framed. As shown in Table 6 and Figure 3 more number of male teachers were engaged (65.64%) compared to the female teachers (58.47%) in the online learning platform. The situation is obvious because all the family members were available in the house during the lockdown. Female teachers were also engaged in managing their family and their teaching responsibility. The situation can also be viewed in response to 81.67% and 79.82% male and female teachers, respectively, engaged in online teaching through video conferencing tools like YouTube, zoom, etc.

Question 7: Have you used ICT tools first time during the lockdown?

Question 8: Has your University/College released any notification/Notice to use online ICT tools for Teaching-learning and instructed you to keep in touch with students during the lockdown?

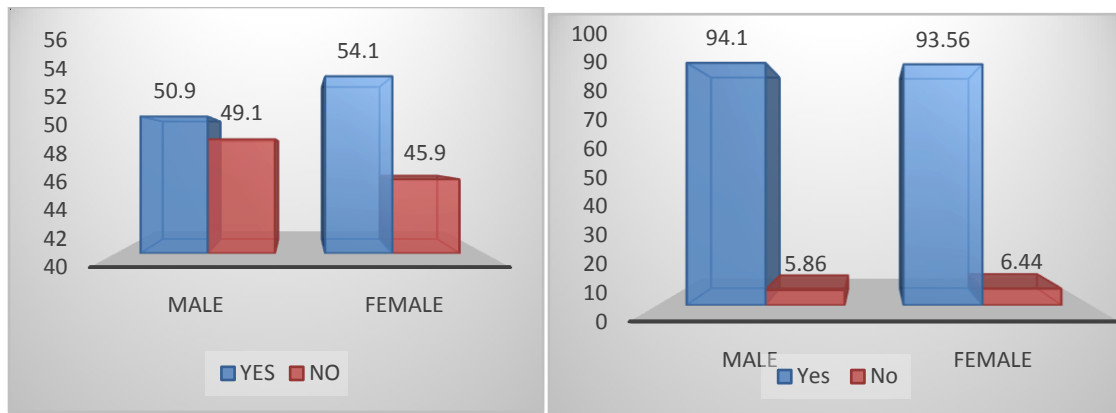| Table 7: Statistics related to question No. 7 and 8.				
	Question 7		**Question 8**	
Gender	**Frequency**	**Percentage**	**Frequency**	**Percentage**
Male	Yes: 200	50.90	Yes: 352	94.14
	No: 193	49.10	No: 41	5.86
Female	Yes: 185	54.10	Yes:320	93.56
	No: 157	45.90	No: 22	6.44

Figure 4: A comparative graph of Male Vs. Female teachers for Question 7 (Left) and Question 8 (Right).

Since online teaching was not so popular and many ICT-related buzzwords are not so common among the teachers, a larger part of the population did not utilize ICT tools. The same is reflected against question No. 7, where 50.90% of male teachers and 54.10% of female teachers indicated using ICT tools for the first time during the lockdown. It means the teachers have converted this pandemic used the opportunity to learn the new technology that were adopted in Teaching-Learning process. All HEIs have also instructed their teachers to engage in online teaching as well to maximum utilization of ICT to keep in touch with their students during the lockdown. Regarding Table 7 above where 94.1% male teachers and 93.56% female teachers responded that their institution had released notification relating to the use of ICT tools in Teaching-Learning as well as keeping in touch regularly with students. Comparative bar graphs of both the questions are shown in Figure 4.

Question 9: Lockdown has enhanced your knowledge and provide an opportunity to learn ICT tools for Teaching-Learning.?

Question 10: Have you attended any ICT-related workshop/Seminar etc., during the lockdown to enhance your knowledge.?

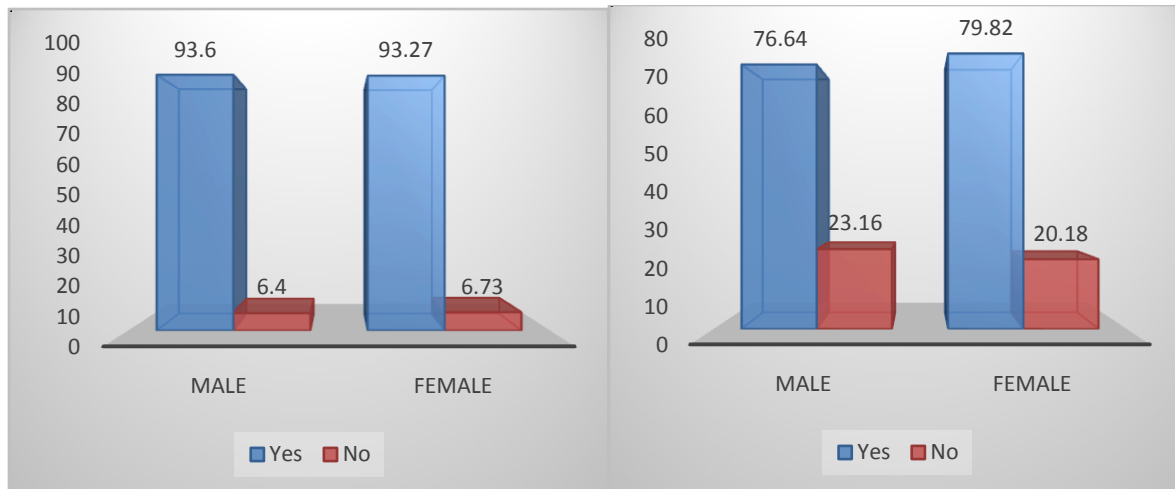| Table 8: Statistics related to question No. 9 and 10.				
	Question 9		**Question 10**	
Gender	**Frequency**	**Percentage**	**Frequency**	**Percentage**
Male	Yes: 359	93.60	Yes: 302	76.64
	No: 25	6.40	No: 91	23.16
Female	Yes: 319	93.27	Yes:273	79.82
	No: 23	6.73	No: 69	20.18

Figure 5: A comparative graph of Male Vs. Female teachers for Question 9 (Left) and Question 10 (Right).

As shown in Table 8 and Figure 5, in response to question No. 9, it was found that 93.6% male and 93.37% female teachers indicated that they have enhanced their knowledge about the utilization of ICT tools. However, in response to question No. 10, fewer male teachers (76.64%) have enrolled and attended ICT-related workshops/Seminars than female teachers (79.82%). It also reflects that many teachers have not attended any workshop/Seminar to learn ICT tools.

4. CONCLUSION

In this research work, we have conducted a survey among the teachers of HEIs of Chhattisgarh state of India about the use of ICT tools in the Teaching-Learning process during the lockdown. Research work was carried out after collecting the data from teachers using the questionnaire, and the total number of respondents were 735. Comparative research work was carried out to analyse male and female teachers' performance behaviour using ICT tools in Teaching-Learning. The research work reflects the following findings:

i.   Both Male and Female teachers are compatible with using ICT tools for Teaching-Learning.
ii. Most of the teachers have used ICT tools first time during the lockdown. It means the COVID-19 pandemic has provided an opportunity to learn these tools.
iii. Male and Female teachers have almost similar behavior and experiences using ICT tools in the Teaching-Learning process. However, male teachers are a little ahead of female teachers in many cases.

Future research can be extended and can be carried out among other groups like Science and Non-science teachers, College and University teachers, etc.

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