

# ICT Based Pedagogy Challenges & Opportunities Post COVID-19: A Study in Indian Management Educational Institutions

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## ABSTRACT:

*“In The Middle of Difficulty Lies Opportunity”—Albert Einstein*

The Corona virus outbreak closed all the educational institutions and universities in 175 countries, worrying 90 % of learners in the world and around 250 million students in India. As a result, digital platforms have taken over classroom teaching; dramatic change can be seen in education. But the technological infrastructure in India has not achieved the state of excellence to guarantee the sound delivery of online classes to learners across the nation.

In Information and Communication Technology (ICT) based education system, seamless internet connectivity, adequate power supply, technology accessibility in remote and rural areas are of prerequisites, which if conquered, consequently will augment distance learning.

ICT has the potential to be used as a supportive educational tool and construct a powerful learning experience. Bridging the gap between teachers and learners it can reach out to masses, enabling e-learning irrespective of geographic locations. In this pandemic, the digital platform is a savior for education to keep going and to mitigate the loss of learners to some extent.

This paper focuses on the sudden transformation and several challenges faced by the education system since COVID-19, and hidden opportunities in this time of crisis to build their capacities.

**KEYWORDS:** Information and Communication Technology (ICT), Digital Platform, E-learning

## I.INTRODUCTION

Due to the COVID-19 pandemic, like many other sectors, even the education sector has been badly affected, and still, it's uncertain when the educational institutions will re-open. Thankfully ICT has come to an aid, which dominates every facet of today's life. Nowadays many easy to use digital communication tools are available, providing a variety of teaching and learning solutions. In this current virulent disease scenario, teachers, learners, and families are struggling with the instantaneous task of online lessons, and some are introduced to the digital platform for the very first time. The study is conducted to explore certain unprecedented challenges faced by educational institutions due to COVID-19, and what alternative measures can be considered by the institutions to ease the lockdown impact on the education sector.

### **COVID-19 has cropped up many challenges for all the sectors, as well as for education.**

In such a condition ICT is rescuer for most of them, but without proper infrastructure, making online provision for learning is less likely.

According to “Internet and Mobile Association of India (IAMAI)”, & Nielsen's 2019 report only 36% of Indian population has access to internet facilities. And ICT is a form of technology that is used to create, process, transmit, store, display, and exchange information through electronic means. An adequate supply of electricity, uninterrupted internet services, ICT devices like Smartphone's, laptops, tablets, etc., trained teachers and educational resources are of utmost significance for online education. Many students in India are still grappling with the situation, as most of them don't have household computers, lack of internet connectivity at home, and lack of mobile network coverage.

In ICT based education systems, educational institutions also need to consider the digital literacy and understanding level of parents to support the stay-at-home learning, especially for school going earlier grade students. Students from poor family backgrounds and remote and rural areas are at most risk.

**Building ICT capacities to ensure education is ready to counteract future crisis:**

Capacity building refers to development of digital skills of teachers and constructing digital infrastructure of educational institutes, which is a very important factor to administer and sustain with ICT. There are very high chances that the COVID-19 crisis is not short lived and cases may flare up in future resulting in closure of educational institutions again.

Education goals visibly state that ICT must be employed to build up education systems, information access, knowledge distribution, effective and quality learning, and more effectively providing service. To make teaching and learning deep, reliable and related, ICT should be utilized effectively. Institutions need to come up with innovative teaching methods that will blend with face-to-face teaching to make sure those students are prepared for future closure of the institutions. Anticipating future emergencies, authorities need to take up the task for facilitating, monitoring and access to ICT at educational institutions and also at homes. Digital technology needs to be integrated to develop an effective learning environment. Institutions can deliver online courses and teachers can give instructions, learning resources can be shared, quizzes can also be conducted. Online education can serve as a route finder for the teachers & learners who might be fascinated in online education in the post-pandemic era.

## II.LITERATURE REVIEW

There is a series of studies that has been undertaken in the field of ICT in education and what are the issues, challenges, impact, future directions etc. However, COVID-19 like situation is novel for everyone. Following are the few literature reviews of ICT in education.

**(Yildirim 2007)**

To address the barriers, suggested that schools need to provide appropriate access to technology. Furthermore, schools and related institutional systems need to employ new policies to involve teachers in the decision-making and planning processes regarding ICT in their classrooms.

**(Staples, Pugach and Himes 2005)**

Stated that good planning for technology integration requires a special understanding of specific hardware and software related to the curriculum. Staff development and teacher training are also indispensable to supporting the curriculum with technology integration.

**(Tezci 2011a)**

Teachers should learn not only how to use technology to enhance traditional teaching or increase productivity, but also should learn from a student centered perspective how ICT can be integrated into classroom activities in order to promote student learning.

**(Birch and Irvine 2009; Honan 2008)**

The teachers need to use ICT in more creative and productive ways in order to create more engaging and rewarding activities and more effective lessons.

**(Frederick, Schweizer and Lowe 2006)**

Showed that student mobility, special needs, and anxiety over standardized test results are the main challenges associated with ICT use. These challenges can be solved by providing more authentic group- and problem-based learning activities, and adequate learning support.

**(Whelan 2008)**

Recommends the following strategies to facilitate the learning process: more induction, orientation, and training for students; an increased emphasis on the importance of instructor access and effective administration; and the expansion of podcasting and online conferencing tools. In general, capacity building, curriculum development, infrastructure, policy, and government support are required in order to lower student barriers and improve the effectiveness of ICT use in education.

### **Research Methodology:**

Various studies conducted by researchers have recognized the significance of ICT in teaching and learning that changes the approach of students towards learning and content material. But unknown situations like COVID-19 are brand new for all the sectors, this study is focusing on challenges faced in ICT based education due to inadequate ICT infrastructure in India and hidden opportunities in this Pandemic for educational institutions w.r.t capacity building.

### **Objectives of the study:**

- To understand the benefits and uses of ICT to impart quality in educational institutes in lockdown.
  - To study the degree of correlation between use of ICT and education standards.
  - To analyze whether the standard of students is conditional on the usage of ICT in education.

### **Hypothesis of the Study:**

**Hypothesis 1:**-E-education is effective in delivering quality education during COVID-19 lockdown for educational institutions.

**Hypothesis 2:**-Use of ICT during COVID-19 lockdown is related in raising the standard of students/education

**Hypothesis 3:**-Standard of the students is dependent use of ICT and digital communication tools

### Primary Method of Data Collection

#### Questionnaires:

The data was collected through the Google form questionnaire as a feasible method to collect data during the COVID-19 lockdown period, by targeting faculty members of higher education using selective sampling techniques.

#### Secondary Method of Data Collection

The secondary data was collected from: Books, reports, newspaper articles, e- journals, journals, research papers, websites, and publications- periodicals.

#### Sample size:

Sample size of the study taken is 105 and data was collected using selective sampling techniques by targeting faculty members of higher education from all management education to participate in the study, through the Google form questionnaire as a feasible method to collect data during the COVID-19 lockdown. Existing theories on ICT, books, articles and contributions made by the researchers to the topic were referred to as a source.

### III. RESPONDENTS DEMOGRAPHIC INFORMATION

Analytical presentation below of the data analysis and the results from the statistics researcher would see the basic information of the respondents and their attitudes towards ICT in education sector which are randomly selected for this research study.

#### Gender

Around 123 responses were received. The final and appropriate responses considerable for research were 105. There were 56 male respondents and 49 female respondents accordingly. Research student have considered both male and female employees to make concrete suggestions at the end of the study.

#### Age

The second question is to get to know about employee's age so that some relationship between age group and ICT can be found and appropriate result can be interpreted.

#### Teaching at Degree/ Programme.

This question is to find out teachers, teaching to various degrees or programmes in the education sector, the purpose of this question is to investigate the need of ICT according to their related teaching degree/ programme.

#### Geographical Area for the Collection of Sample

Andhra Pradesh, Assam, Delhi, Goa, Maharashtra, Kerala, Karnataka, Gujarat, Up, West Bengal, Warangal, Punjab, Rajasthan, Odissa, Tamil Nadu, Telangana were the geographical location for the collection of data for the purpose of research.

### IV. DEMOGRAPHIC DATA ANALYSIS AND INTERPRETATION



The responses received from the faculty members were satisfactory.

**Table 1: Respondents Characteristics**

Sr. No.	Characteristics	Category	Count	%	Cumulative %
1	Gender	Male	56	53	53
		Female	49	47	100
2	Age	Below 30 years old	7	7	7
		31 – 40 years old	62	59	66
		41 – 50 years above	36	34	100
3	Qualification	Post Graduate	86	82	82
		Doctorate	19	18	100
4	Teaching : Degree/ Programme	B.Com	12	11	11
		BA	1	1	12
		BBA	8	8	20
		Engg.	2	2	22
		MBA	77	73	95
		MCA	2	2	97
		MLM	1	1	98
		MSW	1	1	99
5	Respondents States	ANDHRA PRADESH	6	6	6
		ASSAM	1	1	7
		DELHI	4	4	10
		GOA	1	1	11
		GUJARAT	3	3	14
		KARNATAKA	11	10	25
		KERALA	1	1	26
		MP	5	5	30
		MAHARASHTRA	23	22	52
		ODISHA	1	1	53
		PUNJAB	4	4	57
		RAJASTHAN	3	3	60
		TAMILNADU	6	6	66
		TELANGANA	33	31	97
		UP	2	2	99
WEST BENGAL	1	1	100		

**Demographic Data Interpretation:**

For the study it was considered to collect data based on gender as it acts as indicator for measuring change for ICT in education sector. It refers to quantitative indicator based which separate measures for men and women can be considered, while implementing such methods for male and female faculty members

**Gender:** Among 105 responses, **56 (53%) are male** respondents and **49 (47 %) are female** respondents. This indicates the numbers of male and female are approximately at par in this sector.

**Age Group:** The inference drawn is; faculty members in the age group of 31 to 40 years contributing to 59 % of the sample size are active users of ICT in their teaching, learning and assessment, and expressed their comfort, issues and challenges in using ICT during this phase.

**Qualification:** Majority i.e. 82% of respondents; faculty members are doctorate, who are well qualified and rich in experience to put forth their points in implementation of ICT.

**Degree/Programme associated with:** About 73 % of faculty members teach to MBA programme and around 11 % teach to Commerce programme, depicting the major challenges faced by management faculty members in implementation of ICT based teaching.

**Place of Residence (States):** We have received data from all over states of India, but major 2 states responses we have i.e., from Telangana 31% and Maharashtra 22%, which gives apt data for the research, as both the states are densely populated with huge number of educational institution in the country.

**Table 2: Frequency Table**

Variable	Valid	Frequency	Percent	Valid Percent	Cumulative Percent
ICT Imp. In Edu.	Disagree	3	2.9	2.9	2.9
	Agree	102	97.1	97.1	100.0
		105	100.0	100.0	
Usage of Dig. Plat.	Strongly Disagree	2	1.9	1.9	1.9
	Disagree	1	1.0	1.0	2.9
	Not Sure	102	97.1	97.1	100.0
		105	100.0	100.0	
Easy to use feat.	Disagree	20	19.0	19.0	19.0
	Agree	85	81.0	81.0	100.0
		105	100.0	100.0	
ICT Infra. In India	Disagree	60	57.1	57.1	57.1
	Agree	45	42.9	42.9	100.0
		105	100.0	100.0	
Inconvenience using ICT tool	Strongly Disagree	23	21.9	21.9	21.9
	Disagree	9	8.6	8.6	30.5
	Not Sure	73	69.5	69.5	100.0
		105	100.0	100.0	
Is online teaching Challenging	Disagree	15	14.3	14.3	14.3
	Agree	90	85.7	85.7	100.0
		105	100.0	100.0	
E-edu. dele. qualityedu.	Disagree	33	31.4	31.4	31.4
	Agree	72	68.6	68.6	100.0
		105	100.0	100.0	
ICT current global civilization	Disagree	25	23.8	23.8	23.8
	Agree	80	76.2	76.2	100.0
		105	100.0	100.0	
Facilities of Digi plat.	Disagree	4	3.8	3.8	3.8
	Agree	101	96.2	96.2	100.0
		105	100.0	100.0	
lockdown building digital capacity	Disagree	12	11.4	11.4	11.4
	Agree	93	88.6	88.6	100.0
		105	100.0	100.0	
ICT & edu. standards	Disagree	24	22.9	22.9	22.9
	Agree	81	77.1	77.1	100.0
		105	100.0	100.0	
ICT & prevent loss of learners	Disagree	25	23.8	23.8	23.8
	Agree	80	76.2	76.2	100.0
		105	100.0	100.0	

**Table 3: Frequency Analysis**



		ICT Imp. In Edu.	Usage of Dig. Plat.	Easy to use feat.	ICT Infra. In India	Inconv. In using ICT tool	Is online teaching challenging	E-edu. dele. qualityedu.	ICT current global civilization	Facilities of Digital plat.	lockdown building digital capacity	ICT & edu. standards	ICT & prevent loss of learners
N	Valid	105	105	105	105	105	105	105	105	105	105	105	105
	Missing	0	0	0	0	0	0	0	0	0	0	0	0
Mean		3.9429	2.9524	3.6190	2.8571	2.4762	3.7143	3.3714	3.5238	3.9238	3.7714	3.5429	3.5238
Std. Deviation		.33480	.29026	.78912	.99449	.83315	.70321	.93291	.85592	.38469	.63937	.84385	.85592
Variance		.112	.084	.623	.989	.694	.495	.870	.733	.148	.409	.712	.733
Skewness		-5.742	-6.308	-1.599	.293	-1.093	-2.071	-.812	-1.248	-4.896	-2.460	-1.312	-1.248
Std. Error of Skewness		.236	.236	.236	.236	.236	.236	.236	.236	.236	.236	.236	.236
Kurtosis		31.569	39.797	.569	-1.952	-.654	2.333	-1.368	-.452	22.399	4.130	-.286	-.452
Std. Error of Kurtosis		.467	.467	.467	.467	.467	.467	.467	.467	.467	.467	.467	.467

**Hypotheses of the Study:**

Hypothesis 1:

H0: E-education is not effective in delivering quality education during COVID-19 lockdown for educational institutions.

H1: E-education is effective in delivering quality education during COVID-19 lockdown for educational institutions.

Level of Significance = 0.05

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean
E-edu. deli. qualityedu.	105	3.3714	.93291	.09104

One-Sample Test						
	Test Value = 0					
	t	Df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
E-edu. deli. qualityedu.	37.031	104	.000	3.37143	3.1909	3.5520

**Conclusion:**

Since P value (0.000) is less than the level of significance (0.05) the null hypothesis H0 is rejected.

Hence it is concluded that we accept the alternative hypothesis H1 at 95 % confidence level; as there

is a significant relation in Effectiveness of E-education in delivering quality education effective during COVID-19 lockdown for educational institutions.

**Hypothesis 2:**

H0: Use of ICT during COVID-19 lockdown is not related in raising the standard of the students/education

H2: Use of ICT during COVID-19 lockdown is related in raising the standard of the students/education

**Table 4: Level of Significance = 0.05**

Correlations
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		ICT Imp. In Edu	ICT & Edu. standards
ICT Imp. In Edu	Pearson Correlation	1	.315**
	Sig. (2-tailed)		.001
	N	105	105
ICT & Edu. standards	Pearson Correlation	.315**	1
	Sig. (2-tailed)	.001	
	N	105	105

\*\* . Correlation is significant at the 0.01 level (2-tailed).

**Conclusion:**

Since P value (0.000) is less than the level of significance (0.05) the null hypothesis H0 is rejected. As there is no relation between use of ICT during COVID-19 lockdown and raising the standard of the students/education and hence rejected because the two tailed significance is less than 0.05. Hence it is concluded that we accept the alternate hypothesis H2 at 95 % confidence level; as there is a significant relation in implementing ICT during COVID 19 and raising the standard of students/education.

**Hypothesis 3:**

H0: Standard of the students is not dependent by use of ICT and digital communication tools.

H3: Standard of the students is dependent by use of ICT and digital communication tools.

Variables Entered/Removed <sup>a</sup>			
Model	Variables Entered	Variables Removed	Method
1	Easy to use feat ICT Imp. In Edu	.	Enter
a. Dependent Variable: ICT & Edu. standards			
b. All requested variables entered.			

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.362 <sup>a</sup>	.131	.114	.79422
a. Predictors: (Constant), Easy to use feat, ICT Imp. In Edu				

ANOVA <sup>a</sup>						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9.717	2	4.858	7.702	.001 <sup>b</sup>
	Residual	64.340	102	.631		
	Total	74.057	104			
a. Dependent Variable: ICT & Edu. standards <sup>1</sup>						
b. Predictors: (Constant), Easy to use feat, ICT Imp. In Edu						

Coefficients <sup>a</sup>						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.170	.968		-.176	.861
	ICT Imp. In Edu	.766	.233	.304	3.286	.001
	Easy to use feat	.191	.099	.179	1.936	.056
a. Dependent Variable: ICT & Edu. standards						

**Conclusion:**

Since P value (0.000) is less than the level of significance (0.05) the null hypothesis H0 is rejected. Hence it is concluded that we accept the alternate hypothesis H3 at 95 % confidence level; as there



is a significant relation in Standard of the students by use of ICT and digital communication tools.

#### V.RESULTS

As per the study conducted, it was observed that;

- Maximum number of respondents agreed that integration of ICT in education is of utmost importance, and most of them have used digital platforms during lockdown to teach & learn.
- Adoption of ICT is beneficial to raise the standards of education, as it will help the teachers to impart quality education if used effectively.
- Though ICT supported education to continue in the lockdown, many users faced power cut, network/internet connectivity issues, as our country is in the developing stage of ICT infrastructure.
- Along with providing various opportunities like webinars, online courses, tutorials etc. ICT platform was also used to reduce the loss of learners.

#### VI.CONCLUSION

Technology provides an ocean of opportunities. Current situation of COVID-19 lockdown has taught us that integration of ICT in education is the most important requirement for educational institutions. Digital communication tool's have been a medium of continuity for teaching and learning processes in this pandemic. No doubt that the contribution of ICT in education is progressively changing the environment; it is one of the most valuable resources for learning and providing students with proper skills required for the development of the nation.

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