ANALYSIS OF DIGITAL LEARNING IN LOCKDOWN PERIOD FOR STUDENTS IN INDIA

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Abstract

Objectives: The primary objective of the present study is to explore the factors affecting students' digital learning during lockdown period in India. The researchers aim to design and develop the conceptual model for problems faced by students in digital learning and the ways to resolve them. **Methods**: The primary data for the study has been collected using a self-designed structured questionnaire framed using focused group discussion. The data has been analyzed to explore the various factors affecting students' digital learning using Factor analysis. Jamovi software has been employed to analyze the collected data. **Findings**: The study mainly observes and analyzes the factors affecting students' digital learning during the lockdown period in India to find out the problems faced by the learners. The issues and opportunities in digital learning have further been explored. Using factor analysis method on primary data collected from 411 respondents. Three factors are constructed namely; Training needs, convenience in use and infrastructure. Researchers have done a detailed analysis and designed a conceptual model by introducing three variables in the model as previously no model exists. **Novelty:** The study is exploratory in nature as it aims to identify issues and opportunities in digital learning. The novelty and originality of this research lies in the fact that factors affecting students' digital learning during lockdown period has not been previously explored with the help of primary data collected from Indian students. This is validated by the fact that no scale exists for such data collection. Thus, the researchers tried to explore this and suggest a model which highlights three factors which are of prime importance viz., Training needs, convenience in use of technology and infrastructure. This forms the basis of further analysis by other researchers.

Keywords: Students, Factors, Convenience, Infrastructure, Training.

1. INTRODUCTION

Corona virus (Covid 19) was the pandemic declared by World Health Organization. Just like the whole world, India is also trying to escape from this scenario. Having a huge population of more than 130 crores, and fewer resources, lockdown was the only option to avoid spreading the disease by ruling government. During this lockdown, educational institutions were also closed. It was very challenging for the young population to keep their education from being negatively affected. Hence online learning or digital classes were an option implemented by universities, UGC and other regulating bodies.

Indian population is divided into rural, urban and metropolitan. There is a huge gap in these areas when it comes to digitalization. So it was a big challenge to go online for education. Many villages where even electricity is not available, online education is a big question mark. In urban areas and metropolitan cities, smartphones, laptops and desktops are available but Wi-Fi connectivity and non-interrupted data may be the

challenges. So what are the challenges faced by students? Can these problems be identified as factors, is the crux of the study.

For this study, to develop the scale, feedback was gathered from focus groups consisting of students. Questions about the problems they face were asked from students. And then these problems were formed into a questionnaire made on Google forms and circulated widely to students online through emails and WhatsApp. To get responses from the students, teachers' help was taken to forward and convince the students to fill out the questionnaire. The instrument was on a five-point Likert scale coded from one to five. Code 1 was for strongly disagree, code 2 for disagree, code 3 for indifferent, code 4 for and code 5 for strongly agree.

Data was analyzed using Jamovi software which is free and open. Factor analysis is considered suitable for getting factors.

As the COVID-19 pandemic significantly impacted education worldwide, the research on digital learning during the lockdown period has been extensive. Researchers across disciplines have investigated various aspects of this topic to understand its implications, challenges, and opportunities for students, educators, and educational systems.

Some authors highlighted the digital divide during the lockdown period, indicating disparities in access to technology and internet availability. Students from low economic status or from low income families faced challenges in access to online education and resulted in lack of their educational progress. Various researchers examined the effectiveness of various online learning platforms and tools implemented during the lockdown. Studies investigated the advantages and limitations of Learning Management Systems (LMS), video conferencing tools, educational apps, and multimedia resources in facilitating remote learning.

Researchers also explored different pedagogical approaches innovated by educators during the lockdown to ensure useful digital learning experiences. The shift to online education necessitated adjustments in teaching methods, including synchronous and asynchronous instruction, flipped classrooms, and collaborative learning.

Researchers explored feelings of isolation, loneliness, and stress experienced by students and identified strategies to provide emotional sustain and promote a sense of community in the virtual classroom.

Research Gap for the Present Research

While existing literature identifies the digital divide's emerging during the lockdown period, further research is needed to delve deeper into its impact on students' learning outcomes. Understanding the specific factors contributing to the digital divide, such as access to devices and internet connectivity, and their influence on student's academic performance can provide valuable insights for educational policymakers and institutions.

However, there is a need for longitudinal research that assesses the long-term effects of digital learning on students' academic achievement, cognitive skills, and overall educational development. Comparing the outcomes of students who experienced prolonged online learning with those who had traditional in-person education can help identify potential advantages and disadvantages of digital learning approaches.

And more importantly, also there is a strong need to study the psychological effects of online learning during the lockdown, more comprehensive studies are needed to understand how digital learning environments can impact students' mental health. Exploring factors that contribute to stress, anxiety, and well-being during online learning and identifying effective support mechanisms can help design interventions to promote students' emotional well-being.

Objectıves of the Study:

This study is to raise the issue of Digital learning in the lockdown period for the wellbeing of students. In this framework, following are the objectives:

- To find out factors related to problems faced by students in digital learning during the lockdown period.

- To suggest a model, if any for problems faced by students in digital learning during the lockdown period.

2. METHODOLOGY

Present study is exploratory in nature, COVID 19 is a novel virus and in Indian scenario this type of study has not been required until now as offline education is most prevailing in India.

Data and literature review is not available as lockdown period is also new in India so no researches were available on education during lockdown period. Primary data is used for this study.

Sampling design and size: purposive sampling is used. Only students are considered for filling the questionnaire as respondents. 411 responses were found complete for analysis.

Instrument: A questionnaire for data collection is prepared in Google Forms and sent to online for data collection. It took one month to fill the data and April-May 2020 is the study period.

Tool for Analysis: Factor analysis was used to know the factors affecting digital learning to students.

3. RESULTS AND DISCUSSION

Exploratory Factor Analysis

Table 1: Factor Loadings for Problems in Digital Learning

	Factor			Uniqueness
	1	**2**	**3**	**Uniqueness**
Training2	0.777			0.382
Training3	0.852			0.288
Conv2		0.567		0.426
Infra2			0.515	0.509
Infra3			0.617	0.515
Infra4			0.691	0.537
Conv1		0.951		0.123
Training1	0.591			0.581
Note. The 'Minimum residual' extraction method was used in combination with a 'oblimin' rotation				

Training2=I face problems in digital learning in lockdown period as difficult to learn than conventional offline learning

Training 3 = face problems in digital learning in the lockdown period as it is difficult to understand

Conv2= I can't afford a data package for digital learning

Infra2=lack of Electricity/regular power supply is a problem in digital learning

Infra3=I feel a problem in digital learning as I do not have smart-phone

Infra4= I feel a problem in digital learning as I do not have smart-phone

Conv1+I feel problem in digital learning as it takes more time than traditional lecture

Training1=I feel problems in digital learning as I do not have knowledge how to use

Above table shows exploratory factor analysis and 3 factors are computed. There is no cross loading. Also all factor loadings are more than .5. Uniqueness is also low which shows statements of factors are interrelated but factors are unique.

Assumption Checks for factors:

The following tables are for testing the assumptions

Table 2: KMO Measure of Sampling Adequacy for Factors

		MSA	
Overall		0.799	
Training2		0.733	
Training3		0.731	
Conv2		0.755	
Infra2		0.863	
Infra3		0.873	
Infra4		0.878	
Conv1		0.752	
Training1		0.855	

KMO should be greater than .60. in this case, it is overall .799 which shows sample adequacy and also all statement have good KMO. So Measure of sample adequacy (MSA) is also good

Confirmatory Factor Analysis

Table 3: Factor Loadings after EFA

Factor		Indicator		Estimate		SE		Z		p	
Training		Training2		1.025		0.0607		16.9		< .001	
		Training3		1.126		0.0631		17.8		< .001	
		Training1		0.911		0.0675		13.5		< .001	
Convenience		Conv1		1.04		0.0587		17.7		< .001	
		Conv2		1.135		0.0644		17.6		< .001	
Infrastructure		Infra2		1.01		0.0689		14.7		< .001	
		Infra3		1.053		0.0794		13.3		< .001	
		Infra4		0.981		0.076		12.9		< .001	

From the table it is observed that factor training has three statements standard error is less than .10, which is good indicator of model fitness and p values are less than .01 which supports the model fitness.

Table 4: Test for Exact Fit

χ²		df		P	
48.8		17		< .001	

Null hypothesis is rejected which indicates model is fit.

Table 5: Model Fit Measures

				RMSEA 90% CI		
CFI		TLI		RMSEA	Lower	Upper
0.972		0.955		0.0675	0.0457	0.09

Model fit measures show that CFI > .9 is treated well, in this case, it is .972, TLI is also treated>.9 it is .955, RMSEA is only .0675, lower value is treated good for model fit.

Table 6: Descriptive Statistics for Variables Used

		Training2	Training3	Conv2	Infra2	Infra3	Infra4	Conv1	Training1	
N		411	411	411	411	411	411	411	411	
Mean		3.84	3.73	2.03	2.27	2.93	2.68	1.88	3.58	

Code Training2 has the highest mean = 3.84 as students face problems in digital learning in lockdown period as difficult to learn than conventional offline learning. Data is also from rural India where there is lack of training about digital medium. Code Training 3=I faces problem in digital learning in lock down period as it is difficult to understand having mean of 3.73 can be treated as a second problem. Training1=I feel problems in digital learning as I do not have knowledge of how to use shows third problem faced having mean = 3.58, but Conv2= I can't afford data package for digital learning is not the big issue as mean = 2.03 as data is very affordable in India. Infra2=lack of Electricity/regular power supply is problem in digital learning. Infra3=I feel problems in digital learning as I do not have smart phone have mean=2.93,, Infra4= I feel problems in digital learning as I do not have smart phone mean = 2.68, Conv1+I feel problems in digital learning as it takes more time than traditional lecture, this problems is not faced as no extra time is taken . Adversely it saves time of students. So model is recommended by author for wellbeing of students for better education.
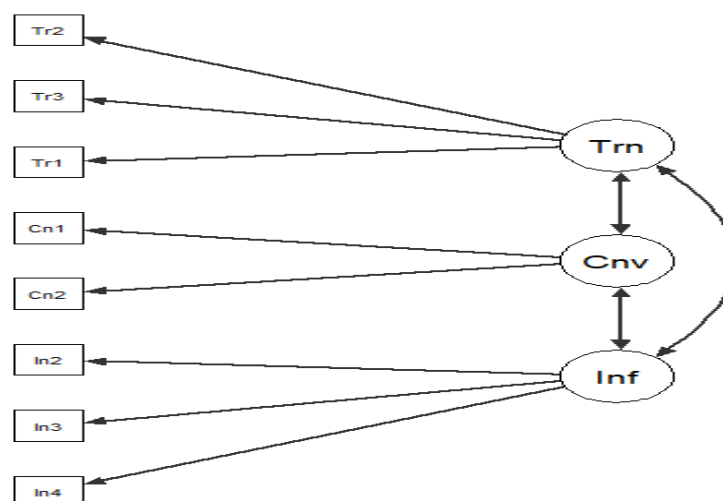

Figure 1: Suggested Model for digital learning using Jamovi Software

4. CONCLUSION

The present study is relatable to the lockdown period. All educational regulatory bodies and organisations were trying hard to make the student's time useful. They want no stone left to provide education. Not only classrooms become digital, but also many publishers were providing free online study material for students. However students facing problems in digital learning is the issue discussed in this study. Collected data based on structured instruments is analyzed using Jamovi software. Three factors are identified: infrastructure, convenience and Training. General Suggestions include Students have laptops or smart phones but data requirement is more in online learning, if data is provided students at concessional prices, problems can be minimized. In online class, there may be technical issues, and audio and video may create problem. In this scenario, recorded video and audio lectures will be useful; students can study anytime and anywhere. On the basis of research, the Conceptual model is recommended by the author that problems in digital learning have three factors identified. First is the Requirement of training to apply digital learning. Ease of use or convenience and infrastructure requirements are the other two.

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