COVID-19 Pandemic Disruption and Efficacy of Blended Learning on Learning Outcomes

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INTRODUCTION

Covid 19 – Pandemic Disruption and Impact

UNESCO stated in its report that an estimated 290 million students' education was disrupted in 22 different countries; the figures estimated in India were close to 32 crores. According to another UNESCO estimation, 63 million teachers were affected in 165 countries, nearly 1.3 billion learners were stopped from attending School, College and University. In India, the numbers were put at 32,07,14,810 of which the male population numbers were at 15,81,58,233 and the female population numbers were at 16,25,55,577. The nationwide lockdown affected nearly 91% of the student community.

The Covid crisis had two issues; the first was fighting the pandemic and finding an effective vaccine and the second was coping with loss of jobs, livelihood and an economic recession. It brought tremors at the personal levels with psychosocial issues on the rise due to the loss of livelihood and security. The worry across educational systems was the chasm that the pandemic could create on learning leading to severe skill shortages. The World Bank's data (2019) stated that 53% of the primary school children in low and middle-income countries experienced learning gaps. The estimate pointed to an alarming 43% of children would continue to remain poor learners in 2030. This issue would be further aggravated by shutdowns and moving of the entire education system to the online platform.

Covid 19 Implications on Teaching-Learning Process

According to UNESCO's report, 826 million students could not continue online or blended learning due to the lack of computers. Another 706 million learners around the world had no access to the internet at home. The effect of the pandemic disrupted in-person engagement for teachers and students as no one could go to Schools, colleges and universities due to lockdowns and quarantine measures taken by government authorities. The question facing educational institutions was how to replicate the in-person face to face engagement into an online or virtual mode. The challenge posed before teachers was how to prepare teaching content and exhibit it on the online mode effectively as they did

it in classrooms before. Teachers were not conversant enough with digital tools and online teaching-learning platforms to engage with students. Institutions that were already offering online courses and those that had already adopted blended learning pedagogies found it easier to include modules, methods and pedagogies, and they continued using the same during the pandemic. Teachers who were new to the online and blended learning systems had to convert teaching materials into online or digital formats that could be easily shown and shared across learning management systems. The online learning platforms were different in terms of engaging with students. Lessons had to be taught in a non-classroom and remote environment by looking at computer screens. Teachers had to think of creative ways of engaging and interacting with students. It was a new experience for both the teachers and the students.

In April 2020, the Ministry of Human Resources Development in India publicized a set of free digital E-learning platforms such as NPTEL, SWAYAM, DIKSHA for students and teachers to benefit and continue their learning during the lockdown. The Ministry also suggested that Higher Education Institutions could continue teaching online and urged teachers to keep the students engaged. This online engagement also gave teachers and students a perfect opportunity to experiment with the digital open-source platforms freely available. In India, many established institutions such as IIT's, IIM's, Jawaharlal Nehru University, IGNOU which already had digital platforms continued to go ahead seamlessly with their classes whereas the rest of the educational institutions around the country had not even started and did not know the way forward. The higher educational institutions that were equipped with quickly adopted to resume classes using Zoom, Microsoft teams, Moodle, Web-Ex and so on, whereas the rest of the institutions were instructed to use open-source online teaching platforms such as Skype, Google Hangouts and YouTube.

The modern educational system which imbibes the in-person interaction between the teacher and students takes its roots from the Gurukula system of which the core principles were the teacher-student interaction rooted in culture and dharma. The outbreak of the pandemic which suddenly thrust the educational system into the virtual model was not a popular option as teachers and students found it difficult to adapt. A majority of them were not trained in teaching and engaging students online. Teachers and students faced many challenges from poor infrastructure to non-availability of laptops and mobile phones to poor internet connectivity.

Blended Learning – An effective Pedagogical model

Blended Learning in recent years has been adopted by educational institutions to engage learners beyond the traditional classroom. The advances in educational technology have enabled this process to be quickly accepted by institutions though there has been a lack of clarity in terms of the concept (Oliver & Trigwell, 2005) and understood differently by people making it an untapped resource (Driscoll, 2002). Hofmann (2001) stated that instructional developers identify a learning content,

break it into modules and choose the appropriate delivery mechanism to deliver content. The definitions for Blended Learning that are acceptable and widely used are a combination of traditional learning with web-based tools, or a combination of media tools used during online learning, or a combination of pedagogical tools with or without technology in learning (Whitelock & Jelfs, 2003). (Kerres & DeWitt, 2003) revealed that blended learning pedagogy can be an effective mixture of different didactic methods and delivery formats. Driscoll (2002) summarized the concept of Blended Learning into a) a combination of web based technologies to achieve an educational objective b) a combination of pedagogical approaches to achieve a learning outcome c) a combination of instructional technology with the facilitation of an online tutor, and d) a combination of instructional technology with on the job tasks.

The Blended Learning method comprises different pedagogical tools such as web-based content, learning Management systems, collaborative interactive tools and many more. It also includes classroom lectures, e-interactions and self-paced learning (Valiathan, 2002). Blended Learning can be further categorized into three models; a) A Skill driven learning that allows the learner to acquire knowledge and skill at their convenience b) An Attitude driven learning that exposes the learner to certain event-based activities to enable them to acquire specific skills and behaviours c) A Competency driven learning method that combines online support tools with e - content and mentoring for specific competencies (Valiathan, 2002). The sudden outbreak of Covid 19 resulted in more students and tutors adopting blended learning. This acceptance has been recognized among teachers as a methodology that provides opportunity and flexibility for effectively blending classroom interaction with online web engagement.

This pedagogy offers many advantages in enhancing the learners' experience (Ginns & Ellis, 2009). It creates an active learning environment allowing for greater flexibility in using resources and allows tutors to engage with learners individually or through small groups (Oh & Park, 2009). It increases student's experiences and outcomes if combined well with traditional learning methods (Badii & Cullen, 2008). Blended Learning system using technology in a physical classroom allows students to access to extra resources. This helps learners to increase their confidence, competence and quality of learning (Azizan, 2010), contribute to deeper learning and active engagement (Chen & Jones, 2007) and add to cooperative activities beyond the physical classroom (Yuen, 2010).

The strength of blended methods of learning lies in the ability to offer new learning experiences using technology. Past studies have shown that this system reduces failure rates among learners, creates higher interest in the learning process and increases the commitment of students making them responsible to take up activities in this system. Universities and colleges have developed a Learning Management System (LMS) for conducting online classes, assignment submissions, online examinations, interactive chats and discussions, and also effectively monitoring students' learning

progress. The teachers have the opportunity to explore new tools for making learning more engaging and enriching. Blended Learning has effectively integrated the World Wide Web features with a face-to-face interaction making the learning experience an enjoyable one.

Research Objectives:

- To understand the effectiveness of Blended learning as a teaching-learning pedagogy
- To recognize the relationship that Blended Learning Method has on learning outcomes
- To ascertain the impact of Blended Learning as a teaching-learning on learning outcomes.

RESEARCH METHODOLOGY

The study titled 'Covid 19 – Pandemic Disruption and efficacy of Blended Learning on Learning Outcomes' was conducted to understand the implication and impact of the pandemic and examine the adoption of Blended learning and its impact on learning outcomes. The study sample included teachers and students actively engaged in the teaching-learning. The respondents selected for the study were active users of the blended learning model.

Sources of Data collection and Sampling Method

Primary data was collected using a structured questionnaire designed for the purpose of the study. 152 participants were included in the sample, chosen using convenient sampling. 106 respondents were finally selected as active users of Blended learning whose opinions were gathered for effective analysis.

Hypotheses:

Ha1: Blended Learning Pedagogy positively enhances learning outcomes

Ha2: Blended Learning Pedagogy significantly influences learning outcomes

Table 1: Analysis- Descriptive Statistics

Age	**Frequency**	**Per cent**
Under 20 years	51	33.6
21-30 years	70	46.1
31-40 years	08	5.3
41-50 years	17	11.2
Above 50	6	3.9
Total	152	100.0
Gender	**Frequency**	**Per cent**
Male	94	61.8
Female	58	38.2
Total	152	100.0

Educational Qualification	**Frequency**	**Per cent**
Pre-university (PUC)	23	15.1
Undergraduate	59	38.8
Postgraduate	57	37.5
others	13	8.6
Total	152	100.0
Current employment status	**Frequency**	**Per cent**
Pursuing Education	80	52.6
Unemployed	33	21.7
Part Time Employment	7	4.6
Full Time Employment	32	21.1
Total	152	100.0
Occupation	**Frequency**	**Per cent**
Teacher	22	14.5
Entrepreneur	4	2.6
Facilitator	2	1.3
Student	108	71.1
Others	16	10.5
Total	152	100.0

Type	**Frequency**	**Per cent**
Parent	8	5.3
Teacher	16	10.5
Facilitator	8	5.3
Student	110	72.4
Others	10	6.5
Total	152	100.0
Experience of Blended Learning	**Frequency**	**Per cent**
Yes	106	69.7
No	46	30.3
Total	152	100.0
Duration of Blended Learning	**Frequency**	**Per cent**
Less than 6 months	45	42.4
6 months to 1 year	51	48.1
1 to 3 years	5	4.75
Above 3 years	5	4.75
Total	106	100.0

Platforms of blended learning	**Frequency**	**Per cent**
LMS	18	11.84
Moodle	14	9.22
Google classrooms	57	37.51
Zoom meetings	24	15.78
Others	39	25.65
Total	152	100.0

Effective mode	**Frequency**	**Per cent**
Offline/In-person classroom Learning	49	43.2
Online/Digital learning	19	12.5
Blended learning	38	25.0
Others	46	19.3
Total	106	100.0

Summary Statistics

The study involved 46.1% of the respondents in the age bracket of 21-30 and 33.6% under 20 aged learners. 61.8% of the respondents were male. 38.2% of the respondents were female. The educational profile included 37.5% post graduate learners, 38.8% undergraduate learners. 52.6% of the respondents of the study were pursuing education, 21.1% were in full employment. The study comprised of 71% students actively involved in blended learning. 14.5% were teachers followed by the rest. When respondents were asked to identify what role they were participating in the survey, 72.4 % of students, 10.5% of teachers and the rest identified themselves as parents, facilitators and others. With respect to the exposure and experience to the blended learning model, 69.7% of the respondents opined in favour of it. In terms of the duration of the exposure, 48.1% stated the duration was between 6 months to 1 year, followed by 42.4% as less than 6 months in exposure. Google classrooms secured a response of 37.51% followed by 25.65% for others, and Zoom as an online tool secured a percentage of 15.78%. And Significantly, 43.2% of the active respondents stated that In-person classroom learning is the most effective followed by blended learning that got a 25% of opinion in favour of it.

Table 2: Mean Score ranking for Blended Learning Pedagogy

STATEMENTS	Mean Scores	Rank
Blended Learning allows me to study at my own pace	3.2453	4
Blended learning has a positive impact on my learning outcomes	3.0094	7
Blended Learning is an easier and more convenient system	3.1698	5
Blended Learning minimizes costs of teaching and learning	3.4151	2
Blended learning is better than traditional/ face-to-face learning	2.4717	8
Blended Learning causes fragmentation of work and loss of consistency in learning	3.0943	6
Blended Learning reduces team work and collaboration between students	3.4057	3
Blended learning satisfaction highly depends on the learning climate/environment	3.5000	1

Summary – The top three statements for Blended Learning included that it depended on the learning climate/environment, it minimized cost of teaching and learning and there was little or no possibility for team work. The last three ranks were given to Blended learning as least preferred to traditional, face-to-face learning, has lower positive impact on learning outcomes and it led to fragmentation of work and inconsistency in learning.

Table 3: Mean Score ranking for Learning Outcomes

STATEMENTS	Mean Scores	Rank
Learners are able to acquire the intended knowledge.	2.7453	5
Learners improved their knowledge/skills.	3.3208	2
Learners could absorb the training effectively and map it to individual learning objectives.	3.1899	3
Learners are motivated to learn and perform.	3.0000	4
Learners are able to perceive practicability and have potential for applying the learning.	3.7547	1
Learners are focused and engaged during the learning.	2.5472	6

Summary: The top three ranks were given to the learning outcomes of practicality and potential for learning, outcome of learning improved knowledge and skills, and being able to absorb training and match to learning objectives. Last three ranks were given to motivation to learn which held a neutral opinion, ability to acquire intended knowledge received less favourability followed by focus and engagement during learning.

Table 4: Correlation between Blended Learning Pedagogy and Learning outcomes among Learners

		Blended Learning Pedagogy	Learning Outcomes
Blended Learning Pedagogy	Pearson Correlation	1	.537**
	Sig. (2-tailed)		.000
	N	106	106
Learning Outcomes	Pearson Correlation	.537**	1
	Sig. (2-tailed)	.000	
	N	106	106

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

A Pearson product-moment correlation determined the relationship between Blended Learning Pedagogy and Learning Outcomes among learners. There was a strong positive correlation between Blended Learning Pedagogy and Learning Outcomes which was statistically significant (r = .537, n = 106, p = .000).

Regression Analysis for Blended Learning Pedagogy and Learning Outcomes

Table 5: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.537[a]	.288	.281	.49383

a. Predictors: (Constant), Blended Learning pedagogy

Table 5 provides the *R* and R^2 values. The *R* value represents the simple correlation and is 0.537 (the "**R**" Column) which indicates a moderate degree of correlation between Blended Learning Pedagogy and Learning Outcomes. The R^2 value at .288 indicates that the extent of Blended Learning Pedagogy at 28.8% is minimal, explaining that the pedagogy cannot fully impact the Learning outcomes of learners.

Table 6: ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10.270	1	10.270	42.114	.000[b]
	Residual	25.363	104	.244		
	Total	35.633	105			

a. Dependent Variable: Learning Outcomes

b. Predictors: (Constant), Blended Learning Pedagogy

Table 6 indicates that the regression model predicts the dependent variable of Learning Outcomes significantly well. Here, $p < 0.0000$, which is less than 0.05, indicates that the regression model statistically and significantly predicts Learning outcomes.

Table 7: Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.915	.188		10.201	.000
	Blended Learning Pedagogy	.372	.057	.537	6.490	.000

a. Dependent Variable: Learning Outcomes

Table 7 provides us with the necessary information to predict Learning outcomes from Blended Learning Pedagogy as well as it determines whether Learning outcomes contribute statistically and significantly to the model. Learning Outcomes = 1.915 + .372 (Blended Learning Pedagogy)

DISCUSSION AND CONCLUSION

The Blended Learning Pedagogy has been accepted and adopted worldwide as an effective learning tool. The sudden outbreak of Covid 19 accentuated its implementation at a far greater pace as millions of learners around the world were able to continue their education in an uninterrupted manner. The method is enhanced further with additions in applications and technology plugins that makes it more user friendly and compliments traditional class room learning. Learning tools as virtual or collaboration software, self-paced web courses, leaning management systems and performance management support make the method more result oriented. It mixes a combination of classroom learning, e-learning, online chats and interactions that include synchronous and asynchronous learning content (Singh, 2003). Academic Institutions adopting Blended learning pedagogy can opt for any of the three models; a) Skill driven model b) Attitude driven model c) Competency driven model. These models can be chosen depending on learning objectives and outcomes of different courses. The skill driven models are suitable for courses that impart specific knowledge and skills, the attitude driven models are apt for those courses that are designed to help learners develop job relevant attitudes and behaviours and competency driven models are good for courses where learners need to capture and translate learning into actions or specific behaviours (Valiathan, 2002). Oilver and Trigwell (2005) highlighted the difficulties in introducing blended learning effectively. They pointed out the practical difficulties where e-learning and traditional learning are used, where online learning and face to face learning take place, where usage of different media and contexts takes place. The role and responsibilities of the learner, facilitators need to be defined. The objective and outcomes need to be clearly defined. What content requires to be taught in the traditional and e learning mode needs to be defined and well mapped for learning and evaluation. The adoption and acceptance to these pedagogies depend on the availability and access to digital devices and tools.

The study of the Covid 19 impact and blended learning on learning outcomes was empirically tested resulting in a 53% correlation between Blended Learning pedagogy and Learning outcomes, but with respect to the impact of Blended Learning pedagogy on learning outcomes, the findings showed a dismal figure of 28%. It can be inferred as that Blended Learning can only complement traditional face to face learning and cannot replace it totally. Tutors and learners prefer an educative environment which allows them to focus on increasing the interaction and engagement with the learning community. Blended learning method has been effective in helping learners continue education during covid times, and it has been a promising alternative so far. This pedagogical model can be improved further if the right educative environment is blended with the right mix of traditional learning systems, e learning systems and learning contexts.

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