Blended Learning- A Step to Minimize Effect of Covid-19 on Education

[1]Dr. Daksha Parmar, [*2]Dr Sajad Ahmad Malik, [3]Mr. Malik Mubashir Ahmad & [4]Dr S. A. Shaffi

[1]*Assistant Professor, RIE NCERT Bhopal, Madhya Pradesh – India*
[2]*Lecturer Government Degree College Kupwara J&K*
[3]*Teacher, Government High School, Gulgam Kupwara Jammu & Kashmir – India*
[4]*Ex-Principal RIE NCERT Bhopal (MP)*

Abstract

After recording the first Covid 19 case on 30th January, 2020, India went on complete lockdown on 24th, March. With this lockdown restrictions were imposed all over the country and students were made to stay at homes to be safe. Examinations at all levels were postponed and educational institutions were shut down creating a huge loss to the educational sector in the country. The country witnessed the largest disruption in the history affecting 320 million students enrolled at various educational institutions and 1.6 billion learners were also kept away from schools worldwide. To avoid this learning loss while this pandemic lasts, the government initiated technology based teaching to make sure that learners are in reach to learning materials while remaining at home. Blended learning is one such proposal that combines face-to-face learning with online learning system. The paper reviewed the loss caused by this pandemic and reviewed the usefulness of Blended learning in academic recovery. The research study is based on qualitative aspect and to meet the objectives of this research, data was collected from different sources. It was found that learning can be improved through blended mode and can be implemented during outbreak of diseases like Covid. It was accomplished that blended learning can be devised in India, but some far-flung schools would not benefit much due to lack of basic facilities and technology. It was suggested that there is a need to install digital appliances so that technology based learning is available to all learners in India.

Keywords: *Covid 19, Lockdown, Learning loss, Blended learning, Face to face teaching*

Introduction

As the world progressed and got converted to a global village, the rate of risk we face also increased. With the outbreak of Covid-19, we realized how helpless we are and how mighty nature could be. The pandemic did not limit itself, nor recognized boundaries of nations and effected people irrespective of their religion, region, gender or material status. People of all fields got affected with it. With its outbreak during last months of 2019, it spread rapidly to several countries and finally World Health Organization on 30, January, 2020 announced it as " Public Health Emergency of International Concern (PHEIC)", subsequently WHO on 11, March, 2020 declared it as 'World Pandemic'. "This Pandemic forced people to adopt new life styles with restricted measures like, Self isolation, Wearing of facial masks, physical/ social distancing, lockdown, quarantine of exposed persons, containment zones where large number of people were infected etc". [1]). This led to the closing of schools, colleges and universities throughout the world. India went on complete lockdown on 24th of March due to which around 320 million children got affected.

Learning Loss: The Covid 19 pandemic gave rise to global education crises and was immediately followed by temporary closure of educational institutions and the postponement of examinations at all levels. With increasing restrictions and lockdowns, learning loss widened and gained critical magnitude. "COVID-19 pandemic has

resulted to total closure of schools in about 192 countries all over the world with 91.4% of the total number of enrolled learners in these countries temporarily forced out of school. It is reported that over 1.6 billion learners across the world are currently compelled to stay out of schools as social distancing is being enforced locally and regionally around the world in order to contain the spread of Corona virus disease. Report shows that lockdown of schools is more prominent in some continents such as Africa, South America and in some parts of Europe". [2] Its effect was also felt on mental health, nutrition and overall development of children. "For the most vulnerable children, school closures have deprived them of their one nutritious meal a day; children living in violent or dysfunctional family settings who rely on school to provide a safe, nurturing environment have also been cut off from this safety net." [3] It also gave rise to the risk that some students, particularly girls will never return back to school because long closures of schools will lead them to child labor and early marriages. "At an estimate the global school closures could result in a loss of at least US $10 trillion in lifetime earnings for this generation." [4] "Early evidence from school closures already suggests an increase in early marriage and sexual violence in some countries, whereas others report increased involvement of children in household chores." [5] A study conducted in "44 districts across 5 States, *namely*, Chhattisgarh, Karnataka, Madhya Pradesh, Rajasthan and Uttarakhand covering 16067 children in Classes 2 to 6 in 1137 schools in January 2021 indicates that 92% children lost at least one specific language ability and 82% lost at least one specific mathematical ability from the previous year across all classes. Thus, school closures have resulted in loss of not only curricular learning but given rise to a widespread phenomenon of regression (forgetting) by students of learning from the previous class. This includes loss of foundational learning abilities such as reading with understanding and performing addition and multiplication which they had learnt earlier and had become proficient in. This regression in curricular learning will impact learning of not only more complex abilities but also conceptual understanding across subjects leading to a cumulative loss over the years impacting academic performance in school years and their future learning in college" [6].

Rationale of the Study

Covid 19, probably the major pandemic mankind had ever seen, lead to severe crises all over the world. It also posed severe global educational crises. Hence to minimize its effect and to become prepared for such pandemics, there is need to develop alternative means for education. It was found that there is scarcity of research which demonstrates how to minimize its effect on education. Much research has been carried out showing effect of Covid on education, but little has been done to minimize it. It was hence found necessary to focus on such a problem which could help students, teachers and administrators to design alternatives in this respect.

Objectives:

- To assess effect of Covid 19 on education.
- To present useful solutions and suggestions for proper execution and successful outcome of blended learning at academic institutions during Covid like situations.

Methodology

The research paper tries to assess the impact of Covid 19 on education and the importance of blended learning during these crises of pandemic. For analyzing the data, content analysis was used as a research tool and descriptive research as research method. Qualitative aspects had been kept into consideration while framing this research study. This study is solely based on the secondary data. The collected literature was systematically reviewed that was collected from different Secondary sources like journals, reports, search engines, educational websites, scholarly articles, research papers, and other academic publications.

Blended Learning: Digital methods of learning were prominent even before the start of the Covid 19; however this pandemic reshaped the state of education and made us understand the necessity for technology in education. Now as this pandemic is steadily losing ground and the life is returning to normal, the opportunities of blended learning in educational sector have emerged to ensure much more useful and suitable learning practice. Blended

learning, also known as hybrid learning, is a mixture of online and offline education, enabling students to interrelate with students, teachers and study material both through physical classrooms and online platforms. With this initiative learning has become easy, productive and more promising. The concept of Blended learning which was developed in the early 1960's has evolved to different approaches that are widely practiced in educational systems all over the world. Blending is a word that connotes the combination of different components into a whole new structure and consequently formed the basis for the conceptualization of blended learning. [7] Factors such as "diseases outbreak, distance and other factors can limit students or learners access to education. Limited access to education is one of the challenges of education that Blended Learning was developed to address and therefore teaching by Blended Learning does not seek to supplement some aspects of normal classroom instructions but rather to completely replace them." [8] "Blended learning can therefore be summarized as all forms of teaching and learning that combine the conventional face-to-face classroom method of instruction with online system of learning, making use of information communication technology-facilitated learning in situations where the learners and teachers are sometimes separated by distance." [9] The important features of Blended Learning environment are:

- To increase engagement of students in learning.
- To increase student teacher interaction.
- Authority for learning.
- Time control and elasticity.
- Improved student learning outcomes.
- Improved institutional status.
- More plastic teaching and learning environment.
- More acquiescent for self and continuous learning.
- Better chances for experiential learning.

ICT Tools for implementing Blended Learning

"Blended learning environment may be a true blend of learning content and interactions of varied types, resulting in authentic learning experiences. Technology has made it possible to produce a range of learning resources and interactions to reinforce student learning in both distance and campus contexts. Typically, a blended learning course will have components of both online and face-to-face teaching and therefore the context will determine the proportion of the blend. Some of the online platforms are:

- ***Massive Open Online Courses*** (MOOCs) is a free online Educational System available for everyone to enroll. MOOCs provides an affordable, flexible and efficient platform for learners to learn new skills with the help of various features like videos, study material, quizzes, assignment and online examination. Millions of aspirants around the world use this platform for various reasons like career development, college preparation, supplement learning, e learning, and much more.
- ***SWAYAM*** (Study Webs of Active-Learning for young and Aspiring Minds) is an initiative of Indian government to achieve the three central principles of education, i.e. access, equity and quality. Its main purpose is to provide best teaching learning resources to all. It also tries to overcome the digital divide for students who have remained untouched by the digital revolution.
- **Virtual Lab** projects provide remote access to labs in all major disciplines and thus address the lack of good lab facilities and lack of trained teachers particularly in the fields of science and technology. These labs have the capacity to address the needs of students at UG, PG levels and can also cater research scholars. They are any place, any pace, any-time, any-type labs and is a paradigm shift in student-centric, online education. These lab projects specifically address the following issues:
  - Provide online access to engineering colleges that lack these lab facilities.
  - Provide online access to labs as a supporting facility to those colleges that already have labs.
  - Training and skill development through workshops and on-site/ online training.

- **FOSSEE** (Free/ Libre and Open Source Software for Education) is learning project developed by the Indian Institute of Technology Bombay that promotes the use of FLOSS tools to improve the quality of education and research in our country. It is funded by the National Mission on Education through Information and Communication Technology (NMEICT), Ministry of Education (formerly MHRD), Government of India. Some of the projects promoted by FOSSEE are:

  - **E-Sim** (previously known as Oscad / FreeEDA) is a free/libre and open source EDA tool for circuit design, simulation, analysis and PCB design. It is an integrated tool built using free/libre and open source software such as KiCad, Ngspice, Verilator, makerchip-app, sandpiper-saas and GHDL. eSim is released under GPL. eSim offers similar capabilities and ease of use as any equivalent proprietary software for schematic creation, simulation and PCB design, without having to pay a huge amount of money to procure licenses. Hence it can be an affordable alternative to educational institutions and SMEs. It can serve as an alternative to commercially available/licensed software tools like OrCAD, Xpedition and HSPICE.

  - **Osdag** is cross platform **free/libre and open-source software for the design of steel structures,** following the Indian Standard IS 800:2007. It allows the user to design steel connections, members and systems using a graphical user interface. Osdag is primarily built upon Python and other Python-based FLOSS tools, such as, PyQt, OpenCascade, Python OCC, and svgwrite.

  - **DWSIM** is a multiplatform, CAPE-OPEN compliant chemical process simulator for Windows, Linux, Android, macOS, and iOS. DWSIM allows chemical engineering students and practicing engineers to model process plants by using rigorous thermodynamic and unit operations models. Since DWSIM is free/libre and open-source, they can see how the calculations are actually being done by inspecting the code behind during execution using free/libre tools available elsewhere.

  - **OpenFOAM** (Open source Field Operation and Manipulation) is a free/libre and open source toolbox which is used in academia and industry to solve continuum mechanics problems, including Computational Fluid Dynamics (CFD). CFD is a branch of fluid mechanics that uses numerical analysis and data structures to solve and analyze problems that involve fluid flow.

  - **SOUL** (*Science OpensoUrce Software for Teaching Learning*) is an attempt to put together the much used and popular ICT software used as teaching/learning tools by the community of educators and the learners in basic concept as well as advanced learning of Science subjects. This software can be used as ICT tools in classroom teaching and learning for topics in science subjects.

  - **QGIS** (Quantum GIS) is a free and open-source desktop **Geographic Information System (GIS)** application. It has features that support viewing, editing, and analysis of geospatial data. QGIS is a cross-platform application (works on **Linux, Unix, Mac OSX, Microsoft Windows and Android)**. It allows users to analyze and edit spatial information, composing and exporting graphical maps.

  - **R** is a language and environment for statistical computing and graphics. It provides various statistical (linear and nonlinear modeling, classical statistical tests, time-series analysis, classification, clustering …) and graphical techniques.

  - **PLC** (Programmable Logic Controller or programmable controller) is an industrial digital computer used for automation of various electro-mechanical processes in industries. These controllers are ruggedized to survive in harsh situations. The program is written on a computer and is downloaded to the PLC. These loaded programs are stored in non volatile memory of the PLC.

  - **Python** is a general-purpose, high-level, remarkably powerful dynamic programming language that is used in a wide variety of application domains. Python supports multiple programming paradigms, including object-oriented, imperative and functional programming styles. [10]

Implementation of Blended Learning

Blended learning is a systematic and planned instructional process which requires understanding and skills of using appropriate pedagogies with suitable technologies

- **Generating ideas:** Learners through BL technique can contribute by sharing their experiences, knowledge, ideas and views on online platforms like discussion forms, shared documents, blogs etc. moreover resources and external links can also be uploaded.
- **Brainstorming:** It is a technique where learners meet to generate new ideas and solutions around a specific domain of interest by removing obstructions. Instead of listening only to teachers, the learners enjoy generation of new ideas by the whole group and also create an environment of responsibility and independent learning.
- **Mind Mapping:** Developing cognitive approach/ schemas on subject matters in the minds of learners is the pre requirement of any learning process. The attributes like inserting images, sticky-notes, sketches in such tools makes the exercise interesting and learners get engaged in the process of meaningful learning.
- **Creative Presentation:** B L creates an environment of creative thinking abilities among learners. The creation of cartoon strips in subjects like biology and sociology and the act of story creating tool in place of mere presentation makes learning interesting and long lasting. Info graphs, short videos, podcasts provide learners an opportunity to give a creative form to their knowledge.

Making Blended Learning Work

"To create a satisfactory blending learning environment means to form suitable choices and overcoming the challenges of technology. A number of challenges and suggestions were detected in recent research on teacher perspectives, by Athabasca University and also the Commonwealth of Learning. They are:

- **Technology access:** A critical initiative is to understand which resources are available to your students. Is there limited bandwidth, unreliable Internet connectivity, or lack of devices like laptops or smart phones? Once you're clear about access, you'll be able to choose learning activities with the technology in ways in which allow all to participate.
- **Design:** Creating the suitable in-person and online activities means designing courses with the pedagogic principles of both and integrating technology during a way that supports meaningful learning.
- **Safety and Security:** Create awareness of cyber-malice and ensure security interventions against unethical learning practices, academic dishonesty, fraud and bullying are in situ.
- **Skill development, support and training:** Both students and instructors must have technological literacy and competence with technology applications.
- **Motivation:** Students need adequate motivation when engaging in an exceedingly big selection of often shifting learning modalities, a number of which can require significant skill development."

IPSIT: Indian Framework for Blended learning

Various models of Blended have been implemented worldwide, however in India IPSIT model has been proposed[10] which stands for:

1. **Identify Resources and Learner-Centered activity:** Blended Learning is the proper blend of online and face to face interaction, hence it's proper planning and proper environment is necessary. Therefore the required infrastructure for online systems such as access of internet, bandwidth, hardware, space and other such resources should be made easily available for smooth execution of BL process. The activities to be delivered in online mode in labs and classrooms should be planned in advance.
2. **Provide Resources and Announce Activities on LMS:** Implementation of BL plan needs a concrete digital environment, hence LMS becomes an essential component of BL. Instructors can announce various online activities which can be further supported by other ICT tools. Syllabus, Learning Outcomes, reading/viewing resources, announcements and instructions for individual as well as group activities, etc. will be uploaded on LMS in advance.
3. **Scaffolding and Support to learners:** In B L mode teacher has to shift his role from teach to facilitator. As the learner is obtaining resources and getting engaged in learning activities, regular scaffolding is required. Classroom environment gets shifted from teacher centric to student centric by involving students

in resolving queries, investigation and application of knowledge, and creativity under the teacher's guidance and supervision. The condition is that proper training for using various ICT platforms should be provided.

4. **Identification of learning gaps and feedback:** For any effective learning, it is necessary to assess the progress of every learner on individual learning path. Hence learners should be informed about their achievements at proper stage. Through Quizzes, presentations, assessments, assignments and projects, learning gaps can be measured.

5. **Testing: assessment and evaluation:** learner's achievement is best measured by summative assessments. Considering its innovative approach teachers are expected to adopt summative assessments. 'Recall' level test items will not suffice the need of true assessment. To measure the levels of learning outcomes and skills it is necessary that testing should be well planned and executed.

Benefits and challenges

"Some of the benefits and challenges of creating blending courses and programmes in an institution are:

Benefits:

- **Opportunities for collaborative learning:** Online learning provides greater, more engaging collaboration experiences between students and instructors. These opportunities include collaborative tools like online forum discussions, wikis, blogs, chat, etc. Through these tools, collaborative connections are available in or out of the web classroom.

- **Improved accessibility:** Access to classroom and online materials and communication provides convenience and learning skill development.

- **Communication improvement:** Teachers can reach part-time or full-time students through multiple communication channels. Learning management systems offer many communication opportunities: email, chat, news, forums, assignment spaces, etc.

- **Assessment strategies:** Student evaluations of both formative and summative feedback will be more detailed and frequent through online reporting structures. Self-evaluation and practice assessments can improve engagement and learning.

Challenges

- **Technological requirements:** Technological requirements include hardware, software and Internet access with appropriate bandwidth. These resource requirements can create systematic lack of access. Technology tools must be available, user-friendly, reliable and current for Internet use to support learning in an exceedingly meaningful way.

- **IT knowledge and skill:** Termed IT literacy, preparation to be used of technological tools is required. Lack of such knowledge and skill could be a significant barrier to access within the first place and quality learning experiences thereafter. Access to technical support could be a related and significant requirement.

- **Lack of self-pacing and self-direction:** Online learning both requires and encourages learner independence and management, for instance, some research suggest that several students will watch multiple weeks' worth of video lectures directly instead of in keeping with course structure. Students come to online learning with varying degrees of learning competence."

Recommendations

The following recommendations provide ways to build a platform for blended learning in India;

- Bridging the digital divide gap by increasing access to technology with mobile networks and free data for educational purpose. High internet connectivity or applications working on slower speed and good electricity supply should be provided to the remote areas.
- Proper training should be provided to teachers in e-learning and distance education to make blended learning work in India.

- ▪ Developing a distance learning strategy to reach out marginalized children and to address the underlying reasons for children being at risk of dropping out.

Discussion

Covid 19 pandemic had paralyzed the whole educational system of the world including India. It made countries to close their educational institutions and hence created a situation where educational institutions had to adopt an online mode to ensure continued education of students. With this initiative of using ICT to ensure that education reaches to distant places of the country, has helped to create a platform having "a lot of scope and possibilities for the future. Some of the novel ones being *Vidyadaan* – a national content contribution program that leverages DIKSHA platform to permit contributors particularly individuals & organizations across the country to contribute e-learning resources to ensure that quality learning continues for learners across India. *Chat Bot* – Technology Aided Responses and Answers (TARA), National Digital Education Architecture (NDEAR) – a technological framework which aims to enable existing systems to upgrade and become interoperable, while making available the building blocks for the creation of novel tools and solutions and hence boosts the digital education ecosystem. It is also a fact that various issues like Lack of electricity, lack of good classrooms and lack of other basic amenities are archetypal of rural schools and these can hinder effective integration of technology with conventional teaching methods in rural schools." [13] The socioeconomic condition of rural schools entails that they are less advantaged than urban schools in terms of quality education and good teachers, but still online education will eventually become an integral component of school education. Thereby in the near future a Blended (Hybrid) mode of education needs to be developed based on the experiences during the COVID-19 pandemic so as to meet any such situations in future.[14]

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