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HYBRID MODE OF EDUCATION IS THE FUTURE

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Abstract: The pandemic disrupted education for students and teachers both at the school level and the college level. In the pre-pandemic times, offline education was the norm at all levels of education. During the pandemic, Internet became hugely popular. Digital banking, shopping, browsing, digital marketing, social media all gained momentum. All sectors were affected by the surge in the usage of internet. Education sector was also not spared. Teaching was forced to move completely online. Researchers, educators, and teachers scrambled to adopt various online modes of education. India is racing to become the next economic superpower and is fast developing in various sectors. In the field of learning too many developments have taken place. Educators find online education to be more popular and cost-effective way of imparting education. New technologies have developed in the educational field. This article touches upon the emergence of online education in India, its plus points and minus points and discusses the various initiatives the Indian government has taken in online education. Responses were collected from a small group of HEI students to see how effective online teaching was especially during the lockdown period. Also, the digital infrastructure in India has been discussed in this article.

Keywords: - pre-pandemic, offline education, online education, digital infrastructure, digital marketing, digital infrastructure.

I. INTRODUCTION

Hybrid or blended mode of education means the teacher teaches both in-person and remotely also. Today, post-pandemic, in most institutions we find hybrid or blended mode of learning being followed. This is the new-normal. Not only in teaching but also on the work front we find hybrid mode of working. Wherein, employees visit their office on few days of the week. On other days they work from home.

II. The Gap in Digital Infrastructure:

The pandemic shook the whole world and people from all walks of life were affected. The disparities between the rich and poor, between the rural and urban Indians was drastically exposed during that period. Many students and even teachers in rural areas and in government schools did not have access to the internet or to smart phones. As, students were missing their education during the lockdown period. Indian education was forced to switch to online education. But the switch was not successful for many because only 9% of homes with young people have a computer. For online education, uninterrupted supply of electricity is very important. The Indian government's Saubhagaya scheme stated that 99% of Indian homes have an electrical connection. But the quality and per hour availability of electricity is very limited. Such as those found out during the nationwide survey carried out by the Ministry of Rural Development of villages. Their survey data showed that only 47% of Indian homes got more than 12 hours of electricity. Majority of the schools and colleges opted for online teaching and most of the companies adopted the 'Work from Home' (WFH). This fuelled an increased demand for smart phones, laptops, PCs, tablets, computer desks and chairs. For online classes, computers are the ideal devices. But most of the Indian students managed their online classes with smart phones. Smart phones are not suitable for lengthy lectures or for assignments. But this was the preferred device used by most students. As it was more affordable than laptops or PCs or tablets. According to the Global Pew survey conducted in February 2019 only 24% of Indians owned a smart phone. One in four Indians own a smart phone. Smart phone ownership has been slow to rise in India as compared to other emerging economies like Brazil, Philippines, Mexico, Indonesia etc. In India it was noticed that smart phone ownership varies, at different educational levels and the gender gap is widest too. Men own smart phones more (34%) as compared to women (15%) in India. Only 11% of Indians have computers like desktop computers, laptops, notebooks, or tablets. The availability of internet is also uneven in India according to the National Sample Survey educational report of 2017 – 2018. Only 24% of Indian homes had an internet connection. 42% of urban Indian homes have more access to internet as compared to only 15% of rural Indian homes. More than 66% of Indians live in villages. Only 8% of Indian homes have a computer and an internet connection. National Sample Survey also clarifies that a connection or device per household need not necessarily imply it is owned by the household.

III. Evolution of Online Education:

Online education has evolved through many stages. It started from distance learning. Distance learning has been a part of the American system and according to Bartley & Golek 2004, it is the largest sector at present. Distance education started with correspondence courses. Years later, many improvements happened in this form of education. During the 1950s, video conferencing and tele conferencing started. Issac Pitman was the person who invented correspondence courses. He used to teach shorthand both through regular classes and through correspondence. Then, in the early 60s teleconferencing started as a cost-effective form of distance education. Colleges started offering telecourses. Study materials and assignments used to be supplied to students. Nowadays, Doordarshan regularly shows the online classes of IGNOU. During the 70s and 80s video broadcasting and video playback equipment was invented. Many TV channels started educational channels. Interactive videos helped teachers to interact with their students remotely. Video conferencing became a form of distance education and was considered closer to the classroom experience of learning. The popular form of distance education is the web-based education. Though the world wide web educational instructions can be imparted in a cost-effective and collaborative manner. Web-based instruction makes the teacher a facilitator and the learner undergoes experiential learning. Still many open universities continue to offer correspondence courses. But the quality of teaching is not good as compared to classroom form of learning. With the developments in communication technologies, the boundaries between distance education and campus education have blurred. Universities like Punjab Technical University have set up learning centres in various parts of the country. Where, they offer blended learning which includes both regular classes and online classes. This form of learning has been profitable for many universities.

IV. E-learning Initiatives undertaken in India:

E-learning had become increasing popular nowadays because it offers a virtual learning environment. Karnataka State Open University was started as a public private partnership to deliver MBA programs with great success. In Aurangabad and Kolkata an initiative by private sector was started "Training of Trainers in E-Learning" which was to train teachers in E-Learning. Total of 240 teachers were trained not only in the use of e-learning in education but also to create e-content. National Task Force on Information Technology and Software Development was an enterprise started to make India a "Superpower in IT". NTFITSD was started in a few states to give government officials training in computers. This led to a shift from physical classrooms to virtual classrooms. Without any physical interaction between teachers and their learners, the communication took place with the help of video/audio taped materials, online testing software, internet-based information sources and the phone communication. This kind of new learning environment led to the setting up of virtual universities. In an online university all the knowledge is delivered digitally through internet-based courses remotely. These universities create continuous assignments and exams online to monitor, assess, manage, track and record student's progress. They also provide online help and electronic libraries. In India, 35 virtual universities are there to provide distance learning. Namely, Indira Gandhi National Open University (also termed as 'People's University'), New Delhi, Yashwantrao C. Maharashtra Open University, Nasik, IMT Distance and Open Learning University, Ghaziabad etc.

In 2014, seven Indian institutes of technology (IITs) along with Indian Institute of Science (IISC) set up India's first home grown virtual technology university. The IITs involved in this joint venture are based in Mumbai, Delhi, Guwahati, Chennai, Kharagpur and Roorkee. The virtual university provides a degree directly and has tie ups with other universities to transfer credits for a degree. Initially, these IITs provided online content through NPTEL platform (National Programme on Technology Enhanced Learning). NPTEL is a joint venture between seven IITs and IISC offering web and video-based course materials for basic sciences, engineering, and humanities. Engineering, science, and management students could freely access these courses through the YouTube channel. Students get degrees, certificates, and credits for the courses they learn. IITs are also trying to get information technology and engineering companies to provide employment value to the degrees offered by NPTEL. The Ministry of Human Resources has spearheaded the starting of this virtual university. NPTEL is a project started by IITs, IIMs and Carnegie Melton to create content as web-based supplements and video courses. NPTEL covers five main branches of engineering, and the core science programs that need to be taken by engineering students. These high-quality MOOC courses were based on All India Council of Technical Education model.

II PLUS, AND MINUS POINTS OF ONLINE EDUCATION:

2.1. Plus Points:

Virtual education is an effective tool to educate students. Not only students but working people can also avail online education for their professional development. It is a cost-effective way of delivering education. Especially, when compared to the traditional face to face form of education. It is cost effective in combating the rising cost of postsecondary education, offers credit transfer options and most important it offers the possibility of offering world class education to anyone with a broadband connection (Bartley & Golek, 2004; De La Varre, Keane, & Irvin, 2011; Gratton-Lavoie & Stanley, 2009; Koller & Ng, 2014; Lorenzetti, 2013).

At the college level, online education has received maximum attention. Because of the rising costs of college education and for gainful employment, college degree has become very important today. Nowadays, because of high educational costs, many students are going for educational loans. Many educators and scholars think that online education is an effective tool to combat the rising costs of college education by covering their operational cost of teaching over many students as compared to traditional form of teaching (Bowen, 2013; Bartley & Golek, 2004; Jung & Rha, 2000; Koller & ng, 2014; Tucker, 2007). The marginal cost of an online student is very negligible as compared to a student of the traditional classroom. As classroom learning is limited by factors like size and number of classrooms available.

With college education, there is another issue of earning college credit. Many educators hoped that credit transfers could happen in online education. The Coursera founders have worked with the American Council on Education to recommend credit transfer for some virtual courses (Koller & Ng, 2012). UGC as per its regulation of 2016, also recommended credit transfer facility our virtual university 'NPTEL'. Credit transfer option has increased completion rate, reduced the time of getting degrees, has also reduced the costs of higher learning and gave more access to virtual learners.

Online education provides world class education. Several websites and companies have come up like Khan academy, Udacity, Edx, Coursera etc.

High expectations are there for these massive open online courses (MOOCs) from respected scholars and educators. (Bowen, 2013; fisher, 2012; Koller & ng, 2012; Lewin, 2012; Selingo, 2013).

Several studies have been done which found positive outcomes to learning in the virtual or hybrid format as compared to the physical format. Some of the positive outcomes were, improved learning as measured by their test scores, more of student engagement, improved perceptions among students, helped to develop community feeling among them and reduced the number of students withdrawing or failing. A study was done by Riffell and Sibley (2005). Wherein, Jean-Luc an archaeologist wanted to complete a general science course to graduate. He had attended the traditional science course, but he had not performed well. So, he took up a hybrid environmental biology course which offered bi-weekly online assignments along with traditional learning. Jean-Luc noticed that the virtual assignments aided him in thinking and reflecting about what he had learnt, understand ideas well and helped him in participating actively in the traditional active-learning exercises. He found the online course more meaningful as compared to his physical classes. He got a profound knowledge of environmental biology and in the end, scored above average marks as compared his physical counterparts.

Rovai and Jordan (2004) compared the sense of community feeling among the students of the traditional format against that of the students of the blended format (hybrid format). In their study they found that the learners of the online setup have a stronger community feeling as compared to learners of the blended setup. Research was carried out to compare the learning outcomes of learners of the online format as against that of the learners of the face-to-face format for a macroeconomic course. When comparing the test scores, it was found that learners of the virtual format scored four points higher as compared to the learners of the face-to-face format. (Harmon and Lambrinos, 2006). Difficult experimental research was done by Bowen and Ithaka, 2012. In the study, learners were arbitrarily allocated to the face-to-face format which was the regulator group. A blended interactive learning virtual format which met weekly wherein students did most of the work virtually was the treatment group. The study found that the learning consequences for both the clusters were comparable and over time there was reduction in costs and more output gains from the blended path. Also, the researchers pointed out that learning improvements and cost saving gains would surge as new developments continuously happen in online education. As virtual education increased, there was more and more usage of the game method enhance task engagement and reduce erosion among the students (Deterding, Dixon, Khaled & Nacke, 2011; Huotari & Hamari,2012; Kapp, 2012.

2.2 Minus points of online education:

Many more studies were conducted which found no significant effectiveness in online education. One of the well-known studies done by Thomas Russel (1999) was to find out the effectiveness of online education and this work got 1900 citations. More than 350 studies were done on remote and virtual education and found no noteworthy variance was there between virtual setup and the traditional in person setup. Thomas Russel continued his studies on various formats of online education and compiled them into the website – https://www.nosignificantdifference.org. This site covers the latest research done and 70% of the studies found no significant difference between online education and traditional form of education. Russel's work even though extensive received a common criticism that most of the research had poor methods, lacked regulator groups, arbitrary assignments, no investigational controls were mentioned. Succeeding meta- analysis done by Bernard et.al (2004) and by Means et.al (2010) have used more strict choice of standards.

Bernard et.al (2004) found overall no important change in accomplishment, attitude and retention outcomes between virtual education and old-style education. These studies found that learning outcomes were better in the old-style educational setup.

Another study was done by Zhao et.al (2005) to analyse the efficiency of virtual instruction. This study included Russel's 1999 study and Zhao et.al used strict criteria to remove those studies that had weak methodologies. The study came out with exciting findings. Whenever, favourable findings would be arrived at regarding online education, they found the presence of the Hawthorne effect and they found that the hybrid or blended learning to be very effective. Which implied that when online learning and traditional format of learning was combined it was more effective than when learning was carried out in a single format only. The study further suggested, when online technologies and digital media improves, they would become more effective in student learning. Research printed after 1998 was in favour of online education. One can consider online education before 1998 to be first age group virtual courses and after 1998 to be second age group virtual courses. Second age group virtual courses have improved with better technology which has enhanced student learning. Can the massive open online courses be considered as third generation online courses because they are open access and have attracted large number of users?

So, overall, maximum studies found no noteworthy variance between online and offline format, and they also found that some groups of students favoured online education and some groups favoured face-to-face traditional format.

A few of the studies, found a negative effect of online education. In 2002, Brown and Liedholm conducted a study to compare student learning results in a microeconomic path. Students in the online format did very poorly in tests as compared to offline setup. Even if they got good grade results. It was noted especially seen in the case of complex questions and not so much in elementary questions. One of the reasons given was that half of the students in the online format spend below three hours a week for their course. Whereas traditional format students did not miss a single class and spend at least three hours a week on their studies. In another study also this difference in class engagement was noted, which resulted in different learning outcomes (Hiltz et.al, 2000). Brown and Liedholm (2002) found through their studies that girl learners did inferior as compared to their male counterparts in the old-style setup but in the online format there was not much difference in the performance of both genders. Other studies also done to compare student learning outcomes in both formats also found a gender wise difference in the old-style setup and the virtual setup (Figlio, Rush & Yin, 2010; Xu & Jaggers,2013). Xu and Jaggers (2013) took data of 40,000 students from Washington state and found that learning outcomes were negative in the virtual setup for mainly male learners, young learners, and low achievers.

The most mixed findings were found in a meta-analysis study done by Kelly Lack at Ithaka S&R (2013). The researcher found a mixed result in most of his studies. In some experiments, learners in the virtual or blended setup did well when compared to traditional format learners. In other studies, they performed worse than te old-style setup learners and, in some studies, there was no noteworthy variance among the two groups. Finally, the researcher concluded that the above-mentioned studies did not deliver enough proof to prove that virtual learning is more effective than or is less effective than the old-style in person setup. All these studies strongly prove that mixed outcomes have come about on the efficacy of virtual teaching and that student characteristics like gender, race and ability have affected the outcomes. Other factors too have affected learning outcomes of both formats like existence of learning communities, types of online learning activities, variety of materials available, types of assessments and the level of student activity engagements (Biltz,2013; Brown and Liedholm, 2004; Hiltz et.al, 2000; Tsai & Lin, 2000; Wang et.al, 2006).

Based on the studies shown on nosignificantdifference.org it has been observed that more than 90% of the virtual and remote tutoring studies show that virtual instruction is as effective as or better than old-style instruction. High quality meta studies of Means et.al (2010) was favourable towards online education and said there was a positive noteworthy variance between virtual and the old-style learning setups. Whereas studies of Lack (2013) pointed out that there is not enough indication to conclude if virtual or traditional education is better. Based on these findings, it is left to the researchers and educators to decide which of the two approaches to make.

Two approaches:

The first approach that researchers can take are 'more investigation is needed' tactic to determine the effects of virtual education. Researchers and teachers need to conduct more rigorous investigations to determine the efficacy of virtual education. Adequate literature must be collected especially those factors that influence virtual education. More research needs to be done to find out more about student online learning and how adaptive online software can enhance that learning.

The second approach that educators and researchers can adopt is to conclude that there is no noteworthy variance between virtual instruction and the old-style form of instruction. Moreover, scientists, educators and entrepreneurs should go through the huge volume of information got from MOOCS and analyse pupil learning by going through the quizzes and lessons. Then, they will come to know how students like to learn online and thereby design better online courses to improve student learning outcomes.

For teachers also, nowadays lot of support resources are available which will help them to smoothly changeover from old-style teaching setup to online teaching setup. A lot of practical learning resources are there which encourage dynamic education virtually with customized ready-made activities, precise instances which tell what to do, case studies that give details of actual teaching practices and tips for effective pedagogy.

Gamification increases engagement, drive and output in resolving difficulties and task engagement in a number of non-game backgrounds which includes learning (Deterding et.al, 2011; Hamari, Koivisto, Sarsa & Hamari,2014; Kapp,2012; Landers & Callen, 2011; Tsai, Tsai & Lin,2015). The inventers of the course should be experts on gamification, virtual learning and in learning sciences. Then only they can create courses that maximize student learning.

Online learning is not an educational fad which will go away after some time. Overall, evidence proves that at least virtual learning is as effective as the old-style setup of direct learning.

III HEI Students' responses on the Effectiveness of Online Teaching:

3.1 A basic descriptive research study was done on a group of Higher Education students. Sample size was 50 respondents and questionnaire were administered to them to gauge their primary responses. A hypothesis was formulated.

H0: Satisfaction level towards online education is independent of Gender.

H1: Satisfaction level towards online education is dependent on Gender.

Research analysis tool applied was Chi Square. Findings of this research study was the following: 54% are male students and 46% are female students. Out of this sample group 96% are pursuing PG courses, whereas only 4% of them are pursuing UG courses. Majority of the colleges had started online classes (84%) by the month of April 2020 itself and 62% of the students stated that classes are taken daily. This means academics was not much disrupted because of the pandemic. The good news is that 84% of the Indian students are internet savvy and only 16% of them are not. But 94% of the students were using phones to attend the classes and only a few students were using laptops and tablets. Regarding the problems they faced in attending online classes, 76% students stated network issues, 8% of them are connectivity issues and the rest stated power breakdowns and devices not working to be the other issues. This points out to the backwardness in the development of digital infrastructure in India. Only 28% of the students were satisfied with online classes and 16% and 32% were dissatisfied and very dissatisfied with the online classes respectively. Only 26% of the students said that teachers had adapted well to teaching. 38% felt teachers have not adapted well and 36% were not sure about this.

So, even though Indians teachers took up the challenge of teaching online during the pandemic, they need to improve their online teaching skills. 78% of students do not prefer online teaching to classroom teaching and have stated many problems. The prominent problems stated are network problems, not being able to focus as on offline classes and that it is difficult to teach practical subjects in online mode. The popular app used by teachers to teach is the Zoom app (64%), 20% used Cisco WebEx and only 14% used Google Meet. Many suggestions were put forth to improve classes. Like improving network issues, connectivity problems, using proper timetable, fixing the class time limit to one hour as they find it difficult to concentrate.

3.2 Current Improvements in Indian Digital Infrastructure:

The pandemic caused severe disruptions throughout the world. But, on the technology front India's digital infrastructure has greatly improved. This was a classic case of India finding an opportunity in adversity. India seized the opportunity during the pandemic to fast-forward its digital infrastructural developments. India has combined traditional techniques with new technologies and innovative thinking to accelerate its digital transformation. Today, digital transformations are driving India's economic growth. Digital infrastructures have been improving since 2019. 'Digital India' was announced to make India more digitally empowered. So, during the pandemic India was ready to go virtual and its digital transformation greatly accelerated thereafter. Half a billion people are using the internet and accessing services which were not available earlier. Connectivity has increased and India has become a growing market for digital customers. Online shopping and remote working and online learning have become commonplace.

There has been an increase in the usage of language apps, virtual tutoring, online learning software and blended learning models. Hybrid learning has greatly increased post-pandemic and is found favourable by college students and teachers alike. Many educators think that this sudden rush towards 'online learning' will not sustain. Because of reasons like inadequate training of teachers, insufficiency in bandwidth and because of connectivity issues. But some educators do believe that the hybrid model of learning will sustain with significant benefits. Rapid developments in information technology will quicken this process of online learning and make it part of school and college education. It is believed that a student under the hybrid model of learning can learn at his own

pace from home, prepare and submit his assignments online and can also work on projects. Online learning can be more effective with students deciding when and how to undertake research trips. If it's part of their curriculum. Students can be called to the classrooms for clarifying doubts, for group discussions, for individual discussions and assessments too. If students have the right access to communication technology, then online learning can become more effective. As, students can enjoy the benefits of both offline and online learning. This hybrid form of learning will also force teachers to come out of their comfort zones and upskill themselves. This was greatly noticed amongst the teachers during the lockdown period- how teachers adopted various online tools and software's to conduct their classes. There are many easy-to-use apps and tools like Zoom, mind-mapping, popplet etc which can save time of teachers and bring demonstrative-learning to the classrooms.

Research has shown that on an average students retain about 25-60% of knowledge when learning online. Comparatively, students retain only 8-10% when learning in classrooms. This is because students learn faster through e-learning because they need 40-60% less time to learn concepts as compared to the traditional classroom learning.

In India laptops, cell phones and other consumer electronic items are being manufactured in Gujarat. As, an MOU has been signed between Foxconn, Vedanta, and Gujarat with an investment of 1.54 crore in Gujarat to manufacture semiconductors n display manufacturing facilities. This will provide 10,000 jobs for Indians. OEMs are being encouraged by the Indian government. Prices will fall drastically for consumer electronics. Laptops which usually cost a lakh will be available for Rs. 40,000. For the first time, Tata Group is in talks with Apple supplier Wistron to set up a joint venture to manufacture electronics items to manufacture iPhones in India. Also, Vedanta plans to set up a hub to manufacture iPhones in India.

IV Conclusion:

4.1 The future of Hybrid model of education:

The hybrid model of learning and training will boost the confidence of learners. Will make them more self-disciplined and self-dependent which will greatly help them in their professional development also. The hybrid model will result in greater flexibility and bring about more effective teaching. Which in turn will result in effective learning. The hybrid model of learning will address each individual student's needs and problems. Students can either attend live sessions in the classroom or access them remotely. AI or Artificial Intelligence will greatly aid the teachers in planning their classes, do effective student profiling, keep accurate records, predict learning outcomes, design courses, and come up with remedial measures for their students. This will result in regular assessments, student evaluations and result in more of experiential learning among students.

In the New Education Policy of the Government (NEP 2020) also, technology would be greatly adopted to make education flexible and to help teachers to teach and assess in a more creative way through the hybrid model of teaching. Virtual classes, flexible assessments, freedom of choice in subjects will the future of education in India. The new normal in education is going to be the Hybrid model of education.

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