"The Role Of Social Media Platforms In Facilitating Personalized Learning Experiences Of E-Learners & Sustainability Of E-Education Industry And Hybrid Learning."

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ABSTRACT

Majority of schools and colleges of India were closed from October 15, 2020 after complete lockdown imposed in March, 2020 creating a huge vacuum in education sector of India.

To make classes functioning e-educational industry have to synchronise with digital demand which resulted in an unwitnessed surge of internet based education i.e. "sellers' market" in e-educational industry.

The Ed- tech industry in India witnessed a pump of approximately one billion USD by investors in 2020. E-learning industry across the globe accomplished investment of `USD 253.0 billion in the year 2021 and same is predicted to increase by almost USD 70 billion in the next following years. Before initial stages of pandemic people were digitally deprived which pushed students to opt for the digital mediums. This sudden shift because of the Covid-19, has boosted the online experience of education.

The EdTech sector had seen a humongous inward cash flow of investments in the year 2020. The two top torch bearers of Indian E-education providers; Byju's and Unacademy which are based on the "Freemium model" and have received massive inflows of fund in pandemic time. India's own and the highest valued BYJU'S with `5.5 million annual paid subscribers, have able to receive approximately 1 billion USD worth of funding in the pandemic year. Byju's had also bought White Hat J for USD 300 million in August- 2020.The growth of Unacademy during this year was nearly nine fold.

The prime motivating tools for the education industry during the 2020-2021 has been the state of the art technologies like Machine learning and artificial intelligence that made E-learning more adoptive, stretchable, and responsive. This digital mode of education had enabled students to understand their courses better.

Zoom, MS Teams were the preferred application while Face book and YouTube were the most preferred social media platforms for the learning.

Thus, the Covid- 19 was a real time experiment that has shown the pathway to educational institutions to adopt innovative technologies to deliver content and impart education. Though, there was a digital divide during the Covid-19, still, blended learning model, the conventional class room education, digital learning or mix will be the sustainability model for the EdTech companies in the future. The pandemic has already transformed the world and society and these positive effects can be witnessed on the education sector which are testimonials of its embracement to different modes of online learning.

Keywords: Pandemic, EdTech startup, Sustainability. Digital learning, Hybrid learning.

1.0 Introduction

E-learning (electronic learning) has become a successful tool to remove many obstacles in learning stream for example barriers in geographical, socio-economic, physical and financial. Because of e-learning students living in remote places can engage in self- paced learning by saving time and effort.Learning platforms helps students to reduce the effort and travel expenses, other expenses that accompany traditional learning.

It is worth to mention that conventional or traditional educational institution opted first the various mode of E-learning, including hybrids or a mixture of blended learnings.

Synchronous and asynchronous are two mode of learning. Real time broadcast and interactions are possible in synchronous mode,

In an in asynchronous mode, the students may listen or go through the recorded videos and finish their online activities at their convenient time and place.
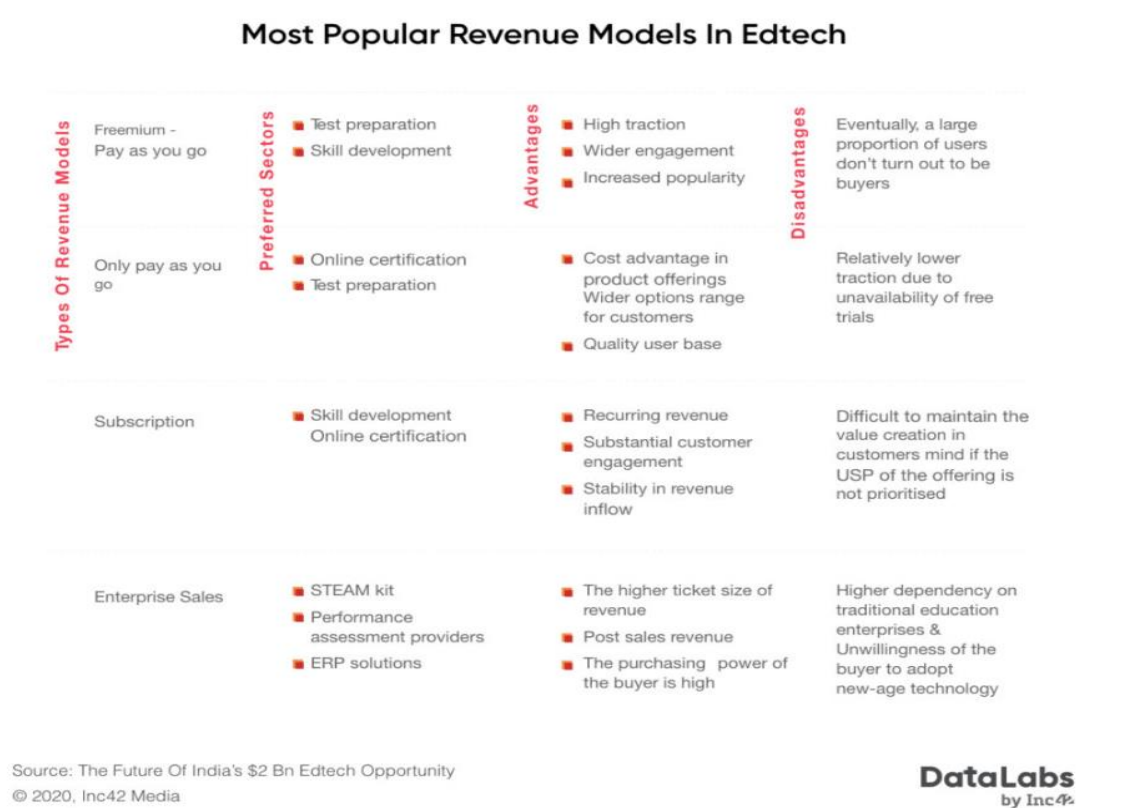
1.1 Literature Review

The report published by KPMG and Google in 2017 finds that Indian students experienced "convenience, flexibility with commencement dates and variety of study material" which the key motivational factors for the E-Education. The online education has also resulted in reduction of age of the learning. (KPMG in India & Google, 2017)

1.1.1 E-Education Industry

Indian E-Learning market is the second largest market in the globe. This market got paced under the digital policies by the Indian Government. With the substantial increase in internet population, digital penetration and awareness about E-education industry, this sector has grown manifold and able to cover the large chunk of Indian population in its umbrella. Indian E-Learning market had valuation of Rs. 280.13 billion in 2021 and is likely to touch CAGR of approximately 30 % during 2021-2026. This progress of E-learning industry has been impacted by ease of learning, variety of courses, elasticity and availability of numerous courses. For better experience of this online learning this sector is imbibing state of the art advance it tools like Big data Analytics, artificial intelligence and other applications.

1.1.2 EdTech Company

The EdTech sector had seen a humongous inward cash flow of investments in the year 2020. The two top torch bearers of Indian E-education providers; Byju's and Unacademy which are based on the "Freemium model" and have received massive inflows of fund in pandemic time(Fig 1,4 & 5). India's own and the highest valued BYJU'S with `5.5 million annual paid subscribers, have able to receive approximately 1 billion USD worth of funding in the pandemic year. Byju's had also bought White Hat J for USD 300 million in August- 2020.The growth of Unacademy during this year was nearly nine fold.

Fig.-1: Revenue Models in EdTech

2.0 Objectives

The main aim of present paper to evaluate Sustainability of E-Education Industry & Hybrid Learning by reviewing the literature and compiling the collected secondary data with an aim to:
1. Explore the adequacy of the existing infrastructure and the implemented online
   Platform along with digital divide.

2. To evaluate, the various platforms adopted during pandemic due to corona virus.
3. Sustainability of E-Education Industry & Hybrid Learning

2.1 Effect of Covid-19 Pandemic on E-Education Industry

As per an UNESCO report ~ 1.6 billion learners had experienced difficulties in their conventional method of education due to pandemic after March-2020.

Almost all schools and colleges of our country were closed after various guidelines by the Indian government from October 15, 2020 after complete lockdown imposed in March, 2020. This created a huge vacuum in education sector of India and to make classes functioning e-educational industry have to synchronise with digital demand which resulted in an unwitnessed surge of internet based education, thus resulted in a "sellers' market" in e-educational industry.

The Ed- tech industry in India witnessed a pump of approximately one billion USD by investors in 2020. E-learning industry across the globe accomplished investment of `USD 253.0 billion in the year 2021 and same is predicted to increase by almost USD 70 billion in the next following years. Before pandemic and initial stages people were digitally deprived which pushed students to opt for the digital mediums and lessons in lockdowns. This sudden shift because of the Covid-19 has boosted the digital experience of learning.

3.0 Effect of Pandemic on E-Education Industry

3.1 E-learning & its Benefits

E-learning (electronic learning) has become a successful tool to eradicate many obstacles in learning stream for example barriers in geographical, socio-economic, physical and financial. Because of e-learning students can engage in self- paced learning by saving time and effort for living in distant places.E- Learning platforms helps students to reduce the efforts and travelling expenses along with other expenses that accompany traditional or conventional learnings modes.

According to Niharika and Arti Vaish (2021), E-Education is Cost-Effective, Self-paced, Flexibility, No age limits, Lectures can be taken multiple times, large target audience, Better Retention & Eco-Friendly.

The SWOT analysis for E-Education industry (Fig-2) is given below:
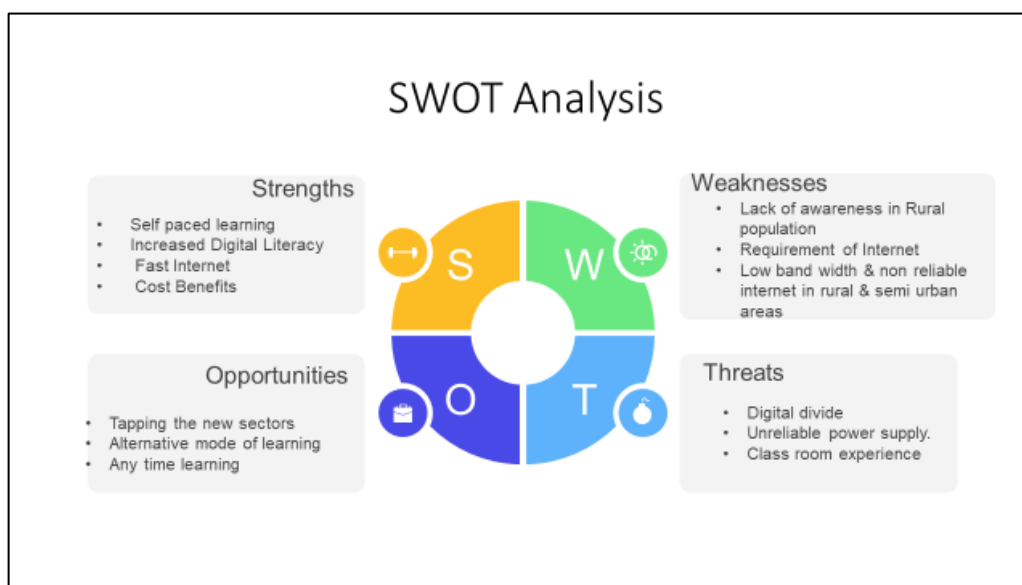
Fig.-2: SWOT Analysis

3.3 Synchronous & asynchronous learning

Synchronous and asynchronous are two mode of learning. Real time broadcast and interactions are possible in synchronous mode,

In an in asynchronous mode, the students may listen or go through the recorded videos and finish their online activities at their convenient time and place and this make E-learning as useful tool to navigate the problem of education by traditional methods.

3.4 E-Education Industry

Indian E-Learning market is the second largest market in the globe. This market got paced under the digital policies by the Indian Government. With the substantial increase in internet population, digital penetration and awareness about E-education industry, this sector has grown manifold and able to cover the large chunk of Indian population in its umbrella.

The value of this online market is expected to touch the 360.3 billion Indian rupees by 2024. This progress of E-learning industry has been impacted by ease of learning, variety of courses, elasticity and availability of numerous courses. For better experience of this online learning this sector is imbibing state of the art advance it tools like Big data Analytics, artificial intelligence   and other applications.

3.5 Segmentation of E-Education Industry
The Indian E-Education Industry may be categorized into: Pre-School, K-12, Higher Education, & Others. Others include Test preparation and skill certification courses.

3.6 Effects of Covid-19 Pandemic on E-Education Industry
As per an UNESCO report ~ 1.6 billion learners had experienced difficulties in their conventional method of education due to pandemic after March-2020.
Almost all schools and colleges of our country were closed after various guidelines by the Indian government from October 15, 2020 after complete lockdown imposed in March, 2020. This created a huge vacuum in education sector of India. To make classes functioning e-educational industry have to synchronise with digital demand which resulted in an unwitnessed surge of internet based education, thus resulted in a "sellers' market" in e-educational industry(Marko Teräs,2021).
The EdTech industry in India witnessed a pump of approximately one billion USD by investors in 2020. E-learning industry across the globe accomplished investment of `USD 253.0 billion in the year 2021 and same is predicted to increase by almost USD 70 billion in the next following years. Before pandemic and initial stages people were digitally deprived which pushed students to opt for the digital mediums and lessons in lockdowns. This sudden shift because of the Covid-19 has boosted the virtual/digital experience of education (Fig-3).
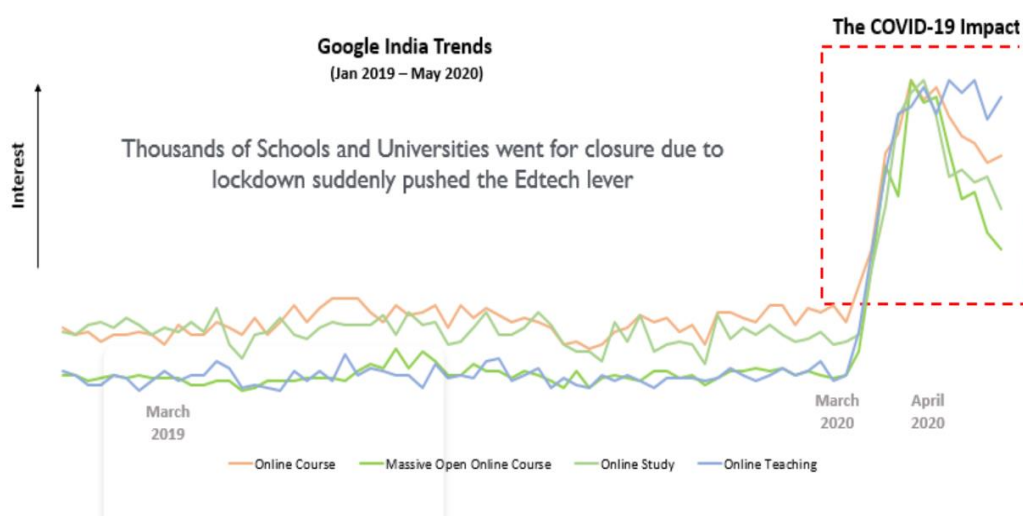Which is also evident by the report published by the NASSCOM insights.

Fig.-3: Trends pre and post pandemic.

**3.7 Instruments of E-Education Industry during Pandemic**
Indian online market was the second largest with close to 636 million users of internet in 2019. The total internet penetration rate was approximately fifty percent (50 %) that suggest 50 percent of Indian population has access of the Internet in 2020, it has almost 700 million of the users and it is predicted that it would reach approximately 974 millions of users by 2025. This rise in internet penetration has given accessibility to digital courses especially to young lot who are in the age group of 15 to 40 years. They are the active and smart users having the access of smart phones. They can take up any online learning programs with their self-paced learning. Courses in online mode also offers variety of choices in courses, degrees, and certifications.

**3.8 Rise of EdTech Companies/E-learning platforms in India**
E-learning platforms have witnessed enormous growth during COVID 19 period and during the lockdown period, educational apps/sites have witnessed an increase of 30 percent more time stay. The EdTech companies were producing more jobs and employing new people. The Indian EdTech platforms that have observed substantial jump in growth during pandemic (Fig-4 &5).
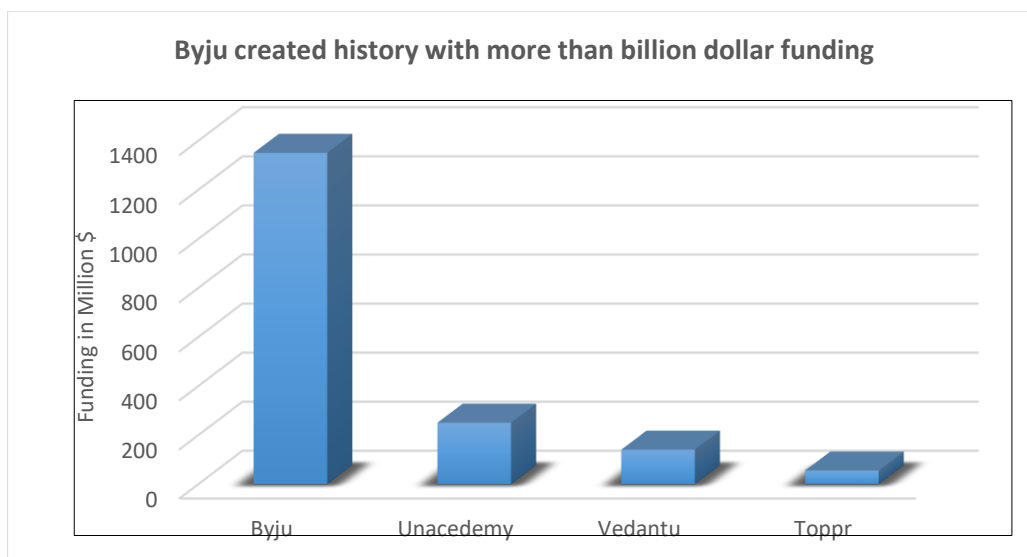
Fig.-4: Funding during pandemic
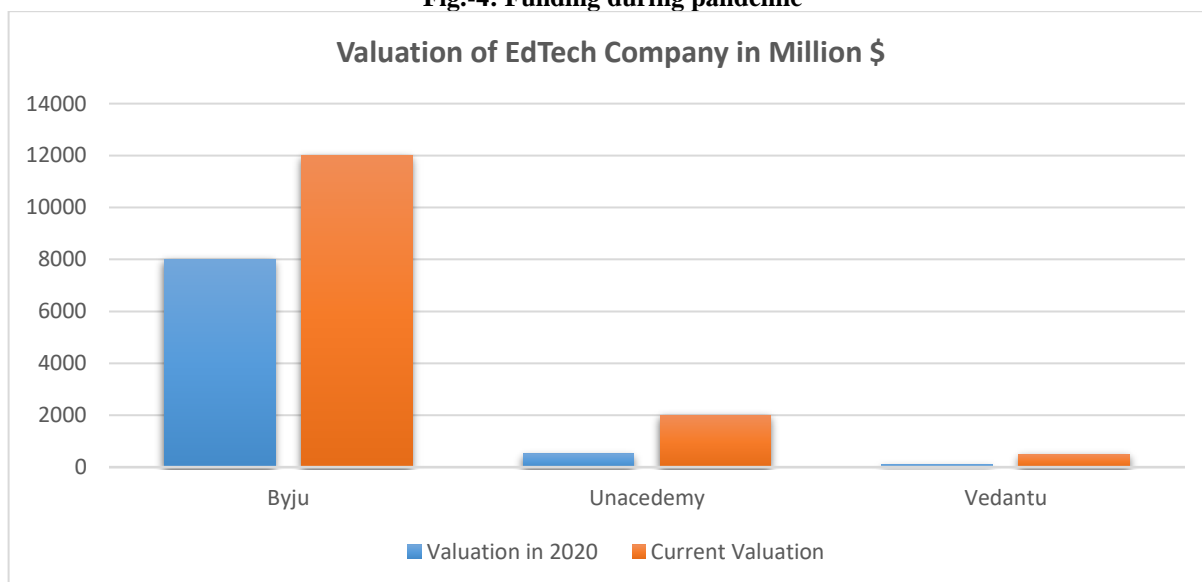
Fig.-5: Valuation of EdTech
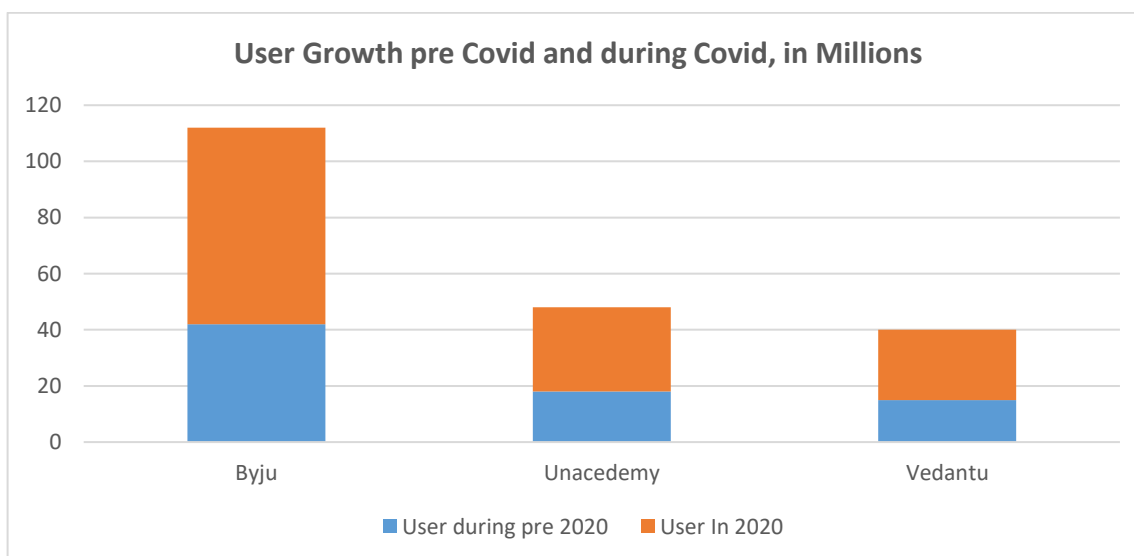
Fig.-6: User growth pre and post pandemic

1. BYJU's

Provides content of educational nature for class 1st to 12th and competitive exams. It is founded by Byju Raveendran in the year 2011 . Byju has offered free acces to its educational content during the pandemic. A report published on Business Standard pointed that during pandemic EdTech company Byju become a decacorn and surpassed valuation of $10.5 billion after it has raised fresh funding of approx. $100 million from Mary Meeker's Bond capital who is a Silicon valley investor . Byju's has also narrowed down the gap to crown as the most valuable start up after the Paytm which was vaued at around $ 16 billion.

2. Vedantu

Vamsi Krishna, Pulkit Jain, Anand Prakash, and Saurabh Saxena in founded Vedantu in 2011.it has witnessed 6.5 times increase of new learners on its platfor during the lockdown period. Vedantu revenue was also increased 80 percent in May-2020 over the past months.

3. Unacademy

Gaurav Munjal, Roman Saini, and Hemesh Singh founded the Unacedemy in 2015. Its revenue is increased by 82 percent 2020 and it is almost 10 fold of its revenue during the same period in last year. It has become one of the biggest learning platform with 60000 registered teachers/educators and over 62 million learners from its origin which was as a You tube channel.

3.9 Effective online teaching applications/ tools worldwide during Pandemic

Online education where adopted to make teaching and learning mode possible in any situation. There are many internet based video conference mode and platforms present to assist in education field In spite of presence of different virtual platforms/modes having diversified features but with their inherent advantage and disadvantages.

A study in 2021 by Cavus, N., & Sekyere–Asiedu, D, carried out a comparative research studies to compare features, maximum participants in an online meeting recording duration, trial version, chat screen sharing, archive meeting and account creation to use mobility of seven internet based video conferencing platforms like Google Meett, Microsoft Teams , Go to meeting, Zoom Meetings, Cisco WebEx Meetings, Big Blue Button and Click Meetings.

The study has depicted that Google Meet and Zoom have offered the longest free usage to these virtual modes than others video conferencing modes by a simple account on any of these platforms. While, Microsoft Teams according to their findings provides plenty of times for meetings and therefore, would be best, for government, tertiary or institutions of developing countries who wants to utilize these free online space and theses have also provided lesson in tertiary level that usually have duration of 60 minutes or more. Secondly Cisco WebEx meetings has provided smallest duration of days for trail versions..

The study by Mohammad Ali et al (2021); had compared the applications like Google Meet, MS Teams, Zoom, Cisco Webex Meetings that helped online teaching in college and universities of India concluded that Zoom and MS Teams were the most efficient tools of online teaching mode owing to their simple user interface for use , best audio and video features for learning and official meetings.

Christos Papadimitriou (2022) in their paper found that students and academics use numerous different social media platforms. The most used social media is You Tube and second –highest used site was Facebook. The other social media platforms used by students were not referred by academics such as Twitter and WhatsApp. Study also concluded positive effect of social media on higher education. Social media has enhanced the teaching, learning with interactions in higher education, supporting and motivating the learners and developing students and developing community connections. The authors recommended that faculties of university should incorporate social media into their learning and teaching process.

4.0 Indian E-Education Industry after Pandemic

EdTech platforms, particularly which are in the K-12 field have the formidable challenge of discouraging students from the classrooms ,playgrounds and keeping their continuous interest in online learning .According to report published by various media groups (Fig-7) ,Byju had laid off approximately 1 percent (approximately five hundred) of its 50k strong work force. This reduction was a strategy to improve business efficiencies of Byju's and its group of companies.

Byju is restricting its business as peoples from core Byju's team have moved to other rival groups like Toppr and Aakash institutes.

Companies are taking cost efficient measures to maximize profits as hiring was done blindly (Fortune India,2022).

According to report published by BUSINESS STANDARD, EdTech platform, Unacademy in 2022 has asked to 2.6 percent of its workforce to leave as to implement Performance Improvement Programme (PIP)

Vedantu let go of more than 600 employees in the month of May 2022. In February 2022, LIDO, shut down and around 1200 employees were laid off which offering the online program earlier.

Investments to Indian EdTech is lowest in the year 2023 and was down to 80 %, what it used to be 2020-21(Fig-8).It is predicated that sustainability of these EdTech companies funding will depend upon hybrid mode of education(report by Inc42.com)
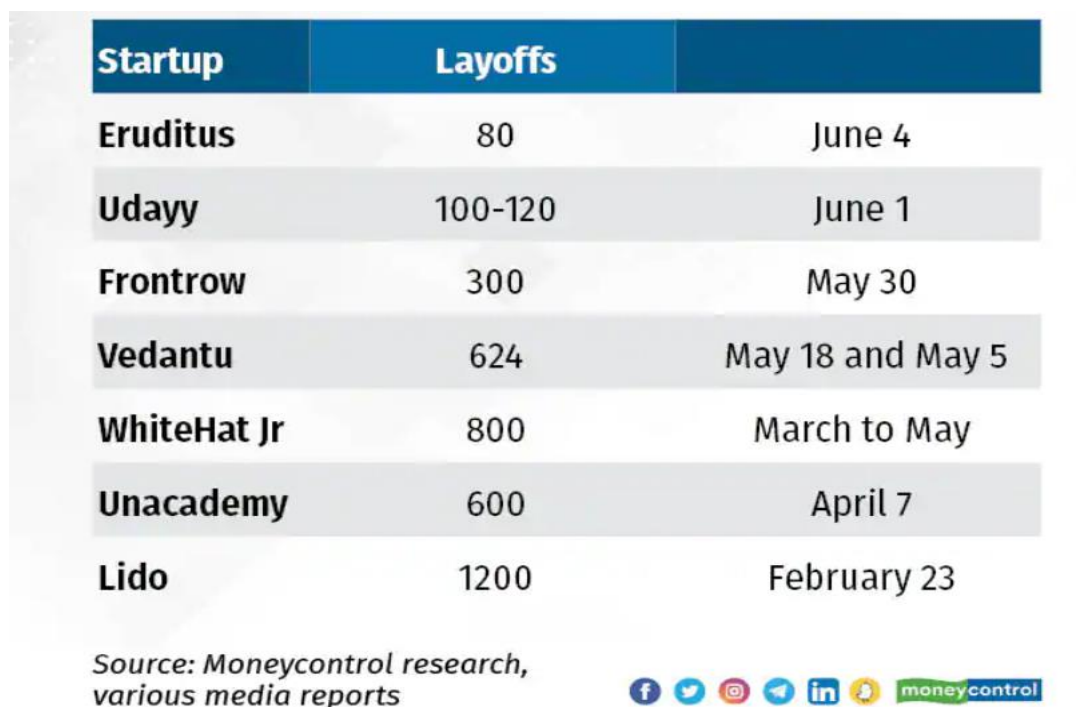
Startup	Layoffs	
Eruditus	80	June 4
Udayy	100-120	June 1
Frontrow	300	May 30
Vedantu	624	May 18 and May 5
WhiteHat Jr	800	March to May
Unacademy	600	April 7
Lido	1200	February 23

Source: Moneycontrol research,
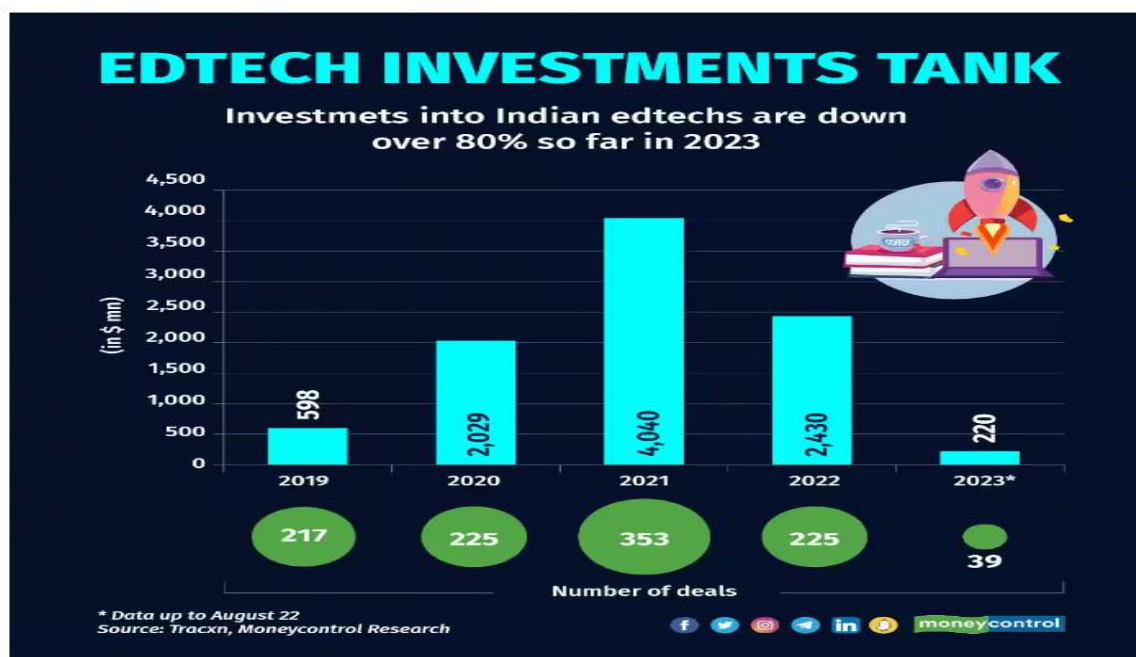various media reports

Fig.-7: Layoffs in EdTech

Fig.-8: EdTech Investment over the years

Udayy's is going to shut its operations and will return the remaining capital of approximately dollar 8.5 million to its investors. The K-12 space (kindergarten to class 12) in which a startup company Udayy is operating, is facing school reopening challenges , this forces its founders to shut down the company"s operations according to an article which was published in Money Control, 2022.
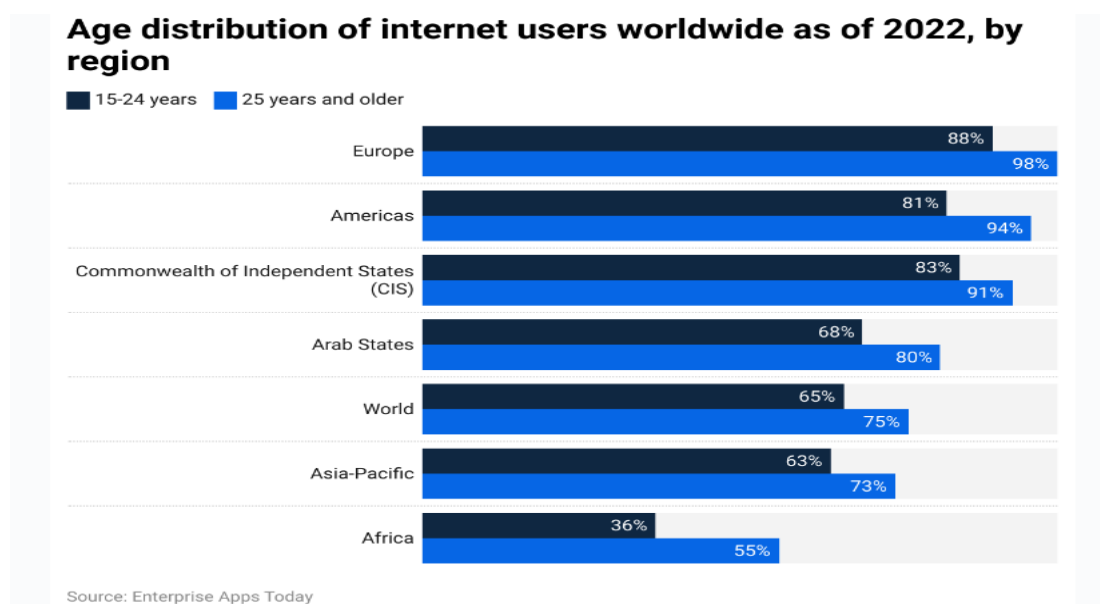
4.1 Hybrid or Blended Learning
As we enter in post-Covid-19 era, there is a need to consider blended learning (BL) a way forward and as a new normal considering the observations made earlier and the facts discussed below:

4.2 Reach of Digital Technology
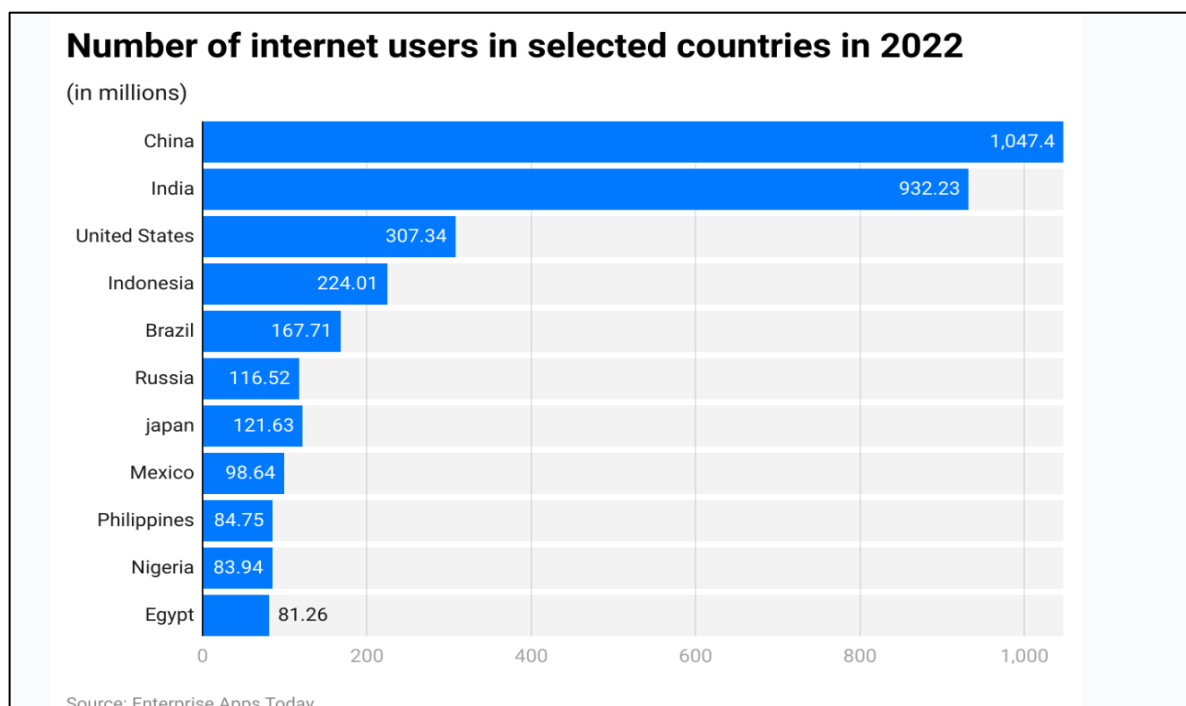
**Fig.-9: Data of Internet users in selected countries**

Fig.-10: Age distribution of internet users in 2022

According to a statistic published by enterpriseappstoday, it can be deduce that though number of internet users have increased in India, it remains insufficient, considering the overall population of the country (Fig-9).Data also points that only 63% of internet users are of 15 to 24 years in the Asia-Pacific region ((Fig-10).Considering the above published data, it can be suggested that there still exits a gap in digital reach to full fill the aim of online education.

4.2 Unsustained Growth of EdTech Companies

Six Indian EdTech posted a cumulative loss of INR 7,521.70 Cr ($916.93 Mn) in FY22 against the earned revenue of INR 3,846.57 Cr ($468.91 Mn) (Source, inc42.com) this resulted in to huge layoffs by the EdTech companies at the beginning of FY23 (April 2022). This unstained growth of revenue during the years after the Covid-19 and layoffs corroborates need of hybrid learning.
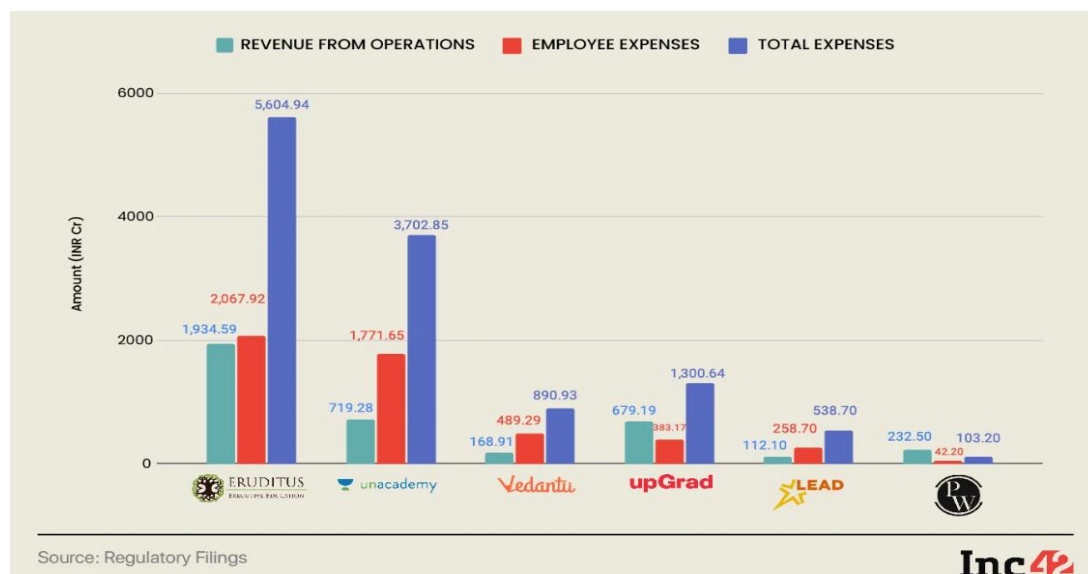
Fig.-11: EdTech's revenue from operations.

According to Eldho Mathews, a deputy advisor with the unit for International cooperation at the National institute of Educational Planning and Administration (NIEPA), a research focused universities in New Delhi, told that "EdTech industry will grow as a support mechanism but it cannot be a replacement for classrooms.

Byju, sensing the importance of offline learning in India, a market where with a large portion of population is still very much receptive to the idea of classroom education, EdTech players are becoming hybrid. Byju's for instance has launched brick and mortar tuition centres. These physical centres are technology enabled and offer a hybrid or blended learning format to students of class 4 to 10. "There are two separate cohorts of parents, one which totally believes in online learning and another which seeks some sort of a physical intervention (Fortune India). It has also acquired Akash educational services in 2021.

Since February-2022, the company has opened 100 Byju's Tuition Centres nationwide that combine both in-classroom learning and online tuition

Byju's has started offline centres with an investment of $200 million , in February-2022, announced that it was opening offline tuition centres with an investment of $200 million. The company also expects to enrol one million students into the offline programme by 2024. Unacademy has also followed suit and opened offline tuition centres in May-2022 . Unacademy had introduced an 'experience center' in March-2022 before a full-fledged entry into the offline segment.

Unacademy had acquired Chandigarh-based PrepLadder, a leading post-graduate medical entrance exam preparation platform, for $50 million. PrepLadder prepares students for medical examinations and provides access to education services and preparation material for exams such as NEET PG, AIIMS PG, NEET SS, and FMGE.

CEO & Co-Founder of Vedantu Innovations deliberated during Emeritus India Summit that that their hybrid learning model has shown a "huge spike in in-class attendance and engagement rate." He explains that in their long-term online courses with one to two-year durations, the attendance rate starts at around 85% but would gradually decrease over the year, resulting in only 60-65% attendance by the year-end. However, in their hybrid courses, attendance starts at 88%, and the cohort reduction only goes up to 82%.

A research by Amreen Bashir (2021) demonstrates that preparing content for online teaching was more time consuming than teaching face to face. Furthermore, attention must be paid to the technological burden of maintaining devices and equipment, and ensuring the appropriate online tools and platforms are available to facilitate student interaction and engagement (Dhawan, 2020).

The pandemic has prepared students to work remotely, which is a crucial aspect of delivering a successful hybrid model and reflects the global adaptations made by many organisations to adapt to evolving laws, restrictions and guidance
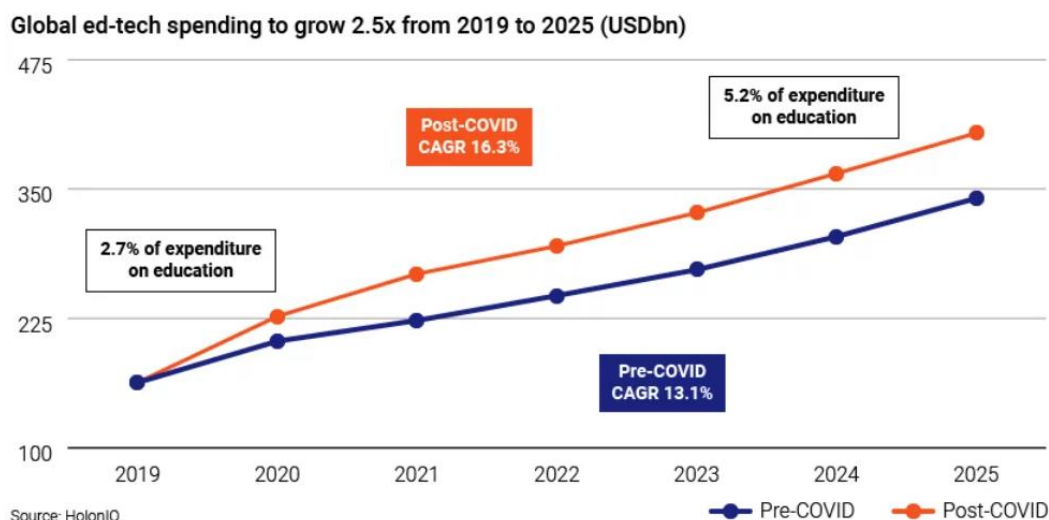
Fig.-12: Global spending by EdTech

Another study by Grand View Research (GVR) suggests a shift in the education sector from exam-oriented learning (the conventional method) to an interactive and personalised learning approach in recent years. Digitalisation has had a positive impact, with new and creative techniques being invented to deliver education, skills and knowledge and spending by global EdTech company will continue to grow (Fig-12). Digital education is expected to benefit a substantial number of individuals across geographies, age groups and socioeconomic status

UNESCO mentioned in one of his report in 2021 that human interaction and well-being must be given priority in the post-pandemic.

A report by Columbia University in 2021 pointed that blended mode of learning holds a huge potential for the future of the Education sector. Especially in the post-pandemic phase when access to learning for all students is so crucial. This mode of learning has been a popular approach across the global educational community due to the various opportunities it offers. It allows a mix of teaching approaches making it suitable for different kinds of learners in the classroom.

The University Grants Commission in 2021 introduced a blended model of teaching and learning in universities and colleges, where up to 40 percent of any course can be taught in online mode and the rest of the 60 percent can be taught in the classroom.

One of the most important outcome of the National Education Policy 2020(NEP 2020) is recognition of the hybrid learning.

Modern Artificial Intelligence based learning like Chat GPT, Augmented Reality (AR) etc. will continue to provide the momentum to the online learning but these will not be a replacement to traditional need of writing, understating of the concepts or replacement of teacher in true sense.

5.0 Conclusions

The pandemic transformed the institutions to adapt innovative solutions to provide content and delivery of knowledge. However, future of online learning will be blended learning, the traditional full-time classroom learning, digital learning or mix. The positive effects seen from the pandemic on the education sector are indicator of its embracement and EdTech Company will depend and thrive parallel on this mix of traditional full-time classroom learning and digital learning. Sustainability of any EdTech company will depend on this optimum need blend of this hybrid or flexible learning in coming future.

6.0 References

1. Aditya, K.S., Jha, G.K., 2020. Students' Perception and Preference for Online Education in India During COVID-19 Pandemic.
2. Anab, M., 2020. Covid-19 Paves Way for e-learning, but Deepens Digital Divide Among Students. August 24. The Times of India.
3. Bashir A, Bashir S, Rana K, Lambert P and Vernallis A (2021) Post-COVID-19 Adaptations; the Shifts Towards Online Learning, Hybrid Course Delivery and the Implications for Biosciences Courses in the Higher Education Setting.Front. Educ. 6:711619. doi: 10.3389/feduc.2021.711619.

4. Bettinger, E., Fox, L., Loeb, S., Taylor, E., 2015. Changing distributions: how onlinecollege classes alter student and professor performance. Am. Econ. Rev.
5. Bhat, S. (2020, March 12). *Top 5 Reasons Why Online Learning Is Better Than Face-To-Face Learning* . ELearning Industry.
6. https://elearningindustry.com/reasons-why-online-learning-face-to-face-learning
7. Bower, B.L., 2001. Distance education: facing the faculty challenge. Online J. Dis.Learning Adminis. 4 (2).
8. Business Standard." EdTech platform Unacademy lays off 2.6% employees due to poor performance". (August 13,2022).
9. https://www.business-standard.com/article/companies/EdTech-platform-unacademy-lays-off-2-6-employees-due-to-poor-performance-1220618004
10. Cavanaugh, C., Gillan, K.J., Kromrey, J., Hess, M., Blomeyer, R., 2004. The Effects of Distance Education on K-12 Student Outcomes: a Meta-analysis. Learning Point
11. Associates/North Central Regional Educational Laboratory (NCREL).
12. Cavus, N., & Sekyere–Asiedu, D., & (2021). A comparison of online video conference platforms: Their contributions to education during COVID-19 pandemic. *World Journal on Educational Technology: Current Issues*.13 (4), 1170-1181 https://doi.org/10.18844/wjet.v13i4.6329
13. Chavan Shruti ,"Global Education Technology Market Segmented By Sector By End-user By Type & By Region - Forecast And Analysis 2022" . (April 02, 2022) https://bit.ly/3Jjj5a5
14. Conceiç̃ao, S.C., 2006. Faculty lived experiences in the online environment. Adult Educ. Q. 57 (1), 26–45.
15. Dhawan, S., 2020. Online learning: a panacea in the time of COVID-19 crisis. J. Educ.Technol. Syst. 49 (1), 5–22.
16. Emeritus.org. "Is Hybrid Learning the Future of Education? Top Insights from Leaders". (April, 2023)
17. https://emeritus.org/blog/online-learning-hybrid-learning-is-the-future/
18. Enterpriseappstoday. "Internet Statistics By Region, Time, Usage, Speed, Community, Age, Education, Language and Websites".
19. https://www.enterpriseappstoday.com/stats/internet-statistics.html
20. Ewelina Zarzycka, Joanna Krasodomska, Anna Mazurczak-Mąka & Monika Turek-Radwan | (2021) Distance learning during the COVID-19 pandemic: students' communication and collaboration and the role of social media, Cogent Arts & Humanities, 8:1, 1953228, DOI: 10.1080/23311983.2021.1953228
21. El Mansour, B., Mupinga, D.M., 2007. Students' positive and negative experiences in hybrid and online classes. Coll. Stud. J. 41 (1), 242.
22. **Fortune India."Business News, Strategy, Finance and Corporate Insight".** (**Aug 2, 2022**) https://www.fortuneindia.com/enterprise/what-ails-byjus/109161
23. Hartman, J., Dziuban, C., Moskal, P., 2000. Faculty satisfaction in ALNs: a dependent or independent variable. J. Asynchronous Learning Net. 4 (3), 155–179.
24. Hrastinski, S., 2008. Asynchronous and synchronous E-Learning (EDUCAUSE quarterly).Educause. Edu. Educause Q. 31 (4).
25. HRD, 2020. HRD Ministry Launches "Pragyata" With Digital Education Guidelines,Screen-time and Mental Health Tips for Children. July 14. India Today. https://mh rd.gov.in/school-education.
26. Inc.42.com, 2023." 9 EdTech Predictions for 2024".
27. https://inc42.com/features/9-EdTech-predictions-for-2024/
28. Inc.42.com."India's Top 13 EdTech Startups Spent $675 Mn on Employee Benefits in FY22".
29. https://inc42.com/features/indias-top-13-EdTech-startups-spent-675-mn-on-employee-benefits-in-fy22
30. James, G., 2002. Advantages and Disadvantages of Online Learning. Retrieved July, 1,2006.
31. Joshi, P., 2022. *Impact And Development Of Online Education (E-Learning) In India*. [online] Available at: <https://cibg.org.au/>
32. Kim, K.J., Bonk, C.J., 2006. The future of online teaching and learning in higher education. Educause Q. 29 (4), 22–30.
33. Kuikka, M., Kitolab, M., Laaksob, M.J., 2014. Challenges when introducing electronic exam. Res. Learn. Technol. Vol. 22
34. Kumar, D., 2010. Pros and Cons of Online Education. Manuscript. North Carolina State University, Raleigh, NC, USA.
35. Lashgari, K., Talkhabi, A., Nazarpour, M., 2011. Comparison between online classes and traditional classes. Nature Sci. 9 (6), 18–23.
36. Mishra, L., Gupta, T., Shree, A., 2020. Online teaching-learning in higher education during lockdown period of COVID-19 pandemic. Int. J. Educ. Res. Open 1, 100012.
37. Mohammad Ali, Khan Mohammed Zaid, . Sudhir A. Shegunshi; 2021. Effective Online Teaching Tools and Comparison (MS Teams, Cisco WebEx Meetings, Zoom & Google Meet), IIJC, Vol 11,Issue no. 08
38. Money Control. " Layoffs, restructuring, slowdown: India's EdTech firms are struggling post-pandemic".(June 06,2022)

39. https://www.moneycontrol.com/news/business/startup/layoffs-restructuring-slowdown-indias-EdTech-firms-are-struggling-post-pandemic-8646451

40. Online Education in India : 2021 " A study by KPMG in India and Google" . (31 May,2017)

41. https://home.kpmg/in/en/home/insights/2017/05/internet-online-education-india.html

42. Vaish, Arti. (2021). A Study Of E-Learning Market In India And Impact Of Covid-19 On Education Sector. Psychology, Society, & Education. (2021), ISSN 1553 – 6939.. 3619-3629.

43. Papadima-Sophocleous, S., Loizides, F., 2016. Exploring the benefits and disadvantages of introducing synchronous to asynchronous online technologies to facilitate flexibility in learning. CALL Communities and Culture–short Papers From EUROCALL, pp. 363–368.

44. Papademetriou, C.; Anastasiadou, S.; Konteos, G.; Papalexandris, S. COVID-19 Pandemic: The Impact of the Social Media Technology on Higher Education. Educ. Sci. 2022, 12, 261 https://doi.org/10.3390/ educsci12040261

45. Roy, S., 2020. Education in Lockdown: Poor Internet Connectivity Shadows Online Classes, Many Students Walking to Reception Areas. The Hindustan Times. Retrieved on August 1, 2020.

46. Raghukumaran Sankar ,"Opportunities in the global education technology market by2020 ".

47. https://www.acuitykp.com/blog/digital-revolution-in-EdTech-market/

48. Sahu, P., 2020. Closure of universities due to Coronavirus Disease 2019 (COVID-19): impact on education and mental health of students and academic staff.

49. Cureus Seok, S., DaCosta, B., Kinsell, C., Tung, C.K., 2010. Comparison of instructors'and students'perceptions of the effectiveness of online courses. Q. Rev. Dist. Educ. 11 (1), 25.

50. Simon, H., Yatrakis, P., 2002. The effect of self-selection on student satisfaction and performance in online classes. Int. Rev. Res. Open Distrib. Learn. 3 (2).

51. Sloan Consortium, 2002. Quick Guide: Pillar Reference Manual. Needham, MA. Author.Retrieved August, 28, 2008.

52. Sigma Sathyan & Krishna Prasad, K. (2021). Byju's Learning App in the COVID-19 Outbreak to Analyze Online Education-A Case Study. *International Journal of Case Studies in Business, IT, and Education (IJCSBE), 5*(2), 75-86. DOI: Song, L., Singleton, E.S., Hill, J.R., Koh, M.H., 2004. Improving online learning: student perceptions of useful and challenging characteristics. Internet High. Educ. 7 (1), 59–70.

53. Teräs, Marko & Suoranta, Juha & Teräs, Hanna & Curcher, Mark. (2020). Post-Covid-19 Education and Education Technology 'Solutionism': a Seller's Market. Postdigital Science and Education. 2. 10.1007/s42438-020-00164-x.

54. Toquero, C.M., 2020. Challenges and opportunities for higher education amid the COVID-19 pandemic: the philippine context. Pedagog. Res. 5 (4).

55. UNESCO, 2020. Education: From Disruption to Recovery [online] Available at:https://en.unesco.org/covid19/educationresponse/

56. [Volery, T., Lord, D., 2000. Critical success factors in online education. Int. J. Educ. Manag.

57. Vonderwell, S., 2003. An examination of asynchronous communication experiences and perspectives of students in an online course: a case study. Internet High. Educ. 6 (1), 77–90.

58. Wikipedia contributors, 2021. Education in India. Wikipedia. April 25.

59. https://en. wikipedia.org/wiki/Education_in_India#cite_note-50.

60. **http://doi.org/10.5281/zenodo. 5205305**

61. Zee Business. "India to have 500 mn additional smartphone users by 2025, 5G subscriptions to top 2.6 bn globally: Ericsson". (November 25, 2019). https://www.zeebiz.com/technology/news-india-to-have-500-mn-additional-smartphoneusers- by-2025-5g-subscriptions-to-top-26-bn-globally-ericsson-114768